Four Decades of STCR research - Crop Wise Recommendations

AICRP on Soil Test Crop Response Correlation

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Four Decades of STCR Research - Crop Wise Recommendations

Crop -wise Index

Numbers given in the brackets are indication of number of fertilizer prescription equations developed for that crop in that particular state.

Food Grain Crops

Millets

Fodder corps

Cash Crops

Oilseeds Crops

Pulses

Horticulture crops

Vegetables crops

Fruit crops

Medicinal aromatic plants

Food Grain Crops

Crop- Wise Soil Test Based Recommendations (AICRP on STCR)

The fertilizer prescription equations developed by the AICRP centre of the project on STCR for different crops of different agro-ecological situations in different states and they are pooled and given in crop wise index given already. These fertilizer prescriptions are developed for different soils, different varieties and for different reasons. They also include IPNS based adjustment equations using different type of local available organic sources. Substitution of soil test values in the prescription equations gives us that particular fertilizer nutrient recommendations which need to be converted in to fertilizer quantity to be applied (using conversion factor).

In case of IPNS based equations, FYM composition and the rate are to be substituted in the place of FYM given in the fertilizer prescriptions. Similarly, with other type of organic sources also. The obtained quantity based on nutrient, will be applied through suitable method and time of application i.e. stage of crop. These recommendations are developed for 2-3 years initially. Exhaust crop will be taken up for bringing the uniformity in the fertility. Later, gradiant crop was taken up followed by test crop.

After harvest of crop, using the basic data and nutrient uptake, the prescription equations are developed. These equation are validated either on university farm or on farmers' fields. After seeing the yield variation they were demonstrated on farmers' fields through FLD's With the help of department of Agriculture and Cooperation, the project received One Crore (Rs.), which was used for conduct of 1000 FLD's during 1996-1998. Since, last two years under ISOPOM, project is receiving financial help regularly from New Delhi mainly for oilseeds. It is also proved that these equations are found to be for superior (>20% increasing in yield) to general recommended dose given in the past.

Ready reckoners are also developed using the target yield equations for different prevailing targets of yields and for the given available soil nutrient range. Given the soil test values and target yield, one can get fertilizer nutrient dose to be applied for that particular type of soil, variety and season. Using IPNS based equations, lesser quantity of fertilizer nutrients are to be applied. Thus, these fertilizer target yield equations would take care of fertilizer use efficiency, soil use efficiency, farmers' available resources which is not possible with other conventional methods. Thus, it is amply proved that the use of these IPNS recommendations will not only help in saving of fertilizers and improving the economy but also help in improvement of soil health. These fertilizer recommendations are grouped in two groups mainly food grain crops and horticultural crops. The varius details are as given below:

Rice

1. Andhra Pradesh (Rice), District Guntur

Name of the Centre : **Guntur (Amaravathi)**
Soil : **Black soil (Vertisols)**
Crop and variety : **Rice-Mashuri**
Season developed : ***Kharif,* 1986**
Target range : **50 q ha^{-1} – 55 q ha^{-1}**
Soil Nitrogen range : **150 – 400 kg ha^{-1}**
Soil phosphorus range : **50 -55**
Soil potassium range : **150 – 650**
FYM composition : **1%N : 0.4%P : 1.2%K**
FYM rate : **10 t ha^{-1}**
Green manure composition : **0.6%N**
Green manure rate : **10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.79 T – 0.50 SN, FP_2O_5 = 3.19 T – 3.17 SP, FK_2O = 1.60 T – 0.19 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) For yield target of					
			50 (q ha^{-1})			55 (q ha^{-1})		
KmnO$_4$ N	Olsens' P	Amm. Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
150	5	150	115	144	52	133	144	60
175	10	200	102	128	42	121	128	50
200	15	250	90	112	33	108	112	40
225	20	300	77	96	23	96	96	31
250	25	350	65	80	14	83	80	22
275	30	400	52	64	4	71	65	12
300	35	450	40	49	3	58	49	10
325	40	500	27	33	2	46	33	10
350	45	550	14	17	2	33	17	10
375	50	600	2	15	2	21	15	10
400	55	650	0	15	2	8	15	10

Verification: The above Fertilizer adjustment equations were tried on the farmers' fields in Guntur district with yield targets of 55 and 60 q ha^{-1} during *kharif* 1997 and all the yield targets could be achieved at the place tried.

Applicability

Soil Testing Laboratories : Guntur, Vijayawada and Ongole
Soil type : Black soils
Crop : Rice – high yielding varieties
Season developed : *Kharif*
Yield target : Upto 55 q ha^{-1}

Note : The above equations may be tested in soils other than black soil in the farmers' fields in above districts with three or four yield targets and pickup the best one for making recommendations.

2. **Andhra Pradesh (Rice), District Karim Nagar**

Name of the Centre	**: Jagtial**	**Soil phosphorus range**	**: 5 -55 kg ha^{-1}**
Soil	**: Inceptisols (Sandy loam)**	**Soil potassium range**	**: 100 – 600 kg ha^{-1}**
Crop and Variety	**: Rice-Pothana**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Kharif,* 1993**	**FYM rate**	**: 10 t ha^{-1}**
Target range	**: 50 q ha^{-1} – 60 q ha^{-1}**	**Green manure composition**	**: 0.6%N :**
Soil Nitrogen range	**: 150 – 400 kg ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.78 T – 0.44 SN, FP_2O_5 = 1.96 T – 2.13 SP, FK_2O = 2.96 T – 0.36 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
mnO$_4$ N	**Olsens' P**	**Amm. Ac-K**	**50 (q ha^{-1})**			**60 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	5	100	123	87	112	161	107	142
175	10	150	112	77	94	150	96	124
200	15	200	101	66	76	139	86	106
225	20	250	90	55	58	128	75	88
250	25	300	79	45	40	114	65	70
275	30	350	68	34	22	106	54	52
300	35	400	57	23	4	95	44	34
325	40	450	46	13	2	84	33	16
350	45	500	35	12	2	73	23	15
375	50	550	24	12	2	62	12	15
400	55	600	13	12	2	51	2	15

Verification: The above results are yet to be verified in the farmers' fields.

Applicability

Soil Testing Laboratories	:	Khammam, Nizamabad, Adilabad (Northern Telangana Zone)
Soil type	:	Chalka soils
Crop	:	Rice – high yielding varieties
Season developed	:	*Kharif*
Yield target	:	Upto 60 q ha^{-1}

3. Andhra Pradesh (Rice)

Name of the Centre : **Maruteru**
Soil : **Alluvial**
Crop and Variety : **Rice-MTU-2067**
Season developed : ***Kharif,* 1993 & 1994**
Target range : **50 q ha^{-1} – 60 q ha^{-1}**
Soil Nitrogen range : **150 – 400 kg ha^{-1}**
Soil phosphorus range : **5 -55 kg ha^{-1}**
Soil potassium range : **100 – 600 kg ha^{-1}**
FYM composition : **1%N : 0.4%P : 1.2%K**
FYM rate : **10 t ha^{-1}**
Green manure composition : **0.6%N :**
Green manure rate : **10 t ha^{-1}**

Fertilizer adjustment equations

FN = 2.30 T – 0.32 SN, FP_2O_5 = 1.91 T – 1.90 SP, FK_2O = 2.27 T – 0.27 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for yield target of					
mn	Olsens'	Amm.	55 (q ha^{-1})			60 (q ha^{-1})		
O_4 N	P	Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
200	10	200	63	86	71	74	96	82
225	15	250	55	77	57	66	86	69
250	20	300	47	67	44	58	77	55
275	25	350	39	58	30	50	67	42
300	30	400	31	48	17	42	58	28
325	35	450	23	39	3	34	48	15
350	40	500	15	29	2	26	39	15
375	45	550	15	20	2	18	29	15
400	50	600	15	10	2	10	20	15
425	55	650	15	10	2	2	10	15
450	60	700	15	10	2	2	10	15

Verification: The above equations are to be verified in the farmers' fields.

Applicability

Soil Testing Laboratories : Tadepalligudem, Samalkot and Vijayawada (East and West Godavari and Krishna districts)

Soil type : Alluvial (Heavy)
Crop : Rice – high yielding variety
Season developed : *Kharif*
Yield target : Upto 60 q ha^{-1}

Note : The above equations may be tested in soils other than Alluvial soil (Heavy) on the farmers' fields with three or four targets and the bet one may be picked up for making recommendations.

4. Andhra Pradesh (Rice)

Name of the Centre	**: Nandyal**	**Soil phosphorus range**	**: 10 -60 kg ha^{-1}**
Soil	**: Black soil**	**Soil potassium range**	**: 200 – 700 kg ha^{-1}**
Crop and Variety	**: Rice-MTU-5182**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Kharif,* 1987 (pooled data)**	**FYM rate**	**: 10 t ha^{-1}**
		Green manure composition	**: 0.6%N :**
Target range	**: 60 q ha^{-1} – 70 q ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**
Soil Nitrogen range	**: 150 – 400 kg ha^{-1}**		

Fertilizer adjustment equations

FN = 3.35 T – 0.33 SN, FP_2O_5 = 2.52 T – 4.53 SP, FK_2O = 1.24 T – 0.12 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**60 (q ha^{-1})**			**70 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	200	152	106	50	185	131	63
175	15	250	143	83	44	177	108	57
200	20	300	135	61	38	169	86	51
225	25	350	127	38	32	160	63	45
250	30	400	119	15	26	152	41	39
275	35	450	110	15	20	144	18	33
300	40	500	102	15	14	136	15	27
325	45	550	94	15	8	127	15	21
350	50	600	86	15	2	119	15	15
375	55	650	77	15	2	111	15	15

Verification: The above equations are to be verified in black sols of Kurnool district with yield targets of 60 and 70 q ha^{-1}. Yield targets could be achieved at the places tested.

Applicability

Soil Testing Laboratories	:	Yemmiganoor, Anantapur & Cuddapah
Soil type	:	Black soils
Crop	:	Rice – high yielding varieties
Season developed	:	*Kharif*
Yield target	:	Upto 70 q ha^{-1}

Note : For adoption in soils other than black soils in the above districts, it is better to test on the farmers' fields with three or four targeted yields and pick up the best one among them for making recommendations.

5. **Andhra Pradesh (Rice)**

Name of the Centre	**: Nellore**	**Soil Nitrogen range**	**: 150 – 350 kg ha^{-1}**
Soil	**: Sandy clay loam (Alluvial)**	**Soil phosphorus range**	**: 10 -50 kg ha^{-1}**
		Soil potassium range	**: 150 – 550 kg ha^{-1}**
Crop and Variety	**: Rice-NLR-9672**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Kharif,* 1995 & 1994 (pooled data)**	**FYM rate**	**: 10 t ha^{-1}**
		Green manure composition	**: 0.6%N :**
Target range	**: 45 q ha^{-1} – 50 q ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.47 T – 0.37 SN, FP_2O_5 = 2.53 T – 2.12 SP, FK_2O = 1.89 T – 0.20 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
mnO_4 N	**Olsens' P**	**Amm. Ac-K**	**45 (q ha^{-1})**			**50 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	101	93	55	118	105	65
175	15	200	91	82	45	109	95	55
200	20	250	82	71	35	100	84	45
225	25	300	73	61	25	90	74	35
250	30	350	64	50	15	81	63	25
275	35	400	54	40	5	72	52	15
300	40	450	45	29	5	63	42	5
325	45	50	36	18	5	53	31	5
350	50	550	27	8	5	44	20	5

Verification: The above equations are to be verified on the farmers' fields of Nellore district with yield targets of 45 and 50 q ha^{-1} and in Prakasam district with yield targets of 55 and 60 q ha-1 during *kharif,* 1997. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories : Nellore, Ongole, Tirupati and Cuddapah

Soil type : Sandy clay loam

Crop : Rice – high yielding varieties

Season developed : *Kharif*

Yield target : Upto 50 q ha^{-1}

Note : The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

6. Andhra Pradesh (Rice)

Name of the Centr	**: Rajendranagar**	**Soil phosphorus range**	**: 10 -60 kg ha^{-1}**
Soil	**: Light black soil (Sandy clay)**	**Soil potassium range**	**: 150 – 650 kg ha^{-1}**
Crop and Variety	**: Rice-Tellahamsa**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Kharif,* 1979, 1980,**	**FYM rate**	**: 10 t ha^{-1}**
	1981 & 1982 (pooled data)	**Green manure composition**	**: 0.6%N :**
Target range	**: 50 q ha^{-1} – 55 q ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**
Soil nitrogen range	**: 150 – 400 kg ha^{-1}**		

Fertilizer adjustment equations

FN = 4.20 T – 0.55 SN, FP_2O_5 = 2.70 T – 2.67 SP, FK_2O = 2.22 T – 0.21 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**50 (q ha^{-1})**			**55 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	128	108	80	149	122	91
175	15	200	114	95	69	135	108	80
200	20	250	100	82	59	121	94	70
225	25	300	86	68	48	108	81	59
250	30	350	73	55	38	94	67	49
275	35	400	59	41	27	80	53	38
300	40	450	45	28	17	66	39	28
325	45	500	31	15	6	53	26	17
350	50	550	18	2	5	39	12	7
375	55	600	4	--	5	25	10	7
400	60	650	4	--	5	12	10	7

Verification: The above fertilizer adjustment equations were tested on the farmers' fields of Ranga Reddy district (Black and Chalka sols) during *kharif,* 1983 with yield targets 50 and 55 q ha^{-1} and on the farmers' fields of Nalgonda district (Chalka soils) with yield targets of 55 and 65 q ha^{-1} during *kharif,* 1997. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories	:	Rajendranagar, Jadcherla, Sanga Reddy and Nalgonda
Soil type	:	Black and light soils
Crop	:	Rice
Season developed	:	*Kharif*
Yield target	:	Upto 50 q ha^{-1} in Ranga Reddy district, upto and 55 q ha^{-1} in Nalgonda district

Note : The above equations may be verifed in Mahaboobnagar and Medak districts with two or three yield targets and pick up the best one for making recommendations.

7. Andhra Pradesh (Rice)

Name of the Centre	**: Warangal**	**Soil phosphorus range**	**: 10 -60 kg ha^{-1}**
Soil	**: Black soil (Vertisol)**	**Soil potassium range**	**: 150 – 650 kg ha^{-1}**
Crop and Variety	**: Rice-Pothana**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Kharif,* 1988**	**FYM rate**	**: 10 t ha^{-1}**
Target range	**: 50 q ha^{-1} – 55 q ha^{-1}**	**Green manure composition**	**: 0.6%N :**
Soil nitrogen range	**: 150 – 400 kg ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 4.75 T – 0.75 SN, FP_2O_5 = 2.75 T – 4.20 SP, FK_2O = 1.99T – 0.15 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient m(kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**50 (q ha^{-1})**			**55 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	125	96	77	149	109	87
175	15	200	106	75	70	130	88	79
200	20	250	88	54	62	111	67	72
225	25	300	69	33	55	93	46	64
250	30	350	50	12	48	74	25	57
275	35	400	31	10	40	55	4	49
300	40	450	12	10	33	36	2	42
325	45	500	10	10	25	17	2	34
350	50	550	10	10	18	15	2	27
375	55	600	10	10	10	15	2	19
400	60	650	10	10	3	15	2	12

Verification: The above fertilizer adjustment equations were verified on the on the farmers' fields of Warangal district for 55 and 60 q ha^{-1} yield targets. All the yield targets could be obtained at the places tested.

Applicability

Soil Testing Laboratories : Warangal, Karimnagar, Nizamabad, Adilabad

Soil type : Black soils
Crop : Rice-high yield varieties
Season developed : *Kharif*
Yield target : Upto 55 q ha^{-1}

Note : Equations may be tested in Karimnagar, Nizamabad and Adilabad districts under submerged condition.

8. Andhra Pradesh (Rice)

Name of the Centre	**: Nandyal**	**Soil phosphorus range**	**: 10 -50 kg ha^{-1}**
Soil	**: Black soil**	**Soil potassium range**	**: 200 – 600 kg ha^{-1}**
Crop and Variety	**: Rice-Tellahamsa**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Rabi,* 1984**	**FYM rate**	**: 10 t ha^{-1}**
Target range	**: 50 q ha^{-1} – 55 q ha^{-1}**	**Green manure composition**	**: 0.6%N :**
Soil nitrogen range	**: 150 – 350 kg ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 2.83 T – 0.32 SN, FP_2O_5 = 2.29 T – 2.98 SP, FK_2O = 1.34 T – 0.17 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**50 (q ha^{-1})**			**55 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	200	122	108	46	150	131	60
175	15	250	114	93	38	142	116	51
200	20	300	106	78	29	134	101	43
225	25	350	98	63	21	126	86	34
250	30	400	90	48	12	118	71	26
275	35	450	82	33	4	110	56	17
300	40	500	74	18	0	102	41	8
325	45	550	66	3	--	94	26	0
350	50	600	58	--	--	86	11	--

Verification: The above results were verified in black soils of Kurnool district with yield targets of 60 and 70 q ha-1. All the yield targets could be attained at all the places tested.

Applicability

Soil Testing Laboratories	:	Yemmiganoor, Anantapur & Cuddapah
Soil type	:	Black soils
Crop	:	Rice-high yield varieties
Season developed	:	*Rabi*
Yield target	:	Upto 70 q ha^{-1}

Note :For adoption in soils other than black soils in the above districts, it is better to test in the farmers' fields with three or four yield targets and pick up the best one foradoption.

9. **Andhra Pradesh (Rice)**

Name of the Centre : **Nellore**
Soil : **Alluvial soils (Sandy loam)**
Crop and Variety : **Rice-NLR 33057**
Season developed : ***Rabi,* 1994-95**
Target range : **45 q ha^{-1} – 50 q ha^{-1}**
Soil nitrogen range : **150 – 400 kg ha^{-1}**
Soil phosphorus range : **10 -60 kg ha^{-1}**
Soil potassium range : **150 – 650 kg ha^{-1}**
FYM composition : **1%N : 0.4%P : 1.2%K**
FYM rate : **10 t ha^{-1}**
Green manure composition : **0.6%N :**
Green manure rate : **10 t ha^{-1}**

Fertilizer adjustment equations

FN = 4.53 T – 0.51 SN, FP_2O_5 = 2.12 T – 2.06 SP, FK_2O = 2.35 T – 0.21 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			45 (q ha^{-1})			**50 (q ha^{-1})**		
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	127	75	74	150	85	86
175	15	200	115	65	64	137	75	76
200	20	250	102	54	53	125	65	65
225	25	300	89	44	43	112	55	55
250	30	350	76	34	32	99	44	44
275	35	400	64	23	22	86	34	34
300	40	450	51	13	12	74	24	23
325	45	50	38	3	2	61	13	13
350	50	550	25	2	2	48	3	2
375	55	600	12	2	2	35	2	
400	60	650	12	2	2	35	2	2

Verification: The above equation was tested on the farmers' fields with yield targets of 45 and 50 q ha^{-1} in Nellore district and 50 and 55 q ha^{-1} in Chittoor district during *Rabi* 1996-97. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories : Nellore, Chittoor, Cuddapah and Prakasam
Soil type : Sandy clay loam
Crop : Rice-high yield varieties
Season developed : *Rabi*
Yield target : Upto 50 q ha^{-1}

Note : The above equations may be tested in soils other than sandy clay loam with three or four targets yield and pickup the best one for making recommendations.

10. **Andhra Pradesh (Rice)**

Name of the Centre : **Maruteru**
Soil : **Alluvial**
Crop and Variety : **Rice-IR-64**
Season developed : ***Rabi,* 1993-94**
Target range : **70 q ha^{-1} – 80 q ha^{-1}**
Soil nitrogen range : **200 – 450 kg ha^{-1}**
Soil phosphorus range : **10 -60 kg ha^{-1}**
Soil potassium range : **200 – 700 kg ha^{-1}**
FYM composition : **1%N : 0.4%P : 1.2%K**
FYM rate : **10 t ha^{-1}**
Green manure composition : **0.6%N :**
Green manure rate : **10 t ha^{-1}**

Fertilizer adjustment equations

FN = 2.65 T – 0.28 SN, FP_2O_5 = 2.00 T – 2.16 SP, FK_2O = 1.96 T – 0.21 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for yield target of					
			70 (q ha^{-1})			80 (q ha^{-1})		
Kmn O_4 N	Olsens' P	Amm. Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
200	10	200	130	118	95	156	138	115
225	15	250	123	108	85	149	128	101
250	20	300	116	97	74	142	117	94
275	25	350	109	86	64	135	106	85
300	30	400	102	75	53	128	95	75
325	35	450	95	64	43	121	84	66
350	40	500	88	54	32	114	74	56
375	45	550	81	43	22	107	63	47
400	50	600	74	32	11	100	52	37
425	55	650	67	21	10	93	41	28
450	60	700	60	10	10	86	30	18

Verification: The above equations were tested on the farmers' fields of West Godavari district with yield targets of 60 and 70 q ha^{-1} during *rabi,* 1996-97. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories : Tadepalligudem, Samarlakota and Vijayawada (East and West Godavari and Krishna district)
Soil type : Alluvial soils
Crop : Rice
Season developed : *Rabi*
Yield target : Upto 80 q ha^{-1}

Note : The above equations may be tested in East Godavari and Krishna districts and in soils other than alluvial at two or three targets and select the best one for making recommendations.

11. **Andhra Pradesh (Rice)**

Name of the Centre	**: Rajendranagar**	**Soil phosphorus range**	**: 10 -60 kg ha^{-1}**
Soil	**: Chalka soils**	**Soil potassium range**	**: 150 – 650 kg ha^{-1}**
Crop and Variety	**: Rice-Tellahamsa**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Rabi,* 1979-80**	**FYM rate**	**: 10 t ha^{-1}**
Target range	**: 70 q ha^{-1} – 80 q ha^{-1}**	**Green manure composition**	**: 0.6%N :**
Soil nitrogen range	**: 150 – 400 kg ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.23 T – 0.26 SN, FP_2O_5 = 1.51 T – 1.80 SP, FK_2O = 1.65 T – 0.16 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**70 (q ha^{-1})**			**80 (q ha^{-1})**		
			N	**P_2O**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	139	65	67	155	73	75
175	15	200	132	56	59	148	64	67
200	20	250	126	47	51	142	55	59
225	25	300	119	38	43	135	46	51
250	30	350	113	29	35	129	37	43
275	35	400	106	20	27	122	28	35
300	40	450	100	11	19	116	19	27
325	45	500	93	2	11	109	10	19
350	50	550	87	2	3	103	1	11
375	55	600	80	2	2	96	2	3
400	60	650	74	2	2	90	2	2

Verification: The above equations were tested on the farmers' fields of Ranga Reddy district with yield targets of 50 and 60 q ha^{-1} during *rabi,* 1984-85. The yield targets could be achieved at the places tested.

Applicability

Soil Testing Laboratories : Rajendranagar, Miryalaguda, Jadcherla and Sanga Reddy

Soil type : Chalka soils
Crop : Rice-high yielding varieties
Season : *Rabi*
Yield target : Upto 60 q ha^{-1}

Note : The above equations may be tested in Nalgonda, Mahaboobnagar and Medak districts also and in soils other than chalka soils at 2 or 3 yield levels. The best one may be adopted for making recommendations.

12. Andhra Pradesh (Rice)

Name of the Centre	**: Rajendranagar**	**Soil nitrogen range**	**: 150 – 400 kg ha^{1}**
Soil	**: Light Black Soil (Sandy clay)**	**Soil phosphorus range**	**: 10 -60 kg ha^{-1}**
		Soil potassium range	**: 150 – 650 kg ha^{-1}**
Crop and Variety	**: Rice-Tellahamsa**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Rabi,* 1979-80, 1980-81 & 1981-82**	**FYM rate**	**: 10 t ha^{-1}**
		Green manure composition	**: 0.6%N :**
Target range	**: 60 q ha^{-1} – 70 q ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.58 T – 0.57 SN, FP_2O_5 = 1.71 T – 2.46 SP, FK_2O = 1.48 T – 0.16 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			60 (q ha^{-1})			**70 (q ha^{-1})**		
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	129	78	65	165	95	80
175	15	200	115	66	57	151	83	72
200	20	250	101	53	49	137	71	64
225	25	300	87	41	41	122	58	56
250	30	350	72	29	33	108	46	48
275	35	400	58	17	25	94	34	40
300	40	450	44	4	15	80	21	32
325	45	500	30	2	7	65	9	24
350	50	550	15	2	5	51	9	16
375	55	600	10	2	5	37	9	8
400	60	650	10	2	5	23	9	8

Verification: The above fertilizer adjustment equations were tested on the farmers' fields of Ranga Reddy district (black and sandy clay loam) with yield targets of 60 and 70 q ha^{-1} during *Rabi,* 1996-97 and in Mahaboobnagar district (Sandy clay loam) with yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories	:	Rajendranagar, Miryalaguda, Jadcherla and Sanga Reddy
Soil type	:	Black soil (Light & Heavy)
Crop	:	Rice
Season	:	*Rabi*
Yield target	:	Upto 70 q ha^{-1}

Note : The above equations may be tested in Nalgonda and Medak districts also.

13. **Andhra Pradesh (Rice)**

Name of the Centre : Warangal
Soil : Black Soils
Crop and Variety : Rice-Pothana
Season developed : *Rabi,* 1988-89
Target range : 55 q ha^{-1} – 60 q ha^{-1}
Soil nitrogen range : 150 – 400 kg ha^{1}
Soil phosphorus range: 10 -60 kg ha^{-1}
Soil potassium range : 150 – 650 kg ha^{-1}
FYM composition : 1%N : 0.4%P : 1.2%K
FYM rate : 10 t ha^{-1}
Green manure composition : 0.6%N :
Green manure rate : 10 t ha^{-1}

Fertilizer adjustment equations

FN = 3.97 T – 0.50 SN, FP_2O_5 = 2.65 T – 3.52 SP, FK_2O = 1.51 T – 0.08 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for yield target of					
			55 (q ha^{-1})			60 (q ha^{-1})		
Kmn O_4 N	Olsens' P	Amm. Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
150	10	150	143	111	64	163	124	79
175	15	200	130	93	60	151	106	75
200	20	250	118	75	56	138	87	71
225	25	300	106	58	52	126	71	67
250	30	350	93	40	48	113	53	63
275	35	400	81	23	44	101	36	59
300	40	450	68	5	40	88	18	55
325	45	500	56	5	36	76	15	51
350	50	550	43	5	32	63	15	47
375	55	600	31	5	28	51	15	43
400	60	650	18	5	24	38	15	39

Verification: The above equations were tested on the farmers' fields of Warangal and Karimnagar in both black and chalka soils with yield targets of 55 and 60 q ha^{-1} in Karimnagar district and 60 and 70 q ha^{-1} in Warangal district during *Rabi,* 1996-97 season. All the yield targets were attained at the places tested.

Applicability

Soil Testing Laboratories : Warangal, Karimnagar, Nizamabad and Adilabad
Soil type : Black and Chalka Soils
Crop : Rice-high yielding varieties
Season : *Rabi*
Yield target : Upto 60 q ha^{-1} target in light and black soils

Note : The equations area to be tested in Nizamabad and Adilabad districts under submerged conditions.

14. Andhra Pradesh (Rice)

Name of the Centre : **Nellore**
Soil : **Sandy clay loam (Alluvial)**
Crop and Variety : **Rice-NLR-9672**
Season developed : ***Kharif,* 1995 & 1994 (pooled data)**
Target range : **80 q ha^{-1}**
Soil nitrogen range : **120 – 240 kg ha^{-1}**
Soil phosphorus range : **10 -40 kg ha^{-1}**
Soil potassium range : **150 – 300 kg ha^{-1}**
FYM composition : **1%N : 0.4%P : 1.2%K**
FYM rate : **10 t ha^{-1}**
Green manure composition : **0.6%N :**
Green manure rate : **10 t ha^{-1}**

Fertilizer adjustment equations

N = 3.43 T – 1.45 SN- 0.70 FYM N

FP_2O_5 = 1.30 T – 4.83 SP- 0.43 FYM P

FK_2O = 1.93 T – 0.56 SK- 0.104 FYM K

FN = 3.43 T – 1.45 SN- 0.65 GM N

FP_2O_5 = 1.30 T – 4.83 SP- 0.38 GM P

FK_2O = 1.93 T – 0.56 SK- 0.14 GM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for production of 80 q ha^{-1}								
Kmn O_4-N	Olsen -P	AmmA oc-K	Only Chemical fert.			With Fym @ 10 t ha^{-1}			With green manure @ 10 t ha^{-1}		
			N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
120	10	150	100	56	70	65	45	70	61	50	57
140	15	175	71	32	56	36	21	56	32	26	53
160	20	200	42	7	42	7	0	42	3	2	39
180	25	225	13	0	28	0		28	0	0	25
200	30	250	10		14			14			11
220	35	275	10								
240	40	300	10								

Verification: The above equations were verified on the farmers' fields of Nellore district with yield targets of 70 and 80 q ha^{-1} and in Prakasam district with yield targets of 60 and 65 q ha-1 during *kharif,* 1997, 1998 and 1999. The yield targets were attained at most of the places tested.

Applicability

Soil Testing Laboratories : Nellore, Ongole, Tirupati and Cuddapah
Soil type : Alluvial soils and Sandy clay loam soils
Crop and variety : Rice – high yielding varieties
Season developed : *Kharif*
Yield target : Up to 70-80 q ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

15. **Andhra Pradesh (Rice)**

Name of the Centre : **Nellore**
Soil : **Sandy clay loam (Alluvial)**
Crop and Variety : **Rice-NLR-9672**
Season developed : ***Kharif*, 1995 & 1994 (pooled data)**
Target range : **80 q ha^{-1}**
Soil nitrogen range : **120 – 200 kg ha^{-1}**
Soil phosphorus range : **10 -30 kg ha^{-1}**
Soil potassium range : **150 – 520 kg ha^{-1}**
FYM composition : **1%N : 0.4%P : 1.2%K**
FYM rate : **10 t ha^{-1}**
Green manure composition : **0.6%N :**
Green manure rate : **10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.47 T – 0.37 SN- 0.19 FYM N
FP_2O_5 = 2.53 T – 2.12 SP- 0.97 FYM P
FK_2O = 1.89 T – 0.20 SK- 0.05 FYM K

FN = 3.47 T – 0.37 SN- 0.70 GM N
FP_2O_5 = 2.53 T – 2.12 SP- 0.48 GM P
FK_2O = 1.89 T – 0.20 SK- 0.04 GM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 80 q ha^{-1}**								
Kmn O_4-N	**Olsen -P**	**AmmA oc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With green manure 10 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	10	150	100	43	51	30	17	48	64	15	49
140	15	175	71	19	37	1	0	34	35	0	35
160	20	200	42	0	23	0		20	6		21
180	25	225	13		9			5	0		7
200	30	250	0		0			0			0

Applicability

Soil Testing Laboratories : Nellore, Ongole, Tirupati and Cuddapah
Soil type : Alluvial soils and Sandy clay loam soils
Crop : Rice – high yielding varieties
Season developed : *Kharif*
Yield target : Up to 70-80 q ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

16. Andhra Pradesh (Rice)

Name of the Centre : **Nandyal**
Soil : **Vertisol (Clay)**
Crop and Variety : **Rice- MTV 5182**
Season developed : ***Kharif,* 1989 & 1990 and modified in 1999 & 2000**
Target range : **60 q ha^{-1}**
Soil nitrogen range : **120 – 340 kg ha^{-1}**
Soil phosphorus range : **10 -65 kg ha^{-1}**
Soil potassium range : **150 – 425 kg ha^{-1}**
FYM composition : **1%N : 0.4%P : 1.2%K**
FYM rate : **10 t ha^{-1}**
Green manure composition :
Green manure rate : **10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.36 T – 0.33 SN- 0.74 FYM N
FP_2O_5 = 2.53 T – 4.53 SP- 0.81 FYM P
FK_2O = 1.42 T – 0.12 SK- 0.15 FYM K

FN = 3.36 T – 0.33 SN- 1.62 GLM N
FP_2O_5 = 2.53 T – 4.53 SP- 1.30 GLM P
FK_2O = 1.42 T – 0.12 SK- 1.09 GLM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 60 q ha^{-1}**								
Kmn O_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With green manure @ 10 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	10	150	162	107	54	88	74	36	120	99	51
140	15	175	155	84	48	81	51	3	113	77	46
160	20	200	149	61	43	75	29	25	107	54	40
180	25	225	142	39	38	68	6	20	100	31	35
200	30	250	136	16	33	62	0	15	94	9	30
220	35	275	129	10	27	55		9	87	0	25
240	40	300	122	10	22	48		4	80		19
260	45	325	116	10	17	42		0	74		14
280	50	350	109	10	12	35			67		
300	55	375	103			29			61		
320	60	400	96			22			54		
340	65	425	89			15			47		

Verification: The above equations were verified on the farmers' fields of Nandyal, Kurnool district with yield targets of 55 and 60 q ha^{-1} during *kharif,* 1997. and 1998. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories : Nandyal, Ongole, Kurool and Cuddapah

Soil type : Clay, Clay Loam, Sandy clay loam
Crop : Rice – high yielding varieties
Season developed : *Kharif*
Yield target : Up to 70 q ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

17. Andhra Pradesh (Rice)

Name of the Centre	**: Nandyal**	**Soil phosphorus range**	**: 10 -75 kg ha^{-1}**
Soil	**: Vertisol (Clay)**	**Soil potassium range**	**: 150 – 475 kg ha^{-1}**
Crop and Variety	**: Rice-MTU-5182**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Kharif*, 1999 & 2000**	**FYM rate**	**: 10 t ha^{-1}**
Target range	**: 70 q ha^{-1}**	**Green manure composition**	**:**
Soil nitrogen range	**: 120 – 380 kg ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.36 T – 0.33 SN- 0.74 FYM N

FP_2O_5 = 2.53 T – 4.53 SP- 0.81 FYM P

FK_2O = 1.42 T – 0.12 SK- 0.15 FYM K

FN = 3.36 T – 0.33 SN- 1.62 GLM N

FP_2O_5 = 2.53 T – 4.53 SP- 1.30 GLM P

FK_2O = 1.42 T – 0.12 SK- 1.09 GLM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 70 q ha^{-1}**								
Kmn O_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With green manure @ 10 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	10	150	196	132	68	163	124	49	128	126	51
140	15	175	189	109	63	157	101	46	122	103	48
160	20	200	182	87	57	150	78	43	115	80	45
180	25	225	176	64	52	143	56	40	109	58	42
200	30	250	169	41	47	137	33	37	102	3	39
220	35	275	163	19	42	130	10	34	95	12	36
240	40	300	156	0	36	124	0	31	89	0	33
260	45	325	149		31	117		28	82		30
280	50	350	143		26	110		25	76		27
300	55	375	136		21	104		22	69		24
320	60	400	130		15	97		19	62		21
340	65	425	123		10	91		16	56		18
360	70	450	116			84		13	49		15
380	75	475	110			77		10	43		12

Verification: The above equations were verified on the farmers' fields of Nandyal, Kurnool district with yield targets of 55 and 60 q ha^{-1} during *kharif, 2000*. and 2001. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories : Nandyal, Ongole, Kurool and Cuddapah

Soil type : Clay, Clay Loam, Sandy clay loam
Crop : Rice – high yielding varieties
Season developed : *Kharif*
Yield target : Up to 70 q ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

18. Andhra Pradesh (Rice)

Name of the Centre	**: Rajendranagar**	**Soil nitrogen range**	**: 120 – 340 kg ha^{-1}**
Soil	**: Sandy clay loam (Tropaquept)**	**Soil phosphorus range**	**: 10 -65 kg ha^{-1}**
		Soil potassium range	**: 150 – 425 kg ha^{-1}**
Crop and Variety	**: Rice-Tella hamsa**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
Season developed	**: *Kharif,* 1981 & 1982 modified in 1989 & 1990**	**FYM rate**	**: 10 t ha^{-1}**
		Green manure composition	**: 1.3%**
Target range	**: 70 q ha^{-1}**	**Green manure rate**	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 4.20 T – 0.55 SN- 0.74 FYM N

FP_2O_5 = 2.7 T – 2.67 SP- 0.81 FYM P

FK_2O = 2.22 T – 0.21 SK- 0.15 FYM K

FN = 4.20 T – 0.55 SN- 1.62 GLM N

FP_2O_5 = 2.7 T – 2.67 SP- 1.30 GLM P

FK_2O = 2.22 T – 0.21 SK- 1.09 GLM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients(kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 60 q ha^{-1}**								
Kmn O_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With green manure @ 10 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	10	150	186	135	102	112	115	84	90	96	97
140	15	175	175	122	96	101	102	78	79	82	91
160	20	200	164	109	91	90	88	73	68	69	86
180	25	225	153	95	86	79	75	68	57	56	81
200	30	250	142	82	81	68	62	63	46	42	76
220	35	275	131	69	75	57	48	57	35	29	70
240	40	300	120	55	70	46	35	52	24	15	65
260	45	325	109	43	65	35	21	47	13	2	60
280	50	350	98	29	60	24	8	42	2	0	55
300	55	375	87	15	54	13	0	36			49
320	60	400	76	2	49			31			44
340	65	425	65	0	44			26			39

Verification: The above equations were verified on the farmers' fields of Rajendranagar, Raga Reddy district with yield targets of 55 and 60 q ha^{-1} during *kharif,* 1997. and 1998. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories : Raga Reddy and Mahabubnagar districts

Soil type : Clay, Clay Loam, Sandy clay loam
Crop : Rice – high yielding varieties
Season developed : *Kharif*
Yield target : Up to 60 – 70 q ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

19. Andhra Pradesh (Rice)

Name of the Centre : **Rudrur, Nizamabad**
Soil : **Vertisols**
Crop and Variety : **Rice**
Season developed : ***Kharif,* 1984 & 1985 modified in 1992 & 1993**
Target range : **60 q ha^{-1}**

Soil nitrogen range : **120 – 400 kg ha^{-1}**
Soil phosphorus range : **10 -80 kg ha^{-1}**
Soil potassium range : **150 – 500 kg ha^{-1}**
FYM composition : **1%N : 0.4%P : 1.2%K**
FYM rate : **10 t ha^{-1}**
Green manure composition :
Green manure rate : **10 t ha^{-1}**

Fertilizer adjustment equations

FN = 3.79 T – 0.50 SN- 0.43 FYM N
FP_2O_5 = 3.19 T – 3.17 SP- 0.34 FYM P
FK_2O = 1.60 T – 0.19 SK- 0.24 FYM K

FN = 3.79 T – 0.50 SN- 0.94 GLM N
FP_2O_5 = 3.19 T – 3.17 SP- 1.38 GLM P
FK_2O = 1.60 T – 0.19 SK- 1.38 GLM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 60 q ha^{-1}**								
Kmn O_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With green manure @ 10 t ha^{-1}**		
			N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
120	10	150	167	160	68	124	139	56	85	129	58
140	15	175	157	144	63	114	123	51	75	113	53
160	20	200	147	128	58	104	108	46	65	98	48
180	25	225	137	112	53	94	92	41	55	82	44
200	30	250	127	96	49	84	76	37	45	66	39
220	35	275	117	80	44	74	60	32	35	50	34
240	40	300	107	65	39	64	44	27	25	34	29
260	45	325	97	49	34	54	28	22	15	18	25
280	50	350	87	33	30	44	13	18	5	3	20
300	55	375	77	17	25	34	0	13	0	0	15
320	60	400	67	1	20	24					10
340	65	425	57	0	15	14					
360	70	450	47		11						
380	75	475	37		6						
400	80	500	27		1						

Verification: The above equations were verified on the farmers' fields of Rajendranagar, Raga Reddy district with yield targets of 55 and 60 q ha^{-1} during *kharif,* 1997. and 1998. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories : Raga Reddy and Mahabubnagar districts
Soil type : Clay, Clay Loam, Sandy clay loam
Crop : Rice – high yielding varieties
Season developed : *Kharif*
Yield target : Up to 60 – 70 q ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

20. Andhra Pradesh (Rice)

Name of the Centre	**: Maruteru, EastGodavari district**	**Soil nitrogen range**	**: 120 – 400 kg ha^{-1}**
Soil	**: Alluvial**	**Soil phosphorus range**	**: 10 -80 kg ha^{-1}**
Crop and Variety	**:Rice-MTU-2067**	**Soil potassium range**	**: 150 – 500 kg ha^{-1}**
Season developed	**: *Kharif,* 1993 & 1994 modified in 1995 & 1996**	**FYM composition**	**: 0.7N%**
		FYM rate	**: 10 t ha^{-1}**
Target range	**: 70 q ha^{-1}**	**Green manure composition**	**:**
		Green manure rate	**: 10 t ha^{-1}**

Fertilizer adjustment equations

FN = 2.30 T – 0.32 SN- 0.74 FYM N
FP_2O_5 = 1.91 T – 1.90 SP- 0.36 FYM P
FK_2O = 2.27 T – 0.27 SK- 0.29 FYM K

FN = 2.30 T – 0.32 SN- 0.57 GLM N
FP_2O_5 = 1.91 T – 1.90 SP- 2.43 GLM P
FK_2O = 2.27 T – 0.27 SK- 1.35 GLM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 70 q ha^{-1}**								
Kmn O_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With green manure @ 10 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	10	150	123	115	118	71	93	87	60	76	109
140	15	175	116	105	112	64	84	80	53	66	102
160	20	200	110	96	105	58	74	73	47	57	95
180	25	225	103	86	98	52	65	66	41	47	89
200	30	250	97	77	91	45	55	60	34	38	82
220	35	275	91	67	85	39	46	53	28	28	75
240	40	300	84	58	78	32	36	46	21	19	68
260	45	325	78	48	71	26	27	39	15	9	62
280	50	350	71	39	64	20	17	33			55
300	55	375	65	29	58	13	8	26			48
320	60	400	59	20	51	7		19			41
340	65	425	52	10	44	0		12			35
360	70	450	46	1	37			5			28
380	75	475	39	0	31			0			21

Verification: The above equations were verified on the farmers' fields of Maruteru Tadepalligudem, East Godavari district with yield targets of 55 and 60 q ha^{-1} during *kharif,*

16. and 1998. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories	:	East Godavari district in Krishna Godavari Zone
Soil type	:	Alluvial
Crop	:	Rice –MTU-2067
Season developed	:	*Kharif*
Yield target	:	Up to 70 – 80 q ha^{-1}

Note: The above equations may be tested in soils other than Alluvial in the farmers' fields with three or four targets and pick up the best one for making recommendations in Krishna Godavari zone.

21. Andhra Pradesh (Rice)

Name of the Centre : Warangal
Soil : Vertisol
Crop and Variety : Rice-Pothana
Season developed : *Kharif*, 1988 & 1989
modified in 1995 & 1996
Target range : 60 q ha^{-1}

Soil nitrogen range : 120 – 400 kg ha^{-1}
Soil phosphorus range : 10 -80 kg ha^{-1}
Soil potassium range : 150 – 500 kg ha^{-1}
FYM composition : 1%N : 0.4%P : 1.2%K
FYM rate : 10 t ha^{-1}
Green manure composition : 0.75%N
Green manure rate : 10 t ha^{-1}

Fertilizer adjustment equations

FN = 4.75 T – 0.75 SN- 0.76 FYM N
FP_2O_5 = 2.75 T – 4.20 SP- 0.34 FYM P
FK_2O = 1.99 T – 0.15 SK- 0.34 FYM K

FN = 4.75 T – 0.75 SN- 1.45 GLM N
FP_2O_5 = 2.75 T – 4.20 SP- 2.51 GLM P
FK_2O = 1.99 T – 0.15 SK- 1.31 GLM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for production of 60 q ha^{-1}								
Kmn O_4-N	Olsen-P	Amm Aoc-K	Only Chemical fert.			With Fym @ 10 t ha^{-1}			With green manure @ 10 t ha^{-1}		
			N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
120	10	150	195	123	97	119	102	73	86	85	88
140	15	175	180	102	93	104	81	69	71	64	84
160	20	200	165	81	89	89	60	66	56	43	80
180	25	225	150	60	86	74	39	62	41	22	76
200	30	250	135	39	82	59	18	58	26	1	73
220	35	275	120	18	78	44	0	54	11	0	69
240	40	300	105	0	74	29		51	0		65
260	45	325	90		71	14		47			61
280	50	350	75		67	0		43			58
300	55	375	60		63			39			54
320	60	400	45		59			36			50
340	65	425	30		56			32			46
360	70	450	15		52			28			43
380	75	475	0		48			24			39
400	80	500			44			21			35

Verification: The above equations were verified on the farmers' fields of Warangal and Karimnagar districts with yield targets of 55 and 60 q ha^{-1} during *kharif,* 1998. and 1999. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories : Warangal district in North Telangana Zone

Soil type : Vertisol
Crop : Rice –Pothana
Season developed : *Kharif*
Yield target : Up to 60 – 70 q ha^{-1}

Note: The above equations may be tested in soils other than Clay soils in the farmers' fields with three or four targets and pick up the best one for making recommendations in North Telangana zone.

22. Andhra Pradesh (Rice)

Name of the Centre	**: Jagtityal, Karimnagar district**	**Soil nitrogen range**	**: 120 – 400 kg ha^{-1}**
Soil	**: Inceptisols (Sandy Loam)**	**Soil phosphorus range**	**: 10 -60 kg ha^{-1}**
Crop and Variety	**: Rice-Pothana**	**Soil potassium range**	**: 150 – 650 kg ha^{-1}**
Season developed	**: *Kharif,* 1993 & 1994 modified in 1996 & 1997**	**FYM composition**	**: 1%N : 0.4%P : 1.2%K**
		FYM rate	**: 10 t ha^{-1}**
Target range	**: 40 q ha^{-1} – 50 q ha^{-1}**	**Green manure composition**	**:**
		Green manure rate	**: 10 t ha^{-1}**

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 60 q ha^{-1}**								
Kmn O_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With green manure @ 10 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	10	150	174	96	124	96	72	74	79	66	110
140	15	175	165	86	115	87	61	65	70	55	101
160	20	200	156	75	106	78	50	56	61	44	92
180	25	225	148	64	97	70	40	47	52	34	83
200	30	250	139	54	88	61	29	38	44	23	74
220	35	275	130	43	79	52	18	29	35	12	65
240	40	300	121	32	70	43	8	20	26	2	56
260	45	325	112	22	61	34	0	11	17	0	47
280	50	350	104	11	52	26					38
300	55	375	95		43	17					29
320	60	400	86		34						20
340	65	425	77		25						11
360	70	450	68		16						2
380	75	475	60		7						0
400	80	500	51		0						

Verification: The above equations were verified on the farmers' fields of Jagtiyal, Karimnagar in Karimnagar district with yield targets of 55 and 60 q ha^{-1} during *kharif,* 1998 and 1999. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories	:	Karimnagar district in Southern Telangana Zone
Soil type	:	Inceptisol
Crop	:	Rice –Pothana
Season developed	:	*Kharif*
Yield target	:	Up to 60 – 70 q ha^{-1}

Note: The above equations may be tested in soils other than Sandy loam of Inceptisol in the farmers' fields with three or four targets and pick up the best one for making recommendations in North Telangana zone.

1. Himachal Pradesh (Rice)

Name of the centre	**: CSK HPKV, Palampur**	**Soil phosphorus range**	**: 5-50 kg/ha**
Soil	**: Alfisol, Entisol, Inceptisol**	**Soil potassium range**	**: 50-250 kg/ha**
Crop & Variety	**: Rice**	**FYM composition**	**: -**
Season developed	**: Kharif**	**FYM rate**	**: -**
Target range	**: 40 q ha^{-1}**	**Green manure composition**	**: -**
Soil Nitrogen range	**: 200-600 kg/ha**	**Green manure rate**	**: -**
Areas of Applicability	**: Parts of Kangra, Kullu, and Shimla**		

Fertilizer adjustment equations

F N = 5.46 T – 0.32 SN, F P_2O_5 = 2.50 T – 2.67 SP, F K_2O = 2.82T – 0.68 SK

Ready reckoner for soil test based fertilizer recommendations for yield target of 40q ha^{-1} rice (Mid hills wet temperate zone)

Soil test value (kgha^{-1})			Fertilizer nutrient dose (kgha^{-1})		
Alkaline $KmnO_4$-N	**Olsen's –P**	**NH_4Oac-K**	**N**	**P_2O_5**	**K_2O**
200	5	50	154	87	79
250	10	75	138	73	62
300	15	100	122	60	45
350	20	125	106	47	28
400	25	150	90	33	15
450	30	175	74	20	15
500	35	200	58	10	15
550	40	225	42	10	15
600	50	250	26	10	15

Validation of fertilizer adjustment equations of rice on farmers' fields (average of 12 experiments) in mid hills wet temperate zone (1999-2001)

Treatment	Fertilizer dose (kgha^{-1})			Grain yields (kgha^{-1})	Per cent deviation	B:C ratio
	N	P_2O_5	K_2O			
Control	0	0	0	958	-	-
Farmers' practice	30	0	0	1283	-	-
State level dose	90	40	40	2468	-	7.6
Soil Test based	107	31	38	2665	-	8.5
Target (kg ha^{-1}) based						
4000	74	41	10	3802	-5.0	26.0
5000	120	48	21	4705	-5.9	14.0
6000	182	88	46	5043	-16.0	9.6
7000	152	76	42	5110	-27.0	6.6

Fertilizer adjustment equation:
FN = 5.46 T-0.32 SN, F P_2O_5 = 2.50 T-2.67 SP, F K_2O = 2.82T-0.68 SK

Fertilizer dose, grain yield and per cent deviation under FLD plots in mid hills wet temperate zone (1996-98)

Crop	Treatment	Fertilizer dose ($kgha^{-1}$)			Grain yield ($kgha^{-1}$)	Per cent deviation	Nutrients uptake (kg ha^{-1})		
		N	P_2O_5	K_2O			N	P	K
Rice	**Farmers' practice**	40	0	0	3140	-	61	8.9	83
	SLD	90	40	40	3350	-	66	10.5	87
	4000	0	41	57	3800	-5.0	73	12.7	95
	5000	35	67	85	4800	-4.0	87	13.5	102
	5000+FYM	35	67	85	5210	+4.2	103	15.4	108

2. Himachal Pradesh (Rice)

Name of the centre : **CSK HPKV, Palampur**
Soil : **Alfsol, Entisol, Inceptisol**
Crop & Variety : **Rice**
Season developed : **Kharif**
Target range : **40 q ha^{-1}**
Soil Nitrogen range : **200-600 kg/ha**
Areas of Applicability : **Una, Bilaspur, Hamirpur and part of Kangra and Sirmaur**

Soil phosphorus range : **5-50 kg/ha**
Soil potassium range : **50-250 kg/ha**
FYM composition : **-**
FYM rate : **-**
Green manure composition : **-**
Green manure rate : **-**

Fertilizer adjustment equation:
FN = 5.90 T-0.43 SN , FP_2O_5 = 3.22 T-3.29 S, F K_2O = 3.14T-0.71 SK

Ready reckoner for soil test based fertilizer recommendations for yield target of 40 q/ha rice (Sub-montane low hills sub tropical zone)

Soil test value ($kgha^{-1}$)			Fertilizer nutrient dose ($kgha^{-1}$)		
Alkaline $KmnO_4$-N	Olsen's –P	NH_4Oac-K	N	P_2O_5	K_2O
200	5	50	150	112	90
250	10	75	128	96	72
300	15	100	107	79	55
350	20	125	86	63	37
400	25	150	64	47	19
450	30	175	43	30	19
500	35	200	21	14	19
550	40	225	21	14	19
600	50	250	21	14	19

Fertilizer dose, grain yield and per cent deviation under FLD plots in sub-montane low hills subtropical zone (1996-98)

Crop	Treatment	Fertilizer Doses ($kgha^{-1}$)			Grain Yields ($kgha^{-1}$)	Per cent deviation	Nutrients uptake ($kg\ ha^{-1}$)		
		N	P_2O_5	K_2O			N	P	K
Rice	**Farmers' practice**	40	0	0	3370	-	67	8.0	83
	SLD	90	40	40	3900	-	75	12.2	92
	4000	36	100	58	4250	+6.3	84	10.0	97
	5000	105	133	90	5290	+5.8	95	15.0	101
	5000+FYM	105	133	90	5860	+17.2	117	16.2	111

1. Bangalore, Karnataka (Paddy) for Zone-5

Crop	**: Rice**	**Soil phosphorus range**	**: 38 -164 kg acre**
SOIL	**: Red lateritic**	**Soil potassium range**	**: 30 -102 kg/ acre**
Season	**: Kharif**	**FYM composition**	**: .0.5%N : 0.3P:0.5K**
Variety	**: Jaya & other HYV**	**FYM rate**	**: 4.00 t\ acre**
Target range	**: 20 q\acre**	**Green manure composition**	**: 1.1N : 0.13P:0.45K**
Soil Nitrogen range	**: 0.3% - 0.80 %(OC)**	**Green manure rate**	**: 2.00t\ acre**

Area of applicability : Bangalore, Kolar and Tumkur districts.

Target yield equation

F.N. = 7.26 T - 129 SN (OC %), $F.P_2O_5 = 4.05\ T - 2.52\ SP_2O_5$ (Olsen's - P_2O_5)

$F.K_2O = 3.15\ T - 0.29\ SK_2O$ (NH_4 OAC - K_2O)

STV O.C. (%)	Fertilizer nitrogen (kg/acre)	STV Olsen's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
0.35	100	12	51	40	51
0.40	94	14	46	50	49
0.45	87	16	41	60	46
0.50	81	18	36	70	43
0.55	74	20	31	80	40
0.60	68	22	26	90	37
0.65	61	24	21	100	34
0.70	55	26	16	110	31
0.75	49	28	11	120	28

To increase or decrease the yield target of one q/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 7.25 kg/acre P_2O_5 = ± 4.00 kg/acre K_2O = ± 3.15 kg/acre.

2. **Banglore, Karnataka (Paddy)Zone-6 (IPNS)**

Crop	**: Rice**	**Soil phosphorus range**	**: 55 -300kg/ acre**
SOIL	**: Red**	**Soil potassium range**	**: 40-200kg/ acre**
Season	**: Kharif**	**FYM composition**	**: 0.3%N : 0.2P:0.5K**
Variety	**: Rasi**	**FYM rate**	**: : 4.00 t\ acre**
Target range	**: 20q/ acre**	**Green manure composition**	**: 1.0N : 0.15P:0.45K**
Soil Nitrogen range	**: .0..5% - 0.8%**	**Green manure rate**	**: 2.00t\ acre**

Area of applicability : Mandya and Mysore districts.

Target yield equation :

FN = 4.703 T– 274.865 SN (OC %) – 0.00141 OM

FP_2O_5 = 1.636 T–0.2563 SP_2O_5 (Olsen's - P_2O_5) – 0.00077 OM

FK_2O = 2.306 T–0.494 SK_2O (NH_4OAC - K_2O) – 0.00114 OM

STV O C (%)	Fertilizer nitrogen (kg/acre)	STV Bray's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
0.2	72.1	3	32.0	20	36.2
0.3	61.1	5	31.4	25	33.8
0.4	50.1	7	30.9	30	31.3
0.5	39.1	9	30.4	35	28.8
0.6	28.1	11	29.9	40	26.4
0.7	17.1	13	29.4	45	23.9
		15	28.9	50	21.4
		17	28.4	55	19.0
		19	27.9	60	16.5
		21	27.3	65	14.0
		23	26.8	70	11.5
		25	26.3		
		27	25.8		
		29	25.3		
		31	24.8		
		33	24.3		
		35	23.7		
		37	23.2		

Note: If one tonne FYM /acre is used then decrease N by 1.4 kg/acre, P_2O_5 by 0.8 kg/acre and K_2O by1.1 kg/acre

To increase or decrease the yield target by one q/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 4.7 kg/acre P_2O_5 = ± 1.6 kg/acre K_2O = ± 2.3 kg/acre.

3. Bangalore, Karnataka (Paddy)Zone-5

Crop	**: Rice**	**Soil phosphorus range**	**: 38 -164 kg/ acre**
SOIL	**: Red lateritic**	**Soil potassium range**	**: 30 -120 kg/ acre**
Season	**: Kharif**	**FYM composition**	**: .0.5%N : 0.3P:0.5K**
		FYM rate	**: 3.00 t\ acre**
Variety	**: Jaya & other HYV**	**Green manure composition**	**: 1.1N : 0.13P:0.45K**
Target range	**: 20q/ acre**	**Green manure rate**	**: 2.0 t/acre**
Soil Nitrogen range	**: 0.2%-0.5%**		

Area of applicability **: Bangalore, Kolar and Tumkur districts.**

Target yield equation :

F.N. = 7.26 T - 129 SN (OC %), $F.P_2O_5 = 4.05\ T - 2.52\ SP_2O_5$ (Olsen's - P_2O_5)

$F.K_2O = 3.15\ T - 0.29\ SK_2O$ (NH_4 OAC - K_2O)

STV O.C. (%)	Fertilizer nitrogen (kg/acre)	STV Olsen's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
0.35	100	12	51	40	51
0.40	94	14	46	50	49
0.45	87	16	41	60	46
0.50	81	18	36	70	43
0.55	74	20	31	80	40
0.60	68	22	26	90	37
0.65	61	24	21	100	34
0.70	55	26	16	110	31
0.75	49	28	11	120	28
0.80	42	30	10	130	25
0.85	36	32	10	140	22
0.90	29	34	10	150	20
0.95	23	36	10	160	17
1.00	16	38	10	170	14
1.05	18	40	10	180	11

To increase or decrease the yield target of one q/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 7.25 kg/acre P_2O_5 = ± 4.00 kg/acre K_2O = ± 3.15 kg/acre.

1. New Delhi Centre

Crop	**: Rice**	**Soil phosphorus range**	**: 10-38**
Soil	**:Typic Haplustept (Alluvial)**	**Soil potassium range**	**: 100-375**
Season	**: Kharif**	**FYM composition (%) N,P,K**	**: 0.5, 0.2, 0.35**
Situation	**: Irrigated**	**FYM rate**	**: 10 t/ha**
Target range	**: 50 - 60 q ha $^{-1}$**	**Green manure composition**	**: Nil**
Soil Nitrogen range	**: 100 - 375**	**Green manure rate**	**; Nil**

Applicable area : Delhi state and adjoining soil-agro-climatic areas of
UP : Gautam Budhanagar, Ghaziabad , Bagpat Meerut , Mujjafarnagar, Saharanpur, Buland Shahr, Aligarh, Maha mayanagar, Etah, Agra, Etawah, Mainpuri , Shikohabad, Agra, Mathura, Jhansi, Ferozabad, Jalaun
Haryana : Rohtak, Sonipat, Panipat, Jhajjar, Rewari, Gurgaon, Faridabad, Mewat, Karnal
Punjab : Mansa, Patiala, Sangrur
M P : Bhind, Morana, Gwalior, Shivpuri

Fertilizer adjustment equations for targeted yields of crops in NCR of Delhi (Without FYM)

FN = 4.93 T – 0.47 SN, FP_2O_5 = 4.48 T – 7.82 SP, FK_2O = 2.31 T – 0.21 SK

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Rice

Soil test values (kg ha^{-1})			**Nutrient needed (kg ha^{-1}) for an yield target of 50 q ha^{-1}**			**Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	200	120	95	250	120	120
125	13	125	190	120	90	235	120	115
150	15	150	175	105	85	225	120	105
175	18	175	165	85	80	215	120	100
200	20	200	155	70	75	200	115	95
225	23	225	140	50	70	190	95	90
250	25	250	130	30	65	180	75	85
275	28	275	120	10	60	165	55	80
300	30	300	105	10	55	155	35	75
325	33	325	95	10	50	145	15	70
350	36	350	85	10	45	130	15	65
375	38	375	70	10	35	120	15	60

1. Pantanagar (Paddy)

Name of the Centre	:	**Soil phosphorus range**	:
Soil	:	**Soil potassium range**	:
Crop and Variety	: **Paddy- P.D-4**	**FYM composition**	:
Situation	:	**FYM rate**	:
Season developed	:	**Green manure composition**	:
Target range	: **q ha^{-1}**	**Green manure rate**	:
Soil Nitrogen range	:		

Fertilizer adjustment equations of STCR experiments for different crops under IPNS

F N (N kg/ha) = 5.72 x YT (q/ha) – 1.01 SN-0.95 FYM-N

F P (P kg/ha) = 0.93 x YT (q/ha) – 0.72 SP-0.23 FYM-P

F K (K kg/ha) = 1.15 x YT (q/ha) – 0.20 SP-0.30 FYM-K

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of paddy

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 15 q ha^{-1}**		
$KmnO_4$ N	**P**	**K**	**N**	**P_2O_5**	**K_2O**
100	10	100	103.8	162.1	34.2
125	13	125	94.6	148.6	29.1
150	15	150	85.3	139.6	23.9
175	18	175	76.1	126.0	18.8
200	20	200	66.8	117.0	13.6
225	23	225	57.6	103.5	8.5
250	25	250	48.3	194.5	3.3
275	28	275	39.1	80.9	2.0
300	30	300	29.8	71.9	2.0
325	33	325	20.6	58.4	2.0
350	35	350	11.3	49.4	2.0
375	38	375	2.1	35.8	2.0
400	40	400	2.0	26.8	2.0

1. Pusa (Bihar)- Rice

Name of the Centre	**: RAU,Pusa**	**Soil phosphorus range**	**: 4- 30 kg P_2O_5/ha**
Soil	**: Red Loam Soil**	**Soil potassium range**	**: 60- 190 kg K_2O/ha**
Season	**: Kharif**	**Compost composition**	**: N. A.**
Crop	**: Paddy**	**Compost rate**	**: N.A.**
Target range	**: 25- 30 q/ha**	**Green manure composition**	**: N.A.**
Soil Nitrogen range	**: 120- 250 kg N /ha**	**Green manure rate**	**: N. A.**

Valid for Districts : All districts of Jharkhand state having red loam / laterite soil

Soil Test Values : Alk. $KMnO_4$ – N expressed in **kg N/ha**
Bray's P_1 expressed in **kg P_2O_5/ha**
Ammonium OAc – K expressed in **kg K_2O/ha**

Minimum maintenance dose of fertilizer if soil test value is high : **25 kg N, 15 kg P_2O_5 and 10 kg K_2O/ha**

Soil: Red Loam Soils of Jharkhand **Crop: Paddy**

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				**Targetted Yield Equations**
Nutrient	**N R(kg/q)**	**C S (%)**	**C F (%)**	
N	2.29	20.6	37.3	FN = 6.14 T – 0.55 SN
P_2O_5	0.71	54.2	25.1	FP_2O = 2.83 T – 2.16 SP_2O_5
K_2O	1.61	30.2	43.4	FK_2O = 3.73 T – 0.70 SK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			**Fertilizer Nutrients Required (kg/ha) for Yield Target of**					
			25 q/ha			30 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	88	62	51	118	76	70
130	6	70	82	58	44	113	72	63
140	8	80	77	53	37	107	68	56
150	10	90	71	49	30	102	63	49
160	12	100	66	45	23	96	59	42
170	14	110	60	41	16	91	55	35
180	16	120	55	36	10	85	50	28
190	18	130	49	32	10	80	46	21
200	20	140	44	28	10	74	42	14
210	22	150	38	23	10	69	37	10
220	24	160	33	19	10	63	33	10
230	26	170	25	15	10	58	29	10
240	28	180	25	15	10	52	24	10
250	30	190	25	15	10	47	20	10

1. Rice: Tamil Nadu

Name of the centre : **Coimbatore**
Soil : **Alluvial (Noyyal series)**
Crop & Variety : **Rice – IR 50**
Season developed : **Kharif**
Target range : **60 q ha^{-1}**
Soil Nitrogen range : **180 – 280 kg ha^{-1}**
Soil phosphorus range : **16 – 36 kg ha^{-1}**
Soil potassium range : **180 – 280 kg ha^{-1}**

FYM composition : **-**

FYM rate : **-**

Green manure composition (N:P:K) : **2.53 : 0.70 : 2.44 % (Dry weight basis)**

Green manure rate : **6.25 t ha^{-1} (70% moisture)**

Fertiliser Adjustment Equations

FN = 4.39 T - 0.52 SN - 0.80 ON

FP_2O_5 = 2.22 T - 3.63 SP - 0.98 OP

FK_2O = 2.44 T - 0.39 SK - 0.72 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	16	180	170	75	76
190	18	190	165	68	72
200	20	200	159	61	68
210	22	210	154	53	64
220	24	220	149	46	60
230	26	230	143	39	56
240	28	240	138	32	52
250	30	250	133	24	49
260	32	260	128	19	45
270	34	270	123	19	41
280	36	280	118	19	37

Blanket Recommendation: 128 : 38 : 38 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : River Alluvium- Sandy loam
Yield target : 60 q ha^{-1}
District (s) : Coimbatore
Grade : Good

2. Rice: Tamil Nadu

Name of the centre	**: Coimbatore**	**FYM composition**	**: -**
Soil	**: Alluvial (Noyyal series)**	**FYM rate**	**: -**
Crop & Variety	**: Rice - IR 20**		
Season developed	**: Rabi**	**Green manure composition (N:P:K)**	**: 2.25 : 0.70 : 2.63 % (Dry weight basis)**
Target range	**: 60 q ha^{-1}**		
Soil Nitrogen range	**: 180 – 270 kg ha^{-1}**		
Soil phosphorus range	**: 16 – 34 kg ha^{-1}**	**Green manure rate**	**: 6.25 t ha^{-1} (70% moisture)**
Soil potassium range	**: 180 – 270 kg ha^{-1}**		

Fertiliser Adjustment Equations

FN	=	4.63	T	-	0.56	SN	- 0.90	ON
FP_2O_5	=	1.98	T	-	3.18	SP	- 0.99	OP
FK_2O	=	2.57	T	-	0.42	SK	- 0.67	OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	16	180	177	68	78
190	18	190	172	62	74
200	20	200	166	55	70
210	22	210	160	49	66
220	24	220	155	43	62
230	26	230	149	36	57
240	28	240	144	30	53
250	30	250	138	25	49
260	32	260	132	25	45
270	34	270	127	25	41

Blanket Recommendation: 150 : 50 : 50 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Red - sandy loam
Yield target : 60 q ha^{-1}
District (s) : Coimbatore
Grade : Good

3. Rice : Tamil Nadu

Name of the centre	**: Bhavanisagar (sub centre)**	**FYM composition**	**: -**
Soil	**: Red (Irugur series)**		
Crop & Variety	**: Rice - IR 50**	**FYM rate**	**: -**
Season developed	**: Kharif**		
Target range	**: 60 q ha^{-1}**	**Green manure composition**	**: 2.07 : 0.64 : 1.73 %**
Soil Nitrogen range	**: 150 – 240 kg ha^{-1}**	**(N:P:K)**	**(Dry weight basis)**
Soil phosphorus range	**: 8 – 26 kg ha^{-1}**	**Green manure rate**	**: 6.25 t ha^{-1}**
Soil potassium range	**: 150 – 240 kg ha^{-1}**		**(70% moisture)**

Fertiliser Adjustment Equations

$FN = 5.19\ T - 0.89\ SN - 0.98\ ON$

$FP_2O_5 = 2.27\ T - 4.50\ SP - 1.09\ OP$

$FK_2O = 3.11\ T - 0.59\ SK - 1.02\ OK$

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
150	8	150	178	100	98
160	10	160	169	91	93
170	12	170	160	82	87
180	14	180	151	73	81
190	16	190	142	64	75
200	18	200	133	55	69
210	20	210	124	46	63
220	22	220	115	37	57
230	24	230	106	28	51
240	26	240	97	19	45

Blanket Recommendation : 128 : 38 : 38 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Red - sandy loam
Yield target : 60 q ha^{-1}
District(s) : Coimbatore, Dindigul, Erode, Karur, Madurai, Namakkal, Salem, Theni, Tiruchirappalli
Grade : Good

4. Rice : Tamil Nadu

Name of the centre	**: Bhavanisagar (Sub centre)**	**FYM composition**	**: -**
Soil	**: Red (Irugur series)**		
Crop & Variety	**: Rice - ASD 18**	**FYM rate**	**: -**
Season developed	**: Rabi**		
Target range	**: 60 q ha^{-1}**	**Green manure composition**	**: 2.81 : 0.31 : 2.98 %**
Soil Nitrogen range	**: 150 – 240 kg ha^{-1}**	**(N:P:K)**	**(Dry weight basis)**
Soil phosphorus range	**: 8 – 26 kg ha^{-1}**	**Green manure rate**	**: 6.25 t ha^{-1}**
Soil potassium range	**: 150 – 240 kg ha^{-1}**		**(70% moisture)**

Fertiliser Adjustment Equations

$FN = 4.88\ T - 0.68\ SN - 0.72\ ON$

$FP_2O_5 = 2.06\ T - 2.91\ SP - 2.27\ OP$

$FK_2O = 2.89\ T - 0.47\ SK - 0.59\ OK$

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
150	8	150	191	100	103
160	10	160	184	94	98
170	12	170	177	89	94
180	14	180	171	83	89
190	16	190	164	77	84
200	18	200	157	71	79
210	20	210	150	65	75
220	22	220	143	56	70
230	24	230	137	54	65
240	26	240	130	48	61

Blanket Recommendation: 150 : 50 : 50 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Red - sandy loam
Yield target : 60 q ha^{-1}
District(s) : Coimbatore, Dindigul, Erode, Karur, Madurai, Namakkal, Salem, Theni, Tiruchirappalli
Grade : Good

5. Rice : Tamil Nadu

Name of the centre : **Aduthurai (sub centre)**
Soil : **Black Alluvial (Adanur series)**
Crop & Variety : **Rice - CR 1009**
Season developed : **Kharif**
Target range : **70 q ha^{-1}**
Soil Nitrogen range : **180 – 280 kg ha^{-1}**
Soil phosphorus range : **16 – 36 kg ha^{-1}**
Soil potassium range : **180 – 280 kg ha^{-1}**

FYM composition : **-**

FYM rate : **-**

Green manure composition (N:P:K) : **2.28 : 0.39 : 1.54 % (Dry weight basis)**
Green manure rate : **6.25 t ha^{-1} (70% moisture)**

Fertiliser Adjustment Equations

$FN = 2.80\ T - 0.29\ SN - 0.89\ ON$

$FP_2O_5 = 1.35\ T - 1.28\ SP - 1.78\ OP$

$FK_2O = 2.50\ T - 0.42\ SK - 1.14\ OK$

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 70 q ha^{-1}		
KMnO4-N	Olsen-P	NN NH_4OAc-K	N	P_2O_5	K_2O
180	16	180	144	74	99
190	18	190	141	72	95
200	20	200	138	69	91
210	22	210	135	66	87
220	24	220	132	64	83
230	26	230	129	61	78
240	28	240	126	59	74
250	30	250	123	56	70
260	32	260	121	54	66
270	34	270	118	51	62
280	36	280	115	48	57

Blanket Recommendation: 150 : 50 : 50 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : River Alluvium - Clay loam
Yield target : 70 q ha^{-1}
District(s) : Cuddalore, Karur, Thanjavur, Thiruvarur, Nagapattinam
Grade : Good

6. Rice : Tamil Nadu

Name of the centre : **Aduthurai (Sub centre)**
Soil : **Black Alluvial (Kalathur series)**
Crop & Variety : **Rice - ADT 31**
Season developed : **Kharif**
Target range : **60 q ha^{-1}**
Soil Nitrogen range : **180 – 280 kg ha^{-1}**
Soil phosphorus range : **16 – 36 kg ha^{-1}**
Soil potassium range : **180 – 280 kg ha^{-1}**

FYM composition : **-**

FYM rate : **-**

Green manure composition (N:P:K) : **2.28 : 0.89 : 2.14 % (Dry weight basis)**
Green manure rate : **6.25 t ha^{-1} (70% moisture)**

Fertiliser Adjustment Equations

$FN = 5.29\ T - 0.75\ SN - 0.89\ ON$

$FP_2O_5 = 1.65\ T - 1.76\ SP - 0.78\ OP$

$FK_2O = 2.73\ T - 0.37\ SK - 0.82\ OK$

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}		
KMnO4-N	Olsen-P	NN NH_4OAc-K	N	P_2O_5	K_2O
180	16	180	182	71	97
190	18	190	174	67	93
200	20	200	167	64	90
210	22	210	159	60	86
220	24	220	152	57	82
230	26	230	144	53	79
240	28	240	137	50	75
250	30	250	129	46	71
260	32	260	122	43	68
270	34	270	114	39	64
280	36	280	107	36	60

Blanket Recommendation: 120 : 38 : 38 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : River Alluvium - Clay loam
Yield target : 60 q ha^{-1}
District(s) : Madurai, Nagapattinam, Perambalur, Thanjavur, Thiruvarur, Tiruchirappalli
Grade : Good

7. Rice: Tamil Nadu

Name of the centre	**: Aduthurai (Sub centre)**		
Soil	**: Black Alluvial (Kalathur series)**	**FYM composition**	**: -**
Crop & Variety	**: Rice - ADT 31**		
Season developed	**: Rabi**	**FYM rate**	**: -**
Target range	**: 60 q ha^{-1}**		
Soil Nitrogen range	**: 180 – 280 kg ha^{-1}**	**Green manure composition**	**: 2.78 : 0.99 : 2.20 %**
Soil phosphorus range	**: 16 – 36 kg ha^{-1}**	**(N:P:K)**	**(Dry weight basis)**
Soil potassium range	**: 180 – 280 kg ha^{-1}**	**Green manure rate**	**:6.25 t ha^{-1} (70 % moisture)**

Fertiliser Adjustment Equations

FN = 5.34 T - 0.67 SN - 0.73 ON

FP_2O_5 = 1.90 T - 1.86 SP - 0.70 OP

FK_2O = 2.81 T - 0.33 SK - 0.80 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	16	180	199	84	110
190	18	190	193	81	106
200	20	200	186	77	103
210	22	210	179	73	100
220	24	220	173	69	96
230	26	230	166	66	93
240	28	240	159	62	90
250	30	250	152	58	86
260	32	260	146	55	83
270	34	270	139	51	80
280	36	280	132	47	77

Blanket Recommendation: 150 : 50 : 50 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : River Alluvium - Clay loam
Yield target : 60 q ha^{-1}
District(s) : Madurai, Nagapattinam, Perambalur, Thanjavur, Thiruvarur, Tiruchirappalli
Grade : Good

8. Rice : Tamil Nadu

Name of the centre	**: Killikulam (Sub centre)**	**FYM composition**	**: -**
Soil	**: Red (Manakkarai series)**		
Crop & Variety	**: Rice - ASD 16**	**FYM rate**	**: -**
Season developed	**: Kharif**		
Target range	**: 60 q ha^{-1}**	**Green manure composition**	**: 2.57 : 0.78 : 2.15 %**
Soil Nitrogen range	**: 180 – 280 kg ha^{-1}**	**(N:P:K)**	**(Dry weight basis)**
Soil phosphorus range	**: 12 – 32 kg ha^{-1}**	**Green manure rate**	**: 6.25 t ha^{-1}**
Soil potassium range	**: 180 – 280 kg ha^{-1}**		**(70% moisture)**

Fertiliser Adjustment Equations

FN = 4.25 T - 0.60 SN - 0.79 ON

FP_2O_5 = 2.71 T - 4.39 SP - 0.89 OP

FK_2O = 3.83 T - 0.60 SK - 0.82 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	12	180	147	110	122
190	14	190	141	102	116
200	16	200	135	93	110
210	18	210	129	84	104
220	20	220	123	75	98
230	22	230	117	66	92
240	24	240	111	58	86
250	26	250	105	49	80
260	28	260	99	40	74
270	30	270	93	31	68
280	32	280	87	23	62

Blanket Recommendation: 120 : 38 : 38 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : River Alluvium - Sandy clay loam
Yield target : 60 q ha^{-1}
District(s) : Tirunelveli
Grade : Good

9. Rice : Tamil Nadu

Name of the centre	**: Killikulam (Sub centre)**	**FYM composition**	**: -**
Soil	**: Red (Manakkarai series)**		
Crop & Variety	**: Rice - IR 20**	**FYM rate**	**: -**
Season developed	**: Rabi**		
Target range	**: 60 q ha^{-1}**	**Green manure composition**	**: 2.26 : 0.78 : 2.14 %**
Soil Nitrogen range	**: 180 – 280 kg ha^{-1}**	**(N:P:K)**	**(Dry weight basis)**
Soil phosphorus range	**: 12 – 32 kg ha^{-1}**	**Green manure rate**	**: 6.25 t ha^{-1}**
Soil potassium range	**: 180 – 280 kg ha^{-1}**		**(70 % Moisture)**

Fertiliser Adjustment Equations

$FN = 4.47\ T - 0.58\ SN - 0.79\ ON$

$FP_2O_5 = 2.66\ T - 3.68\ SP - 0.89\ OP$

$FK_2O = 4.08\ T - 0.65\ SK - 0.82\ OK$

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 60 q ha^{-1}		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	12	180	164	115	128
190	14	190	158	108	121
200	16	200	152	101	115
210	18	210	146	93	108
220	20	220	140	86	102
230	22	230	135	79	95
240	24	240	129	71	89
250	26	250	123	64	82
260	28	260	117	57	76
270	30	270	111	50	69
280	32	280	106	42	63

Blanket Recommendation: 150 : 50 : 50 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : River Alluvium - Sandy clay loam
Yield target : 60 q ha^{-1}
District(s) : Tirunelveli
Grade : Good

1. West Bengal(Rice)

Name of the Centre	**: Kalyani, BCKV**	**Soil phosphorus range**	**: 21-41 kg.ha^{-1}**
Soil	**: Inceptisol**	**Soil potassium range**	**: 132 - 435 kg.ha^{-1}**
Crop and variety	**: Rice (cv. IET- 4094)**	**FYM composition**	**: NA**
Season developed	**: Kharif, 2004**	**FYM rate**	**: NA**
Target range	**: 35 to 40 q ha^{-1}**	**Green manure composition**	**: NA**
Soil Nitrogen range	**: 296 - 346 kg.ha^{-1}**	**Green manure rate**	**: NA**

Fertilizer adjustment equations:

FN = 3.60 T – 0.25 SN, FP_2O_5 = 2.29 T – .82 SP, FK_2O = 2.61 T – 0.19 SK

Fertilizer levels (kg.ha^{-1})	**N**	**0, 100, 120, 140**
	P_2O_5	**0, 40, 60**
	K_2O	**0, 40, 60**
Initial soil test values (kg.ha^{-1})	**$KMnO_4$-N**	**296 - 346**
	Olsen-P	**21- 41**
	NH_4OAc-K	**132 - 435**
Yield (kg.ha^{-1})	**Control plot**	**2000 - 2200**
	Treated plot	**5520 - 7200**

Ready-reckoner* of fertilizer doses at varying soil test values for specific yield target

Available soil nutrients (kg.ha^{-1})			**Fertilizer nutrient required (kg.ha^{-1})**					
			Targeted yield 3.5 t.ha^{-1}			**Targeted yield 4.0 t.ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
250	5	100	111	84	87	129	98	90
275	10	150	102	84	87	120	98	90
300	15	200	93	84	87	111	98	90
325	20	250	84	84	87	102	94	90
350	25	300	76	80	87	94	89	100
375	30	350	67	75	77	85	85	90

* A minor modification was made in the ready-reckoner.

2. West Bengale (Rice)

Name of the Centre	**: Kalyani, BCKV**	**Soil phosphorus range**	**: 17-41 kg.ha^{-1}**
Soil	**: Inceptisol**	**Soil potassium range**	**: 142 - 335 kg.ha^{-1}**
Crop and variety	**: Borp rice (cv. IET- 4789)**	**FYM composition**	**: NA**
Season developed	**: Boro, 2004**	**FYM rate**	**: NA**
Target range	**: 55 to 60 q ha^{-1}**	**Green manure composition**	**: NA**
Soil Nitrogen range	**: 216 - 326 kg.ha^{-1}**	**Green manure rate**	**: NA**

Fertilizer adjustment equations:
FN = 3.28T- 0.18, FP_2O_5 = 4.80 T- 5.02 SP, FK_2O = 2.83 T- 0.54 SK

Fertilizer levels (kg.ha^{-1})	**N**	**120, 150, 170**
	P_2O_5	**50, 60, 80**
	K_2O	**60, 80,100**
Initial soil test values (kg.ha^{-1})	**$KMnO_4$-N**	**216- 326**
	Olsen-P	**17-41**
	NH_4OAc-K	**142-335**
Yield (kg.ha^{-1})	**Control plot**	**3013-2483**
	Treated plot	**5100-3050**

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Available soil nutrients (kg.ha^{-1})			**Fertilizer nutrient required (kg.ha^{-1})**					
			Targeted yield 55 q.ha^{-1}			**Targeted yield 60 q.ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
250	5	100	117	90	71	139	99	80
275	10	150	103	85	61	126	94	69
300	15	200	90	80	50	113	89	59
325	20	250	77	75	40	100	83	48
350	25	300	64	69	29	86	78	38
375	30	350	50	64	19	73	73	27

3. West Bengale (Rice)

Name of the Centre	**: Kalyani,BCKV**	**Soil phosphorus range**	**: 22 - 32 kg.ha^{-1}**
Soil	**: Inceptisol**	**Soil potassium range**	**: 118 - 238 kg.ha^{-1}**
Crop and variety	**: Boro rice (cv. IET-4786)**	**FYMcomposition**	**: 0.7%N.0.4%P,0.7%K**
		FYM rate	**: 5 and 10 t ha^{-1}**
Season developed	**: Rabi 2006**	**Green manure composition**	**: NA**
Target range	**: 50-55q ha^{-1}**	**Green manure rate**	**: NA**
Soil Nitrogen range	**: 232- 293 kg.ha^{-1}**		

Targeted yield equation:

FN = 2.75 T – 0.63 STVN -.035MN, FP = 0.48 T – 0.54 STVP -0.07MP, FK = 1.24 T – 0.62 STVK - 0.24MK

Fertilizer levels (kg.ha^{-1})	**N**	**120, 150, 170**
	P_2O_5	**50, 60, 80**
	K_2O	**60, 80,100**
	FYM (t ha^{-1})	**2.5,5.0**
Initial soil test values (kg.ha^{-1})	**$KMnO_4$-N**	**232- 293**
	Olsen-P	**22 - 32**
	NH_4OAc-K	**118 - 238**
Yield (kg.ha^{-1})	**Control plot**	**3083-2583**
	Treated plot	**5300-3250**

Ready-reckoner* of fertilizer doses at varying soil test values for specific yield target

Available soil nutrients (kg.ha^{-1})			**Fertilizer nutrient required (kg.ha^{-1})**					
			Targeted yield 5.0 t.ha^{-1}			**Targeted yield 5.5 t.ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
250	5	100	122	83	92	141	96	103
275	10	150	112	83	92	132	96	103
300	15	200	103	83	92	118	96	103
325	20	250	96	83	92	110	89	103
350	25	300	83	78	92	98	86	92
375	30	350	74	68	86	89	79	89

*In a few cases when calculated fertiliser requirement values were almost zero, a minimum dose say 20 kg for N and 10 kg. ha^{-1} each for P and K were added to the calculated values particularly for the cereal and oilseed crops. While for groundnut crop (legume) these values for N was 5.0 kg but for P and K it was 10 kg each. Contrarily, when the calculated values of fertiliser doses were very high/high, the values nearer to the reasonable ones were used for the ready-reckoners.Targeted yield equations used for the verification trials are given below:

Kharif rice (cv. IET-4097)

FN = 15.34 T- 1.62 SN, **FP_2O_5 = 2.97 T- 3.62 SP,** **FK_2O = 2.52 T- 0.28 SK**

Verification trials for kharif Rice (mean of 7 trials)

Treatment	Grain yield ($q.ha^{-1}$)	Straw yield ($q.ha^{-1}$)
T_1 - Farmers' practice	**40.2**	**62.4**
T_2- Govt. recommended dose	**36.4**	**56.8**
T_3 - Soil test based fertilizer dose for targeted yield of 3.5 t ha^{-1}	**35.2**	**53.7**
T_4 - Soil test based fertilizer dose for Targeted yield of 4.0 t ha^{-1}.	**40.9**	**64.8**

Applicability: All the equations are valid for Nadia, Murshidabad, 24Pgs North, Hoogly and Burdwan districts

1. Hisar (Haryana)Paddy

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Paddy (PR 106)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Kharif
Target range : 65 to 75 q/ha
Soil nitrogen range : 80 to 240 kg/ha
Soil phosphorus range : 4 to 32 kg/ha
FYM composition : 1.00 % N and 0.54 % P_2O_5
FYM rate : 15 t/ha
Targeted Yield Equations : FN = 3.70T – 1.10 SN,FP_2O_5 = 1.35T – 2.66 SP*

Ready reckoner of soil test based fertilizer recommendations for paddy (PR 106) grain yield of 65, 70 and 75 q/ha

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	65	70	75		65	70	75
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertiilzer P_2O_5, kg/ha)		
80	154	171	190	4	64	78	91
90	142	160	179	6	58	72	85
100	131	149	168	8	53	67	80
110	120	139	157	10	48	62	75
120	109	127	146	12	42	56	69
140	87	105	124	14	37	51	64
160	65	83	102	16	32	46	59
180	43	61	80	20	21	35	48
200	38	39	58	24	15	25	38
220	38	38	38	28	15	15	28
240	38	38	38	32	15	15	15

*SN and SP are available N and P (kg/ha), respectively, T = Yield target (q/ha)

Note: The dose of fertilizer N and P_2O_5 be reduced by 1.50 and 1.00 kg/ha, respectively; from the above fertilizer doses for each ton of applied FYM/compost.

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields in various agro-climatic zones of Haryana. The yield targets of 65 to 75 q/ha were achieved within -7.1 to +5.8 per cent deviations.

Applicability: These fertilizer adjustment equations will hold good throughout Haryana for high yielding varieties of dwarf paddy

1. Bhubaneswar (Paddy)

Crop : Rice (cv. Lalat)

General fertilizer recommendation : 80-40-40

Fertilizer adjustment equations

FN = 8.4 T – 1.4 SN, F P_2O_5 = 5.0 T – 3.1 S P_2O_5, FK_2O = 6.6 T – 1.5 S K_2O

Corrected ready reckoner of fertilizer doses at varying soil test values for specific yield targets

Available soil nutrients (kg ha^{-1})			Fertilizer nutrients required (kg ha^{-1})								
			Targeted yield (40 q ha^{-1})			Targeted yield (45 q ha^{-1})			Targeted yield (50 q ha^{-1})		
N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	30	80	160	80	80	180	80	100	200	80	100
120	35	100	160	80	80	180	80	100	200	80	100
140	40	120	140	76	80	180	80	100	200	80	100
160	45	140	112	60	54	154	80	87	196	80	100
180	50	160	84	45	14	126	70	57	168	80	96
200	55	180	56	30	10	98	54	27	140	79	66
220	60	200	28	14	10	70	39	10	112	64	36
230	65	220	20	10	10	56	23	10	98	48	10
240	70	250	20	10	10	42	10	10	84	33	10
250	80	300	20	10	10	28	10	10	70	10	10

(NB : when the calculated fertilizer requirement values tend to zero, a minimum dose, say 20 kg ha^{-1} for N and 10 kg ha^{-1} each for P and K are added to the calculated values to bring the dose to a reasonable one).

Equation used by the Soil Testing Laboratory :
Bhubaneswar, Puri, Cuttack, Dhenkanal, Sambalpur, Sundargarh

Districts covered :
Khurda, Puri, Nayagarh, Cuttack, Angul, Dhenkanal, Sambalpur,Bargarh, Jharsududa, Sundargarh

1. Kerala (Rice)

Variety - Kanakam
Season - September-October to December-January
Irrigation - Irrigated
Soil type - Laterite

Area of adaptability - Laterite soils of Kerala (65% Total geographical area of Kerala is occupied by laterite soils. Laterite soils are found in all the 14 districts of the state.)

Fertilizer Adjustment Equations

F N = 43.49T- 0.26SN
FP2O5 = 42.21T-9.87SP
FK2O = 47.65T-0.99SK

Ready reckoner for fertilizer dozes at varying Soil Test Values for specific yield target of rice (Variety Kanakam) under irrigated condition. (Rabi - Season)

Soil available nutrients (kg ha-1)			Fertilizer nutrient required (kg ha^{-1}) for rice (variety: Kanakam) yield target of								
			3t ha^{-1}			4t ha^{-1}			5t ha^{-1}		
$KmnO_4$ *N*	Bray`s P	Amm Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	6	100	105	67	45	148	110	93	191	152	140
150	8	200	91	48	00	134	90	00	177	132	41
200	10	300	78	28	00	121	70	00	164	112	00
250	12	400	65	8	00	108	50	00	151	92	00
300	14	500	52	00	00	95	30	00	138	72	00
350	16	600	38	00	00	82	10	00	125	52	00
400	18	700	25	00	00	68	00	00	111	32	00

1. Chhattisgarh

Crop - **Rice (Improved dwarf)**
Soil type - Inceptisol
Variety - R-269 (Ruchi)
Season - 1985, Kharif
Area for Suitability - Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

$FN = 3.73\ Y - 0.55\ SN$, $FP_2O_5 = 1.45\ Y - 5.61\ SP$, FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of improved dwarf variety of rice in Inceptisol (*Matasi*).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kgha^{-1})	Yield Targets (q ha^{-1}) (Rice - improved dwarf var.)					
		40		50		60	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	67	41	104	56	141	70
175	6	53	24	90	39	128	53
200	9	39	8	77	22	114	37
225	12	25	3	63	5	100	20
250	15	12	3	49	3	86	3
275	18	4	3	35	3	73	3
300	21	4	3	22	3	59	3
350	24	4	3	4	3	31	3
400	27	4	3	4	3	4	3

2. Crop - **Rice**
Soil type - Alfisol
Variety - IR-36
Season - *Kharif*, 1985

Area for suitability - Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

$FN = 5.88\ Y - 0.88\ SN$, $FP_2O_5 = 107 - (11439 - 202.5Y)^{1/2} - 4.13\ SP$, FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of improved dwarf variety of rice in Alfisol (*Dorsa*)

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1}**	**Yield Targets (q ha^{-1}) (Rice - improved dwarf var.)**					
		40		**50**		**60**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	103	37	162	58	221	86
175	6	81	24	140	46	199	74
200	9	59	12	118	34	177	62
225	12	37	9	96	21	155	49
250	15	15	9	74	9	133	37
275	18	15	9	52	9	111	28
300	21	15	9	30	9	89	9
350	24	15	9	15	9	45	9
400	27	15	9	15	9	15	9

Recommend the fertility group method for potassic fertilizer because the soil test K having > 250 kg K/ha do not respond fertilizer K_2O to the test crop in soils under study.

3. Crop - **Rice**
Soil type - Vertisol
Variety - R-269 (Ruchi)
Season - *Kharif*, 1888

Area for Suitability - Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

FN = 4.95 Y – 0.62 SN, FP_2O_5 = 130 - (16819 – 260Y) $^{1/2}$ – 2.56 SP , FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of improved dwarf variety of rice in Vertisol (*Kanhar*)

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1}**	**Yield Targets (q ha^{-1}) (Rice - improved dwarf var.)**					
		40		**50**		**60**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	105	42	155	61	204	87
175	6	90	35	139	53	189	80
200	9	74	27	124	45	173	72
225	12	59	19	108	37	158	64
250	15	43	11	93	30	142	57
275	18	28	4	77	22	127	49
300	21	12	4	62	14	111	41
350	24	12	4	31	7	80	34
400	27	12	4	12	4	49	26

4. Rice (scented and improved semi tall)

Crop - Rice
Soil type - Vertisol
Variety - Indira – 9
Season - *Kharif*, 2002

Area for Suitability - Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

FN = 3.65 Y – (0.489 SN + 5.12 t FYM)
FP2O5 =129 – (16710- 244Y) 1/2 – (2.89 SP + 3.0 t FYM)
FK2O = No K if SK >250 kg ha-1

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of improved scented rice (Indira -9) in Vertisol (*Kanhar*).

Alkaline KMnO4-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) (Rice - improved dwarf var.)**					
		35		**45**		**55**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	54	30	91	45	127	63
175	6	42	21	79	36	115	54
200	9	30	13	66	27	103	46
225	12	18	4	54	19	91	37
250	15	6	2	42	10	79	28
275	18	6	2	30	2	66	20
300	21	6	2	18	2	54	11
350	24	6	2	6	2	30	2
400	27	6	2	6	2	6	2

Ready reckoners on soil test based fertilizer recommendations with INM (5 ton FYM) for specific yield targets of improved scented rice (Indira -9) in Vertisol (Kanhar).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1}	Yield Targets (q ha^{-1}) (Scented Rice – Indira -9)					
		35		45		55	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	29	15	65	30	102	48
175	6	17	6	53	21	90	39
200	9	4	4	41	12	77	31
225	12	4	4	29	4	65	22
250	15	4	4	16	4	53	13
275	18	4	4	4	4	41	5
300	21	4	4	4	4	28	4
350	24	4	4	4	4	4	4
400	27	4	4	4	4	4	4

5. Crop - Rice
Soil type - Inceptisol
Variety - Indira -9
Season - *Kharif*, 2002

Area for Suitability - Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

FN = 4.58 Y – (0.677 SN + 6.02 t FYM)
FP2O5 = 91 – (8313- 147Y)1/2 – (3.13 SP + 3.26 t FYM)
FK2O = No K if SK >250 kg ha-1

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of improved scented rice (Indira -9) in Inceptisol

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1}**	**Yield Targets (q ha^{-1}) (Scented Rice – Indira -9)**					
		35		**45**		**55**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	59	25	105	40	150	67
175	6	42	16	88	31	133	57
200	9	25	7	71	22	117	48
225	12	8	1	54	12	100	38
250	15	3	1	37	3	83	29
275	18	3	1	20	1	66	20
300	21	3	1	3	1	49	10
350	24	3	1	3	1	15	1
400	27	3	1	3	1	3	1

Ready reckoners on soil test based fertilizer recommendations with INM (5 ton FYM) for specific yield targets of improved scented rice (Indira -9) in Inceptisol (*Matasi*).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) (Scented Rice – Indira -9)					
		35		45		55	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	29	9	74	24	120	50
175	6	12	3	58	15	103	41
200	9	7	3	41	5	86	31
225	12	7	3	24	3	69	22
250	15	7	3	7	3	53	13
275	18	7	3	7	3	36	3
300	21	7	3	7	3	19	3
350	24	7	3	7	3	7	3
400	27	7	3	7	3	7	3

6. Crop - Rice
Soil type - Vertisol
Variety - Safari -17 (Local Tall)
Season - *Kharif*, 1990

Area for Suitability - Raipur, Durg, Rajnandgaon, Mahasamund,Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

FN = 3.97 Y – 0.53 SN
FP2O5 =120 – (14388- 252Y) 1/2 – 2.69 SP
FK2O = No K if SK >250 kg ha-1

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of local rice (Safri-17) in Vertisol (*Kanhar).*

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) Rice Local Tall (Safri – 17)					
		35		45		55	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	59	37	99	57	139	89
175	6	46	29	86	49	126	81
200	9	33	21	73	41	112	73
225	12	20	13	59	33	99	65
250	15	6	5	46	24	86	57
275	18	6	5	33	16	73	49
300	21	6	5	20	8	59	41
350	24	6	5	6	5	33	32
400	27	6	5	6	5	6	22

7. Rice with green manure

Soil type - Inceptisol
Variety - Mahamaya
Season - *Kharif*, 1997

Area for Suitability - Irrigated area of Raipur, Raigarh Durg, Rajnandgaon, Mahasamund, Dhamtari, Bilaspur and Korba districts)

Fertilizer adjustment equations

$FN = 4.82Y – 1.114\ SN$
$FP_2O_5 = 106.3 - (11305 – 176Y)^{1/2} – 2.79\ SP$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of rice with green manure in Inceptisol (Matasi).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kgha^{-1})**	**Yield Targets (q ha^{-1}) Rice (var. - Mahamaya)**					
		40		**50**		**60**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	26	33	74	48	122	71
175	6	11	24	46	40	94	62
200	9	11	16	18	31	66	54
225	12	11	8	11	23	39	46
250	15	11	1	11	14	11	37
275	18	11	1	11	6	11	29
300	21	11	1	11	1	11	20
350	24	11	1	11	1	11	12
400	28	11	1	11	1	11	1

8. Crop - Rice
Soil type - Vertisol
Variety - Mahamaya
Season - *Kharif*, 1996

Area for Suitability - Chhattisgarh plains (Raipur,Raigarh, Durg, Rajnandgaon, Mahasamund, Dhamtari, and Bilaspur districts)

Fertilizer adjustment equations

$FN = 3.64\ Y - 0.87\ SN$
$FP_2O_5 = 103.8 - (10712 - 139Y)^{1/2} - 2.85\ SP$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of rice with green manure in Vertisol (Kanhar).

Alkaline $KMnO_4$-N (kgha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) Rice with G M (var. - Mahamaya)**					
		40		**50**		**60**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	15	23	52	34	88	47
175	6	8	15	30	25	66	38
200	9	8	6	8	17	44	29
225	12	8	4	8	8	23	21
250	15	8	4	8	4	8	12
275	18	8	4	8	4	8	4
300	21	8	4	8	4	8	4
350	24	8	4	8	4	8	4
400	28	8	4	8	4	8	4

9. Rice with FYM

Crop - Rice
Soil type - Inceptisol
Variety - Mahamaya
Season - *Kharif*, 1999

Area for Suitability - Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

$FN = 3.88\ Y - 0.578\ SN$
$FP_2O_5 = 129 - (16659 - 233Y)^{1/2} - 2.24\ SP$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of rice with FYM in Inceptisol (Matasi).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) Rice with 5 tons FYM (var. - Mahamaya)**					
		40		**50**		**60**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	69	37	107	52	146	71
175	6	54	30	93	45	132	64
200	9	40	23	78	38	117	57
225	12	25	16	64	31	103	50
250	15	11	10	50	25	88	44
275	18	2	3	35	18	74	37
300	21	2	3	21	11	59	30
350	24	2	3	2	4	31	23
400	28	2	3	2	3	2	15

10. Rice without FYM

Soil type - Inceptisol
Variety - Mahamaya
Season - *Kharif*, 1999

Area for Suitability - Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

$FN = 3.93\ Y - 0.489\ SN$
$FP_2O_5 = 110 - (12195 - 205Y)^{1/2} - 2.11\ SP$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of rice without FYM in Inceptisol (Matasi).

Alkaline KMnO4-N (kgha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) Rice without FYM (var. - Mahamaya)**					
		40		**50**		**60**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	84	40	123	60	162	94
175	6	72	34	111	53	150	87
200	9	59	28	99	47	138	81
225	12	47	21	86	41	126	75
250	15	35	15	74	34	114	68
275	18	23	9	62	28	101	62
300	21	11	2	50	22	89	56
350	24	11	2	25	15	65	49
400	28	11	2	11	7	40	41

11. Chhattisgarh

Hybrid rice (Pro agro -6444)

Crop - Hybrid rice
Soil Type - Inceptisol
Variety - Pro agro-6444
Season - Karif 2007

Area for suitability - Raipur, Durg, , Bilaspur, Janjgir, Raigarh, Mahasamund, and Dhamrtari districts.

Fertilizer adjustment equations for given yield target and integrated nutrient management from QRP model

1. $FN = 478 – (228364 – 2500\ Y)^{1/2} – 0.542\ SN - 5.85\ t\ FYM$
2. $FP_2O_5 = 227 – (51609 – 588\ Y)^{1/2} – 4.72\ SP + 3.69\ t\ FYM$

Ready reckoner of fertilizer N and P_2O_5 for specific yield of hybrid rice based on QRP model without FYM.

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) Hybrid rice							
		50		60		70		80	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	75	64	117	85	166	111	228	145
175	6	62	50	103	71	152	96	215	131
200	9	48	35	90	57	139	82	201	117
225	12	35	21	76	43	125	68	188	103
250	15	21	7	63	28	111	54	174	89
275	18	7	7	49	14	98	40	161	74
300	21	7	7	35	7	84	26	147	60
350	24	7	7	8	7	57	11	120	46
400	28	7	7	8	7	30	7	93	27

Ready reckoner of fertilizer N and P_2O_5 for specific yield of hybrid rice based on QRP model with 5 t FYM.

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) Hybrid rice							
		50		60		70		80	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	46	45	88	67	136	92	199	127
175	6	32	31	74	52	123	78	185	113
200	9	19	17	60	38	109	64	172	98
225	12	5	3	47	24	96	50	158	84
250	15	0	0	33	10	82	36	145	70
275	18	0	0	20	0	69	21	131	56
300	21	0	0	6	0	55	7	118	42
350	24	0	0	0	0	28	0	91	28
400	28	0	0	0	0	1	0	64	9

Hybrid rice (Indira Sona)

12. Crop - Hybrid rice

Soil Type - Inceptisol

Variety - Indira Sona

Season - Kharif 2007

Area for suitability - Raipur, Durg, , Rajanadgaon, Kawardha, Bilaspur and Dhamtari districts

Fertilizer adjustment equations

$FN = 5.18\ Y - 0.88\ SN - 0.79\ FYM$

$FP_2O_5 = 1.48\ Y - 2.50\ SP - 0.45\ FYM$

$FK_2O = 2.13\ Y - 0.24\ SK - 0.11\ FYM$

Where FN, FP_2O_5 and FK_2O are fertilizer N P and K respectively. SN, SP and SK are soil test values for available N P and K. Y = Yield target (q/ha) and FYM is Farm Yard Manure

Ready reckoner of fertilizer N for specific yield of hybrid rice (Indira Sona) with 5 tons of FYM application in Inceptisol

SN kg ha^{-1}	Yield targets of hybrid rice (Indira Sona) q ha^{-1}					
	50	55	60	65	70	75
150	107	132	158	184	210	236
175	84	110	136	162	188	214
200	62.	88	114	140	166	192
225	40	66	92	118	144	170
250	18	44	70	96	122	148
275	0.00	22	48	74	100	125
300	0.00	0.00	26	52	77	103
325	0.00	0.00	4	29	55	81
350	0.00	0.00	0.00	7	33	59

Ready reckoner of fertilizer P2O5 for specific yield of hybrid rice (Indira Sona) with 5 tons of FYM application in Inceptisol

SP kg ha^{-1}	Yield targets of hybrid rice (Indira Sona) q ha^{-1}					
	50	55	60	65	70	75
4	57	64	72	79	87	94
8	50	54	62	69	77	84
12	37	44	52	59	67	74
16	27	34	42	49	57	64
20	17	24	32	39	47	54
24	7	14	22	29	37	44
28	0.00	4	12	19	27	34
32	0.00	0.00	2	9	17	24
36	0.00	0.00	0.00	0.00	7	14

Ready reckoner of fertilizer K2O for specific yield of hybrid rice (Indira Sona) with 5 tons of FYM application in Inceptisol

SK kg ha^{-1}	Yield targets of hybrid rice (Indira Sona) q ha^{-}					
	50	55	60	65	70	75
150	63	74	85	95	106	116
200	51	62	72	83	94	104
250	39	50	60	71	82	92
300	27	38	48	59	70	80
350	15	26	36	47	58	68
400	3	14	24	35	46	56
450	0.00	2	12	23	34	44
500	0.00	0.00	1	11	21	32
550	0.00	0.00	0.00	0.00	9	20

13. Crop - Hybrid rice

Soil Type - Vertisol

Variety - Indira sona

Season - Karif 2007

Area for suitability - Raipur, Durg, , Rajanadgaon, Kawardha, Bilaspur districts

Fertilizer adjustment equations

$FN = 6.02\ Y - 1.05\ SN - 0.85\ FYM$

$FP_2O_5 = 1.48\ Y - 2.51\ SP - 0.34\ FYM$

$FK_2O = 2.53\ Y - 0.20\ SK - 0.09\ FYM$

Where FN, FP_2O_5 and FK_2O are fertilizer N P and K respectively. SN, SP and SK are soil test values for available N P and K. Y = Yield target (q/ha) and FYM is Farm Yard Manure

Ready reckoner of fertilizer N for specific yield of hybrid rice (Indira Sona) with 5 tons of FYM application in Vertisol.

SN kg ha^{-1}	Yield targets of hybrid rice (Indira Sona) q ha^{-1}					
	50	55	60	65	70	75
150	123	153	183	213	243	273
175	96	126	157	187	217	247
200	70	100	130	160	190	221
225	44	74	104	134	164	194
250	18	48	78	108	138	168
275	0	22	52	82	112	142
300	0	0	26	56	86	116
325	0	0	0	30	60	90
350	0	0	0	3	33	64

Ready reckoner of fertilizer P2O5 for specific yield of hybrid rice (Indira Sona) with 5 tons of FYM application in Vertisol

SP kg ha^{-1}	Yield targets of hybrid rice (Indira Sona) q ha^{-1}					
	50	55	60	65	70	75
4	58	66	73	80	88	95
8	48	56	63	70	78	85
12	38	46	53	60	68	75
16	28	36	43	50	58	65
20	18	25	33	40	48	55
24	8	15	23	30	38	45
28	0	5	13	20	28	35
32	0	0	3	10	17	25
36	0	0	0	0	7	15

Ready reckoner of fertilizer K_2O for specific yield of hybrid rice (Indira Sona) with 5 tons of FYM application in Vertisol

SK kg ha^{-1}	Yield targets of hybrid rice (Indira Sona) q ha^{-}					
	50	55	60	65	70	75
150	92	104	117	129	142	155
200	82	94	107	120	132	145
250	72	85	97	110	122	135
300	62	75	87	100	113	125
350	52	65	78	90	103	116
400	43	55	68	80	93	106
450	33	45	58	71	83	96
500	23	36	48	61	74	86
550	13	26	38	51	64	76

13. Crop – Rice under Rainfed condition

Crop – Rice
Variety – MTU – 1010
Soil Type - Vertisol

Area for suitability - Entire Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Bilaspur, Kawardha, Janjgir, Jashpur, Mahasamund, Dhamtari and Kanker districts

Fertilizer adjustment equations

FN = 4.38 Y – 0.23 SN – 0.20 FYM
FP2O5 = 1.11 Y – 0.66 SP – 0.08 FYM
FK2O = 1.29 Y – 0.04 SK – 0.02 FYM

Where FN, FP_2O_5 and FK_2O are fertilizer N P and K respectively. SN, SP and SK are soil test values for available N P and K. Y = Yield target (q/ha) and FYM is Farm Yard Manure

Ready reckoner of fertilizer N, P_2O_5 and K_2O for specific yield of rainfed rice (MTU-1010) without FYM application

SN Kg/ ha	SP Kg/ ha	SK Kg/ ha	Yield targets of rainfed rice (MTU-1010) q ha^{-1}								
			Fertilizer N (kg/ha)			Fertilizer P_2O_5 (kg/ha)			Fertilizer K_2O (kg/ha)		
			30	35	40	30	35	40	30	35	40
150	4	150	97	119	141	31	36	42	33	40	46
175	8	200	91	113	135	28	33	39	31	38	44
200	12	250	85	107	129	25	31	36	29	36	42
225	16	300	80	101	123	23	28	34	28	34	40
250	20	350	74	96	118	20	26	31	26	32	39
275	24	400	68	90	112	17	23	29	24	30	37
300	28	450	62	84	106	15	20	26	22	28	35
325	32	500	57	78	100	12	18	23	20	27	33
350	36	550	51	73	95	10	15	21	18	25	31

Ready reckoner of fertilizer N, P_2O_5 and K_2O for specific yield of rainfed rice (MTU-1010) with 5 t/ha FYM application

SN Kg/ ha	SP Kg/ ha	SK Kg/ ha	Yield targets of rainfed rice (MTU-1010) q ha^{-1}								
			Fertilizer N (kg/ha)			Fertilizer P_2O_5 (kg/ha)			Fertilizer K_2O (kg/ha)		
			30	35	40	30	35	40	30	35	40
150	4	150	92	114	135	29	35	41	32	38	45
175	8	200	86	108	130	27	32	38	30	37	43
200	12	250	80	102	124	24	30	35	28	35	41
225	16	300	74	96	118	22	27	33	26	33	39
250	20	350	69	91	112	19	24	30	25	31	37
275	24	400	63	85	107	16	22	27	23	29	36
300	28	450	57	79	101	14	19	25	21	27	34
325	32	500	51	73	95	11	17	22	19	25	32
350	36	550	46	68	89	8	14	19	17	24	30

1. Jabalpur, Rice

Crop	**:**	Rice
Soil Type	**:**	Shallow, Medium black and Deep black soils
Varieties	**:**	IR-8, IT- 1991, Patel -85, Kranti,Sugandha, IR 36, JR 201
Yield (q ha^{-1})	**:**	30 - 45
Applicability	**:**	Range of soil test values (Kg ha^{-1}) ; N: 100- 500 ; P: 5- 25 K: 100-500
Districts	**:**	Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,, Narsinghpur, Powarkheda, Rewa, Satna, Sagar, Sehore, Ujjain. Grade : Good

Equation for Calculating the fertilizer nutrient Requirement:

FN= 4.25 T – 0.45 SN FP_2O_5 = 3.55 T – 4.89 SP FK_2O = 2.1 T – 0.18 SK

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			30			40		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**125**	**118**	**48**	**104**	**100**	**38**
150	**10**	**250**	**102**	**95**	**39**	**81**	**75**	**29**
200	**15**	**300**	**80**	**69**	**30**	**59**	**51**	**20**
250	**20**	**350**	**60**	**44**	**21**	**36**	**26**	**11**
300	**25**	**400**	**35**	**20**	**12**	**14**	**-**	**-**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 4.2 kg ha^{-1}; P_2O_5= ± 3.5 kg $ha^{-1}$and K_2O= ±2.1 kg ha^{-1}

Rahuri, (Maharashtra), Rice

Crop : Sugarcane (Adsali) **Variety: Co 7219**
Soil : Typic Haplusterts **Situation: Irrigated**

Districts : Ahmednagar, Pune, Satara, Sangli, Kolhapur, Nasik, Dhule, Latur, Solapur, Parbhani, Osmanabad, Nanded.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**1.68**	**60**	**38**
P_2O_5	**0.68**	**83**	**42**
K_2O	**2.61**	**43**	**140**

Targeted Yield Equations

FN = 4.39 T – 1.56 SN

FP_2O_5 = 1.62 T – 4.56 SP

FK_2O = 1.86 T – 0.37 SK

Fertilizer prescription for targeted yields of adsali sugarcane for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			175 t ha^{-1} target			200 t ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**612**	**256**	**252**	**722**	**297**	**298**
120	**8**	**300**	**581**	**247**	**215**	**691**	**288**	**261**
140	**10**	**400**	**550**	**238**	**178**	**660**	**278**	**224**
160	**12**	**500**	**519**	**229**	**141**	**628**	**269**	**187**
180	**14**	**600**	**487**	**220**	**104**	**597**	**260**	**150**
200	**16**	**700**	**456**	**211**	**67**	**566**	**251**	**113**

Wheat

1. Himachal Pradesh (Wheat)

Crop	**: Wheat**	**Soil Nitrogen range**	**: 200-600 kg ha^{-1}**
Soil	**: Alfisol, Entisol, Inceptisol**	**Soil phosphorus range**	**: 5-50 kg ha^{-1}**
Situation	**: Irrigated**	**Soil potassium range**	**: 50-250 kg ha^{-1}**
Districts	**: Parts of Kangra, Sirmour, Mandi, Kullu and Shimla districts**	**FYM composition**	**: -**
		FYM rate	**:-**
		Green manure composition	**:-**
Season developed	**: Rabi**	**Green manure rate**	**:-**
Target range	**: 40 q ha^{-1}**		

Fertilizer adjustment equation:

FN = 3.26 T-0.20SN, FP_2O_5 = 5.47 T-4.72 SP, FK_2O = 3.28T-0.48 SK

Ready reckoner for soil test based fertilizer recommendations for yield target of 40qha^{-1} wheat (Mid hills sub humid zone)

Soil test value (kgha^{-1})			Fertilizer nutrient dose (kgha^{-1})		
Alkaline $KMnO_4$-N	Olsen's –P	NH_4OAc-K	N	P_2O_5	K_2O
200	5	50	90	195	107
250	10	75	80	172	95
300	15	100	70	148	83
350	20	125	60	124	71
400	25	150	50	101	59
450	30	175	40	77	47
500	35	200	30	54	35
550	40	225	20	30	23
600	50	250	10	20	11

Validation of fertilizer adjustment equations of wheat on farmers' fields (average of 46 experiments) in mid hills wet temperate zone (1985-86 to 2000-01)

Treatment	Fertilizer dose (kgha^{-1})			Grain yield (kgha^{-1})	Per cent deviation	B:C ratio
	N	P_2O_5	K_2O			
Control	0	0	0	1330	-	-
Farmers' practice	30	0	0	1559	-	-
State level dose	120	90	30	2621	-	3.2
Soil Test based	115	72	34	2586	-	4.1
Target (kgha^{-1}) based						
2500	36	51	10	2516	+0.1	9.2
3500	67	89	26	3499	-0.1	6.1
4000	91	121	36	3831	-4.2	5.6
5000	161	153	62	4481	-10.4	4.6

2. Himachal Pradesh (Wheat)-IPNS

Crop	**: Wheat**	**Soil Nitrogen range**	**: 200-600 kg ha^{-1}**
Soil	**: Alfisol, Entisol, Inceptisol**	**Soil phosphorus range**	**: 5-45 kg ha^{-1}**
Situation	**: Irrigated**	**Soil potassium range**	**: 50-250 kg ha^{-1}**
Season developed	**: Rabi**	**FYM composition**	**: *Moisture 10%, N=0.50%, $P_=$ 0.25 % and K= 0.50 %***
Target range	**: 40 q ha^{-1}**	**FYM rate**	**: *12.5 t ha^{-1}***
		Green manure composition	**-**
		Green manure rate	**:-**

Fertilizer adjustment equations

F N = 5.27 T - 0.25 SN - 1.06ON, F P2O5 = 4.13 T– 0.38 SP - 0.98OP, F K2O = 2.87 T– 0.15 SK – 0.55OK

Ready recknor for IPNS based fertilizer equations at different soil test values for wheat

Soil test value (kgha^{-1})			Fertilizer nutrient dose (kgha^{-1})		
Alkaline $KMnO_4$-N	**Olsen's –P**	**NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
200	5	50	101	136	76
300	15	100	76	132	69
400	25	150	51	128	62
500	35	200	26	124	55
600	45	250	10	120	48

1. Bangalore, Karnataka (Wheat)Zone-3

Crop	**: Wheat**	**Soil Nitrogen range**	**: 0.35 -0.56%(OC)**
Variety	**: Wheat (Keerthi)**	**Soil phosphorus range**	**: 40-160kg/acre**
Soil	**: Black Clayey**	**potassium range**	**: 80-200 kg/acre**
Situation	**: irrigated**	**FYM composition %**	**: 0.35N,0.3.1,P0.4K**
Season developed	**: Rabi 1986**	**FYM rate:3t/acre**	**3.0 t/acre**
Target range	**: 12q/acre**	**Green manure composition:**	
		Green manure rate	**:**

Applicability : Tungabhadra Command Area of Bellary and Raichur districts.

Target yield equations :

F.N. = 6.61 T- 28.29 SN (OC%), F.P_2O_5 = 5.2 T- 1.28 SP_2O_5 (Olsen's - P_2O_5)

F.K_2O = 4.54 T- 0.06 SK_2O NH_4OAC - K_2O)

STV O.C. (%)	Fertilizer nitrogen (kg/acre)	STV Olsen's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
0.1	77	1	61	250	40
0.2	74	3	59	300	37
0.3	71	5	56	350	34
0.4	68	7	53	400	31
0.5	65	9	51	450	28
0.6	62	11	48	500	25
0.7	60	13	46	550	22
0.8	57	15	43	600	19
0.9	54	17	41	650	16
1.00	51	19	38	700	13
1.10	48	21	36	750	10
1.20	45	23	33		
1.30	43	25	30		

To increase or decrease the yield target by one q/acre The variations to be made in the fertilizer recommendations are as follows:

N = ± 6.5 kg/acre P_2O_5 = ± 5.25 kg/acre K_2O = ± 4.5 kg/acre

1. New Delhi Centre(Wheat)

Crop	**: Wheat**	**Soil phosphorus range**	**: 10-38**
Soil	**:Typic Haplustept (Alluvial)**	**Soil potassium range**	**: 100-375**
Season	**: Rabi**	**FYM composition (%) N,P,K**	**: 0.5, 0.2, 0.35**
Situation	**: Irrigated**	**FYM rate**	**: 10 t/ha**
Target range	**: 50 - 60 q ha $^{-1}$**	**Green manure composition**	**: Nil**
Soil Nitrogen range	**: 100 – 375**	**Green manure rate**	**; Nil**

Applicable area : Delhi state and adjoining soil-agro-climatic areas of
UP : Gautam Budhanagar, Ghaziabad , Bagpat Meerut , Mujjafarnagar, Saharanpur, Buland Shahr, Aligarh, Maha mayanagar, Etah, Agra, Etawah, Mainpuri , Shikohabad, Agra, Mathura, Jhansi, Ferozabad, Jalaun
Haryana : Rohtak, Sonipat, Panipat, Jhajjar, Rewari, Gurgaon, Faridabad, Mewat, Karnal
Rajasthan : Alwar, Bharatpur, Sawai madhopur, Sikar, Karauli
Punjab : Mansa, Patiala, Sangrur
M P : Bhind, Morana, Gwalior, Shivpuri

Fertilizer adjustment equations for targeted yield of crops in NCR of Delhi	
With FYM	**Without FYM**
FN = 3.85 T– 0.41 SN –1.64 FYM, FP_2O_5 = 2.78 T – 4.12 SP – 1.72 FYM FK_2O = 2.04 T – 0.29 SK – 0.88 FYM	FN = 5.31 T – 0.51SN, FP_2O_5 = 3.45 T – 5.55 SP, FK_2O = 2.75 T – 0.32 SK

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Wheat FYM 10t ha^{-1}

Soil test values (kg ha^{-1})			Nutrient needed (kg ha^{-1}) for an yield target of 50 q ha^{-1}			Nutrient needed (kg ha^{-1}) for an yield target of 60 q ha^{-1}		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	135	80	65	175	110	85
125	13	125	125	70	55	165	100	75
150	15	150	115	60	50	155	90	70
175	18	175	105	50	40	145	80	65
200	20	200	95	40	35	135	65	55
225	23	225	85	30	30	120	55	50
250	25	250	75	20	20	110	45	40
275	28	275	65	10	15	100	35	35
300	30	300	55	10	10	90	25	25
325	33	325	45	10	10	80	15	20
350	36	350	35	10	10	70	10	10
375	38	375	20	10	10	60	10	10

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Wheat

Soil test values (kg ha^{-1})			Nutrient needed (kg ha^{-1}) for an yield target of 50 q ha^{-1}			Nutrient needed (kg ha^{-1}) for an yield target of 60 q ha^{-1}		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	215	115	105	250	120	120
125	13	125	200	100	100	250	120	120
150	15	150	190	90	90	245	120	120
175	18	175	175	75	80	230	110	110
200	20	200	165	60	75	215	95	100
225	23	225	150	50	65	205	85	95
250	25	250	140	35	60	190	70	85
275	28	275	125	20	50	180	55	80
300	30	300	110	10	40	165	40	70
325	33	325	100	10	35	155	25	60
350	36	350	85	10	25	140	15	55
375	38	375	75	10	20	130	15	45

Results of frontline demonstrations conducted at farmers' fields in NCR Delhi

Fertilizer nutrient dose (kg ha^{-1}) N	P_2O_5	K_2O	Treat-ment	Yield Obtained (q ha^{-1})	Extra yield (q ha^{-1})	Cost of extra yield (Rs.ha^{-1})	Cost of fertilizer (Rs.ha^{-1})	Response ratio kg grain kg^{-1} nutrient	Net profit (Rs. ha^{-1})
Farmer : Shri Ram Singh				**Village : Kanganheri**					
Wheat (*Kundan*)				**Year : 1997-98**					
0	0	0	C	19.2	-				
114	34	55	T_{50}	49.0	29.8	23840	2542	14.7	21298
120	60	40	Gen	47.5	28.3	22640	2860	12.8	19780
80	57	0	FP	41.2	22.0	17600	1895	15.9	15705
Farmer : Shri Ram Chander				**Village : Daulatpur**					
Wheat (*HD-2285*)				**Year :1997-98**					
0	0	0	C	18.5	-				
131	56	67	T_{50}	52.2	33.7	26960	3213	13.3	23747
120	60	40	Gen	46.0	27.5	22000	2860	12.5	19140
80	57	0	FP	38.5	20.0	16000	1895	14.6	14105
Farmer : Shri Sube Singh				**Village : Nanakheri**					
Wheat (*HD-2643*)				**Year : 1998-99**					
0	0	0	C	22.0	-				
131	22	56	T_{50}	52.7	30.7	24560	2593	14.7	21967
120	60	40	Gen	47.5	25.5	20400	2860	11.6	17540
80	57	0	FP	38.6	16.6	13280	1895	12.1	11385
Farmer : Shri Raghu Nath				**Village : Nanakheri**					
Wheat (*HD-2643*)				**Year : 1998-99**					
0	0	0	C	18.2	-				
107	76	64	T_{50}	49.6	31.4	25120	3171	12.7	21949
120	60	40	Gen	44.3	26.1	20880	2860	11.9	18020
80	57	0	FP	36.0	17.8	14240	1895	13.0	12345
Farmer : Shri Inder Singh				**Village : Kanganheri**					
Wheat (*HD-2380*)				**Year : 1999-00**					
0	0	0	C	21.2	-				
129	17	67	T_{50}	54.2	33.0	26400	2602	15.5	23798
120	60	40	Gen	49.6	28.4	22720	2860	11.7	19860
80	57	0	FP	38.5	17.3	13840	1895	12.6	11945

Farmer : Shri Lachhu Singh **Village : Daulatpur**

Wheat (*HD-2380*) **Year : 1999-00**

0	0	0	C	18.0	-				
109	77	51	T_{50}	48.8	30.8	24640	3082	13.0	21558
120	60	40	Gen	44.0	26.0	20800	2860	11.8	17940
80	57	0	FP	34.2	16.2	12960	1895	11.8	11065

Farmer : Shri Chand Ram **Village : Bharthal**

Wheat (*HD-2687*) **Year : 2000-01**

0	0	0	C	18.0	-				
134	22	87	T_{50}	53.5	35.5	28400	2942	15.9	25458
120	60	40	Gen	48.0	30.0	24000	2860	13.6	21140
80	57	0	FP	39.0	21.0	16800	1895	15.3	14905

Farmer : Shri Rajendra **Village : Dorala**

Wheat (*HD-2687*) **Year : 2002-03**

0	0	0	C	18.6	-				
138	34	0	T_{50}	52.0	33.4	26720	2304	19.9	24416
120	60	40	Gen	49.2	30.6	24480	2860	13.9	21620
80	57	0	FP	41.3	22.7	18160	1895	16.6	16265

Farmer : Shri Sukhbir **Village : Dorala**

Wheat (*HD-2687*) **Year : 2002-03**

0	0	0	C	20.2	-				
123	70	0	T_{50}	53.8	33.6	26880	2649	17.4	24231
120	60	40	Gen	50.6	30.4	24320	2860	13.8	21460
80	57	0	FP	40.6	20.4	16320	1895	14.9	14425

Farmer : Shri Ranbir Singh **Village : Dhulsiras**

Wheat (*HD-2687*) **Year : 2003-04**

0	0	0	C	20.8	-				
145	10	74	T_{50}	53.4	32.6	26080	2775	14.2	23305
120	60	40	Gen	46.3	25.5	20400	2860	11.6	17540
80	57	0	FP	38.3	17.5	14000	1895	12.8	12105

Farmer : Shri Suraj Bhan **Village : Dhulsiras**

Wheat (*HD-2687*) **Year : 2003-04**

0	0	0	C	17.2	-				
140	82	14	T_{50}	51.0	33.8	27040	3190	14.3	23850
120	60	40	Gen	44.2	27.0	21600	2860	12.3	18740
80	57	0	FP	36.1	18.9	15120	1895	13.3	13225

Farmer: Shri Teeka Ram;				**Village : Shikarpur**					
Wheat (*HD-2733*)				**Year : 2004-05**					
0	0	0	C	16.0					
145	22	27	T_{50}	48.7	32.7	22890	2985	13.4	19905
120	60	40	Gen	44.2	28.2	19740	2860	12.8	16880
80	57	0	FP	37.4	21.4	14980	1895	15.6	13085
Farmer: Shri Shrikishan				**Village : Chhawala**					
Wheat (*PBH-343*)				**Year : 2005-06**					
0	0	0	C	16.0					
142	16	72	T_{50}	47.6	31.6	22120	2806	14.2	19314
120	60	40	Gen	43.2	27.2	19040	2860	12.8	16180
80	57	0	FP	34.1	18.1	12670	1895	13.2	10775

1 .Uttarakhand (Wheat)

Crop : **Wheat**
Variety : **UP-2382, UP-2687, SD-2285, Rai-3077**
Soil : **Mollisols and Inceptisols**
Situation : **Irrigated**
Districts : **U.S.Nagar**
Season developed : **Rabi**
Target range : **40-45 q ha^{-1}**

STV for Wheat (UP-2382):
Soil O.C. Range : **0.35-0.83%**
Alkaline $KMnO_4$-N : **150-240 kg/ha**
Olsen's-P : **20-60 kg/ha**
Amm. Acetate-K : **150-200 kg/ha**
FYM composition (%) : **0.345-0.242-0.338**
FYM rate :**10 t/ha**
Green manure composition :--------
Green manure rate :--------

Fertilizer adjustment equations for different yield target.	
Wheat (Var. HD 2687) With FYM	**Wheat Var. (UP 2382) With FYM**
FN = 7.96T-0.96 SN-1.04FYM-N FP = 1.25T-0.80 SP-0.17 FYM-P FK = 1.99T-0.29 SK-0.44 FYM-K	F N (N kg/ha) =6.28 x YT (q/ha) – 0.67SN-0.371FYM-N F P (P kg/ha) =0.94 x YT (q/ha) –0.28SP-0.173FYM-P F K (K kg/ha) = 1.36x YT (q/ha) –0.16SP-0.079FYM-K

Fertilizer adjustment equations of STCR experiments for different crops under IPNS	
Wheat (Var. HD-2285) Without FYM	**Wheat (Var. Raj 3077) Without FYM**
FN (N, kg/ha) = 2.69 x YT – 227.49 OC F P (P_2O_5, kg/ha) = 2.88 x YT (q/ha) –0.56 SP F K (K_2O kg/ha) = 2.23 x YT (q/ha)-0.05 SK	F N (N, kg/ha) = 3.15 x YT (q/ha) –45.04 OC F P (P_2O_5, kg/ha) = 2.05 x YT (q/ha) – 0.50 SP F K (K_2O kg/ha) = 1.77 x YT (q/ha)-0.06 SK

Ready reckoners for 40 q/ha yield targets of wheat (UP 2382) based on soil test fertilizer recommendations with 10 t/ha FYM

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 40 q ha^{-1}		
$KmnO_4$ N	P	K	N	P_2O_5	K_2O
150	20	150	137.45	27.81	27.73
170	30	165	123.99	25.01	25.33
190	40	180	110.53	22.21	22.93
210	50	195	97.07	19.41	20.53
230	60	210	83.61	16.61	18.13

Applicability:U.S. Nagar, Haridwar, Nainital and some parts of Western U.P.

1. Bihar (Wheat)

Bihar (Young Alluvium Calcareous Soil)

Name of the Centre : RAU,Pusa
Soil : Young alluvium calcoreaus soil
Season : Rabi
Crop : Wheat
Target range : 30- 45 q/ha
Soil Nitrogen range : 120- 300 kg N /ha
Soil phosphorus range : 4- 40 kg P_2O_5/ha
Soil potassium range : 60- 240 kg K_2O/ha
Compost composition : 0.55 % N, 0.25 % P_2O_5, 0.67 % K_2O
Compost rate : 5- 10 t/ha or available with farmers
Green manure composition : N.A.
Green manure rate : N. A.

Valid for Districts : East Champaran, West Champaran, Siwan, Saran, Sitamarhi, Shivhar, Muzaffarpur, Vaishali,Samastipur, Gopalganj, Begusarai, Part of Khagaria

Soil Test Values : Alk. $KMnO_4$ – N expressed in **kg N/ha**
Olsen's P expressed in **kg P_2O_5/ha**
Ammonium OAc – K expressed in **kg K_2O/ha**

Minimum maintenance dose of fertilizer if soil test value is high : **30 kg N, 15 kg P_2O_5 and 10 kg K_2O/ha**

Bihar (Young Alluvium Calcareous Soil) Crop: Wheat

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				Targetted Yield Equations
Nutrient	N R(kg/q)	C S (%)	C F (%)	
N	2.1	15.3	35.3	FN = 5.95 T – 0.43 SN
P_2O_5	0.46	20.3	15.2	FP_2O = 3.03 T – 1.34 SP_2O_5
K_2O	2.22	51.3	70.3	FK_2O = 3.16 T – 0.73 SK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
120	4	60	127	86	51	186	116	83
130	6	70	123	83	44	182	113	75
140	8	80	118	80	36	178	110	68
150	10	90	114	78	29	174	108	61
160	12	100	110	75	22	169	105	53
170	14	110	105	72	15	165	102	46
180	16	120	101	69	10	161	100	39
190	18	130	97	67	10	156	97	32
200	20	140	93	64	10	152	94	24
210	22	150	88	61	10	148	92	17
220	24	160	84	59	10	143	89	10
230	26	170	80	56	10	139	86	10
240	28	180	75	53	10	135	84	10
250	30	190	71	51	10	131	81	10
260	32	200	67	48	10	126	78	10
270	34	210	62	45	10	122	76	10
280	36	220	58	43	10	118	73	10
290	38	230	54	40	10	113	70	10
300	40	240	50	37	10	109	68	10

2. Bihar (Young Alluvium Calcareous Soil) Crop: Wheat

Targetted Yield Equations: (**WITH ONLY INORGANIC FERTILIZERS :N, P, K & Zn**)**

Basic Data				Targetted Yield Equations
Nutrient	N R(kg/q)	C S (%)	C F (%)	
N	2.04	11.7	33.7	FN = 6.05 T – 0.30 SN
P_2O_5	0.44	35.3	10.4	FP_2O = 4.27 T – 3.39 SP_2O_5
K_2O	3.29	108.4	32.9	FK_2O = 10.02 T – 3.30SK_2O
Zn	7.46*	14.3	2	F Zn = 0.38 T -7.14 SZn

*** g/q of grain production.**

**** Equations not upto the mark**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)				Fertilizer Nutrients Required (kg/ha) for Yield Target of							
				30 q/ha				40 q/ha			
N	**P_2O_5**	**K_2O**	**Zn (ppm)**	**N**	**P_2O_5**	**K_2O**	**Zn**	**N**	**P_2O_5**	**K_2O**	**Zn**
120	4	60	0.4	146	115	103	9	206	157	203	12.3
130	6	70	0.5	143	108	70	8	203	150	170	11.6
140	8	80	0.6	140	101	37	7	200	144	137	10.9
150	10	90	0.7	137	94	10	6	197	137	104	10.2
160	12	100	0.8	134	87	10	6	194	130	71	9.5
170	14	110	0.9	131	81	10	5	191	123	38	8.8
180	16	120	1	128	74	10	4	188	117	10	8.1
190	18	130	1.1	125	67	10	4	185	110	10	7.3
200	20	140	1.2	122	60	10	3	182	103	10	6.6
210	22	150	1.3	119	54	10	2	179	96	10	5.9
220	24	160	1.4	116	47	10	1	176	89	10	5.2
230	26	170	1.5	113	40	10	1	173	83	10	4.5
240	28	180	1.6	110	33	10	0	170	76	10	3.8
250	30	190	1.7	107	26	10	0	167	69	10	3.1
260	32	200	1.8	104	20	10	0	164	62	10	2.3
270	34	210	1.9	101	15	10	0	161	56	10	1.6
280	36	220	2	98	15	10	0	158	49	10	0.9
290	38	230	2.1	95	15	10	0	155	42	10	0.2
300	40	240	2.2	92	15	10	0	152	35	10	0

3. Bihar (Young Alluvium Calcareous Soil) **Crop: Wheat**

Targetted Yield Equations*: (WITH INORGANIC FERTILIZERS and COMPOST**)**

Basic Data					Targeted Yield Equations
Nutrient	**NR (Kg/t)**	**C S (%)**	**C F (%)**	**C C (%)**	
N	2	13	30	15.6	FN = 6.67 T – 0.43 SN - 0.52CN
P_2O_5	0.48	42.9	12.5	10.6	FP_2O = 3.84 T – 3.43 SP_2O_5-0.85 CP_2O_5
K_2O	3.81	79.8	107.5	29.4	FK_2O = 3.54 T – 0.74 SK_2O -0.27CK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values Without compost

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	149	101	62	215	140	97
130	6	70	144	95	54	211	133	90
140	8	80	140	88	47	207	126	82
150	10	90	136	81	40	202	119	75
160	12	100	131	74	32	198	112	68
170	14	110	127	67	25	194	106	60
180	16	120	123	60	17	189	99	53
190	18	130	118	53	10	185	92	45
200	20	140	114	47	10	181	85	38
210	22	150	110	40	10	177	78	31
220	24	160	106	33	10	172	71	23
230	26	170	101	26	10	168	64	16
240	28	180	97	19	10	164	58	10
250	30	190	93	12	10	159	51	10
260	32	200	88	10	10	155	44	10
270	34	210	84	10	10	151	37	10
280	36	220	80	10	10	146	30	10
290	38	230	75	10	10	142	23	10
300	40	240	71	10	10	138	16	10
Reduction in Fertilzer recommendation with the application of compost (N -0.55, P2O5- 0.25 & K2O- 0.67 %)@								
Nutrients	1 t/ha	2 t/ha	3 t/ha	4 t/ha	5 t/ha	6 t/ha	8 t/ha	10 t/ha
N	3	6	9	11	14	17	23	29
P_2O_5	2	4	6	9	11	13	17	21
K_2O	2	4	5	7	9	11	14	18

4. Bihar (Young Alluvium Calcareous Soil) Crop: Wheat

Targetted Yield Equations*: (WITH INORGANIC FERTILIZERS and BIOGAS SLURRY**)**

Basic Data					Targeted Yield Equations
Nutrient	**NR (Kg/q)**	**C S (%)**	**C F (%)**	**C C (%)**	
N	2.16	12.2	42.5	26	FN = 5.08 T – 0.29 SN - 0.63CN
P_2O_5	0.57	30.4	20.3	16	FP_2O = 2.81 T – 1.50 SP_2O_5-0.79 CP_2O_5
K_2O	3.45	52.4	101.3	68.3	FK_2O = 3.41 T – 0.52 SK_2O -0.67CK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values Without Biogas slurry

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	118	78	71	168	106	105
130	6	70	115	75	66	166	103	100
140	8	80	112	72	61	163	100	95
150	10	90	109	69	56	160	97	90
160	12	100	106	66	50	157	94	84
170	14	110	103	63	45	154	91	79
180	16	120	100	60	40	151	88	74
190	18	130	97	57	35	148	85	69
200	20	140	94	54	30	145	82	64
210	22	150	92	51	24	142	79	58
220	24	160	89	48	19	139	76	53
230	26	170	86	45	14	137	73	48
240	28	180	83	42	10	134	70	43
250	30	190	80	39	10	131	67	38
260	32	200	77	36	10	128	64	32
270	34	210	74	33	10	125	61	27
280	36	220	71	30	10	122	58	22
290	38	230	68	27	10	119	55	17
300	40	240	65	24	10	116	52	12

Reduction in Fertilzer recommendation with the application of biogasslurry (N -0.93, P2O5- 0.45 & K2O- 0.55 %)@

Nutrients	1 t/ha	2 t/ha	3 t/ha	4 t/ha	5 t/ha	6 t/ha	8 t/ha	10 t/ha
N	6	12	18	24	30	36	48	60
P_2O_5	4	7	11	14	18	21	28	36
K_2O	4	7	11	15	18	22	29	37

5. Bihar (Young Alluvium Calcareous Soil) Crop: Wheat

Targetted Yield Equations*: (WITH INORGANIC FERTILIZERS and POULTRY MANURE**)**

Basic Data					Targeted Yield Equations
Nutrient	**NR (Kg/q)**	**C S (%)**	**C F (%)**	**C C (%)**	
N	3.31	22.34	56.62	25.82	FN = 5.85 T – 0.40 SN - 0.46CN
P_2O_5	0.59	32.11	15.87	6.96	FP_2O = 3.72 T – 2.02 SP_2O_5-0.44 CP_2O_5
K_2O	3.23	45.73	81.5	66.67	FK_2O = 3.96 T – 0.56 SK_2O -0.82CK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values Without Poultry manure

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	128	104	85	186	141	125
130	6	70	124	99	80	182	137	119
140	8	80	120	95	74	178	133	114
150	10	90	116	91	68	174	129	108
160	12	100	112	87	63	170	125	102
170	14	110	108	83	57	166	121	97
180	16	120	104	79	52	162	116	91
190	18	130	100	75	46	158	112	86
200	20	140	96	71	40	154	108	80
210	22	150	92	67	35	150	104	74
220	24	160	88	63	29	146	100	69
230	26	170	84	59	24	142	96	63
240	28	180	80	55	18	138	92	58
250	30	190	76	51	12	134	88	52
260	32	200	72	47	10	130	84	46
270	34	210	68	43	10	126	80	41
280	36	220	64	39	10	122	76	35
290	38	230	60	35	10	118	72	30
300	40	240	56	31	10	114	68	24
Reduction in Fertilzer recommendation with the application of poultry man. (N -1.47, P2O5- 1.93 & K2O- 1.15 %)@								
Nutrients	1 t/ha	2 t/ha	3 t/ha	4 t/ha	5 t/ha	6 t/ha	8 t/ha	10 t/ha
N	7	15	22	30	37	45	60	75
P_2O_5	5	11	16	21	26	32	42	53
K_2O	6	11	17	23	29	34	46	57

6. Bihar (Young Alluvium Calcareous Soil) Crop: Wheat

Targetted Yield Equations*: (WITH INORGANIC FERTILIZERS and MUSTARD OIL CAKE**)**

Basic Data					Targeted Yield Equations
Nutrient	**NR (Kg/q)**	**C S (%)**	**C F (%)**	**C C (%)**	
N	2.02	14.2	39.5	29.3	FN = 5.12 T – 0.36 SN - 0.74CN
P_2O_5	0.31	38.5	9.1	16	FP_2O = 3.42 T – 4.24 SP_2O_5-1.76 CP_2O_5
K_2O	2.11	41.7	60.3	121.8	FK_2O = 2.50 T – 0.69 SK_2O - 2.02 CK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values Without Mustard Oil Cake

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	110	86	34	162	120	59
130	6	70	107	77	27	158	111	52
140	8	80	103	69	20	154	103	45
150	10	90	100	60	13	151	94	38
160	12	100	96	52	10	147	86	31
170	14	110	92	43	10	144	77	24
180	16	120	89	35	10	140	69	17
190	18	130	85	26	10	136	60	10
200	20	140	82	18	10	133	52	10
210	22	150	78	15	10	129	44	10
220	24	160	74	15	10	126	35	10
230	26	170	71	15	10	122	27	10
240	28	180	67	15	10	118	18	10
250	30	190	64	15	10	115	15	10
260	32	200	60	15	10	111	15	10
270	34	210	56	15	10	108	15	10
280	36	220	53	15	10	104	15	10
290	38	230	49	15	10	100	15	10
300	40	240	46	15	10	97	15	10
Reduction in Fertilzer recommendation with the application of oil cakes (N -5.20, P2O5- 1.82 & K2O- 1.20 %)@								
Nutrients	1 q/ha	2 q/ha	3 q/ha	4 q/ha	5 q/ha	6 q/ha	8 q/ha	10 q/ha
N	3.8	7.7	11.5	15.4	19.2	23.1	30.8	38.5
P_2O_5	3.2	6.4	9.6	12.8	16.0	19.2	25.6	32.0
K_2O	2.4	4.8	7.3	9.7	12.1	14.5	19.4	24.2

7. Bihar (Wheat)

Bihar (Recent Alluvium Non Calcareous Non Saline Soil)

Name of the Centre : **RAU,Pusa**
Soil : **Recent Alluvium Non-Calcareous Non- Saline Soil**
Season : **Rabi**
Crop : **Wheat**
Target range : **30- 40 q/ha**
Soil Nitrogen range : **120- 300 kg N /ha**
Soil phosphorus range : **4- 40 kg P_2O_5/ha**
Soil potassium range : **60- 240 kg K_2O/ha**
Compost composition :**N.A.**
Compost rate :**N.A.**
Green manure composition : **N.A.**
Green manure rate : **N. A.**

Valid for Districts :Purnea, Katihar, Saharsa, Supaul, Madhepura, Araria, Kishanganj, part of Khagaria, Dabhanga and Madhubani

Bihar (Recent Alluvium Non Calcareous Non Saline Soil) Crop: Wheat

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				Targetted Yield Equations
Nutrient	N R(kg/q)	C S (%)	C F (%)	
N	2.36	18.6	16.7	FN = 5.05 T – 0.40 SN
P_2O_5	0.36	25.1	12.1	FP_2O = 3.0 T – 2.11 SP_2O_5
K_2O	1.63	11.6	22.8	FK_2O = 2.10 T – 0.15 SK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	104	82	54	154	112	75
130	6	70	100	77	53	150	107	74
140	8	80	96	73	51	146	103	72
150	10	90	92	69	50	142	99	71
160	12	100	88	65	48	138	95	69
170	14	110	84	60	47	134	90	68
180	16	120	80	56	45	130	86	66
190	18	130	76	52	44	126	82	65
200	20	140	72	48	42	122	78	63
210	22	150	68	44	41	118	74	62
220	24	160	64	39	39	114	69	60
230	26	170	60	35	38	110	65	59
240	28	180	56	31	36	106	61	57
250	30	190	52	27	35	102	57	56
260	32	200	48	22	33	98	52	54
270	34	210	44	18	32	94	48	53
280	36	220	40	14	30	90	44	51
290	38	230	36	10	29	86	40	50
300	40	240	32	10	27	82	36	48

8. Bihar (Old Alluvium Light Textured Soil)

Name of the Centre : RAU,Pusa
Soil : Old Alluvium light Textured Soil
Season : Rabi
Crop : Wheat
Target range : 30- 40 q/ha
Soil Nitrogen range : 120- 300 kg N /ha
Soil phosphorus range : 4- 40 kg P_2O_5/ha
Soil potassium range : 60- 240 kg K_2O/ha
Compost composition : 1.04 % N, 0.23 % P_2O_5, 0.60 % K_2O
Compost rate : 5- 10 t/ha or available with farmers
Green manure composition : N.A.
Green manure rate : N. A.

Valid for Districts :Sheikhpura, Mungher, Bhagalpur, Banka, Jamui and Lakhi Sarai

Bihar (Old Alluvium Light Textured Soil) Crop: Wheat

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				Targetted Yield Equations
Nutrient	**N R(kg/q)**	**C S (%)**	**C F (%)**	
N	2.41	16.6	46.3	FN = 5.20 T – 0.36 SN
P_2O_5	0.4	29.3	13.7	FP_2O = 2.93 T – 2.15 SP_2O_5
K_2O	1.86	21.1	82.81	FK_2O = 2.25 T – 0.25 SK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	113	79	53	165	109	75
130	6	70	109	75	50	161	104	73
140	8	80	106	71	48	158	100	70
150	10	90	102	66	45	154	96	68
160	12	100	98	62	43	150	91	65
170	14	110	95	58	40	147	87	63
180	16	120	91	54	38	143	83	60
190	18	130	88	49	35	140	79	58
200	20	140	84	45	33	136	74	55
210	22	150	80	41	30	132	70	53
220	24	160	77	36	28	129	66	50
230	26	170	73	32	25	125	61	48
240	28	180	70	28	23	122	57	45
250	30	190	66	23	20	118	53	43
260	32	200	62	19	18	114	48	40
270	34	210	59	15	15	111	44	38
280	36	220	55	11	13	107	40	35
290	38	230	52	10	10	104	36	33
300	40	240	48	10	10	100	31	30

9. Bihar (Old Alluvium Light Textured Soil) Crop: Wheat

Targetted Yield Equations*(WITH INORGANIC FERTILIZERS and COMPOST **)**

Basic Data					Targeted Yield Equations
Nutrient	**NR (Kg/q)**	**C S (%)**	**C F (%)**	**C C (%)**	
N	2.01	9	40.8	8.4	FN = 4.92 T – 0.22 SN - 0.51CN
P_2O_5	0.54	22.9	12.3	5.2	FP_2O = 2.62 T – 1.18 SP_2O_5-0.77 CP_2O_5
K_2O	2.62	14.3	64.3	16.5	FK_2O = 3.63 T – 0.65 SK_2O -0.60CK_2O

*** Good Equations**

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	121	74	70	170	100	106
130	6	70	119	72	63	168	98	100
140	8	80	117	69	57	166	95	93
150	10	90	115	67	50	164	93	87
160	12	100	112	64	44	162	91	80
170	14	110	110	62	37	159	88	74
180	16	120	108	60	31	157	86	67
190	18	130	106	57	24	155	84	61
200	20	140	104	55	18	153	81	54
210	22	150	101	53	11	151	79	48
220	24	160	99	50	10	148	76	41
230	26	170	97	48	10	146	74	35
240	28	180	95	46	10	144	72	28
250	30	190	93	43	10	142	69	22
260	32	200	90	41	10	140	67	15
270	34	210	88	38	10	137	65	10
280	36	220	86	36	10	135	62	10
290	38	230	84	34	10	133	60	10
300	40	240	82	31	10	131	58	10
Reduction in Fertilzer recommendation with the application of compost (N -1.04, P2O5- 0.23 & K2O- 0.60 %)@								
Nutrients	1 t/ha	2 t/ha	3 t/ha	4 t/ha	5 t/ha	6 t/ha	8 t/ha	10 t/ha
N	5	11	16	21	27	32	42	53
P_2O_5	2	4	5	7	9	11	14	18
K_2O	4	8	12	16	20	24	32	40

10. Bihar (Old Alluvium Heavy Textured Soil)

Name of the Centre : **RAU,Pusa**
Soil : **Old Alluvium Heavy Textured Soil**
Season : **Rabi**
Crop : **Wheat**
Target range : **40- 50 q/ha**
Soil Nitrogen range : **120- 300 kg N /ha**
Soil phosphorus range : **4- 40 kg P_2O_5/ha**
Soil potassium range : **60- 240 kg K_2O/ha**
Compost composition : **N.A.**
Compost rate : **N. A.**
Green manure composition : **N.A.**
Green manure rate : **N. A.**

Valid for Districts :Rohtas, Bhojpur, Buxar, Bhabhua, Arwal, Patna, Nalanda, Nawadah, Jehanabad, Aurangabad and Gaya

Bihar (Old Alluvium Heavy Textured Soil) **Crop: Wheat**

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				Targetted Yield Equations
Nutrient	**N R(kg/q)**	**C S (%)**	**C F (%)**	
N	**2.31**	**13.2**	**56.9**	**FN = 4.06 T – 0.23 SN**
P_2O_5	**0.42**	**30.3**	**20.7**	**FP_2O = 2.03 T – 1.46 SP_2O_5**
K_2O	**1.76**	**17**	**104.2**	**FK_2O = 1.69 T – 0.16 SK_2O**

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			40 q/ha			50 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	94	55	41	156	75	58
130	6	70	92	52	40	154	72	56
140	8	80	90	49	38	152	70	55
150	10	90	87	46	36	150	67	53
160	12	100	85	43	35	147	64	52
170	14	110	83	40	33	145	61	50
180	16	120	80	38	32	143	58	48
190	18	130	78	35	30	140	55	47
200	20	140	76	32	28	138	52	45
210	22	150	74	29	27	136	49	44
220	24	160	71	26	25	133	46	42
230	26	170	69	23	24	131	43	40
240	28	180	67	20	22	129	40	39
250	30	190	64	17	20	127	37	37
260	32	200	62	14	19	124	34	36
270	34	210	60	11	17	122	32	34
280	36	220	57	10	16	120	29	32
290	38	230	55	10	14	117	26	31
300	40	240	53	10	12	115	23	29

1. Jharkhand (Wheat)

Name of the Centre	**: RAU,Pusa**	**Soil phosphorus range**	**: 4- 30 kg P_2O_5/ha**
Soil	**: Red Loam Soil**	**Soil potassium range**	**: 60- 190 kg K_2O/ha**
Season	**: Rabi**	**Compost composition**	**: N. A.**
Crop	**: Wheat**	**Compost rate**	**: N.A.**
Target range	**: 25- 30 q/ha**	**Green manure composition**	**: N.A.**
Soil Nitrogen range	**: 120- 250 kg N /ha**	**Green manure rate**	**: N. A.**

Valid for Districts : All districts of Jharkhand state having red loam / laterite soil

Soil Test Values : Alk. $KMnO_4$ – N expressed in **kg N/ha**
Bray's P_1 expressed in **kg P_2O_5/ha**
Ammonium OAc – K expressed in **kg K_2O/ha**

Minimum maintenance dose of fertilizer if soil test value is high :
25 kg N, 15 kg P_2O_5 and 10 kg K_2O/ha

Soil: Red Loam Soils of Jharkhand **Crop: Wheat**

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				**Targetted Yield Equations**
Nutrient	**N R(kg/q)**	**C S (%)**	**C F (%)**	
N	2.33	17.7	48.1	FN = 4.84 T – 0.36 SN
P_2O_5	0.32	12.7	10.9	FP_2O_5 = 2.94 T – 1.63 SP_2O_5
K_2O	1.31	10.8	65.3	FK_2O = 2.01 T – 0.16 SK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			**Fertilizer Nutrients Required (kg/ha) for Yield Target of**					
			20 q/ha			30 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	54	52	31	102	82	51
130	6	70	50	49	29	98	78	49
140	8	80	46	46	27	95	75	48
150	10	90	43	43	26	91	72	46
160	12	100	39	39	24	88	69	44
170	14	110	36	36	23	84	65	43
180	16	120	32	33	21	80	62	41
190	18	130	30	29	19	77	59	40
200	20	140	25	26	18	73	56	38
210	22	150	25	23	16	70	52	36
220	24	160	25	20	15	66	49	35
230	26	170	25	16	13	62	46	33
240	28	180	25	15	11	59	43	32
250	30	190	25	15	10	55	39	30

1. West Bengal (Wheat)

Crop	**: Kalyani, BCKV**
Variety	**: Wheat (cv. UP-262)**
Soil	**: Inceptisol**
Situation	**: Irrigated**
Districts	**: Nadia**
Season developed	**: Rabi, 2002-2003**
Target range	**: 25-30q ha^{-1}**

Soil Nitrogen range	**: 239 - 310 kg.ha^{-1}**
Soil phosphorus range	**: 17 - 28 kg.ha^{-1}**
Soil potassium range	**: 72 - 225 kg.ha^{-1}**
FYM composition	**: NA**
FYM rate	**: NA**
Green manure composition	**: NA**
Green manure rate	**: NA**

Fertilizer adjustment equations:

FN = 12.88 T – 0.80 SN, FP_2O_5 = 2.15 T – 0.23 SP, FK_2O = 4.65 T – 0.29 SK

Fertilizer levels (kg.ha^{-1})	**N**	**0, 80, 100, 120**
	P_2O_5	**0, 40, 50**
	K_2O	**0, 40, 50**
Initial soil test values (kg.ha^{-1})	**$KMnO_4$-N**	**239 - 310**
	Olsen-P	**17 - 28**
	NH_4OAc-K	**72 - 225**
Yield (kg.ha^{-1})	**Control plot**	**1464 - 2042**
	Treated plot	**2459 - 2773**

Ready-reckoner* of fertilizer doses at varying soil test values for specific yield target

Available soil nutrients (kg.ha^{-1})			**Fertilizer nutrient required (kg.ha^{-1})**					
			Targeted yield 2.5 t ha^{-1}			**Targeted yield 3.0 t ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
250	5	100	122	53	58	126	63	82
275	10	150	102	51	58	126	62	82
300	15	200	82	50	58	126	61	82
325	20	250	62	49	44	126	60	67
350	25	300	62	48	29	106	59	53
375	30	350	42	47	15	86	58	38

*** A minor modification was made in the ready-reckoner.**

2. West Bengale (Wheat)

Crop	**: Kalyani, BCKV**	**Soil Nitrogen range**	**: 283 – 387 kg.ha^{-1}**
Variety	**: Wheat (cv. PBW - 343)**	**Soil phosphorus range**	**: 25 - 40 kg.ha^{-1}**
Soil	**: Inceptisol**	**Soil potassium range**	**: 71- 180 kg.ha^{-1}**
Situation	**: Irrigated**	**FYM composition**	**: NA**
Districts	**: Nadia**	**FYM rate**	**: NA**
Season developed	**: Rabi, 2003-'04**	**Green manure composition**	**: NA**
Target range	**: 45-50q ha^{-1}**	**Green manure rate**	**: NA**

Fertilizer adjustment equations:

FN = 3.03 T –.18 SN, FP_2O_5 = 1.35T – 0.23SP, FK_2O = 2.15 T – 0.29 SK

Fertilizer levels (kg.ha^{-1})	**N**	**0, 80, 100, 120**
	P_2O_5	**0, 40, 50**
	K_2O	**0, 40, 50**
Initial soil test values (kg.ha^{-1})	**$KMnO_4$-N**	**283 – 387**
	Olsen-P	**25 - 40**
	NH_4OAc-K	**71- 180**
Yield (kg.ha^{-1})	**Control plot**	**550 - 580**
	Treated plot	**1947 - 2200**

Ready-reckoner* of fertilizer doses at varying soil test values for specific yield target

Available soil nutrients (kg.ha^{-1})			**Fertilizer nutrient required (kg.ha^{-1})**					
			Targeted yield 4.5 t.ha^{-1}			**Targeted yield 5.0 t.ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
250	5	100	122	73	89	137	80	100
275	10	150	117	72	75	132	79	86
300	15	200	113	71	60	128	78	71
325	20	250	108	70	46	123	76	57
350	25	300	104	69	31	119	75	42
375	30	350	99	67	17	114	74	28

*** A minor modification was made in the ready-reckoner.**

*In a few cases when calculated fertiliser requirement values were almost zero, a minimum dose say 20 kg for N and 10 kg. ha^{-1} each for P and K were added to the calculated values particularly for the cereal and oilseed crops. While for groundnut crop (legume) these values for N was 5.0 kg but for P and K it was 10 kg each. Contrarily, when the calculated values of fertiliser doses were very high/high, the values nearer to the reasonable ones were used for the ready-reckoners.Targeted yield equations used for the verification trials are given below:

Targeted yield equations used for the verification trials are given below:

Wheat (cv. UP-262)

$FN = 12.88\ T - 0.80\ SN$, $FP_2O_5 = 2.15\ T - 0.23\ SP$, $FK_2O = 4.65\ T - 0.29\ SK$

Verification trials for Wheat (mean of 6 trials)

Treatment	Grain yield ($kg.ha^{-1}$)	Straw yield ($kg.ha^{-1}$)
T_1 - Farmers' practice	**2507**	**5123**
T_2- Govt. recommended dose	**2500**	**5233**
T_3 - Soil test based fertilizer dose for targeted yield of 2.5 t ha^{-1}	**2533**	**5000**
T_4- Soil test based fertilizer dose for Targeted yield of 3.0 t ha^{-1}.	**3061**	**5667**

Applicability: All the equations are valid for Nadia, Burdwan, Murshidabad, 24 pgs North districts

Comparative economics of different fertilizer schedules under verification trials for wheat, rape and kharif rice

	Profit ($Rs.ha^{-1}$) over T_1		
Treatment adopted	**Wheat**	**Rape**	**Kharif rice**
Farmers' practice (T_1)	**-**	**-**	**-**
Govt. recommended dose (T_2)	**- 69 to + 148**	**+ 413 to 1210**	**- 193 to + 360**
Soil test based fertilizer dose targeting 2.5/1.0/3.5 t ha^{-1} yield (T_3)	**+ 1260 to 1870**	**+ 1341 to 2134**	**+ 291 to 570**
Soil test based fertilizer dose targeting 3.0/1.2/4.0 t ha^{-1} yield (T_4)	**+ 4543 to 5216**	**+ 3083 to 3670**	**+ 983 to 1132**

1. Hisar (Haryana) Wheat

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Wheat(WH 711)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Rabi
Target range : 45 to 55 q/ha
Soil nitrogen range : 80 to 240 kg/ha
Soil phosphorus range : 4 to 32 kg/ha
FYM composition : 1.00% N, 0.62% P_2O_5
FYM rate : 15 t/ha

Targeted yield equations :

FN =5.22T-1.04SN-0.12 FYM (N), FP_2O_5 = 2.38T-4.06 SP – 0.14 FYM (P_2O_5)*

Ready reckoner of soil test based fertilizer recommendations for 45, 50 and 55 q/ha grain yield of wheat (WH 711)

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	45	50	55		45	50	55
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertilizer P_2O_5, kg/ha)		
80	152	178	204	4	91	103	115
90	141	167	193	6	83	95	107
100	131	157	183	8	75	87	98
110	121	147	173	10	66	78	90
120	110	136	162	12	58	70	82
140	89	115	142	14	50	62	74
160	69	95	121	16	42	54	66
180	48	74	100	20	26	38	50
200	38	53	79	24	15	22	33
220	38	38	58	28	15	15	17
240	38	38	38	32	15	15	15

*SN and SP are soil available N and P (kg/ha), respectively; T = Yield target (q/ha)
FYM(N) and FYM(P_2O_5) are N and P_2O_5 (kg/ha), respectively in applied FYM

Note : The dose of fertilizer N and P_2O_5 be reduced by 1.25 and 1.00 kg/ha, respectively, from above fertilizer doses for each ton of applied FYM/compost.

Verification: These fertilizer adjustment equations were verified at farmers fields in different districts of Haryana. The yield targets were achieved within -6.2 to +5.0 per cent deviations.

Applicability: These fertilizer adjustment equations will hold good throught Haryana state.

2. Hisar (Haryana) Wheat

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Wheat(WH 542)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Rabi
Target range : 45 to 55 q/ha
Soil nitrogen range : 80 to 240 kg/ha
Soil phosphorus range : 4 to 32 kg/ha
Targeted yield equations :
FN = 5.65T – 1.34 SN, FP_2O_5 = 1.91T – 2.19 SP *

Ready reckoner of soil test based fertilizer recommendations for wheat (WH 542) grain yield of 45, 50 and 55 q/ha

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	45	50	55		45	50	55
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertiilzer P_2O_5, kg/ha)		
80	147	175	204	4	77	87	96
90	133	161	190	6	73	82	92
100	120	148	177	8	68	78	87
110	103	134	163	10	64	74	83
120	93	121	150	12	60	69	79
140	66	97	123	14	55	65	74
160	39	67	96	16	51	60	80
180	38	41	70	20	42	52	61
200	38	38	42	24	33	43	52
220	38	38	38	28	24	34	43
240	38	38	38	32	15	25	34

*SN and SP are available N and P (kg/ha) , respectively, T = Yield target (q/ha)

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields in various agro-climatic zones of Haryana. The yield targets of 45 and 50 q/ha were achieved within -5.0 to +4.4% deviations.

Applicability: These fertilizer adjustment equations will hold good throughout Haryana for high yielding varieties of wheat

3. Hisar (Haryana) Durum Wheat

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Durum Wheat(WH 896)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Rabi
Target range : 35 to 45 q/ha
Soil nitrogen range : 80 to 240 kg/ha
Soil phosphorus range : 4 to 32 kg/ha
Targeted yield equations :
FN = 6.08T – 1.19 SN, FP_2O_5 = 2.58T – 3.68 SP*

Ready reckoner of soil test based fertilizer recommendations for durum wheat (WH 896) grain yield of 35, 40 and 45 q/ha

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	35	40	45		35	40	45
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertiilzer P_2O_5, kg/ha)		
80	118	148	178	4	76	89	101
90	106	136	167	6	68	81	94
100	94	124	155	8	61	74	87
110	82	112	131	10	53	66	79
120	70	100	107	12	46	59	72
140	46	77	83	14	39	52	64
160	38	53	59	16	31	44	57
180	38	38	38	20	17	30	43
200	38	38	38	24	15	15	28
220	38	38	38	28	15	15	15
240	38	38	38	32	15	15	15

*SN and SP are available N and P (kg/ha), respectively, T = Yield target (q/ha)

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields in various agro-climatic zones of Haryana. The yield targets of 35, 40 and 45q/ha were achieved within ±5.5% deviations.

Applicability: These fertilizer adjustment equations will hold good throughout Haryana for high yielding varieties of durum wheat

4. Hisar (Haryana) Durum Wheat

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Durum Wheat (WH 912)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Rabi
Target range : 40 to 50 q/ha
Soil nitrogen range : 80 to 240 kg/ha
Soil phosphorus range : 4 to 32 kg/ha
FYM composition : 1.00% N, 0.62% P_2O_5
FYM rate : 15 t/ha

Targeted yield equations : FN =5.57T-1.04SN-0.15 FYM (N)

FP_2O_5 = 2.12T-2.68 SP – 0.16 FYM (P_2O_5) *

Ready reckoner of soil test based fertilizer recommendations for 40, 45 and 50 q/ha grain yield of durum wheat (WH 912)

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	40	45	50		40	45	50
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertilizer P_2O_5, kg/ha)		
80	140	168	196	4	74	85	96
90	129	157	185	6	69	79	90
100	119	147	175	8	63	74	85
110	108	136	164	10	58	69	79
120	98	126	154	12	53	63	74
140	77	105	133	14	47	58	68
160	56	84	112	16	42	53	63
180	38	64	92	20	31	42	52
200	38	43	71	24	21	31	42
220	38	38	50	28	15	20	31
240	38	38	38	32	15	15	20

*SN and SP are soil available N and P (kg/ha), respectively; T = Yield target (q/ha)
FYM(N) and FYM(P_2O_5) are N and P_2O_5 (kg/ha), respectively in applied FYM

Note : The dose of fertilizer N and P_2O_5 be reduced by 1.50 and 1.25 kg/ha, respectively, from above fertilizer doses for each ton of applied FYM/compost.

Verification: These fertilizer adjustment equations were verified and yield targets were achieved within ± 5.0 % deviations.

Applicability: These fertilizer adjustment equations will hold good for durum wheat throughout Haryana

1. Chhattisgarh (Wheat)

Crop - Wheat

Soil type - Vertisol
Variety - Swati
Season - *Rabi*, 1986-87

Area for Suitability - Raipur, Durg, Rajnandgaon, Kawardha, Jashpur, Korba and Bilaspur districts

Fertilizer adjustment equations

$FN = 7.69\ Y - 0.34\ SN$
$FP_2O_5 = 7.89\ Y - 12.99\ SP$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of wheat (Sujata) in Vertisol (Kanhar).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) wheat (var. - Swati)**					
		15		**20**		**25**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	64	79	103	118	141	158
175	6	56	40	94	79	133	119
200	9	47	2	86	40	124	80
225	12	39	2	77	2	116	41
250	15	30	2	69	2	107	2
275	18	22	2	60	2	99	2
300	21	13	2	52	2	90	2
350	24	5	2	35	2	73	2
400	28	5	2	18	2	56	2

2. **Crop** - **Wheat**
Soil type - Inceptisol
Variety - Swati
Season - *Rabi*, 1990-91

Area for suitability - Raipur, Durg, Mahasamund, Bilaspur, Raigarh, Janjgir, Dhamtari districts

Fertilizer adjustment equations

$FN = 6.99\ Y - 0.41\ SN$
$FP_2O_5 = 115 - (13114 - 460.8Y)^{1/2} - 3.45\ SP$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of wheat (Swati) in Inceptisol (Matasi).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1})) wheat (var. - Swati)**					
		15		**20**		**25**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	43	26	78	42	113	65
175	6	33	16	68	32	103	54
200	9	23	5	58	22	93	44
225	12	13	5	48	11	83	34
250	15	3	5	37	5	72	23
275	18	3	5	27	5	62	13
300	21	3	5	17	5	52	5
350	24	3	5	0	5	31	5
400	28	3	5	0	5	11	5

3. Crop - **Wheat**
Soil type - Vertisol
variety - Sujata
Season - *Rabi*, 2003-04

Area for suitability - Raipur, Durg, Rajnandgaon, Kawardha, Jashpur and Bilaspur districts

Fertilizer adjustment equations

$FN = 6.51\ Y – (0.285\ SN + 3.73\ t\ FYM)$
$FP_2O_5 = 189 - (35721 – 1111Y)^{1/2} – (2.78\ SP + 6.25\ t\ FYM)$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of wheat (Sujata) in Vertisol (Kanhar).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) wheat (var. - Sujata)					
		15		**20**		**25**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	55	43	87	64	120	92
175	6	48	34	80	56	113	83
200	9	41	26	73	48	106	75
225	12	34	18	66	39	99	66
250	15	26	9	59	31	92	58
275	18	19	6	52	23	84	50
300	21	12	6	45	14	77	41
350	24	7	6	31	6	63	33
400	28	7	6	16	6	49	22

Ready reckoners on soil test based fertilizer recommendations with INM (5 ton FYM) for specific yield targets of wheat (Sujata) in Vertisol (Kanhar).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) wheat (var. - Sujata)					
		15		20		25	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	36	11	69	33	101	60
175	6	29	3	62	25	94	52
200	9	22	3	55	17	87	44
225	12	15	3	47	8	80	35
250	15	8	3	40	3	73	27
275	18	5	3	33	3	66	19
300	21	5	3	26	3	59	10
350	24	5	3	12	3	44	3
400	28	5	3	5	3	30	3

1. Bikaner, Wheat

Name of the center : ARS, Bikaner
Soil : Alluvial soils (Adsar and Khiran series)
Crop and variety : Wheat (Raj.-1482)
Season developed : Rabi 1997-98 and 1999-2000
Target range : 25-30 q ha^{-1}
Soil nitrogen range : 110-180 kg ha^{-1}
Soil Phosphorus range : 25-60 kg ha^{-1}
Soil potassium range : 210-350 kg ha^{-1}

Fertilizer adjustment equation

FN = 8.54T – 0.63 SN
FP_2O_5 = 6.93 T – 3.72 SP_2O_5
FK_2O = 7.21 T – 0.55 SK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha-1)			Fertilizer nutrient required (kg ha^{-1}) for yield target of					
$KMnO_4$ N	Olsens' P	Amm.Ac. -K	25 q ha^{-1}			30 q ha^{-1}		
			N	P_2O_5	K_2O	N	P_2O_5	K_2O
110	25	210	144	80	65	180	80	70
120	30	230	138	62	54	180	80	70
130	35	250	132	43	43	174	78	70
140	40	270	125	30	32	168	59	68
150	45	290	119	30	21	162	41	57
160	50	310	113	30	20	155	30	46
170	55	330	106	30	20	149	30	35
180	60	350	100	30	20	143	30	24

Verification **: The above fertilizer adjustment equations were tried on the farmers' fields in Bikaner district with varying yield targets during Rabi 2000-01 and all the yield targets could be achieved at the place tried**

Applicability

Soil testing laboratory : Bikaner
Soil : Sobhasar, Khiran, Jamsar, Bhamatsar series
Crop and variety : Wheat (Raj-1482)
Target range : 25-30 q ha^{-1}
Soil nitrogen range : 110-180 kg ha^{-1}
Soil phosphorus range : 25-60 kg ha^{-1}
Soil potassium range : 210-350 kg ha^{-1}

2. Bikaner, wheat

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**90-170 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Adsar and Khiran series)**	**Soil Phosphorus range**	**:**	**20-60 kg ha^{-1}**
Crop and variety	**:**	**Wheat (Raj-3077)**	**Soil potassium range**	**:**	**210-370 kg ha^{-1}**
Season developed	**:**	**Rabi-2000-01**	**FYM composition**	**:**	**0.61% N, 0.25% P_2O_5 and 0.35% K_2O**
Target range	**:**	**25-30 q ha^{-1}**	**FYM rate**	**:**	**5 t ha^{-1}**

Fertilizer adjustment equation

$FN = 7.87T – 0.76\ SN – 0.50\ ON$
$FP_2O_5 = 3.04\ T – 1.50\ S\ P_2O_5 – 0.45\ OP_2O_5$
$FK_2O = 4.07\ T – 0.26\ SK_2O – 0.53\ OK_2O$

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) with 5 t ha^{-1} FYM for yield target of					
			25 q ha^{-1}			30 q ha^{-1}		
$KMnO_4$ N	Olsens' P_2O_5	Amm.Ac. - K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
90	20	210	113	40	38	152	56	58
100	25	230	106	33	33	145	48	53
110	30	250	98	25	27	137	41	48
120	35	270	90	20	22	130	33	43
130	40	290	83	20	17	122	26	37
140	45	310	75	20	15	114	20	32
150	50	330	68	20	15	107	20	27
160	55	350	60	20	15	99	20	22
170	60	370	52	20	15	92	20	17

Verification **: The above fertilizer adjustment equations were tried on the farmers' fields in Bikaner district with varying yield targets during Rabi-2002-03 and 2003-04 and all the yield targets could be achieved at the place tried**

Applicability

Soil testing laboratory : Bikaner
Soil : Adsar, Khiran, Jamsar, Gajner series
Crop and variety : Wheat (Raj-3077)
Target range : 25-30 q ha^{-1}
Soil nitrogen range : 90-1760 kg ha^{-1}
Soil phosphorus range : 20-60 kg ha^{-1}
Soil potassium range : 210-370 kg ha^{-1}

1. Jabalpur, Wheat

Crop	:	Wheat
Soil Type	:	Shallow, Medium black and Deep black soils
Varieties	:	Narmada -4 , Kalyan sona , Lok-1 , Shera, GW 272
Yield (q ha^{-1})	:	30 - 60
Applicability	:	Range of soil test values (Kg ha^{-1}) **;** N: 100- 500 ; P: 5- 25 K: 100-500
Districts	**:**	Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,, Narsinghpur, Powarkheda, Rewa, Satna, Sagar, Sehore, Ujjain.

Equation for Calculating the fertilizer nutrient Requirement:
FN= 4.40 T – 0.40 SN **FP$_2$O$_5$ = 4.00 T – 4.58 SP** **FK$_2$O = 2.53 T – 0.16 SK**

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			35			40		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**114**	**111**	**57**	**136**	**131**	**69**
150	**10**	**250**	**94**	**83**	**49**	**116**	**103**	**61**
200	**15**	**300**	**74**	**54**	**41**	**96**	**74**	**53**
250	**20**	**350**	**54**	**25**	**33**	**76**	**45**	**45**
300	**25**	**400**	**34**	**-**	**25**	**56**	**17**	**37**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 4.4 kg ha^{-1}; P_2O_5= ± 4.0 kg ha^{-1}and K_2O= ±2.5 kg ha^{-1}

Rahuri, (Maharashtra), Wheat

Crop : Wheat (Rabi) **Variety:HD-2189**
Soil : Vertic Haplustepts **Situation:Irrigated**

Districts : Ahmednagar, Pune, Jalgaon, Nasik, Aurangabad, Parbhani, Jalna, Akola, Buldhana, Wardha, Yawatmal, Satara, Sangli, Kolhapur, Dhule, Nandurbar.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**2.51**	**24.7**	**33.4**
P_2O_5	**1.07**	**70.9**	**56.3**
K_2O	**2.25**	**16.7**	**90.2**

Targeted Yield Equations

FN = 7.54 T – 0.74 SN

FP_2O_5 = 1.90 T – 2.88 SP

FK_2O = 2.49 T – 0.22 SK

Fertilizer prescription for targeted yields of wheat for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			40 q ha^{-1} target			50 q ha^{-1} target		
N	**P**	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**250**	**237**	**59**	**45**	**303**	**78**	**69**
120	**8**	**275**	**222**	**53**	**40**	**288**	**72**	**64**
140	**10**	**300**	**207**	**47**	**34**	**273**	**66**	**58**
160	**12**	**325**	**193**	**41**	**29**	**259**	**60**	**53**
180	**14**	**350**	**178**	**36**	**23**	**244**	**55**	**47**
200	**16**	**375**	**163**	**30**	**18**	**229**	**49**	**42**
220	**18**	**400**	**149**	**25***	**25***	**214**	**43**	**36**
240	**20**	**425**	**133**	**25***	**25***	**199**	**37**	**31**
260	**22**	**450**	**118**	**25***	**25***	**185**	**32**	**25**
280	**24**	**475**	**103**	**25***	**25***	**170**	**26**	**20**
300	**26**	**500**	**80**	**25***	**25***	**155**	**20**	**15**

* Minimum dose of P_2O_5 and K_2O

Maize

1. Andhra Pradesh (MAIZE – Kharif)

Name of the Centre	**: Jagtial**	**Soil phosphorus range**	**: 10 – 60 kg ha^{-1}**
Soil	**: Chalka soils**	**Soil potassium range**	**: 150 – 650 kg ha^{-1}**
Crop and Variety	**: Maize-DHM-105**	**FYM composition**	**:**
Season developed	**: *Kharif,* 1995**	**FYM rate**	**:**
Target range	**: 40 q ha^{-1} – 50 q ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 150 – 400 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 4.19 T – 0.40 SN, FP_2O_5 = 1.50 T – 1.55 SP, FK_2O = 1.49 T – 0.16 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn	**Olsens'**	**Amm.**	**40 (q ha^{-1})**			**50 (q ha^{-1})**		
O_4 N	**P**	**Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	108	45	36	150	60	51
175	15	200	98	37	28	140	52	43
200	20	250	88	29	20	130	44	35
225	25	300	78	21	12	120	36	27
250	30	350	68	14	4	110	29	19
275	35	400	58	6	--	90	21	11
300	40	450	48	0	--	80	13	3
325	45	500	38			70	5	0
350	50	550	28			60		
375	55	600	18			50		

Verification: The above results are yet to be verified on the farmers' fields.

Applicability

Soil Testing Laboratories :Karimnagar, Warangal, Nizamabad and Sanga Reddy
Soil type : Chalka soils
Crop : Maize
Season developed : *Kharif*
Yield target : Upto 50 q ha^{-1}

Note : The above equations may be verified in black soils with three or four targets and pickup the best one for making recommendations.

2. Andhra Pradesh (Maize)

Name of the Centre	**: Rajendranagar**	**Soil phosphorus range**	**: 10 – 60 kg ha^{-1}**
Soil	**: Chalka soils**	**Soil potassium range**	**: 150 – 650 kg ha^{-1}**
Crop and Variety	**: Maize-DHM-101**	**FYM composition**	**:**
Season developed	**: *Rabi,* 1981-82 & 1982-83 (pooled data)**	**FYM rate**	**:**
		Green manure composition	**:**
Target range	**: 40 q ha^{-1} – 50 q ha^{-1}**	**Green manure rate**	**:**
Soil Nitrogen range	**: 150 – 400 kg ha^{-1}**		

Fertilizer adjustment equations

FN = 4.00 T – 0.49 SN, FP_2O_5 = 2.15 T – 2.58 SP, FK_2O = 2.58 T – 0.30 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn	**Olsens'**	**Amm.**	**40 (q ha^{-1})**			**50 (q ha^{-1})**		
O_4 N	**P**	**Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	127	82	99	167	113	110
175	15	200	114	69	84	154	90	95
200	20	250	102	56	69	142	77	80
225	25	300	90	43	54	130	65	65
250	30	350	78	30	39	118	52	50
275	35	400	65	17	24	105	40	35
300	40	450	53	0	9	93	27	20
325	45	500	41		0	81	15	5
350	50	550	29			69	2	0
375	55	600	16			56	0	
400	60	650	4			44		

Verification: The above equations are yet to be verified on the farmers' fields.

Applicability

Soil Testing Laboratories :Rajendranagar, Jadcherla and Sanga Reddy

Soil type :Chalka soils

Crop :Maize

Season developed :*Rabi*

Yield target :Upto 60 q ha^{-1}

Note : The above equations may be verified in black soils with three or four targets and pickup the best one for making recommendations

1. Bangalore, Karnataka (Maize) Zone-5

Crop	**: Maize(Deccan hybrid and Other HYV)**	**Target range**	**: 20q/acre**
		Soil phosphorus range	**:40-100 kg/acre**
SOIL	**: Red lateritic**	**Soil potassium range**	**:60-140 kg/acre FYM**
Season	**: Kharif**	**composition**	**:0.5N,0.2P,0.5K**
Variety	**: Deccan Hybrid**	**FYM rate**	**: 4/t acre**
Area of Applicability	**: Bangalore, Kolar and Tumkur districts.**	**Green manure composition**	**:**
		Green manure rate	**:**
Soil Nitrogen range	**: 180-350 Kg/ acre**	**Zinc Sulphate**	**: 4.0 kg/acre**

Area of applicability : Bangalore, Kolar and Tumkur districts.

Target yield equation :

F.N. = 3.41 T- 0.08 SN. ($KMnO_4$ - N)

F.P_2O_5 = 1.94 T- 0.41 SP_2O_5 (Bray's - P_2O_5)

F.K_2O = 2.28 T- 0.072 SK_2O (N H_4OAC - K_2O)

STV $KMnO_4$-N (kg/acre)	Fertilizer nitrogen (kg/acre)	STV Bray's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
20	67	2	38	40	43
40	65	5	37	60	41
60	63	10	35	80	40
80	62	15	33	100	38
100	60	20	31	120	37
120	59	25	29	140	36
140	57	30	27	160	34
160	55	35	25	180	33
180	54	40	22	200	31
200	52	45	20	220	30
220	51	50	18	240	28
240	49	55	16	260	27

To increase or decrease the yield target by one q/acre. The variations to be made in the fertilizer recommendations are as follows:

N = ± 3.5 kg/acre P_2O_5 = ± 2.0 kg/acre K_2O = ± 2.25 kg/acre

1. New Delhi Centre

Crop	**: Maize**	**Soil phosphorus range**	**: 10-38**
Soil	**: Typic Haplustept (Alluvial)**	**Soil potassium range**	**: 100-375**
		FYM composition (%) N,P,K	**: 0.5, 0.2, 0.35**
Season	**: Kharif**	**FYM rate**	**: 10 t/ha**
Situation	**: Irrigated**	**Green manure composition**	**: Nil**
Target range	**: 30 - 40 q ha^{-1}**	**Green manure rate**	**; Nil**
Soil Nitrogen range	**: 100 – 375**		

Applicable area : Delhi state and adjoining soil-agro-climatic areas of
UP **: Gautam Budhanagar, Ghaziabad , Bagpat Meerut , Mujjafarnagar, Saharanpur, Buland Shahr, Aligarh, Maha mayanagar, Etah, Agra, Etawah, Mainpuri , Shikohabad, Agra, Mathura, Jhansi, Ferozabad, Jalaun**
Haryana : **Rohtak, Sonipat, Panipat, Jhajjar, Rewari, Gurgaon, Faridabad, Mewat, Karnal**
Rajasthan **: Alwar, Bharatpur, Sawai madhopur, Sikar, Karauli**
Punjab **: Mansa, Patiala, Sangrur**
M P **: Bhind, Morana, Gwalior, Shivpuri**

Fertilizer adjustment equations for targeted yield of crops in NCR of Delhi	
With FYM	**Without FYM**
FN = 5.02 T – 0.35 SN – 1.82 FYM, FP_2O_5 = 3.93 T – 3.62 SP – 2.29 FYM FK_2O = 2.25 T – 0.17 SK - 1.00 FYM	FN = 6.61 T – 0.52 SN, FP_2O_5 = 4.77 T – 5.13 SP, FK_2O = 2.75 T – 0.24 SK

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Maize FYM 10t ha^{-1}

Soil test values (kg ha^{-1})			**Nutrient needed (kg ha^{-1}) for an yield target of 30 q ha^{-1}**			**Nutrient needed (kg ha^{-1}) for an yield target of 40 q ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	95	60	40	150	100	65
125	13	125	90	50	35	140	90	60
150	15	150	80	40	30	130	80	55
175	18	175	7	30	30	120	70	50
200	20	200	60	25	25	115	60	45
225	23	225	55	15	20	105	55	40
250	25	250	45	10	15	95	45	35
275	28	275	35	10	10	85	35	35
300	30	300	25	10	10	80	25	30
325	33	325	20	10	10	70	15	25
350	36	350	15	10	10	60	10	20
375	38	375	10	10	10	50	10	15

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Maize FYM 10t ha^{-1}

Soil test values (kg ha^{-1})			Nutrient needed (kg ha^{-1}) for an yield target of 30 q ha^{-1}			Nutrient needed (kg ha^{-1}) for an yield target of 40 q ha^{-1}		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	10	100	145	90	145	210	120	85
125	13	125	135	80	135	200	120	80
150	15	150	120	65	120	185	115	75
175	18	175	110	55	110	175	100	70
200	20	200	95	40	95	160	90	60
225	23	225	80	30	80	145	75	55
250	25	250	70	15	70	135	65	50
275	28	275	55	10	55	120	50	45
300	30	300	40	10	40	110	35	40
325	33	325	30	10	30	95	25	30
350	36	350	15		15	80	10	25
375	38	375	10		10	70	10	20

1. Uttarakhand (Maize)

Crop	**: Maize**	**Amm. Acetate -K**	**: 180-240 kg/ha**
Soil type	**: Mollisols and Inceptisols**	**FYM composition (%)**	**: 0.6-0.2-0.5**
Variety	**: D-765, Ganga-2, Pragati**	**FYM rate**	**: 10 t/ha**
Season	**: Kharif**	**Green manure composition**	**:------**
Target range	**: 30-40 q.ha**	**Green manure rate**	**: ------**
STV range for Maize (Pragati):			
Alkaline $KmnO_4$- N	**: 200-260 kg/ha**		
Olsen's-P	**: 10-40 kg/ha**		

Fertilizer adjustment equations for different yield target	
Maize Fodder (Var. D-765) Without FYM	**Maize Fodder (Var. Ganga 2) Without FYM**
F N (N, kg/ha) = 9.1 x YT (q/ha) – 309.17 OC	F N (N, kg/ha) = 0.82 x YT (q/ha) – 52.24 OC
F P (P_2O_5, kg/ha) =6.94 x YT (q/ha) –0.76 SP	F P (P_2O_5, kg/ha) = 076 x YT (q/ha) –1.58 SP
F K (K_2O kg/ha) = 6.16 x YT (q/ha)-0.18 SK	F K (K_2O kg/ha) = 0.45 x YT (q/ha)-0.13 SK
Maize (Var. Pragati) With FYM	
FN = 12.56T- 1.03N-0.32FYM-N, FP = 4.65T- 3.6SP-1.56FYM-P, FK = 5.94T- 0.59SK-0.93FYM-K	

Ready reckoners for 35 q/ha yield targets of Maize (Pragati) based on soil test fertilizer recommendations with 10t ha^{-1}FYM

Initial Soil Test Value (kg/ha)			Nutrient added (kg/ha) for an yield target of 35 q/ha		
N	P	K	N	P	K
200	10	180	152.60	95.55	55.20
220	20	200	214.40	59.55	43.40
240	30	220	193.80	23.55	31.60
260	40	240	173.20	0	19.80

Applicability:U.S. Nagar, Haridwar, Nainital and some parts of Western U.P.

1. Bihar (Maize)

Bihar (Young Alluvium Calcareous Soil)

Name of the Centre	**: RAU,Pusa**	**Soil phosphorus range**	**: 4- 40 kg P_2O_5/ha**
Soil	**: Young alluvium calcoreaus soil**	**Soil potassium range**	**: 60- 240 kg K_2O/ha**
Season	**: Rabi**	**Compost composition**	**: 0.59 % N, 0.30 % P_2O_5, 0.65 % K_2O**
Crop	**: Maize**	**Compost rate**	**: 5- 10 t/ha or available with farmers**
Target range	**: 50- 80 q/ha**		
Soil Nitrogen range	**: 120- 300 kg N /ha**	**Green manure composition**	**: N.A.**
		Green manure rate	**: N. A.**

Valid for Districts : East Champaran, West Champaran, Siwan, Saran, Sitamarhi, Shivhar, Muzaffarpur, Vaishali,Samastipur, Gopalganj, Begusarai, Part of Khagaria

Soil Test Values : Alk. $KMnO_4$ – N expressed in **kg N/ha**
Olsen's P expressed in **kg P_2O_5/ha**
Ammonium OAc – K expressed in **kg K_2O/ha**

Minimum maintenance dose of fertilizer if soil test value is high : **30 kg N, 15 kg P_2O_5 and 10 kg K_2O/ha**

2. Bihar (Young Alluvium Calcareous Soil) Crop: Kharif Maize

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				Targetted Yield Equations
Nutrient	**N R(kg/q)**	**C S (%)**	**C F (%)**	
N	2.5	23.8	54.8	$FN = 4.71T – 0.43 SN$
P_2O_5	0.4	32.9	15.5	$FP_2O = 2.59 T – 2.13 SP_2O_5$
K_2O	1.36	20	69.3	$FK_2O = 1.96 T – 0.29 SK_2O$

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			30 q/ha			40 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	90	69	41	137	95	61
130	6	70	85	65	39	133	91	58
140	8	80	81	61	36	128	87	55
150	10	90	77	56	33	124	82	52
160	12	100	73	52	30	120	78	49
170	14	110	68	48	27	115	74	47
180	16	120	64	44	24	111	70	44
190	18	130	60	39	21	107	65	41
200	20	140	55	35	18	102	61	38
210	22	150	51	31	15	98	57	35
220	24	160	47	27	12	94	52	32
230	26	170	42	22	10	90	48	29
240	28	180	38	18	10	85	44	26
250	30	190	34	14	10	81	40	23
260	32	200	30	10	10	77	35	20
270	34	210	30	10	10	72	31	18
280	36	220	30	10	10	68	27	15
290	38	230	30	10	10	64	23	12
300	40	240	30	10	10	59	18	10

3. Bihar (Young Alluvium Calcareous Soil) Crop: Rabi Maize

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				Targetted Yield Equations
Nutrient	**N R(kg/q)**	**C S (%)**	**C F (%)**	
N	2.55	29.5	71.9	$FN = 3.55T - 0.31\,SN$
P_2O_5	0.52	88	24.8	$FP_2O = 2.10\,T - 3.57\,SP_2O_5$
K_2O	2.57	75.7	184.6	$FK_2O = 1.50\,T - 0.41\,SK_2O$

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			50 q/ha			60 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	140	91	80	176	112	65
130	6	70	137	84	76	173	105	61
140	8	80	134	76	72	170	97	57
150	10	90	131	69	68	167	90	53
160	12	100	128	62	64	163	83	49
170	14	110	125	55	60	160	76	45
180	16	120	122	48	56	157	69	41
190	18	130	119	41	52	154	62	37
200	20	140	116	34	48	151	55	33
210	22	150	112	26	44	148	47	29
220	24	160	109	19	39	145	40	24
230	26	170	106	15	35	142	33	20
240	28	180	103	15	31	139	26	16
250	30	190	100	15	27	136	19	12
260	32	200	97	15	23	132	15	10
270	34	210	94	15	19	129	15	10
280	36	220	91	15	15	126	15	10
290	38	230	88	15	11	123	15	10
300	40	240	85	15	10	120	15	10

4. Bihar (Young Alluvium Calcareous Soil) Crop: Rabi Maize

Targetted Yield Equations*(WITH INORGANIC FERTILIZERS and COMPOST**)**

Basic Data					Targeted Yield Equations
Nutrient	**NR (Kg/q)**	**C S (%)**	**C F (%)**	**C C (%)**	
N	1.42	16	39.1	35.6	FN = 3.63 T – 0.41 SN - 0.91CN
P_2O_5	0.42	32.6	21.3	30.8	FP_2O = 1.88 T – 1.53 SP_2O_5-1.45 CP_2O_5
K_2O	1.9	35	70.6	63.1	FK_2O = 2.69 T – 0.50 SK_2O -0.89CK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values Without Compost

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			50 q/ha			70 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	132	88	105	205	125	158
130	6	70	128	85	100	201	122	153
140	8	80	124	82	95	197	119	148
150	10	90	120	79	90	193	116	143
160	12	100	116	76	85	189	113	138
170	14	110	112	73	80	184	110	133
180	16	120	108	70	75	180	107	128
190	18	130	104	66	70	176	104	123
200	20	140	100	63	65	172	101	118
210	22	150	95	60	60	168	98	113
220	24	160	91	57	55	164	95	108
230	26	170	87	54	50	160	92	103
240	28	180	83	51	45	156	89	98
250	30	190	79	48	40	152	86	93
260	32	200	75	45	35	148	83	88
270	34	210	71	42	30	143	80	83
280	36	220	67	39	25	139	77	78
290	38	230	63	36	20	135	73	73
300	40	240	59	33	15	131	70	68
Reduction in Fertilzer recommendation with the application of compost (N -0.59, P2O5- 0.30 & K2O- 0.65 %)@								
Nutrients	1 t/ha	2 t/ha	3 t/ha	4 t/ha	5 t/ha	6 t/ha	8 t/ha	10 t/ha
N	5	11	16	21	27	32	43	54
P_2O_5	4	9	13	17	22	26	35	44
K_2O	6	12	17	23	29	35	46	58

5. Bihar (Young Alluvium Calcareous Soil) Crop: Rabi Maize

Targetted Yield Equations*(WITH INORGANIC FERTILIZERS and MUSTARD OILCAKE **)**

Basic Data					Targeted Yield Equations
Nutrient	**NR (Kg/q)**	**C S (%)**	**C F (%)**	**C C (%)**	
N	2.04	13.4	58.2	41.9	FN = 3.51 T – 0.23 SN - 0.72CN
P_2O_5	0.57	49.9	22.8	31.8	FP_2O = 2.50 T – 2.19 SP_2O_5-1.44 CP_2O_5
K_2O	2	48	92.2	193.3	FK_2O = 2.17 T – 0.52 SK_2O - 2.10CK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values Without Mustard Oil Cake

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			50 q/ha			70 q/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	148	116	77	218	166	121
130	6	70	146	112	72	216	162	116
140	8	80	143	107	67	214	157	110
150	10	90	141	103	62	211	153	105
160	12	100	139	99	57	209	149	100
170	14	110	136	94	51	207	144	95
180	16	120	134	90	46	204	140	90
190	18	130	132	86	41	202	136	84
200	20	140	130	81	36	200	131	79
210	22	150	127	77	31	197	127	74
220	24	160	125	72	25	195	122	69
230	26	170	123	68	20	193	118	64
240	28	180	120	64	15	191	114	58
250	30	190	118	59	10	188	109	53
260	32	200	116	55	10	186	105	48
270	34	210	113	51	10	184	101	43
280	36	220	111	46	10	181	96	38
290	38	230	109	42	10	179	92	32
300	40	240	107	37	10	177	87	27
Reduction in Fertilzer recommendation with the application of oil cakes (N -5.20, P_2O_5- 1.82 & K_2O- 1.20 %)@								
Nutrients	**1 q/ha**	**2 q/ha**	**3 q/ha**	**4 q/ha**	**5 q/ha**	**6 q/ha**	**8 q/ha**	**10 q/ha**
N	3.7	7.5	11.2	15.0	18.7	22.5	30.0	37.4
P_2O_5	2.6	5.2	7.9	10.5	13.1	15.7	21.0	26.2
K_2O	2.5	5.0	7.6	10.1	12.6	15.1	20.2	25.2

1. Jharkhand (Maize)

Name of the Centre	**: RAU,Pusa**	**Soil phosphorus range**	**: 4- 30 kg P_2O_5/ha**
Soil	**: Red Loam Soil**	**Soil potassium range**	**: 60- 190 kg K_2O/ha**
Season	**: Kharif**	**Compost composition**	**: N. A.**
Crop	**: Maize**	**Compost rate**	**: N.A.**
Target range	**: 20- 30 q/ha**	**Green manure composition**	**: N.A.**
Soil Nitrogen range	**: 120- 250 kg N /ha**	**Green manure rate**	**: N. A.**

Valid for Districts : All districts of Jharkhand state having red loam / laterite soil

Soil Test Values : Alk. $KMnO_4$ – N expressed in **kg N/ha**
Bray's P_1 expressed in **kg P_2O_5/ha**
Ammonium OAc – K expressed in **kg K_2O/ha**

Minimum maintenance dose of fertilizer if soil test value is high : **25 kg N, 15 kg P_2O_5 and 10 kg K_2O/ha**

Soil: Red Loam Soils of Jharkhand **Crop: Paddy**

Rahuri, (Maharashtra), Upland paddy

Crop : Upland Paddy (Rabi) **Variety: R-24**
Soil : Typic Haplustepts **Situation: Irrigated**
Districts : Kolhapur, Sangli, Satara

Targeted Yield Equations
FN = 5.52 T – 0.54 SN, FP2O5 = 2.19 T – 0.83 SP, FK2O = 2.37 T – 0.05 SK

Fertilizer prescription for targeted yields of upland paddy for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			30 q ha^{-1} target			40 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**112**	**61**	**61**	**167**	**82**	**84**
120	**8**	**300**	**101**	**59**	**56**	**156**	**81**	**79**
140	**10**	**400**	**90**	**57**	**51**	**145**	**79**	**74**
160	**12**	**500**	**80**	**55**	**46**	**134**	**77**	**69**
180	**14**	**600**	**68**	**54**	**41**	**123**	**76**	**64**
200	**16**	**700**	**57**	**52**	**36**	**112**	**74**	**59**

Rahuri, (Maharashtra), Transplanted paddy

Crop : Transplanted paddy Variety : Indrayani
Soil : Typic Ustorthents Situation : Irrigated

Districts : Nasik, Pune, Nandurbar, Gadchiroli, Kolhapur

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**2.09**	**13.72**	**40.15**
P_2O_5	**1.03**	**65.18**	**10.92**
K_2O	**2.67**	**13.04**	**97.7**

Targeted Yield Equations

FN = 5.20 T – 0.34 SN

FP_2O_5 = 9.40 T – 13.66 SP

FK_2O = 2.73 T – 0.16 SK

Fertilizer prescription for targeted yields of transplanted paddy for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			40 q ha^{-1} target			45 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**10**	**200**	**174**	**239**	**77**	**200**	**286**	**91**
150	**15**	**250**	**157**	**171**	**69**	**183**	**218**	**83**
200	**20**	**300**	**140**	**103**	**61**	**166**	**150**	**75**
250	**25**	**350**	**123**	**35**	**53**	**149**	**82**	**67**
300	**30**	**400**	**106**	**25***	**45**	**132**	**25***	**59**

* Minimum dose of P_2O_5

1. Tamil Nadu (Maize -Without IPNS)

Name of the centre : **Coimbatore**
Soil : **Mixed black (Perianaickenpalayam series)**
Crop & Variety : **Maize - CO 1**
Season developed : **Kharif**
Target range : **50 q ha^{-1}**
Soil Nitrogen range : **180 - 270 kg ha^{-1}**
Soil phosphorus range : **8 - 26 kg ha^{-1}**
Soil potassium range : **300 - 480 kg ha^{-1}**

FYM composition :-
FYM rate : -
Green manure composition :-
Green manure rate : -

Fertiliser Adjustment Equations

FN = 4.60 T - 0.55 SN

FP_2O_5 = 2.25 T - 1.80 SP

FK_2O = 5.16 T - 0.49 SK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 50 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	8	300	131	98	111
190	10	320	125	95	101
200	12	340	120	91	91
210	14	360	114	88	82
220	16	380	109	84	72
230	18	400	103	81	62
240	20	420	98	77	52
250	22	440	92	73	43
260	24	460	87	70	33
270	26	480	81	66	25

Blanket recommendation : 135 : 62.5 : 50 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain
Soil type : Black Clay Loam
Yield target : 50 q ha^{-1}
District(s) : Coimbatore, Salem, Tiruchirappalli
Grade : Good

2. Maize : Tamil Nadu

Name of the centre : **Coimbatore**
Soil : **Mixed black (Perianaickenpalayam series)**
Crop & Variety : **Maize - CO 1**
Season developed : **Rabi**
Target range : **50 q ha^{-1}**
Soil Nitrogen range : **180 - 270 kg ha^{-1}**
Soil phosphorus range : **8 - 26 kg ha^{-1}**
Soil potassium range : **300 - 480 kg ha^{-1}**

FYM composition (N:P:K) : **0.59 : 0.28 : 0.59% (Dry weight basis)**
FYM rate : **12.5 t ha^{-1} (30% moisture)**
Green manure composition :-
Green manure rate : -

Fertiliser Adjustment Equations

$FN = 5.29\ T - 0.38\ SN - 0.78\ ON$

$FP_2O_5 = 2.08\ T - 1.29\ SP - 0.89\ OP$

$FK_2O = 5.20\ T - 0.45\ SK - 0.78\ OK$

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 50 q ha^{-1}		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	8	300	196	94	125
190	10	320	192	91	116
200	12	340	189	89	107
210	14	360	285	86	98
220	16	380	181	83	89
230	18	400	177	81	80
240	20	420	173	78	71
250	22	440	170	76	62
260	24	460	166	73	53
270	26	480	162	70	44

Blanket recommendation : 135 : 62.5 : 50 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Black Clay Loam
Yield target : 50 q ha^{-1}
District(s) : Coimbatore, Salem, Tiruchirappalli
Grade : Good

1. Hisar (Haryana) Maize

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Maize (Vijay composite)
Soil : Sierozem (Inceptisols/ Entisols)
Situation : Irrigated
Season developed : Kharif
Target range : 40 to 50 q/ha
Soil nitrogen range : 80 to 220 kg/ha
Soil phosphorus range : 4 to 24 kg/ha
Targeted yield equations :
FN = 4.93T – 1.03 SN, FP_2O_5 = 1.95T – 3.54 SP*

Ready reckoner of soil test based fertilizer recommendations for maize (Vijay composite) grain yield of 40, 45 and 50 q/ha

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	40	45	50		40	45	50
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertiilzer P_2O_5, kg/ha)		
80	115	139	164	4	63	73	83
90	104	129	154	6	56	66	76
100	94	119	144	8	49	59	69
110	84	109	134	10	42	52	62
120	73	98	123	12	35	45	55
140	52	77	102	14	28	38	48
160	38	57	82	16	21	31	41
180	38	38	61	20	16	16	26
200	38	38	41	24	16	16	16
220	38	38	38	28	16	16	16

*SN and SP are soil available N and P (kg/ha), respectively; T = Yield target (q/ha)

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields in various agro-climatic zones of Haryana. The yield targets of 40, 45 and 50 q/ha were achieved within -6.6 to +1.7% deviations.

Applicability: These fertilizer adjustment equations will hold good for high yielding varieties of maize through out Haryana.

1. Chhattisgarh (Maize)

Crop - **Maize**
Soil type - Vertisol
variety - Pro-agro 4640
Season - *Kharif*, 2001

Area for suitability - Raipur, Rajnandgaon, Kawardha, Durg districts

Fertilizer adjustment equations

$FN = 3.97\ Y - 0.465\ SN$
$FP_2O_5 = 358 - (128283 - 1666Y)^{1/2} - 13.5\ SP$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of maize (hybrid) in Vertisol (Kanhar).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) Maize (hybrid)**					
		50		**60**		**70**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	129	105	168	149	208	210
175	6	117	65	157	109	197	169
200	9	106	24	145	68	185	129
225	12	94	7	134	28	173	88
250	15	82	7	122	7	162	48
275	18	71	7	110	7	150	7
300	21	59	7	99	7	138	7
350	24	36	7	75	7	115	7
400	28	13	7	52	7	92	7

1. Jabalpur, Maize

Crop	:	Maize
Soil Type	:	Shallow, Medium black and Deep black soils
Varieties	:	Chandan Makka -3 ,composite JCM -323
Yield (q ha^{-1})	:	30 - 60
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N: 100- 500 ; P: 5- 25 K: 100-500**
Districts	**:**	Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,, Narsinghpur, Powarkheda, Sehore, Ujjain.

Equation for Calculating the fertilizer nutrient Requirement:
FN= 4.40 T – 0.23 SN **FP_2O_5 = 2.38 T – 1.40 SP** **FK_2O = 2.07 T – 0.08 SK**

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			35			40		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**118**	**76**	**56**	**138**	**88**	**67**
150	**10**	**250**	**107**	**69**	**52**	**127**	**81**	**63**
200	**15**	**300**	**96**	**62**	**48**	**116**	**74**	**59**
250	**20**	**350**	**85**	**55**	**44**	**105**	**67**	**55**
300	**25**	**400**	**74**	**48**	**40**	**94**	**60**	**51**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 4.4 kg ha^{-1}; P_2O_5= ± 2.3 kg $ha^{-1}$and K_2O= ±2.0 kg ha^{-1} Grade : need to verify

1. New Delhi Centre

Crop	**: Barley**	**Soil phosphorus range**	**: 10-38**
Soil	**:TypicHaplustept (Alluvial)**	**Soil potassium range**	**: 100-375**
Season	**: Rabi**	**FYM composition (%) N,P,K**	**: 0.5, 0.2, 0.35**
Situation	**: Irrigated**	**FYM rate**	**: 10 t/ha**
Target range	**: 40 - 50 qha^{-1}**	**Green manure composition**	**: Nil**
Soil Nitrogen range	**: 100 - 375 kgha^{-1}**	**Green manure rate**	**; Nil**

Applicable area : Delhi state and adjoining soil-agro-climatic areas of

UP **:** Gautam Budhanagar, Ghaziabad , Bagpat Meerut , Mujjafarnagar, Saharanpur, Buland Shahr, Aligarh, Maha mayanagar, Etah, Agra, Etawah, Mainpuri , Shikohabad, Agra, Mathura, Jhansi, Ferozabad, Jalaun
Haryana : Rohtak, Sonipat, Panipat, Jhajjar, Rewari, Gurgaon, Faridabad, Mewat, Karnal
Rajasthan : Alwar, Bharatpur, Sawai madhopur, Sikar, Karauli
Punjab : Mansa, Patiala, Sangrur
M P : Bhind, Morana, Gwalior, Shivpuri

(Without FYM)

Fertilizer adjustment equations for targeted yields of crops in NCR of Delhi

FN = 3.69 T – 0.64 SN, FP_2O_5 = 2.93 T – 5.24 SP, FK_2O = 2.22 T – 0.31 SK

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Barley

Soil test values (kg ha^{-1})			Nutrient needed (kg ha^{-1}) for an yield target of 40 q ha^{-1}		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**
100	10	100	85	65	60
125	13	125	70	50	50
150	15	150	50	40	40
175	18	175	35	25	35
200	20	200	20	10	25
225	23	225	10	10	20
250	25	250	10	10	10
275	28	275	10	10	10
300	30	300	10	10	10
325	33	325	10	10	10
350	36	350	10	10	10
375	38	375	10	10	10
400	40	400	10	10	10

Ready reckoners on soil test based fertilizer recommendations for specific yield targets (45 qha^{-1})of Barley

Soil test values (kg ha^{-1})			Nutrient needed (kg ha^{-1}) for an yield target of 45 q ha^{-1}		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**
100	10	100	100	80	70
125	13	125	85	65	60
150	15	150	70	55	55
175	18	175	55	40	45
200	20	200	40	25	40
225	23	225	20	15	30
250	25	250	10	10	20
275	28	275	10	10	15
300	30	300	10	10	10
325	33	325	10	10	10
350	36	350	10	10	10
375	38	375	10	10	10
400	40	400	10	10	10

Ready reckoners on soil test based fertilizer recommendations for specific yield targets (50 qha^{-1})of Barley

Soil test values (kg ha^{-1})			Nutrient needed (kg ha^{-1}) for an yield target of 50 q ha^{-1}		
N	P	K	N	P_2O_5	K_2O
100	10	100	120	95	80
125	13	125	105	80	70
150	15	150	90	70	65
175	18	175	75	55	55
200	20	200	55	40	50
225	23	225	40	30	40
250	25	250	25	15	35
275	28	275	10	10	25
300	30	300	10	10	20
325	33	325	10	10	10
350	36	350	10	10	10
375	38	375	10	10	10
400	40	400	10	10	10

1. Uttarakhand (Barley)

Crop : Barley
Variety : Azad
Soil :Mollisols and Inceptisols
Situation : Irrigated
Target range : 25-30 q/ha
Soil O.C. range : 0.40-1.00 %
Alkaline $KMnO_4$-N : 215-405 kg/ha
Olsen's-P : 10-25 kg/ha
Amm. Acetate-K : 150-225 kg/ha
FYM composition : ----
FYM rate : -------
Green manure composition :------
Green manure rate : -------

Fertilizer adjustment equation for yield targets (kg/ha)

FN (N kg/ha) = 5.00 x YT – 111.16 x OC
FP (P kg/ha) = 2.45 x YT – 2.31 SP
FK (K kg/ha) = 4.96 x YT – 0.82 SK

Ready reckoners for 30 q/ha yield targets of Barley based on soil test fertilizer recommendations

Initial Soil Test Value (kg/ha)			Nutrient added (kg/ha) for an yield target of 30 q/ha		
O.C. (%)	P	K	N	P	K
0.2	10	125	127.77	50.40	46.30
0.4	15	150	105.53	38.85	25.80
0.6	20	175	83.30	27.30	5.30
0.8	25	200	61.07	15.75	0
1.0	30	225	38.84	4.2	0

Applicability:U.S. Nagar, Haridwar, Nainital and some parts of Western U.P.

1. Hisar (Haryana) Barley

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Barley(BH 393)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Target range : 35 to 45 q/ha
Soil nitrogen range : 80 to 200 kg/ha
Soil phosphorus range : 4 to 24 kg/ha
FYM composition : 1.00 %N, 0.62% P_2O_5
FYM rate : 15 t/ha

Targeted yield equations :

FN =4.88T-0.98SN-0.15 FYM (N), FP_2O_5 = 2.35T-3.80 SP – 0.16 FYM (P_2O_5) *

Ready Reckoner of soil test based fertilizer recommendations for 35, 40 and 45 q/ha grain yield of (BH 393)

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	35	40	45		35	40	45
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertilizer P_2O_5, kg/ha)		
80	92	117	142	4	67	79	91
90	82	107	132	6	60	71	83
100	73	97	122	8	52	64	76
110	63	87	112	10	44	56	68
120	53	77	101	12	36	48	60
140	34	58	82	14	29	41	53
160	15	38	63	16	21	33	45
180	15	19	43	20	8	18	30
200	15	15	24	24	8	8	15

*SN and SP are soil available N and P (kg/ha), respectively; T = Yield target (q/ha)
FYM(N) and FYM(P_2O_5) are N and P_2O_5 (kg/ha), respectively in applied FYM

Note : The dose of fertilizer N and P_2O_5 be reduced by 1.50 and 1.25 kg/ha, respectively, from above fertilizer doses for each ton of applied FYM/compost.

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields. The yield targets of 35 and 45 q/ha were achieved within deviations -7.7 to +7.6 per cent.

Applicability: These fertilizer adjustment equations will hold good through out Haryana of high yielding varieties of barley.

1. Bikner, Barley

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**70-160 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Adsar and Khiran series)**	**Soil Phosphorus range**	**:**	**20-60 kg ha^{-1}**
Crop and variety	**:**	**Barley (RD-2508)**	**Soil potassium range**	**:**	**170-330 kg ha^{-1}**
Season developed	**:**	**Rabi 2002-03 and 2003-04**	**FYM composition**	**:**	
Target range	**:**	**25-30 q ha^{-1}**	**FYM rate**	**:**	**5 t ha^{-1}**

Fertilizer adjustment equation

FN = 7.67 T – 0.99 SN – 3.62 FYM
FP_2O_5 = 4.60 T – 2.09 S P_2O_5 – 2.02 FYM
FK_2O = 6.31 T – 0.63 SK_2O – 2.66 FYM

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) with 5 t ha^{-1} FYM for yield target of					
			25 q ha^{-1}			30 q ha^{-1}		
$KMnO_4$ N	Olsens' P_2O_5	Amm.Ac. - K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
70	20	170	104	118	37	143	151	69
90	25	190	85	108	25	123	141	56
100	30	210	75	99	15	113	132	44
110	35	230	65	89	15	103	122	31
120	40	250	55	79	15	93	112	19
130	45	270	45	70	15	83	103	15
140	50	290	40	60	15	73	93	15
150	55	310	40	51	15	64	84	15
160	60	330	40	41	15	54	74	15

Verification **: The above fertilizer adjustment equations were tried on the farmers' fields in Bikaner district with varying yield targets during Rabi 2004-05 and all the yield targets could be achieved at the place tried**

Applicability

Soil testing laboratory : Bikaner
Soil : Adsar, Sobhasar, Khiran, Jamsar, Gajner series
Crop and variety : Barley (RD-2508)
Target range : 25-30 q ha^{-1}
Soil nitrogen range : 70-160 kg ha^{-1}
Soil phosphorus range : 20-60 kg ha^{-1}
Soil potassium range : 170-330 kg ha^{-1}

Millets

1. New Delhi Centre

Crop	**: Pearlmillet**	**Soil phosphorus range**	**: 10-38**
Soil	**:TypicHaplustept (Alluvial)**	**Soil potassium range**	**: 100-375**
Season	**: Kharif**	**FYM composition (%) N,P,K**	**: 0.5, 0.2, 0.35**
Situation	**: Irrigated**	**FYM rate**	**: 10 t/ha**
Target range	**: 25 - 30 q ha^{-1}**	**Green manure composition**	**: Nil**
Soil Nitrogen range	**: 100-400 kgha^{-1}**	**Green manure rate**	**; Nil**

Applicable area : Delhi state and adjoining soil-agro-climatic areas of

UP **: Gautam Budhanagar, Ghaziabad , Bagpat Meerut , Mujjafarnagar, Saharanpur, Buland Shahr, Aligarh, Maha mayanagar, Etah, Agra, Etawah, Mainpuri , Shikohabad, Agra, Mathura, Jhansi, Ferozabad, Jalaun**
Haryana : **Rohtak, Sonipat, Panipat, Jhajjar, Rewari, Gurgaon, Faridabad, Mewat, Karnal**
Rajasthan **: Alwar, Bharatpur, Sawai madhopur, Sikar, Karauli**
Punjab **: Mansa, Patiala, Sangrur**
M P **: Bhind, Morana, Gwalior, Shivpuri**

Fertilizer adjustment equations for targeted yield of crops in NCR of Delhi	
With FYM	**Without FYM**
FN = 5.35 T – 0.29 SN – 2.23 FYM, FP_2O_5 = 4.72 T – 3.29 SP – 2.48 FYM FK_2O = 2.88 T – 0.17 SK – 1.35 FYM	FN = 6.97 T – 0.38 SN, FP_2O_5 = 5.73 T – 4.81 SP, FK_2O = 3.92 T – 0.28 SK

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Pearlmillet FYM 10t ha^{-1}

Soil tests (kg ha^{-1})			**Nutrient needed (kg ha^{-1}) for an yield target of 25 q ha^{-1}**			**Nutrient needed (kg ha^{-1}) for an yield target of 30 q ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	80	60	40	110	80	55
125	13	125	75	50	35	100	75	40
150	15	150	70	45	30	95	65	45
175	18	175	60	35	30	85	60	45
200	20	200	55	30	25	80	50	40
225	23	225	45	20	20	70	45	35
250	25	250	40	10	15	65	40	30
275	28	275	30	10	10	55	35	25
300	30	300	25	10	10	45	30	25
325	33	325	15	10	10	40	25	20
350	36	350	10	10	10	30	20	15
375	38	375	10	10	10	25	15	10

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Pearlmillet

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 25 q ha^{-1}			Nutrient added (kg ha^{-1}) for an yield target of 30 q ha^{-1}		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	135	95	70	170	120	90
125	13	125	125	85	65	160	110	80
150	15	150	115	70	55	150	100	75
175	18	175	110	60	50	140	90	70
200	20	200	100	45	40	135	75	60
225	23	225	90	35	35	125	65	55
250	25	250	80	25	30	115	50	50
275	28	275	70	10	20	105	40	40
300	30	300	60	10	15	95	30	35
325	33	325	50	10	10	85	15	25
350	36	350	40	10	10	75	10	20
375	38	375	30	10	10	65	10	15

1. Hisar (Haryana) Bajra

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Bajra (HHH 94)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Kharif
Target range : 20 to 30 q/ha
Soil nitrogen range : 80 to 200 kg/ha
Soil phosphorus range : 4 to 24 kg/ha
FYM composition : 1.00 %N, 0.62% P_2O_5
FYM rate : 15 t/ha
Targeted yield equations: FN = 10.00T – 1.43 SN-0.13 FYM (N)
FP_2O_5 = 3.75T-4.46SP-0.15FYM (P_2O_5)*

Ready reckoner of soil test based fertilizer recommendations for 20, 25 and 30q/ha grain yield of hybrid bajra (HHB 94)

SN* (kg/ha)	Targeted yield, q/ha			SP* (kg/ha)	Targeted yield, q/ha		
	20	25	30		20	25	30
	FN Fertilizer N, kg/ha				FP_2O_5 (Fertilizer P_2O_5 kg/ha)		
80	85	135	185	4	57	76	95
90	71	121	171	6	48	67	86
100	57	107	157	8	39	58	77
110	43	93	143	10	30	49	68
120	30	78	128	12	21	40	59
140	30	50	100	14	12	31	50
160	30	30	71	16	15	22	41
180	30	30	43	20	15	15	23
200	30	30	30	24	15	15	15

*SN and SP are soil available N and P (kg/ha), respectively; T = Yield target (q/ha)
FYM(N) and FYM(P_2O_5) are N and P_2O_5 (kg/ha) respectively in applied FYM

Note : The dose of fertilzier N and P_2O_5 be reduced by abotu 1.25 kg and 1.00 kg/ha, respectively, from above fertilzier doses for each ton of applied FYM/compost.

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields. The yield targets of 20 to 30 q/ha were achieved within deviations -7.7 to +7.6 per cent.

Applicability: These fertilizer adjustment equations will hold good in Haryana in Mohindergarh, Jhajjar, Faridabad, Gurgaon, Rewari, Mewat, Bhiwani, Jind, Sirsa, Fetehabad districts and other bajra growing area for high yielding hybrid varieties of bajra.

Rahuri, (Maharashtra), Pearl millet

Crop : Pearl millet (Kharif) **Variety:Saburi-RHRBH-8609**
Soil : Vertic Haplustepts **Situation:Irrigated**

Districts : Dhule, Nashik, Ahmednagar, Beed, Aurangabad, Akola, Buldhana, Wardha, Yeotmal, Satara, Pune, Solapur.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**0.96**	**11**	**29**
P_2O_5	**2.94**	**156**	**87**
K_2O	**4.71**	**15**	**285**

Targeted Yield Equations

FN = 3.31 T – 0.38 SN

FP_2O_5 = 3.38 T – 4.11 SP

FK_2O = 1.65 T – 0.06 SK

Fertilizer prescription for targeted yields of Pearl millet for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			30 q ha^{-1} target			35 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**250**	**61**	**77**	**35**	**78**	**94**	**43**
120	**10**	**300**	**54**	**60**	**32**	**70**	**77**	**40**
140	**14**	**350**	**46**	**44**	**29**	**63**	**61**	**37**
160	**18**	**400**	**38**	**28**	**26**	**55**	**45**	**34**
180	**22**	**450**	**30**	**11**	**23**	**47**	**28**	**21**
200	**26**	**500**	**23**	**25***	**20**	**40**	**25***	**28**
220	**> 26**	**550**	**16**	**25***	**17**	**32**	**25***	**25**
240	**> 26**	**600**	**8**	**25***	**14**	**25**	**25***	**22**

* Minimum dose of P_2O_5

1. **Bikaner, Bajra**

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**80-160 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Bhamatsar and Khiran series)**	**Soil Phosphorus range**	**:**	**10-50 kg ha^{-1}**
Crop and variety	**:**	**Bajra (HHB-67)**	**Soil potassium range**	**:**	**170-330 kg ha^{-1}**
Season developed	**:**	**Kharif 1997 and 1998**			
Target range	**:**	**12-15 q ha^{-1}**			

Fertilizer adjustment equation

FN = 10.05T – 0.29 SN
FP_2O_5 = 9.02 T – 1.66 S P_2O_5
FK_2O = 8.20 T – 0.25 SK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			12 q ha^{-1}			**15 q ha^{-1}**		
$KMnO_4$ N	**Olsens' P**	**Amm.Ac. -K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
80	**10**	**170**	**97**	**70**	**56**	**120**	**70**	**60**
90	**15**	**190**	**94**	**66**	**51**	**120**	**70**	**60**
100	**20**	**210**	**91**	**52**	**46**	**120**	**70**	**60**
110	**25**	**230**	**88**	**38**	**41**	**118**	**65**	**60**
120	**30**	**250**	**85**	**24**	**36**	**115**	**51**	**60**
130	**35**	**270**	**82**	**20**	**31**	**112**	**37**	**56**
140	**40**	**290**	**79**	**20**	**26**	**109**	**23**	**51**
150	**45**	**310**	**76**	**20**	**21**	**106**	**20**	**46**
160	**50**	**330**	**73**	**20**	**16**	**103**	**20**	**41**

Applicability

Soil testing laboratory : Bikaner
Soil series : Sobhasar, Khiran, Jamsar, Bhamatsar
Crop and variety : Bajra (HHB-67)
Target range : 12-15 q ha^{-1}
Soil nitrogen range : 80-160 kg ha^{-1}
Soil phosphorus range : 10-50 kg ha^{-1}
Soil potassium range : 170-330 kg ha^{-1}

1. Jabalpur, Bajra

Crop	:	Bajra
Soil Type	:	Shallow, Medium black and Deep black soils
Varieties	:	**Composite (B.J.104)**
Yield (q ha^{-1})	:	25-30
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N: 100- 350 ; P: 5- 35 K: 100-300**
Districts	**:**	Bhind,Morena,Naugaown

Equation for Calculating the fertilizer nutrient Requirement:

FN= 10.9 T – 0.78 SN **FP_2O_5 = 5.22 T – 4.00 SP** **FK_2O = 4.19 T – 0.35SK**

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			25			30		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**194**	**110**	**33**	**249**	**137**	**54**
150	**10**	**250**	**155**	**90**	**16**	**210**	**117**	**36**
200	**15**	**300**	**116**	**70**	**-**	**171**	**97**	**20**
250	**20**	**350**	**77**	**50**	**-**	**132**	**77**	**-**
300	**25**	**400**	**38**	**30**	**-**	**93**	**57**	**-**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 10.9 kg ha^{-1}; P_2O_5= ± 5.2 kg $ha^{-1}$and K_2O= ±4.1 kg ha^{-1}

Grade : need to verify

1. Andhra Pradesh (Sorghum)

Name of the Centre : Palem,Mahabubnagar district
Soil : Alfisol (Sandy Loam)
Crop and Variety : Rainfed Jowar – CHS-9
Season developed : *Kharif,* 2001 & 2002
Target range : 20 – 25 q ha^{-1}
Soil Nitrogen range : 100 – 280 kg ha^{-1}
Soil phosphorus range : 5 – 50 kg ha^{-1}
Soil potassium range : 125 – 350 kg ha^{-1}
FYM composition :
FYM rate : 10 t ha^{-1}
Green manure composition :
Green manure rate :

Fertilizer adjustment equations

FN = 7.29 T – 0.82 SN- 0.38 FYM N,

FP_2O_5 = 4.30 T – 1.53 SP- 0.19 FYM P,

FK_2O = 5.10 T – 0.39 SK- 0.17 FYM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for production of 25 q ha^{-1}					
Kmn	Olsen-P	Amm Aoc-	Only Chemical fert.			With Fym @ 10 t ha^{-1}		
O_4-N		K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	5	125	100	100	79	70	88	67
120	10	150	84	92	69	53	81	57
140	15	175	67	85	59	37	73	47
160	20	200	51	77	50	21	66	38
180	25	225	35	69	40	4	58	28
200	30	250	18	62	30	0	50	18
220	35	275	12	54	20		43	8
240	40	300	12*	46	11		35	0
260	45	325	12*	39	1		27	
280	50	350	12*	31	0		20	
300	55	375	12*	23			12	
320	60	400	12*	16			4	
340	65	425	12*	8			4	

* maintainance of dose

Verification: The above equations were verified on the farmers' fields of Palem, Mahabubnagar district with yield targets of 20 and 25 q ha^{-1} during *kharif,* 2002 and 2003. All the yield targets could be attained at the places tested.

Applicability

Soil Testing Laboratories	:	Mahabubnagar, Ranga Reddy and Kurnool districts in Southern Telangana Zone
Soil type	:	Alfisol
Crop	:	Rainfed Jowar (High yielding varieties)
Season developed	:	*Kharif* (Rainfed)
Yield target	:	Up to 20- 25 q ha^{-1}

Note: The above equations may be tested in soils other than Sandy loam of Alfisol in the farmers' fields with three or four targets and pick up the best one for making recommendations in Southern Telangana zone.

1. Sorghum : Tamil Nadu

Name of the centre	**: Coimbatore**	**FYM composition (N:P:K)**	**: 0.47 : 0.28 : 0.60 % (Dry weight basis)**
Soil	**: Red (Irugur series)**		
Crop & Variety	**: Sorghum - CSH 5**		
Season developed	**: Kharif**	**FYM rate**	**: 12.5 t ha^{-1} (30 % Moisture)**
Target range	**: 50 q ha^{-1}**		
Soil Nitrogen range	**: 150 - 240 kg ha^{-1}**	**Green manure composition**	**: -**
Soil phosphorus range	**: 8 -26 kg ha^{-1}**	**Green manure rate**	**: -**
Soil potassium range	**: 150 - 240 kg ha^{-1}**		

Fertiliser Adjustment Equations

FN	=	4.86	T	-	0.53	SN	-	0.98	ON
FP_2O_5	=	1.63	T	-	0.87	SP	-	0.90	OP
FK_2O	=	4.56	T	-	0.59	SK	-	0.76	OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 50 q ha^{-1}		
KMnO4-N	Olsen-P	NN NH_4OAc-K	N	P_2O_5	K_2O
150	8	150	164	75	140
160	10	160	158	73	134
170	12	170	153	71	128
180	14	180	148	69	122
190	16	190	142	68	116
200	18	200	137	66	110
210	20	210	132	64	104
220	22	220	126	62	98
230	24	230	121	61	92
240	26	240	116	59	86

Blanket Recommendation: 90 : 45 : 45 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Red Sandy Loam
Yield target : 50 q ha^{-1}
District(s) : Coimbatore, Dindigul, Erode, Karur, Madurai, Namakkal, Salem, Theni, Tiruchirappalli
Grade : Good

2. Sorghum : Tamil Nadu

Name of the centre : Coimbatore
Soil : Mixed black (Perianaickenalayam series)
Crop & Variety : Sorghum - CO 24
Season developed : Kharif
Target range : 50 q ha^{-1}
Soil Nitrogen range : 180 - 280 kg ha^{-1}
Soil phosphorus range : 8 -28 kg ha^{-1}
Soil potassium range : 300 - 500 kg ha^{-1}

FYM composition (N:P:K) : 0.86:0.34:0.69% (Dry weight basis)
FYM rate : 12.5t ha^{-1} (30 % moisture)
Green manure composition : -
Green manure rate : -

Fertiliser Adjustment Equations

FN = 6.06 T - 0.81 SN - 0.53 ON
FP_2O_5 = 2.06 T - 3.14 SP - 0.72 OP
FK_2O = 5.03 T - 0.47 SK - 0.66 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			Nutrient added (kg ha^{-1}) for an yield target of 50 q ha^{-1}		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	8	300	157	78	111
190	10	320	149	72	101
200	12	340	141	65	92
210	14	360	133	59	82
220	16	380	125	53	73
230	18	400	117	46	64
240	20	420	109	40	54
250	22	440	101	34	45
260	24	460	92	28	35
270	26	480	84	23	26
280	28	500	76	23	23

Blanket Recommendation: 90 : 45 : 45 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Black Clay Loam
Yield target : 50 q ha^{-1}
Districts : Coimbatore, Salem, Tiruchirappalli
Grade : Good

1. **Jabalpur, sorghum**

Crop	:	Jowar
Soil Type	:	Shallow, Medium black and Deep black soils
Varieties	:	CSH -5
Yield (q ha^{-1})	:	30-40
Applicability	:	**Range of soil test values (Kg ha^{-1}) ;** N: 100- 500 ; P: 5- 25 K: 100-500
Districts	**:**	Bhopal, Dhar, Jhabua ,Indore, Khandwa, Khargone, Mandsaur,Ujjain,

Equation for Calculating the fertilizer nutrient Requirement:

FN= 6.48 T – 0.38 SN FP_2O_5 = 3.99 T – 2.29 SP FK_2O = 3.51 T – 0.16SK

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			35			40		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**156**	**108**	**73**	**189**	**128**	**91**
150	**10**	**250**	**137**	**97**	**65**	**170**	**117**	**83**
200	**15**	**300**	**118**	**86**	**57**	**151**	**106**	**75**
250	**20**	**350**	**99**	**74**	**49**	**132**	**94**	**67**
300	**25**	**400**	**80**	**63**	**41**	**113**	**83**	**59**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 6.4 kg ha^{-1}; P_2O_5= ± 3.9 kg $ha^{-1}$and K_2O= ±3.5 kg ha^{-1}

Grade : need to verify

Rahuri, (Maharashtra), Sorghum

Crop : Sorghum (Kharif) **Variety: CSH-9**
Soil : Vertic Ustropepts **Situation:Rainfed**

Districts : Jalgaon, Dhule, Nandurbar, Satara, Kolhapur, Sangli, Akola, Parbhani, Buldhana, Aurangabad, Wardha, Yeotmal, Pune.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**2.01**	**41.9**	**43.9**
P_2O_5	**0.76**	**104.3**	**34.5**
K_2O	**2.48**	**13.3**	**74.3**

Targeted Yield Equations

FN = 4.58 T – 0.96 SN

FP_2O_5 = 2.21 T – 6.94 SP

FK_2O = 3.34 T – 0.22 SK

Fertilizer prescription for targeted yields of *Kharif* sorghum for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			40 q ha^{-1} target			45 q ha^{-1} target		
N	P	**K**	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**87**	**47**	**90**	**110**	**58**	**106**
120	**8**	**300**	**68**	**33**	**68**	**91**	**44**	**84**
140	**10**	**400**	**49**	**19**	**46**	**72**	**30**	**62**
160	**12**	**500**	**30**	**25***	**24**	**52**	**16**	**40**
180	**14**	**600**	**10**	**25***	**25***	**33**	**25***	**18**
200	**> 14**	**700**	**25***	**25***	**25***	**14**	**25***	**25***

* Minimum dose of N, P_2O_5 and K_2O

Rahuri, (Maharashtra), Sorghum

Crop : Sorghum (Rabi) **Variety: CSH-8 R**
Soil : Typic Haplusterts **Situation: Irrigated**

Districts : Jalgaon, Akola, Aurangabad, Jalna, Osmanabad, Parbhani, Latur, Ahmednagar, Buldhana, Solapur, Yeotmal, Satara, Sangli.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**2.07**	**34**	**44**
P_2O_5	**0.78**	**73**	**39**
K_2O	**2.41**	**20**	**72**

Targeted Yield Equations

FN = 4.7 T – 0.77 SN
FP_2O_5 = 2.00 T – 4.29 SP
FK_2O = 3.35 T – 0.33 SK

Fertilizer prescription for targeted yields of *rabi* Sorghum for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			50 q ha^{-1} target			60 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**158**	**74**	**102**	**205**	**94**	**135**
120	**8**	**250**	**143**	**66**	**85**	**190**	**86**	**119**
140	**10**	**300**	**127**	**57**	**69**	**174**	**77**	**102**
160	**12**	**350**	**112**	**49**	**52**	**159**	**69**	**86**
180	**14**	**400**	**96**	**40**	**36**	**143**	**60**	**69**
200	**16**	**450**	**81**	**31**	**19**	**128**	**51**	**53**
220	**18**	**500**	**66**	**23**	**25***	**113**	**43**	**36**
240	**20**	**> 500**	**50**	**14**	**25***	**97**	**34**	**25***

* Minimum dose of K_2O

1. **Andhra Pradesh (Ragi)**

Name of the Centre	**: Palem,Mahabubnagar district**	**Soil phosphorus range**	**: 10 – 75 kg ha^{-1}**
Soil	**: Alfisol (Sandy Loam)**	**Soil potassium range**	**: 150 – 800 kg ha^{-1}**
Crop and Variety	**: Local cultivar**	**FYM composition**	**:**
Season developed	**: *Rabi,* 2005 & 2006**	**FYM rate**	**:**
Target range	**: 8 – 12 q ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 75 – 400 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 18.76 T – 0.30 SN, FP_2O_5 = 3.29 T – 0.78 SP, FK_2O = 3.47 T – 0.02 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**8 (q ha^{-1})**			**12 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
75	10	150	128	19	25	203	32	39
100	15	200	120	15	24	195	28	38
125	20	250	113	11	23	188	24	37
150	25	300	105	7	22	180	20	36
175	30	350	98	3	21	173	16	35
200	35	400	90		20	165	12	34
225	40	450	83		19	158	8	33
250	45	500	75		18	150	4	32
275	50	550	68		17	143		31
300	55	600	60		16	135		30
325	60	650	53		15	128		29
350	65	700	45		14	120		28
375	70	750	38		13	113		27
400	75	800	30		12	105		26

Verification: The above equations are yet to be verified on the farmers' fields.

Applicability

Soil Testing Laboratories :Rajendranagar, Jadcherla and Sanga Reddy
Soil type :Chalka soils
Crop :Ragi
Season developed :*Rabi*
Yield target :Upto 12 q ha^{-1}

Note : The above equations may be verified in black soils with three or four targets and pickup the best one for making recommendations.

1. Bangalore, Karnataka (Ragi) Zone-5 (Good) (* take it to ragi eqns of other states)

Crop	**: Ragi**
SOIL	**: Red lateritic**
Season	**: Kharif**
Variety	**: Indaf-8 & other HYV**
Target range	**: 20q/ acre**
Soil Nitrogen range	**: 0.2%- 0.5%**
Soil phosphorus range	**: 38 -164 Kg/ acre**
Soil potassium range	**: 30 -120 Kg/ acre**
FYM composition	**: .0.5%N : 0.3P:0.5K**
FYM rate	**: 3.00 t\ acre**
Green manure composition	**: 0.3%N : 0.4P:0.5K**
Green manure rate	**: 3.0t/acre**

Area of applicability : Bangalore, Kolar and Tumkur districts

Target yield equation**:** F.N. = 3.314 T- 0.24 SN ($KMnO_4$ - N), $F.P_2O_5$ = 1.85 T- 0.66 SP_2O_5 (Bray's - P_2O_5) $F.K_2O$ = 1.86 T- 0.21 SK_2O (NH_4OAC - K_2O)

STV $KMnO_4$-N (kg/acre)	Fertilizer nitrogen (kg/acre)	STV Bray's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
20	48	2.5	28	10	28
30	46	5.0	26	20	26
40	43	7.5	25	30	23
50	41	10.0	23	40	21
60	39	12.5	20	50	19
70	36	15.0	20	60	17
80	34	17.5	18	70	15
90	31	20.0	16	80	13
100	29	22.5	15	90	11
110	27	25.0	13	100	10
120	24	27.5	11		
130	22	30.0	10		

To increase or decrease the yield target of one q/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 3.25kg/acre P_2O_5 = ± 1.75 kg/acre K_2O = ± 1.75 kg/acre.

2. **Tamil Nadu: Ragi**

Name of the centre	**: Coimbatore**	**FYM composition**	**: 0.47:0.31:1.14%**
Soil	**: Mixed black (Periyanaickanpalayam series)**	**(N:P:K)**	**(Dry weight basis)**
Crop & Variety	**: Ragi - CO 11**	**FYM rate**	**: 12.5 t ha^{-1} (30% Moisture)**
Season developed	**: Kharif**		
Target range	**: 40 q ha^{-}**		
Soil Nitrogen range	**: 180 - 280 kg ha^{-1}**	**Green manure composition**	**:-**
Soil phosphorus range	**: 8 - 28 kg ha^{-1}**	**Green manure rate**	**: $^{-}$**
Soil potassium range	**: 300 - 500 kg ha^{-1}**		

Fertiliser Adjustment Equations

FN	=	4.35	T	-	0.37	SN	-	0.98 ON
FP_2O_5	=	1.18	T	-	1.03	SP	-	0.80 OP
FK_2O	=	2.68	T	-	0.14	SK	-	0.40 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha-1)			**Nutrient added (kg ha^{-1}) for an yield target of 40 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	8	300	107	39	65
190	10	320	104	37	62
200	12	340	100	35	60
210	14	360	96	33	57
220	16	380	93	31	54
230	18	400	89	29	51
240	20	420	85	27	48
250	22	440	82	25	46
260	24	460	78	22	43
270	26	480	74	20	40
280	28	500	70	18	37

Blanket Recommendation: 60:30:30 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Black Clay Loam
Yield target : 40 q ha^{-1}
Districts : Coimbatore, Salem, Tiruchirappalli
Grade : Good

Rahuri, (Maharashtra), Finger millet

Crop : Finger millet (Nagli) **Variety : Nagli RAU-8**
Soil : Typic Haplustepts **Situation:Rainfed**

Districts : Nasik, Nandurbar, Kolhapur, Pune, Gadchiroli, Bhandara

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**2.01**	**10.22**	**45.39**
P_2O_5	**0.59**	**26.14**	**19.86**
K_2O	**1.97**	**3.92**	**162**

Targeted Yield Equations

FN = 4.42 T – 0.225 SN

FP_2O_5 = 2.97 T – 1.32 SP

FK_2O = 1.21 T – 0.024 SK

Fertilizer prescription for targeted yields of finger millet for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			12 q ha^{-1} target			18 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**30**	**28**	**10**	**57**	**45**	**17**
120	**8**	**300**	**26**	**25**	**25***	**52**	**43**	**15**
140	**10**	**400**	**21**	**22**	**25***	**48**	**40**	**25***
160	**12**	**500**	**17**	**20**	**25***	**43**	**37**	**25***
180	**14**	**600**	**25***	**17**	**25***	**39**	**35**	**25***
200	**16**	**700**	**25***	**14**	**25***	**34**	**32**	**25***

Minimum dose of N and K_2O

Fodder corps

1. Hisar(Haryana) Sorghum fodder

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Sorghum (HC 171)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Kharif
Target range :400 to 600 q/ha
Soil nitrogen range : 80 to 200 kg/ha
Soil phosphorus range : 4 to 24 kg/ha
Targeted yield equations : FN =0.46T – 1.27 SN, FP_2O_5 = 0.16T – 3.59 SP*

Ready reckoner of soil test based fertilizer recommendations for sorghum (HC 171) green fodder yield of 400, 500 and 600 q/ha

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	400	500	600		400	500	600
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertiilzer P_2O_5, kg/ha)		
80	82	128	174	4	50	66	82
90	70	116	162	6	42	58	74
100	57	103	149	8	35	51	67
110	44	90	136	10	28	44	60
120	32	78	124	12	21	37	53
140	20	52	98	14	14	30	46
160	20	27	73	16	8	22	38
180	20	20	47	20	8	8	24
200	20	20	22	24	8	8	10

*SN and SP are soil available N and P (kg/ha), respectively; T = Targeted yield

Verification: These fertilizer adjustment equations for yield targets were verified. The yield targets of 400, 500 and 600 q/ha were achieved with ±6.0% deviations.

Applicability: These fertilizer adjustment equations will hold good throughout Haryana for high yielding varieties of sorghum for green fodder.

1. Hisar(Haryana) Oat fodder

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety :Oat (HFO 114)
Soil : Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Rabi
Target range : 400 to 500 q/ha
Soil nitrogen range : 80 to 220 kg/ha
Soil phosphorus range : 4 to 28 kg/ha
Targeted yield equations : FN =0.50T – 1.09 SN, FP_2O_5 = 0.13T – 1.50 SP*

Ready reckoner of soil test based fertilizer recommendations for oat (HFO 114) green fodder yield of 400, 450 and 500 q/ha

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	400	450	500		400	450	500
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertiilzer P_2O_5, kg/ha)		
80	113	138	163	4	46	53	59
90	102	127	152	6	43	50	56
100	91	116	141	8	40	47	53
110	80	105	130	10	37	44	50
120	69	94	119	12	34	40	47
140	47	72	97	14	31	37	44
160	30	50	75	16	28	34	41
180	30	30	53	20	22	29	35
200	30	30	30	24	16	23	29
220	30	30	30	28	10	17	23

*SN and SP are soil available N and P (kg/ha), respectively; T = Targeted yield

Verification: These fertilizer adjustment equations for yield targets were verified. The green fodder yield targets of 400, 450 and 500 q/ha were achieved with ±6.0% deviations.

Applicability: These fertilizer adjustment equations will hold good throughout Haryana for high yielding varieties of oat.

Rahuri, (Maharashtra), Fodder maize

Crop : Fodder Maize (Summer) **Variety : African tall**
Soil : Typic Haplusterts **Situation : Irrigated**

Districts : Kolhapur, Satara, Sangli, Pune, Ahmednagar, Nasik, Solapur

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**4.71**	**40.53**	**72.58**
P_2O_5	**0.82**	**17.25**	**54.31**
K_2O	**4.73**	**20.76**	**192.9**

Targeted Yield Equations

FN = 6.49 T – 0.56 SN

FP_2O_5 = 1.51 T – 0.73 SP

FK_2O = 2.45 T – 0.13 SK

Fertilizer prescription for targeted yields of fodder maize for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			40 t ha^{-1} target			50 t ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**203.6**	**56.02**	**72**	**268.5**	**71.12**	**96.5**
120	**8**	**300**	**192.4**	**54.56**	**59**	**257.3**	**69.66**	**83.5**
140	**10**	**400**	**181.2**	**53.1**	**46**	**246.1**	**68.2**	**70.5**
160	**12**	**500**	**170.0**	**51.64**	**33**	**234.9**	**66.74**	**57.5**
180	**14**	**600**	**158.8**	**50.18**	**20**	**223.7**	**65.28**	**44.5**
200	**16**	**700**	**147.6**	**48.72**	**25***	**215.5**	**63.82**	**31.5**

*** Minimum dose of K_2O**

Cash Crops

1. Andhra Pradesh, Cotton (Without IPNS Based)

Name of the Centre	**: Nandyal**	**Soil phosphorus range**	**: 5 – 75 kg ha^{-1}**
Soil	**: Vertisol**	**Soil potassium range**	**: 125 – 475 kg ha^{-1}**
Crop and Variety	**: Rainfed Cotton**	**FYM composition**	**:**
Season developed	**: *Kharif,* 2001**	**FYM rate**	**:**
Target range	**: 10 q ha^{-1} - 12 q ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 100 – 240 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 15.63 T – 0.70 SN, FP_2O_5 = 8.96 T – 2.15 SP, FK_2O = 13.41 T – 0.304 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) For yield target of					
			10 (q ha^{-1})			12 (q ha^{-1})		
Kmn O_4 N	Olsens' P	Amm. Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	5	125	86	79	96	118	97	123
110	10	150	79	68	89	111	87	115
120	15	175	72	57	81	104	75	108
130	20	200	65	47	73	97	65	100
140	25	225	58	36	66	90	54	93
150	30	250	51	25	58	83	43	85
160	35	275	44	14	51	76	32	77
170	40	300	37	4*	43	69	22	70
180	45	325	30	4*	35	62	11	62
190	50	350	23	4*	28	55	11	55
200	55	375	16	4*	20	48	11	47
210	60	400	9	4*	13	41	11	39
220	65	425	2	4*	5	34	11	32
230	70	450	2	4*	5	27	11	24
240	75	475	2	4*	5	20	11	17

* mintnance dose

Verification: The above equations are yet to be verified on the farmers' fields.

Applicability

Soil Testing Laboratories	:	Nandyal, Kurnool district
Soil	:	Vertisol (Clay)
Crop	:	Rainfed Cotton
Season developed	:	*Kharif*
Yield target	:	Upto 12 q ha^{-1}

Note : The above equations may be verified in Vertisol (Clay) with three or four **targets and pickup the best one for making recommendations.**

1. Tamil Nadu : Cotton

Name of the centre	**: Coimbatore**	**FYM composition**	**:0.59:0.23:0.59%**
Soil	**: Mixed black (Perianaickenpalayam series)**	**(N:P:K)**	**(Dry weight basis)**
		FYM rate	**: 12.5 t ha^{-1} (30 % moisture)**
Crop & Variety	**: Cotton - MCU 5**		
Season developed	**: Rabi**		
Target range	**: 30 q ha^{-}**	**Green manure composition**	**:-**
Soil Nitrogen range	**:180 - 270 kg ha^{-1}**	**Green manure rate**	**: -**
Soil phosphorus range	**: 8 - 26 kg ha^{-1}**		
Soil potassium range	**: 300 - 480 kg ha^{-1}**		

Fertiliser Adjustment Equations

FN	=	8.81	T	-	0.62	SN	-	0.77 ON
FP_2O_5	=	2.53	T	-	1.36	SP	-	1.08 OP
FK_2O	=	4.92	T	-	0.25	SK	-	0.77 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 30 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	8	300	153	65	73
190	10	320	146	62	68
200	12	340	140	60	63
210	14	360	134	57	58
220	16	380	128	54	53
230	18	400	121	51	48
240	20	420	115	49	43
250	22	440	109	46	38
260	24	460	103	43	33
270	26	480	97	41	28

Blanket Recommendation: 80:40:40 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Black - Clay Loam
Yield target : 30 q ha^{-1}
Districts : Coimbatore, Salem, Tiruchirappalli
Grade : Good

2. Tamil Nadu : Cotton

Name of the centre	**: Coimbatore**	**FYM composition (N:P:K)**	**:0.64 : 0.66 : 0.69% (Dry weight basis)**
Soil	**: Red (Irugur series)**		
Crop & Variety	**: Cotton - MCU 5**		
Season developed	**: Sep. - Feb. (Rabi)**	**FYM rate**	**: 12.5 t ha^{-1} (30% moisture)**
Target range	**: 30 q ha^{-1}**		
Soil Nitrogen range	**: 180 - 270 kg ha^{-1}**		
Soil phosphorus range	**: 8 - 26 kg ha^{-1}**	**Green manure composition**	**:-**
Soil potassium range	**: 180 - 270 kg ha^{-1}**	**Green manure rate**	**: -**

Fertiliser Adjustment Equations

FN	=	7.66	T	-	0.43	SN	- 0.71	ON
FP_2O_5	=	3.22	T	-	3.27	SP	- 0.38	OP
FK_2O	=	5.97	T	-	0.50	SK	- 0.66	OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 30 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
180	8	180	153	71	89
190	10	190	148	64	84
200	12	200	144	58	79
210	14	210	140	51	74
220	16	220	135	45	69
230	18	230	131	38	64
240	20	240	127	32	59
250	22	250	122	25	54
260	24	260	118	20	49
270	26	270	114	20	44

Blanket Recommendation: 80:40:40 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Red - Sandy Clay Loam
Yield target : 30 q ha^{-1}
Districts : Coimbatore, Dindigul, Erode, Karur, Madurai, Namakkal, Salem, Theni, Tiruchirappalli
Grade : Good

1. Hisar(Haryana)Cotton

Name of centre : CCS Haryana Agricultural University,Hisar
Soil : Sierozem (Inceptisols/Entisols)
Crop & Varitey : Cotton (H 777)
Season developed : Kharif
Target range :16 to 22 q/ha
Soil nitrogen range : 80 to 220 kg/ha
Soil phosphorus range : 4 to 28 kg/ha
Targeted yield equations :
FN = 10.91T – 1.09 SN, FP_2O_5 = 3.02T – 1.73 SP*

Ready reckoner of soil test based fertilizer recommendations for cotton (H 777) for 16, 18 and 20q/ha kapas yield

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	18	20	22		18	20	22
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertiilzer P_2O_5, kg/ha)		
80	87	109	131	4	41	47	53
90	77	98	120	6	38	44	50
100	66	87	109	8	34	40	46
110	120	98	96	10	31	37	43
120	44	65	87	12	27	33	39
140	22	43	66	14	24	30	36
160	21	21	44	16	20	26	32
180	21	21	22	20	13	19	26
200	21	21	21	24	23	19	12
220	21	21	21	28	16	12	8

*SN and SP are soil available N and P (kg/ha), respectively; T = Targeted yield

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields in various agro-climatic zones of Haryana. The yield targets of 18 and 20 q/ha were achieved with -6.5 to +5.8% deviations.

Applicability**: These fertilizer adjustment equations will hold good for American cotton in the cotton growing areas of Haryana.**

1. Bikaner, Cotton

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**90-170 kg ha^{-1}**
Soil	**:**	Alluvial soils (Adsar and Khiran series)	**Soil Phosphorus range**	**:**	**25-65 kg ha^{-1}**
Crop and variety	**:**	**Cotton (RS-810)**	**Soil potassium range**	**:**	**190-350 kg ha^{-1}**
Season developed	**:**	**Kharif-2003 and 2004**			
Target range	**:**	**18-20 q ha^{-1}**			

Fertilizer adjustment equation

FN = 10.05T – 0.29 SN
FP_2O_5 = 9.02 T – 1.66 S P_2O_5
FK_2O = 8.20 T – 0.25 SK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for yield target of					
			18 q ha^{-1}			20 q ha^{-1}		
$KMnO_4$ N	Olsens' P	Amm.Ac. -K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
90	25	190	91	70	53	105	70	60
100	30	210	87	60	46	101	70	59
110	35	230	82	49	39	97	63	52
120	40	250	78	39	32	92	52	45
130	45	270	74	28	26	88	42	39
140	50	290	69	20	19	84	32	32
150	55	310	65	20	15	80	21	25
160	60	330	61	20	15	75	20	18
170	65	350	57	20	15	71	20	15

Applicability

Soil testing laboratory : Bikaner
Soil : Khiran, Jamsar, Lunkaransar series
Crop and variety : Cotton (RS-810)
Target range : 18-20 q ha^{-1}
Soil nitrogen range : 90-170 kg ha^{-1}
Soil phosphorus range : 25-65 kg ha^{-1}
Soil potassium range : 190-350 kg ha^{-1}

1. Jabalpur, Cotton

Crop	:	Cotton
Soil Type	:	Shallow, Medium black and Deep black
Varieties	:	JKH -1 and Hybrid Cotton
Yield (q ha^{-1})	:	
Applicability	:	**Range of soil test values (Kg ha^{-1}) : N:** 100- 350 ; P: 5- 25 ; K: 100-500
Districts	**:**	Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur, Sehore, Ujjain**.** Grade : need to verify

Equation for Calculating the fertilizer nutrient Requirement:

FN= 11.33 T – 0.59SN **FP_2O_5 = 6.45 T – 4.4 SP** **FK_2O = 4.71 T – 0.14SK**

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			15			20		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**108**	**75**	**43**	**164**	**107**	**66**
150	**10**	**250**	**78**	**52**	**36**	**134**	**84**	**59**
200	**15**	**300**	**49**	**30**	**29**	**105**	**62**	**52**
250	**20**	**350**	**19**	**8**	**22**	**75**	**40**	**45**
300	**25**	**400**	**-**	**-**	**15**	**46**	**17**	**37**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 11.3 kg ha^{-1}; P_2O_5= ± 6.4 kg $ha^{-1}$and K_2O= ±4.7

Rahuri, (Maharashtra), Cotton

Crop : Cotton (Kharif) **Variety:RHR-253**
Soil : Typic Haplusterts **Situation:Irrigated**

Districts : Jalgaon, Akola, Buldana, Amravati, Nanded, Latur, Washim, Pune, Parbhani, Wardha, Yeotmal, Ahmednagar, Satara, Sangli, Solapur, Kolhapur.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**5.20**	**29.8**	**39.2**
P_2O_5	**4.35**	**79.1**	**63.7**
K_2O	**0.96**	**1.70**	**11.2**

Targeted Yield Equations

FN = 13.1 T – 0.75 SN

FP_2O_5 = 6.83 T – 2.84 SP

FK_2O = 8.57 T – 0.18 SK

Fertilizer prescription for targeted yields of cotton for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			20 q ha^{-1} target			24 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**250**	**187**	**119**	**126**	**239**	**146**	**160**
120	**10**	**300**	**172**	**108**	**117**	**224**	**135**	**151**
140	**14**	**350**	**157**	**96**	**108**	**209**	**124**	**142**
160	**18**	**400**	**142**	**85**	**99**	**194**	**112**	**133**
180	**22**	**450**	**127**	**68**	**90**	**179**	**95**	**124**
200	**26**	**500**	**112**	**57**	**81**	**164**	**84**	**115**
220	**30**	**550**	**97**	**45**	**72**	**149**	**73**	**106**
240	**34**	**600**	**82**	**34**	**63**	**139**	**61**	**97**

1.Andhra Pradesh (Sugarcane)

Name of the Sub Centre	**: Nellore**	**Soil phosphorus range**	**: 10 – 60 kg ha^{-1}**
Soil	**: Sandy clay loam (Alluvial)**	**Soil potassium range**	**: 150 – 370 kg ha^{-1}**
		FYM composition	**: 0.75 : 0.60 : 1.20**
Crop and Variety	**: Sugarcane – 87A-298**	**FYM rate**	**: 10 t ha^{-1}**
Season/Year developed	**: 1999-2000**	**Green manure composition**	**:**
Target range	**: 125 t ha^{-1} - 150 t ha^{-1}**	**Green manure rate**	**:**
Soil Nitrogen range	**: 150 – 400 kg ha^{-1}**		

Fertilizer adjustment equations

FN = 3.43 T – 1.45 SN- 0.70 FYM N, FP_2O_5 = 1.30 T – 4.83 SP- 0.43 FYM P

FK_2O = 1.93 T – 0.56 SK- 0.03 FYM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 125 t ha^{-1}**					
Kmn O_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	5	150	276	141	162	230	131	144
140	10	170	244	120	148	201	107	132
160	15	190	212	98	135	172	83	121
180	20	210	180	76	121	143	59	110
200	25	230	148	55	108	114	35	99
220	30	250	116	33	94	85	10	88
240	35	270	84	12	81	56	10	76
260	40	290	52	12	67	27	10	65

Verification: The above equations are to be verified on the farmers' fields of Nellore district with yield targets of 125 and 150 t ha^{-1}.

Applicability

Soil Testing Laboratories	:	Nellore, Ongole, Tirupati and Cuddapah
Soil type	:	Sandy clay loam
Crop	:	Sugarcane
Season developed	:	*Kharif*
Yield target	:	Up to 125-150 t ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

2. Andhra Pradesh (Sugarcane)

Name of the Sub Centre	**: Nellore**	**Soil phosphorus range**	**: 5 – 35 kg ha^{-1}**
Soil	**: Sandy clay loam (Alluvial)**	**Soil potassium range**	**: 150 – 270 kg ha^{-1}**
Crop and Variety	**: Sugarcane – 87A-298 (1st Ratoon crop)**	**FYM composition**	**: 10 t ha^{-1}**
Season/Year developed	**: 2000-2001**	**FYM rate**	**:**
Target range	**: 125 – 150 t ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 120 – 240 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 4.85 T – 2.60 SN- 0.20 FYM N, FP_2O_5 = 1.36 T – 5.73 SP- 0.34 FYM P

FK_2O = 1.94 T – 0.85 SK- 0.40 FYM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 125 t ha^{-1}**					
Kmn	**Olsen-**	**Amm**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**		
O_4-N	**P**	**Aoc-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	5	150	294	141	115	285	126	76
140	10	170	242	113	98	233	97	59
160	15	190	190	84	81	181	68	42
180	20	210	138	55	64	129	40	25
200	25	230	86	27	47	77	11	25
220	30	250	34	27	30	25	11	25
240	35	270	34	27	30	25	11	25

Verification: The above equations are to be verified on the farmers' fields of Nellore district with yield targets of 125 and 150 t ha^{-1}.

Applicability

Soil Testing Laboratories	:	Nellore, Ongole, Tirupati and Cuddapah
Soil type	:	Sandy clay loam
Crop	:	Sugarcane
Season developed	:	*Kharif*
Yield target	:	Up to 150 t ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

3. **Andhra Pradesh (Sugarcane)**

Name of the Sub Centre	**: Rudrur**	**Soil phosphorus range**	**: 10 – 60 kg ha^{-1}**
Soil	**: Black soil**	**Soil potassium range**	**: 150 – 650 kg ha^{-1}**
Crop and Variety	**: Sugarcane – Co. 419**	**FYM composition**	**:**
Season/Year developed	**: 1982**	**FYM rate**	**:**
Target range	**: 80 t ha^{-1} - 100 t ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 150 – 400 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 5.4 T – 1.25 SN, FP_2O_5 = 1.8 T – 4.73 SP

FK_2O = 1.7 T – 0.33 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn O_4-	**Olsen-P**	**Amm**	**80 t ha^{-1}**			**100 t ha^{-1}**		
N		**Aoc-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	245	97	87	353	133	121
175	15	200	213	73	70	321	109	104
200	20	250	182	49	54	290	85	88
225	25	300	151	26	37	259	62	71
250	30	350	120	2	21	228	38	55
275	35	400	88	2	4	196	14	38
300	40	450	57	2	4	165	14	22
325	45	500	26	2	4	134	14	5
350	50	550	26	2	4	103	14	5
375	55	600	26	2	4	71	14	5
400	60	650	26	2	4	40	14	5

Verification: The above equations are to be verified on the farmers' fields of Nizamabad district with yield targets of 80 and 100 t ha^{-1}.

Applicability

Soil Testing Laboratories	:	Nizamabad
Soil type	:	Black soils of Nizam Sugar Factory Area
Crop	:	Sugarcane
Season developed	:	*Kharif*
Yield target	:	Up to 100 t ha^{-1}

Note: For adoption in light soils of Nizam Sugar Factory Area, 3 or 4 targeted yields may be tested in the farmers' fields and pick up the best one to make recommendations.

1. Bangalore, Karnataka (Sugarcane)Zone-4

Name of the centre	**: Bangalore**	**Soil phosphorus range**	**: 15 -25 kg/acre**
Soil	**: Red,Alkaline**	**Soil potassium range**	**: 120 – 200 kg/ acre**
Crop & Variety	**: CO – 419 and Other HYV**	**FYM composition**	**: 0.6N,0.25P,0.5K**
Season developed	**: Khaif- 2000**	**FYM rate**	**: 10t/ acre**
Target range	**: 40 t/ acre**	**Green manure composition**	**: 0.7N,0.2P,0.5K**
Soil Nitrogen range	**: 80 – 120 kg/ acre**	**Green manure rate**	**:**

Area of applicability : Chitradurga and davanagere districts.

Targeted Yield Equation

FN = 5.52 T – 150.24 SN (OC %), FP_2O_5 = 2.27 T –0.96 SP_2O_5 (Olsen's P_2O_5)
FK_2O = 3.75 T –0.38 SK_2O (NH_4OAC-K_2O) RYS = 8.70

Fertilizer prescription for targeted yields of sugarcane for varying soil test values.

STV O.C (%)	Fertilizer nitrogen (kg/acre)	STV Bray's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
0.40	161	5	86	60	127
0.50	146	10	81	80	120
0.55	138	15	76	100	112
0.60	131	20	72	110	108
0.70	116	25	67	120	104
0.75	108	30	62	130	101
0.80	101	35	57	140	97
0.85	93	40	52	150	93
0.90	86	45	48	160	89
1.00	71	50	43	170	85

To increase or decrease the yield target by one t/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 5.5 kg/acre P_2O_5 = ± 2.3 kg/acre K_2O = ± 3.8 kg/acre

2. Crop: Sugarcane (CO-62175)

Targeted Yield Equation

FN = 2.206 T-212.8 SN (OC%), FP_2O_5 = 1.057 T- 3.196 SP_2O_5 (Bray's P_2O_5)
FK_2O = 1.192 T – 0.313 SK_2O (NH_4OAC-K_2O) RYS = 22.50

Yield of sugarcane during 2002-03 under follow up trial.

Yield Target (t/ha)/Fertilizer prescription approach	Fertilizer nutrients applied (kg/ha)			Yield (t/ha)	Response (t/ha)	Deviation (%)	VCR
	N	P_2O_5	K_2O				
150– STCR (Fully Inorganic)	**154**	**0**	**60**	**167.0**	**89.0**	**+11.3**	**1:33.8**
150 – STCR (50% Organic + 50 % Inorganic) 15.5 t FYM	**77**	**0**	**0**	**159.4**	**81.4**	**+6.3**	**1:7.6**
150 – GRD	**250**	**75**	**75**	**161.8**	**83.8**	**+7.9**	**1:13.8**
150 – STL	**213**	**63**	**50**	**147.4**	**69.4**	**-1.7**	**1:13.8**
Control	-	-	-	**78.0**	.		

STV : O C – 0.82 %, Bray's P_2O_5 – 71.68 kg/ha, Amm.Acetate K_2O – 378.0 kg/ha

Bihar (Sugarcane)

Bihar (Young Alluvium Calcareous Soil)

Name of the Centre	**: RAU,Pusa**	**Soil phosphorus range**	**: 4- 40 kg P_2O_5/ha**
Soil	**:Young alluvium calcoreaus soil**	**Soil potassium range**	**: 60- 240 kg K_2O/ha**
		Compost composition	**: N.A.**
Season	**: Spring**	**Compost rate**	**: N. A.**
Crop	**: Sugar Cane main crop**	**Green manure composition**	**: N.A.**
Target range	**: 75-100 t/ha**	**Green manure rate**	**: N. A.**
Soil Nitrogen range	**: 120- 300 kg N /ha**		

Valid for Districts : East Champaran, West Champaran, Siwan, Saran, Sitamarhi, Shivhar, Muzaffarpur, Vaishali,Samastipur, Gopalganj, Begusarai, Part of Khagaria

Soil Test Values : Alk. $KMnO_4$ – N expressed in **kg N/ha**
Olsen's P expressed in **kg P_2O_5/ha**
Ammonium OAc – K expressed in **kg K_2O/ha**

Minimum maintenance dose of fertilizer if soil test value is high : **30 kg N, 15 kg P_2O_5 and 10 kg K_2O/ha**

1. Bihar (Young Alluvium Calcareous Soil) Crop: Sugar cane main crop

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				Targetted Yield Equations
Nutrient	**N R(kg/q)**	**C S (%)**	**C F (%)**	
N	0.171	19.9	72.6	FN = 0.236 T – 0.27 SN
P_2O_5	0.018	25.4	16	FP_2O = 0.113 T – 1.59 SP_2O_5
K_2O	0.18	44.5	178	FK_2O = 0.101 T – 0.25SK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			75 t/ha			100 t/ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	145	78	61	204	107	86
130	6	70	142	75	58	201	103	84
140	8	80	139	72	56	198	100	81
150	10	90	137	69	53	196	97	79
160	12	100	134	66	51	193	94	76
170	14	110	131	62	48	190	91	74
180	16	120	128	59	46	187	88	71
190	18	130	126	56	43	185	84	69
200	20	140	123	53	41	182	81	66
210	22	150	120	50	38	179	78	64
220	24	160	118	47	36	177	75	61
230	26	170	115	43	33	174	72	59
240	28	180	112	40	31	171	68	56
250	30	190	110	37	30	169	65	54
260	32	200	107	34	30	166	62	51
270	34	210	104	31	30	163	59	49
280	36	220	101	28	30	160	56	46
290	38	230	99	24	30	158	53	44
300	40	240	96	21	30	155	49	41

2. Bihar (Young Alluvium Calcareous Soil)

Name of the Centre	**: RAU,Pusa**	**Soil phosphorus range**	**: 4- 40 kg P_2O_5/ha**
Soil	**:Young alluvium calcoreaus soil**	**Soil potassium range**	**: 60- 240 kg K_2O/ha**
		Compost composition	**: N. A.**
Season	**: After harvest of main crop**	**Compost rate**	**:N.A.**
Crop	**: Sugarcane ratoon**	**Green manure composition**	**: N.A.**
Target range	**: 75-100 t/ha**	**Green manure rate**	**: N. A.**
Soil Nitrogen range	**: 120- 300 kg N /ha**		

Valid for Districts : East Champaran, West Champaran, Siwan, Saran, Sitamarhi, Shivhar, Muzaffarpur, Vaishali,Samastipur, Gopalganj, Begusarai, Part of Khagaria

Bihar (Young Alluvium Calcareous Soil) Crop: Sugar cane ratoon

Targetted Yield Equations* (WITH ONLY INORGANIC FERTILIZERS :N, P & K**)**

Basic Data				Targetted Yield Equations
Nutrient	**N R(kg/q)**	**C S (%)**	**C F (%)**	
N	0.211	23.4	80.9	FN = 0.261 T – 0.29 SN
P_2O_5	0.024	30	20	FP_2O = 0.120 T – 1.50 SP_2O_5
K_2O	0.156	27	144.4	FK_2O = 0.108 T – 0.19SK_2O

*** Good Equations**

Fertilizer Recommendation Schedule for Specific Yield Target at Varying Soil Test Values

Soil Available Nutrients (kg/ha)			Fertilizer Nutrients Required (kg/ha) for Yield Target of					
			75 t/ha			100 t/ ha		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
120	4	60	161	84	70	226	114	97
130	6	70	158	81	68	223	111	95
140	8	80	155	78	66	220	108	93
150	10	90	152	75	64	218	105	91
160	12	100	149	72	62	215	102	89
170	14	110	146	69	60	212	99	87
180	16	120	144	66	58	209	96	85
190	18	130	141	63	56	206	93	83
200	20	140	138	60	54	203	90	81
210	22	150	135	57	53	200	87	80
220	24	160	132	54	51	197	84	78
230	26	170	129	51	49	194	81	76
240	28	180	126	48	47	191	78	74
250	30	190	123	45	45	189	75	72
260	32	200	120	42	43	186	72	70
270	34	210	117	39	41	183	69	68
280	36	220	115	36	39	180	66	66
290	38	230	112	33	37	177	63	64
300	40	240	109	30	35	174	60	62

1. Tamil Nadu : Sugarcane

Name of the centre	**: Coimbatore**	**FYM composition**	**: 0.67:0.40:0.72%**
Soil	**: Mixed black (Perianaickenpalayam series)**	**(N:P:K)**	**(Dry weight basis)**
Crop & Variety	**: Sugarcane - COC 671**	**FYM rate**	**: 12.5 t ha^{-1} (30% moisture)**
Season developed	**: -**		
Target range	**: 125 t ha^{-1}**		
Soil Nitrogen range	**: 200 - 300 kg ha^{-1}**	**Green manure composition**	**: -**
Soil phosphorus range	**: 15 -25 kg ha^{-1}**	**Green manure rate**	**: -**
Soil potassium range	**: 300 - 550 kg ha^{-1}**		

Fertiliser Adjustment Equations

FN	=	4.17	T	-	1.09	SN	-	1.11	ON
FP_2O_5	=	1.01	T	-	2.56	SP	-	1.01	OP
FK_2O	=	3.44	T	-	0.84	SK	-	1.03	OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 125 t ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
200	15	300	303	88	178
220	17	350	281	82	136
240	19	400	259	77	94
260	21	450	238	72	56
280	23	500	216	67	56
300	25	550	194	62	56

Blanket Recommendation: 275 : 62.5 : 112.5 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Black clay loam
Yield target : 125 t ha^{-1}
District(s) : Coimbatore, Salem, Tiruchirappalli
Grade : Good

2. Tamil Nadu : Sugarcane

Name of the centre	**: Cuddalore (Sub centre)**
Soil	**: Red (Gadillum series)**
Crop & Variety	**: Sugarcane - CO 6304**
Season developed	**: -**
Target range	**: 125 t ha^{-1}**
Soil Nitrogen range	**: 200 - 300 kg ha^{-1}**
Soil phosphorus range	**: 15 -25 kg ha^{-1}**
Soil potassium range	**: 200 - 300 kg ha^{-1}**
FYM composition (N:P:K)	**: 0.87:0.72:1.30% (Dry weight basis)**
FYM rate	**: 12.5 t ha^{-1} (30 % moisture)**
Green manure composition	**: -**
Green manure rate	**: -**

Fertiliser Adjustment Equations

FN	=	4.06	T	-	0.74	SN	- 0.87	ON
FP_2O_5	=	0.71	T	-	1.09	SP	- 0.72	OP
FK_2O	=	2.67	T	-	0.57	SK	- 1.30	OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 125 t ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
200	15	200	360	73	220
220	17	220	345	70	209
240	19	240	331	68	197
260	21	260	316	66	186
280	23	280	301	64	170
300	25	300	286	62	163

Blanket Recommendation: 275 : 62.5 : 112.5 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Coastal Alluvium - Clay loam
Yield target : 125 t ha^{-1}
Districts : Cuddalore
Grade : Good

3. Sugarcane : Tamil Nadu

Name of the centre	**: Bhavanisagar (sub - centre)**	**FYM composition (N:P:K)**	**: 0.80: 0.41: 0.75% (Dry weight basis)**
Soil	**: Red (Irugur series)**		
Crop & Variety	**: Sugarcane - COC 671**		
Season developed	**: -**	**FYM rate**	**: 12.5 t ha^{-1} (30 % Moisture)**
Target range	**: 100 t ha^{-1}**		
Soil Nitrogen range	**: 200 - 300 kg ha^{-1}**		
Soil phosphorus range	**: 14 -24 kg ha^{-1}**	**Green manure composition**	**: -**
Soil potassium range	**: 200 - 300 kg ha^{-1}**	**Green manure rate**	**: -**

Fertiliser Adjustment Equations

FN = 3.42 T - 0.56 SN - 0.93 ON

FP_2O_5 = 1.15 T - 1.94 SP - 0.98 OP

FK_2O = 3.16 T - 0.73 SK - 0.99 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 100 t ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
200	14	200	230	88	170
220	16	220	219	86	155
240	18	240	208	80	141
260	20	260	196	76	126
280	22	280	185	72	112
300	24	300	174	68	97

Blanket Recommendation: 275 : 62.5 : 112.5 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Red Sandy Loam
Yield target : 100 t ha^{-1}
District(s) : Coimbatore, Dindigul, Erode, Karur, Madurai, Namakkal, Salem, Theni, Tiruchirappalli
Grade : Good

1. Chhattisgarh

Crop - **Sugarcane**
Soil Type - Vertisol
Variety - Co-JN -14186
Season - Rabi 2007-08

Area for suitability - Raipur, Durg, Rajnandgaon, Bilaspur ans Kawardha districts

Fertilizer adjustment equations

FN = 0.59 Y -1.12 SN - 0.88 FYM
FP = 0.13 Y - 3.46 SP - 0.37 FYM
FK = 0.15 Y - 0.13 SK - 0.15 FYM

Where FN, FP_2O_5 and FK_2O are fertilizer N P and K respectively. SN, SP and SK are soil test values for available N P and K. Y = Yield target (q/ha) and FYM is Farm Yard Manure

Ready Reckoners for soil test based fertilizer N recommendation of sugarcane in Vertisol with 5 tonnes of FYM.

Soil Test N Kg/ha	**Yield Target of sugarcane (q ha-1)**					
	500	600	700	800	900	1000
150	123	182	241	300	359	418
175	95	154	213	272	331	390
200	67	126	185	244	303	362
225	39	98	157	216	275	334
250	11	70	129	188	247	306
275	0	42	101	160	219	278
300	0	14	73	132	191	250
325	0	0	45	104	163	222
350	0	0	17	76	135	194
375	0	0	0	48	107	166
400	0	0	0	20	79	138
425	0	0	0	0	51	110
450	0	0	0	0	23	82

Ready Reckoners for soil test based fertilizer P_2O_5 recommendation of sugarcane in Vertisol with 5 tonnes of FYM.

Soil Test P	***Yield Target of sugarcane (q ha-1)***					
Kg/ha	500	600	700	800	900	*1000*
6	42	55	68	81	94	*107*
8	35	48	61	74	87	*100*
10	29	42	55	68	81	*94*
12	22	35	48	61	74	*87*
14	15	28	41	54	67	*80*
16	8	21	34	47	60	*73*
18	1	14	27	40	53	*66*
20	0	7	20	33	46	*59*
22	0	0	13	26	39	*52*
24	0	0	6	19	32	*45*
26	0	0	0	12	25	*38*
28	*0*	*0*	*0*	*5*	*18*	*31*

Ready Reckoners for soil test based fertilizer K_2O recommendation of sugarcane in Vertisol with 5 tonnes of FYM

Soil Test	***Yield Target of sugarcane (q ha-1)***					
Kg/ha	500	600	700	800	900	*1000*
200	48	63	78	93	108	*123*
225	45	60	75	90	105	*120*
250	42	57	72	87	102	*117*
275	39	54	69	84	99	*114*
300	35	50	65	80	95	*110*
325	32	47	62	77	92	*107*
350	29	44	59	74	89	*104*
400	22	37	52	67	82	*97*
450	16	31	46	61	76	*91*
500	*9*	*24*	*39*	*54*	*69*	*84*

1. Jabalpur, Sugarcane

Crop	:	Sugarcane
Soil Type	:	**Shallow**, **Medium black and Deep black**
Varieties	:	**CO-1307**
Yield (q ha^{-1})	:	12-15
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N: 100- 350 ; P: 5- 20 ; K: 100-350**
Districts	**:**	**Jabalpur ,Indore, Khandwa, Khargone, Narsinghpur, Powarkheda, , Sehore Bhopal**Grade : **need to verify**

Equation for Calculating the fertilizer nutrient Requirement:

FN= 5.71 T –1.66 SN FP_2O_5 = 2.28 T – 11.73 SP FK_2O = 1.6 T – 0.53 SK

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (t ha^{-1})					
			12			14		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**519**	**215**	**86**	**633**	**260**	**118**
150	**10**	**250**	**353**	**98**	**33**	**467**	**143**	**65**
200	**15**	**300**	**270**	**39**	**6**	**384**	**84**	**38**
250	**20**	**350**	**187**	**-**	**-**	**301**	**26**	**12**
300	**25**	**400**	**104**	**-**	**-**	**218**	**-**	**-**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 5.7 kg ha^{-1}; P_2O_5= ± 2.2 kg $ha^{-1}$and K_2O= ±1.6

Rahuri, (Maharashtra), Sugarcane

Crop : Sugarcane (Seasonal) **Variety: Co 86032**
Soil : Vertic Haplusterts **Situation: Irrigated**

Districts : Ahmednagar, Pune, Satara, Sangli, Kolhapur, Solapur, Nasik, Aurangabad, Nanded, Parbhani, Jalgaon, Buldhana, Kolhapur.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**2.28**	**64**	**48**
P_2O_5	**1.28**	**70**	**103**
K_2O	**4.78**	**30**	**175**

Targeted Yield Equations

FN = 4.76 T – 1.34 SN

FP_2O_5 = 1.24 T – 1.55 SP

FK_2O = 2.73 T – 0.21 SK

Fertilizer prescription for targeted yields of seasonal sugarcane for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			100 t ha^{-1} target			120 t ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**342**	**115**	**231**	**437**	**140**	**286**
120	**8**	**300**	**315**	**112**	**210**	**410**	**136**	**265**
140	**10**	**400**	**288**	**109**	**181**	**384**	**133**	**244**
160	**12**	**500**	**261**	**105**	**168**	**357**	**130**	**223**
180	**14**	**600**	**234**	**102**	**147**	**330**	**127**	**202**
200	**16**	**700**	**207**	**99**	**134**	**303**	**124**	**181**

Oilseeds Crops

1. Bangalore, Karnataka (Grondnut) Zone-5 (IPNS) Good

Crop	**: Groundnut (TMV-2)**	**Target range**	**: 7q/acre**
SOIL	**: Red**	**Soil phosphorus range**	**:40-100 kg/acre**
Season	**: Kharif**	**Soil potassium range**	**:60-140kg/acre**
Variety	**: TMV-2**	**FYM composition**	**:0.5N,0.2P,0.5K**
Area of Applicability	**: Bangalore, Kolar, Mandya and Tumkur districts.**	**FYM rate**	**: 4t/ acre**
		Green manure composition	**:**
		Green manure rate	**:**
Soil Nitrogen range	**: 180-300 kg/ acre**		

Area of applicability : Bangalore, Kolar,Mandya and Tumkur districts.

Target yield equations:

FN = 3.88 T– 0.53 SN ($KMnO_4$-N) – 0.000334 OM,
FP_2O_5= 5.85 T–1.063 SP_2O_5 (Bray's-P_2O_5) – 0.000332 OM,
FK_2O= 4.24 T – 0.533 SK_2O (NH_4OAC-K_2O) – 0.000423 OM

STV $KMnO_4$- N (kg/acre)	Fertilizer nitrogen (kg/acre)	STV Bray's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
20	20.4	3	43.6	20	23.2
22	19.4	5	41.5	22	22.2
24	18.3	7	39.4	24	21.1
26	17.3	9	37.2	26	20.0
28	16.2	11	35.1	28	19.0
30	15.1	13	33.0	30	17.9
32	14.1	15	30.9	32	16.8
34	13.0	17	28.7	34	15.8
36	12.0	19	26.6	36	14.7
38	10.9	21	24.5	38	13.6
40	9.8	23	22.4	40	12.6
42	8.8	25	20.2	42	11.5
44	7.7	27	18.1	44	10.4
46	6.7	29	16.0	46	9.4
48	5.6	31	13.8	48	8.3
50	4.5	33	11.7	50	7.2

Note: If one tonne FYM /acre is used then decrease N by 0.3 kg/acre, P_2O_5 by 0.3 kg/acre and K_2O by 0.4 kg/acre

To increase or decrease the yield target by one q/acre the variations to be made in the fertilizer recommendations are as follows:
N = ± 3.9 kg/acre P_2O_5 = ± 5.9 kg/acre K_2O = ± 4.2 kg/acre.

1. Bhubneaswar

Crop : Groundnut (cv. Smruti)
General fertilizer recommendation : 20-40-40

Basic data and fertilizer adjustment equations

Nutrient	Basic data			Fertilizer adjustment equations
	NR (kg/q)	Cs (%)	C_f (%)	
N	7.4	75	16	FN = 4.5 T – 0.4 SN
P_2O_5	1.3	49	32	F P_2O_5 = 4.1 T – 1.5 S P_2O_5
K_2O	1.6	21	65	FK_2O = 2.5 T – 0.3 S K_2O

Corrected ready reckoner of fertilizer doses at varying soil test values for specific yield targets

Available soil nutrients (kg ha^{-1})			Fertilizer nutrients required (kg ha^{-1})								
			Targeted yield (15 q ha^{-1})			Targeted yield (20 q ha^{-1})			Targeted yield (25 q ha^{-1})		
N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
60	15	50	40	40	23	50	50	35	60	60	48
70	20	60	40	32	20	50	50	32	60	60	45
80	25	70	36	24	17	50	46	29	60	60	42
100	30	80	28	17	14	50	39	26	60	58	39
120	35	90	20	10	11	42	32	23	60	50	36
140	40	100	10	10	10	34	25	20	56	42	33
160	45	125	10	10	10	26	18	13	48	34	25
180	50	150	10	10	10	18	11	10	40	26	13
200	60	175	10	10	10	10	10	10	32	18	10
220	70	200	10	10	10	10	10	10	24	10	10

(NB : when the calculated fertilizer requirement values tend to zero, a minimum dose, say 10 kg ha^{-1} each for N P and K are added to the calculated values to bring the dose to a reasonable one).

Equation used by the Soil Testing Laboratory :

Districts covered : Khurda, Puri, Nayagarh, Cuttack, Angul, Dhenkanal, Sambalpur, Bargarh, Jharsududa, Sundargarh ,Bhubaneswar, Puri, Cuttack, Dhenkanal, Sambalpur, Sundargarh

1. **Bikaner Groundnut**

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**80-160 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Bhamatsar and Khiran series)**	**Soil Phosphorus range**	**:**	**10-50 kg ha^{-1}**
Crop and variety	**:**	**Groundnut (M-13)**	**Soil potassium range**	**:**	**170-330 kg ha^{-1}**
Season developed	**:**	**Kharif-1999**	**FYM composition**	**:**	**0.58% N, 0.26% P_2O_5 and 0.35% K_2O**
Target range	**:**	**35-40 q ha^{-1}**	**FYM rate**	**:**	**5 t ha^{-1}**

Fertilizer adjustment equation

FN = 1.82 T – 0.26 SN – 0.18 ON
FP_2O_5 = 2.08 T – 1.48 S P_2O_5 – 0.60 OP_2O_5
FK_2O = 2.43 T – 0.22 SK_2O – 0.33 OK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) with 5 t ha^{-1} FYM for yield target of**					
			35 q ha^{-1}			**40 q ha^{-1}**		
$KMnO_4$ N	**Olsens' P_2O_5**	**Amm.Ac. - K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
80	**10**	**170**	**38**	**50**	**41**	**47**	**61**	**53**
90	**15**	**190**	**35**	**43**	**36**	**44**	**53**	**49**
100	**20**	**210**	**32**	**35**	**32**	**42**	**46**	**44**
110	**25**	**230**	**30**	**28**	**28**	**39**	**38**	**40**
120	**30**	**250**	**27**	**21**	**23**	**36**	**31**	**35**
130	**35**	**270**	**25**	**20**	**19**	**34**	**24**	**31**
140	**40**	**290**	**22**	**20**	**14**	**31**	**20**	**27**
150	**45**	**310**	**19**	**20**	**10**	**29**	**20**	**22**
160	**50**	**330**	**17**	**20**	**10**	**26**	**20**	**18**

Applicability

Soil testing laboratory : Bikaner
Soil : Bhamatsar, Khiran, Jamsar, Lunkaransar series
Crop and variety : Groundnut M-13
Target range : 35-40 q ha^{-1}
Soil nitrogen range : 80-160 kg ha^{-1}
Soil phosphorus range : 10-50 kg ha^{-1}
Soil potassium range : 170-330 kg ha^{-1}

1. **Chhattisgarh**

Crop - Groundnut
Soil type - Vertisol,
Variety - J – 11,
Season - *Rabi*, 1996-97

Area for suitability - Raipur, Durg, Raigarh, Mahasamund.

Fertilizer adjustment equations

FN = General recommended dose (20 kg ha-1)
FP_2O_5 = Critical value for SP = 13 kg P ha^{-1}
FK_2O = No K if SK >250 kg ha^{-1}

1. Chhattisgarh

Mustard

Soil type - Vertisol
Variety - Pusa bold
Season - *Rabi*, 1993-94

Area for suitability - Raipur, Durg, Rajnandgaon, Kawardha and Bilaspur districts

Fertilizer adjustment equations

FN = 9.18 Y – 0.256 SN
$FP_2O_5 = 188 - (35180 – 1715Y)^{1/2} – 2.79$ SP
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of mustard (Pusa bold) in Vertisol (Kanhar).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) mustard (var. - Pusa bold**					
		12		**16**		**20**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	72	59	108	92	145	150
175	6	65	50	102	83	139	142
200	9	59	42	96	75	132	133
225	12	53	34	89	67	126	125
250	15	46	25	83	58	120	117
275	18	40	17	76	50	113	108
300	21	33	9	70	41	107	100
350	24	21	6	57	33	94	92
400	28	8	6	44	22	81	80

Rahuri, (Maharashtra), Groundnut

Crop : Groundnut (Kharif) Variety:Phule Pragati (JL-24)
Soil : Vertic Haplustepts Situation:Protctive Irrigated

Districts : Jalgaon, Dhule, Akola, Latur, Aurangabad, Jalna, Parbhani, Buldhana, Nanded, Pune, Wardha, Yeotmal, Satara, Sangli, Kolhapur, Ahmednagar.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**2.92**	**26**	**70.3**
P_2O_5	**1.43**	**55**	**28.9**
K_2O	**0.72**	**3**	**23.1**

Targeted Yield Equations

FN = 4.16 T – 0.37 SN

FP_2O_5 = 4.96 T – 4.36 SP

FK_2O = 3.14 T – 0.16 SK

Fertilizer prescription for targeted yields of *Kharif* groundnut for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			20 q ha^{-1} target			25 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**46**	**73**	**31**	**67**	**98**	**47**
120	**8**	**250**	**39**	**64**	**23**	**60**	**89**	**39**
140	**10**	**300**	**31**	**56**	**15**	**52**	**80**	**31**
160	**12**	**350**	**24**	**47**	**25***	**45**	**72**	**23**
180	**14**	**400**	**17**	**38**	**25***	**37**	**63**	**15**
200	**16**	**450**	**25***	**29**	**25***	**30**	**54**	**25***
220	**18**	**500**	**25***	**21**	**25***	**23**	**46**	**25***

* Minimum dose of N and K_2O

Rahuri, (Maharashtra), Groundnut

Crop : Groundnut (Summer) Variety:SB-IX
Soil : Vertic Haplustepts Situation:Irrigated

Districts : Ahmednagar, Pune, Satara, Sangli, Kolhapur, Nasik, Jalgaon, Thane, Raigad, Ratnagiri, Sindhudurg, Wardha, Nagpur, Buldhana, Gadchiroli, Chandrapur.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**6.62**	**65**	**158**
P_2O_5	**4.21**	**137**	**51**
K_2O	**3.02**	**8**	**94**

Targeted Yield Equations

FN = 4.18 T – 0.40 SN

FP_2O_5 = 8.23 T – 6.15 SP

FK_2O = 3.22 T – 0.10 SK

Fertilizer prescription for targeted yields of summer groundnut for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			20 q ha^{-1} target			25 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**65**	**169**	**61**	**85**	**210**	**77**
120	**8**	**300**	**57**	**157**	**51**	**77**	**198**	**67**
140	**10**	**400**	**49**	**144**	**41**	**69**	**185**	**57**
160	**12**	**500**	**41**	**132**	**31**	**61**	**173**	**47**
180	**14**	**600**	**33**	**120**	**21**	**53**	**161**	**37**
200	**16**	**700**	**25**	**107**	**11**	**45**	**149**	**27**

2. Crop - Mustard

Soil type - Inceptisol

variety - Pusa bold

Season - *Rabi*, 1992-93

Area for suitability - Raipur, Durg, Mahasamund, Raigarh, Dhamtari, Kanker, Raigarh and Bilaspur districts

Fertilizer adjustment equations

$FN = 9.32\ Y - 0.375SN$

$FP_2O_5 = 196.9 - (38784 - 1656Y)^{1/2}\ 3.38\ SP$

FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of mustard (Pusa bold) in Inceptisol (Matasi).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) mustard (var. - Pusa bold**					
		12		**16**		**20**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	55	49	92	76	129	112
175	6	45	39	83	66	120	101
200	9	36	29	73	56	110	91
225	12	26	19	64	45	101	81
250	15	17	9	54	35	91	71
275	18	7	5	45	25	82	61
300	21	7	5	35	15	72	51
350	24	7	5	16	5	53	41
400	28	7	5	7	5	34	27

1. Bikaner, Mustard

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**90-160 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Bhamatsar and Khiran series)**	**Soil Phosphorus range**	**:**	**20-55 kg ha^{-1}**
Crop and variety	**:**	**Mustard (T-59)**	**Soil potassium range**	**:**	**190-330 kg ha^{-1}**
Season developed	**:**	**Rabi 1996-97 and 1997-98**			
Target range	**:**	**8-10 q ha^{-1}**			

Fertilizer adjustment equation

FN = 27.25T – 0.969 SN
FP_2O_5 = 22.11 T – 5.69 S P_2O_5
FK_2O = 21.54 T – 0.59 SK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for yield target of					
			8 q ha^{-1}			10 q ha^{-1}		
$KMnO_4$ N	Olsens' P	Amm.Ac. -K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
90	20	190	132	63	60	160	107	103
100	25	210	122	35	48	160	79	92
110	30	230	112	30	37	160	50	80
120	35	250	103	30	25	157	30	68
130	40	270	93	30	20	148	30	56
140	45	290	84	30	20	138	30	44
150	50	310	74	30	20	129	30	33
160	55	330	64	30	20	119	30	21

Verification **: The above fertilizer adjustment equations were tried on the farmers' fields in Bikaner district with varying yield targets during Rabi 1998-99 and all the yield targets could be achieved at the place tried**

Applicability

Soil testing laboratory : Bikaner
Soil : Bhamatsar, Khiran, Jamsar, Sobhasar series
Crop and variety : Mustard
Target rang : 8-10 q ha^{-1}
Soil nitrogen range : 90-160 kg ha^{-1}
Soil phosphorus range : 20-55 kg ha^{-1}
Soil potassium range : 190-330 kg ha^{-1}

1. Jabalpur, Mustard

Crop	:	Mustard
Soil Type	:	**Shallow**, **Medium black and Deep black**
Varieties	:	**Varuna ,Pusa bold**
Yield (q ha^{-1})	:	**12- 18**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N: 100- 350 ; P: 5- 50 ; K: 100-500**
Districts	**:**	**Bhopal, Dhar,Khargone,Mandsaur,Narsinghpur, Powarkheda, Sagar, Sehore.Ujjain, Jabalpur,Indore,Khandwa** Grade : **Good**

Equation for Calculating the fertilizer nutrient Requirement:

FN= 9.11 T – 0.37SN FP_2O_5 = 3.60 T – 0.75 SP FK_2O = 4.66 T – 0.13 SK

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			10			16		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**72**	**39**	**30**	**109**	**54**	**49**
150	**10**	**250**	**53**	**35**	**23**	**90**	**50**	**42**
200	**15**	**300**	**35**	**32**	**17**	**72**	**47**	**36**
250	**20**	**350**	**16**	**28**	**10**	**53**	**43**	**29**
300	**25**	**400**	**-**	**24**	**-**	**35**	**39**	**23**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 9.1 kg ha^{-1}; P_2O_5= ± 3.6 kg $ha^{-1}$and K_2O= ±4.6

Grade : Good

2. Jabalpur, Mustard

Crop	:	Mustard
Soil Type	:	**Alluvial**
Varieties	:	**Pusa bold , Aghani**
Yield (q ha^{-1})	:	12-20
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N: 100- 350 ; P: 5- 30 ; K: 100-400**
Districts	**:**	**Gwalior**, **Jabalpur , and Gird region** Grade : **Good**

Equation for Calculating the fertilizer nutrient Requirement:

FN= 12.5 T – 0.44 SN **FP_2O_5 = 4.6 T – 1.5 SP** **FK_2O = 6.5 T – 0.19 SK**

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			12			16		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**106**	**47**	**40**	**156**	**66**	**66**
150	**10**	**250**	**84**	**40**	**30**	**134**	**59**	**56**
200	**15**	**300**	**62**	**32**	**21**	**112**	**51**	**47**
250	**20**	**350**	**40**	**25**	**11**	**90**	**44**	**37**
300	**25**	**400**	**18**	**17**	**-**	**68**	**36**	**28**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 12.5 kg ha^{-1}; P_2O_5= ± 4.6 kg $ha^{-1}$and K_2O= ±6.5

Pantanagar (Toria) without IPNS

Name of the Centre	**:**	**Soil phosphorus range**	**:**
Soil	**:**	**Soil potassium range**	**:**
Crop and Variety	**: Toria var. PT 303**	**FYM composition**	**:**
Season developed	**:**	**FYM rate**	**:**
Target range	**: t ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**:**	**Green manure rate**	**:**

Fertilizer adjustment equation for yield targets (kg/ha)

F K (K_2O kg/ha) = 6.08 x YT (q/ha)-0.61 x SK
F N (N, kg/ha) = 11.07 x YT (q/ha) – 101.63 x SN
F P (P_2O_5, kg/ha) = 7.56 x YT (q/ha) –1.63 x SP

Reddy Reckoner Request

1. Hisar (Haryana) Raya

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Raya (RH 8113)
Soil **:** Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Rabi
Target range : 16 to 20 q/ha
Soil nitrogen range : 80 to 220 kg/ha
Soil phosphorus range : 4 to 28 kg/ha
Targeted yield equations :
FN = 9.76T – 0.81 SN, FP_2O_5 = 4.12T – 2.03 SP*

Ready reckoner of soil test based fertilizer recommendations for raya (RH 8113) seed yield of 16, 18 and 20 q/ha

SN*	**Targeted yield (q/ha)**			**SP***	**Targeted yield (q/ha)**		
(kg/ha)	**16**	**18**	**20**	**(kg/ha)**	**16**	**18**	**20**
	FN (Fertilizer N, kg/ha)				**FP_2O_5 (Fertiilzer P_2O_5, kg/ha)**		
80	91	111	130	4	58	66	74
90	83	103	122	6	54	62	70
100	75	95	114	8	50	58	66
110	67	87	106	10	46	54	62
120	59	79	98	12	42	50	58
140	43	62	81	14	38	46	54
160	26	46	65	16	34	42	50
180	20	30	49	20	26	34	42
200	20	20	33	24	18	16	34
220	20	20	20	28	8	18	26

*SN and SP are soil available N and P (kg/ha), respectively; T = Targeted yield

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields in various agro-climatic zones of Haryana. The yield targets of 18 and 20 q/ha were achieved with -6.6 to +7.0% deviations.

Applicability: These fertilizer adjustment equations will hold good in Haryana in Mohindergardh, Faribadad, Jhajjar, Rewari, Mewat, Gurgaon, Bhiwani, Hisar, Sirsa, Fatehabad and Jind districts.

2. **Hisar (Haryana) Raya**

Name of centre : CCS Haryana Agricultural University,Hisar
Crop and variety : Raya (Luxmi))
Soil **:** Sierozem (Inceptisols/Entisols)
Situation : Irrigated
Season developed : Rabi
Target range : 18 to 22 q/ha
Soil nitrogen range : 80 to 200 kg/ha
Soil phosphorus range : 4 to 28 kg/ha
FYM composition : 1.00 %N, 0.62% P_2O_5
FYM rate : 15 t/ha
Targeted yield equations :

FN = 10.61T – 0.95 SN-0.12 FYM(N)

FP_2O_5 = 4.73 T – 3.00 SP-0.10 FYM (P_2O_5)*

Ready reckoner of soil test based fertilizer recommendations for raya (RH 8113) seed yield of 16, 18 and 20 q/ha

SN* (kg/ha)	Targeted yield (q/ha)			SP* (kg/ha)	Targeted yield (q/ha)		
	18	20	22		18	20	22
	FN (Fertilizer N, kg/ha)				FP_2O_5 (Fertiilzer P_2O_5, kg/ha)		
80	115	136	157	4	73	83	93
90	106	127	148	6	67	77	87
100	96	117	138	8	61	71	81
110	87	108	129	10	55	65	75
120	77	98	119	12	49	59	69
140	58	79	100	14	43	53	63
160	39	60	81	16	37	47	57
180	20	41	62	20	25	35	45
200	20	22	43	24	13	23	33
220	20	20	24	28	8	8	21

*SN and SP are soil available N and P (kg/ha), respectively; T = Targeted yield, FYM (N) and FYM (P_2O_5) are N and P_2O_5 (kg/ha), respectively in applied FYM

Note : The dose of fertilzier N and P_2O_5 be reduced by abotu 1.25 kg and 1.00 kg/ha, respectively, from about fertilzier doses for each ton of applied FYM/compost.

Verification: These fertilizer adjustment equations for yield targets were verified at farmers' fields in various agro-climatic zones of Haryana. The yield targets of 18 and 20 q/ha were achieved with -8.3 to +6.2 per cent deviations.

Applicability**: These fertilizer adjustment equations will hold good in Mohindergardh, Faribadad, Mewat, Jhajjar, Rewari, Bhiwani, Hisar, Sirsa, Fatehabad and Jind districts of Haryana.**

1. Andhra Pradesh (Mustard)

Name of the Centre	**: Rajendranagar**	**Soil phosphorus range**	**: 10 – 90 kg ha^{-1}**
Soil	**: Alfisol (sandy loam)**	**Soil potassium range**	**: 200 – 600 kg ha^{-1}**
Crop and Variety	**: Mustard – Pusa Jaikishan**	**FYM composition**	**: 0.75 : 0.6 : 1.3**
Season developed	**: Rabi, 2005**	**FYM rate**	**:**
Target range	**: 8 q ha^{-1}– 10 q ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 200 – 600 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 22.21 T– 0.17 SN, FP_2O_5 = 7.90 T – 0.25 SP, FK_2O = 6.38 T – 0.06 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			8 (q ha^{-1})			**10 (q ha^{-1})**		
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
200	10	200	144	61	39	188	77	52
250	20	250	135	58	36	180	74	49
300	30	300	127	56	33	171	72	46
350	40	350	118	53	30	163	69	43
400	50	400	110	51	27	154	67	40
450	60	450	101	48	24	146	64	37
500	70	500	93	46	21	137	62	34
550	80	550	84	43	18	129	59	31
600	90	600	76	41	15	120	57	28

Verification: The above equations are at to be verified on the farmers' fields of Ranga Reddy and other districts with yield targets of 8 and 12 q ha^{-1}

Applicability

Soil Testing Laboratories	:	Rajendranagar
Soil type	:	Sandy loam
Crop	:	Mustard
Season developed	:	Rabi, 2005
Yield target	:	Upto 10 q ha^{-1}

Note : The above equations may be tested in soils other than Alfisol in the farmer's fields with 3 or 4 yield targets and pickup the best one for making fertilizer recommendation.

1. New Delhi Centre

Crop	**: Mustard**	**Soil phosphorus range**	**: 10-38**
Soil	**:Typic Haplustept (Alluvial)**	**Soil potassium range**	**: 100-375**
Season	**: Rabi**	**FYM composition (%) N,P,K**	**: 0.5, 0.2, 0.35**
Situation	**: Irrigated**	**FYM rate**	**: 10 t/ha**
Target range	**: 20 – 25 q ha^{-1}**	**Green manure composition**	**: Nil**
Soil Nitrogen range	**: 100-375**	**Green manure rate**	**; Nil**

Applicable area : Delhi state and adjoining soil-agro-climatic areas of

UP : Gautam Budhanagar, Ghaziabad , Bagpat Meerut , Mujjafarnagar, Saharanpur, Buland Shahr, Aligarh, Maha mayanagar, Etah, Agra, Etawah, Mainpuri , Shikohabad, Agra, Mathura, Jhansi, Ferozabad, Jalaun, Haryana : Rohtak, Sonipat, Panipat, Jhajjar, Rewari, Gurgaon, Faridabad, Mewat, Karnal, Rajasthan : Alwar, Bharatpur, Sawai madhopur, Sikar, Karauli Punjab : Mansa, Patiala, Sangrur, M P : Bhind, Morana, Gwalior, Shivpuri

Fertilizer adjustment equations for targeted yield of crops in NCR of Delhi	
With FYM	**Without FYM**
FN = 6.64 T – 0.38 SN – 1.72 FYM, FP_2O_5 = 6.10 T – 4.02 SP – 2.43 FYM FK_2O = 3.84 T – 0.24 SK – 1.21 FYM	FN = 7.41 T – 0.44 SN, FP_2O_5 = 6.22 T – 3.41 SP, FK_2O = 6.21 T – 0.39 SK

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Mustard FYM 10t ha^{-1}

Soil test values (kg ha^{-1})			**Nutrient needed (kg ha^{-1}) for an yield target of 20 q ha^{-1}**			**Nutrient needed (kg ha^{-1}) for an yield target of 25 q ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	80	60	40	110	90	60
125	13	125	70	50	35	100	80	55
150	15	150	60	40	30	90	70	50
175	18	175	50	25	25	80	60	40
200	20	200	40	15	15	75	50	35
225	23	225	30	10	10	65	40	30
250	25	250	20	10	10	55	30	25
275	28	275	10	10	10	45	20	20
300	30	300	10	10	10	35	10	10
325	33	325	10	10	10	25	10	10
350	36	350	10	10	10	10	10	10
375	38	375	10	10	10	10	10	10

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Mustard

Soil test values (kg ha^{-1})			Nutrient needed (kg ha^{-1}) for an yield target of 20 q ha^{-1}			Nutrient needed (kg ha^{-1}) for an yield target of 25 q ha^{-1}		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	10	100	105	90	85	140	120	115
125	13	125	95	80	75	130	115	105
150	15	150	80	75	65	120	105	95
175	18	175	70	65	55	110	95	85
200	20	200	60	55	45	95	85	75
225	23	225	50	50	35	85	80	65
250	25	250	40	40	25	75	70	60
275	28	275	25	30	15	65	60	50
300	30	300	15	20	10	55	55	40
325	33	325	10	10	10	40	45	30
350	36	350	10	10	10	30	35	20
375	38	375	10	10		20	30	10

Results of frontline demonstrations conducted at farmers' fields in NCR Delhi

Fertilizer nutrient dose (kg ha^{-1}) N	P_2O_5	K_2O	Treat-ment	Yield Obtained (q ha^{-1})	Extra yield (q ha^{-1})	Cost of extra yield (Rs.ha^{-1})	Cost of fertilizer (Rs.ha^{-1})	Response ratio kg grain kg^{-1} nutrient	Net profit (Rs. ha^{-1})
Farmer : Shri Ram Chander				Village : Daulat pur					
Mustard (*Pusa Jai Kisan*)					**Year : 1997-98**				
0	0	0	C	6.1	-				
106	44	62	T_{25}	17.5	11.4	17100	2658	5.4	14442
80	40	40	Gen	14.3	8.2	12300	2040	5.1	10260
60	57	0	FP	11.2	5.1	7650	1635	4.4	6015
Farmer : Shri Sube Singh					**Village : Nanakheri**				
Mustard (*Pusa Bahar*)					**Year : 1998-99**				
0	0	0	C	7.0	-				
93	48	85	T_{25}	23.8	16.8	25200	2779	7.4	22421
80	40	40	Gen	18.2	11.2	16800	2040	7.0	14760
60	57	0	FP	12.5	5.5	8250	1635	4.7	6615
Farmer : Shri Raghu Nath					**Village : Nanakheri**				
Mustard (*Pusa Bahar*)					Year : 1998-99				
0	0	0	C	7.6	-				
66	76	87	T_{25}	22.6	15.0	22500	2868	6.5	19632
80	40	40	Gen	19.1	11.5	17250	2040	7.1	15210
60	57	0	FP	13.2	5.6	8400	1635	4.6	6765

Farmer : Shri Inder Singh					**Village : Kanganheri**				
Mustard (*Pusa Bahar*)					Year : 1999-00				
0	0	0	C	7.5	-				
75	26	67	T_{25}	22.8	15.3	22950	2035	9.1	20915
80	40	40	Gen	21.0	13.5	20250	2040	8.4	18210
60	57	0	FP	14.6	7.1	10650	1635	6.1	9015
Farmer : Shri Lachhu Singh					**Village : Daulatpur**				
Mustard **(***Pusa Bahar*)					Year : 1999-00				
0	0	0	C	6.8	-				
110	67	54	T_{25}	23.5	16.7	25050	2975	7.2	22075
80	40	40	Gen	18.4	11.6	17400	2040	7.3	15360
60	57	0	FP	12.8	6.0	9000	1635	5.1	7365
Farmer : Shri Daya Nand					**Village : Bharthal**				
Mustard (*Pusa Bahar*)					Year : 2000-01				
0	0	0	C	7.4	-				
88	71	34	T_{25}	24.3	16.9	25350	2549	8.8	22801
80	40	40	Gen	21.0	13.6	20400	2040	8.5	18360
60	57	0	FP	14.4	7.0	10500	1635	6.0	8865
Farmer : Shri Chand Ram					**Village : Bharthal**				
Mustard (*Pusa Bold*)					Year : 2000-01				
0	0	0	C	7.8	-				
83	26	62	T_{25}	23.1	15.3	22950	2089	8.4	20861
80	40	40	Gen	19.2	11.4	17100	2040	7.1	15060
60	57	0	FP	15.8	8.0	12000	1635	6.8	10365
Farmer : Shri Rajendra					Village : Dorala				
Mustard (*Pusa Jai Kisan*)					Year : 2002-03				
0	0	0	C	8.2	-				
102	58	0	T_{25}	22.2	14.0	21000	2196	8.8	18804
80	40	40	Gen	20.1	11.9	17850	2040	7.4	15810
60	57	0	FP	14.4	6.2	9300	1635	5.3	7665
Farmer : Shri Sukhbir					**Village : Dorala**				
Mustard (*Pusa Bold*)					Year : 2002-03				
0	0	0	C	7.4	-				
110	12	0	T_{25}	24.5	17.1	25650	1610	14.1	24040
80	40	40	Gen	18.4	11.0	16500	2040	6.9	14460
60	57	0	FP	13.2	5.8	8700	1635	5.0	7065

1. Uttarakhand (Mustard)

Crop : **Mustard**
SOIL :**Mollisols and Inceptisols**
Season :
Variety : **Kranti, PYS-I**
Target range : **15 -20 q ha^{-1}**

STV range for Mustard (PYS-I):

Alkaline $KMnO_4$-N : **198-325 kg/ha**

Olsen's-P : **15-35 kg/ha**
Amm. Acetate-K : **168-320 kg/ha**
FYM composition : **0.5-0.2-0.6**
FYM rate : **10 t/ha**
Green manure composition : **----**
Green manure rate : **----**

Fertilizer adjustment equations for different yield target of Mustard (PYS-I).

F N (N kg/ha) = 15.63 x YT (q/ha) – 1.04 SN-1.61FYM-N
F P (P kg/ha) = 2.40 x YT (q/ha) – 1.03 SP-0.32 FYM-P
F K (K kg/ha) = 3.88 x YT (q/ha) – 0.16 SP-0.40 FYM-K

Fertilizer adjustment equations for different yield target of Mustard (Kranti).
F N (N, kg/ha) = 13.30 x YT (q/ha) - 0.56 SN
F P (P_2O_5, kg/ha) = 13.40 x YT (q/ha) - 160 SP
F K (K_2O kg/ha) = 6.55 x YT (q/ha)-0.22 SK

Ready reckoners for 15 q/ha yield targets of mustard (PYS-I) based on soil test fertilizer recommendations with 10 t/ha FYM.

Initial Soil Test Value (kg/ha)			Nutrient added (kg/ha) for an yield target of 15 q		
N	**P**	**K**	**N**	**P**	**K**
120	15	150	29.15	14.15	10.20
150	20	170	0	9.00	7.00
180	25	190	0	3.85	3.80
210	30	210	0	0	0.60
240	35	230	0	0	0

Applicability:U.S. Nagar, Haridwar, Nainital and some parts of Western U.P.

Soybean

1. Himachal Pradesh (Soybean)

Name of the Centre : **Palampur**
Soil : **Alfisol, Entisol, Inceptisol**
Crop and Variety : **Soybean**
Situation : **Irrigated**
Season developed : ***Kharif***
Target range : **2.0t ha^{-1}**
Soil Nitrogen range : **200-600 kg ha^{-1}**
Soil phosphorus range : **5-45 kg ha^{-1}**
Soil potassium range : **50-250 kg ha^{-1}**
FYM composition : ***Moisture 10%, N=0.50%, P= 0.25 % and K= 0.50 %***
FYM rate : **12.5 t ha^{-1}**
Green manure composition :-
Green manure rate : -

Biofertilizer: Seed coating with 250ml PBP liquid solution containing 106 cells per ml followed by seed drying before sowing.

Fertilizer adjustment equations

F N = 6.32 T- 0.25SN - 0.85ON, F P_2O_5 = 4.40 T-0.34 SP - 0.66OP - 0.41 PBP
F K_2O = 4.05T - 0.23 SK – 0.80OK

Ready recknor for IPNS based fertilizer equations at different soil test values for soybean

Soil test value (kg ha^{-1})			Fertilizer nutrient dose (kg ha^{-1})		
Alkaline $KMnO_4$-N	**Olsen's –P**	**NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
200	5	50	28	62	25
300	15	100	5	58	13
400	25	150	5	55	5
500	35	200	5	52	5
600	45	250	5	48	5

PBP contribution 6 kg P_2O_5 kg ha^{-1}

1. New Delhi Centre

Crop	**: Soybean**	**Soil phosphorus range**	**: 10-38**
Soil	**:Typic Haplustept (Alluvial)**	**Soil potassium range**	**: 100-375**
Season	**: Kharif**	**FYM composition (%) N,P,K**	**: 0.5, 0.2, 0.35**
Situation	**: Irrigated**	**FYM rate**	**: 10 t/ha**
Target range	**: 20 – 25 qha^{-1}**	**Green manure composition**	**: Nil**
Soil Nitrogen range	**: 100 - 375**	**Green manure rate**	**; Nil**

Applicable area : Delhi state and adjoining soil-agro-climatic areas of
UP : Gautam Budhanagar, Ghaziabad , Bagpat Meerut , Mujjafarnagar, Saharanpur, Buland Shahr, Aligarh, Maha mayanagar, Etah, Agra, Etawah, Mainpuri , Shikohabad, Agra, Mathura, Jhansi, Ferozabad, Jalaun
Haryana : Rohtak, Sonipat, Panipat, Jhajjar, Rewari, Gurgaon, Faridabad, Mewat, Karnal
Rajasthan : Alwar, Bharatpur, Sawai madhopur, Sikar, Karauli
Punjab : Mansa, Patiala, Sangrur
M P : Bhind, Morana, Gwalior, Shivpuri

Fertilizer adjustment equations for targeted yield of crops in NCR of Delhi	
With FYM	**Without FYM**
FN = 6.43 T – 0.34 SN – 1.33 FYM, FP_2O_5 = 5.36 T – 2.83 SP – 2.92 FYM FK_2O = 3.50 T – 0.19 SK – 0.88 FYM	FN = 6.60 T – 0.35 SN, FP_2O_5 = 6.05 T – 3.19 SP, FK_2O = 3.86 T – 0.21 SK

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Soybean FYM 10t ha^{-1}

Soil test values (kg ha^{-1})			**Nutrient needed (kg ha^{-1}) for an yield target of 20 q ha^{-1}**			**Nutrient needed (kg ha^{-1}) for an yield target of 25 q ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	50	50	40	50	75	60
125	13	125	50	45	35	50	70	55
150	15	150	50	35	30	50	65	50
175	18	175	40	30	25	50	60	45
200	20	200	40	20	20	50	55	40
225	23	225	40	15	15	40	50	35
250	25	250	30	10	10	40	45	30
275	28	275	20	10	10	40	40	25
300	30	300	15	10	10	40	35	20
325	33	325	10	10	10	35	30	15
350	36	350	10	10	10	30	25	10
375	38	375	10	10	10	20	20	10

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Soybean

Soil test values (kg ha^{-1})			Nutrient needed (kg ha^{-1}) for an yield target of 20 q ha^{-1}			Nutrient needed (kg ha^{-1}) for an yield target of 25 q ha^{-1}		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	10	100	50	90	55	50	120	75
125	13	125	50	80	50	50	110	70
150	15	150	50	75	45	50	100	65
175	18	175	50	65	35	50	95	60
200	20	200	50	55	30	50	85	55
225	23	225	50	50	25	50	80	50
250	25	250	45	40	20	50	70	45
275	28	275	35	35	15	50	65	40
300	30	300	25	25	10	50	55	35
325	33	325	20	15	10	50	45	30
350	36	350	10	10	10	40	40	25
375	38	375	10	10	10	35	30	20

1. Uttarakhand (Soybean)

Soil : **Mollisols and Inceptisols**
Crop and Variety : **PS-1042, PK-262**
Situation : **Iriiegetad**
Season developed : **Kharif**
Target range : **35 t ha^{-1}**
STV for Soybea (PS-1042):
Soil O.C. range : **0.2-2.6 %**

Alkaline $KMnO_4$-N : **120-240 kg/ha**
Olsen's-P : **10-40 kg/ha**
Amm. Acetate-K : **100-180 kg/ha**
FYM composition (%) : **0.5-0.2-0.6**
FYM rate : **10 t/ha**
Green manure composition :------
Green manure rate : ------

Fertilizer adjustment equations for different yield target.	
Soybean var. PS-1042 (With FYM)	**Soybean var. PK 262 (Without FYM)**
FN = 6.66T- 0.88SN-0.69FYM-N	F N (N, kg/ha) = 3.43 x YT (q/ha) – 643.21 OC
FP = 8.48T- 5.49SP-1.14FYM-P	F P (P_2O_5, kg/ha) = 5.20 x YT (q/ha) –2.78 SP
FK = 8.98T- 1.21SK-1.55FYM-K	F K (K_2O kg/ha) = 4.00 x YT (q/ha)-0.36 SK

Ready reckoners for 30 q/ha yield targets of Soybean (PS-1042) based on soil test fertilizer recommendations with 10 t/ha FYM.

Initial Soil Test Value (kg/ha)			Nutrient added (kg/ha) for an yield target of 30 q		
N	P	K	N	P	K
120	15	100	59.70	149.25	55.40
150	20	120	33.30	121.80	31.20
180	25	140	6.90	94.35	7.00
210	30	160	0	68.90	0
240	35	180	0	39.45	0

Applicability:U.S. Nagar, Haridwar, Nainital and some parts of Western U.P.

2. **Soybean**

Soil type - Vertisol
Variety - Soybean (Gaurav)
Season - *Kharif*, 1992

Area for Suitability - Raipur, Durg, Rajnandgaon, Kawardgha, Bilaspur districts)

Fertilizer adjustment equations

FN = General recommended dose (25 kg ha-1)
$FP_2O_5 = 117.7 - (13858 – 545Y)^{1/2} – 2.90$ SP
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of soybean in Vertisol (*Kanhar)*.

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) (Soybean JS – 305)**					
		15		**20**		**25**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	4	30	31	30	52	30	91
175	6	30	25	30	46	30	85
200	8	30	19	30	40	30	79
225	10	20	13	20	34	20	73
250	12	20	8	20	29	20	68
275	14	20	5	20	23	20	62
300	16	20	5	20	17	20	56
350	18	20	5	20	11	20	50
400	20	20	5	20	5	20	44
450	22	20	5	20	5	20	39
500	24	10	5	10	5	10	33

1. Jabalpur, Soybean

Crop	:	Soybean
Soil Type	:	Shallow, Medium black and Deep black soils
Varieties	:	
Yield (q ha^{-1})	:	
Applicability	:	
Districts	**:**	

Equation for Calculating the fertilizer nutrient Requirement:

FN= 5.19 T – 0.48 SN FP_2O_5 = 5.20 T – 4.10 SP FK_2O = 3.9 T – 0.22 SK

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			20			25		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**100**	**56**	**83**	**34**	**82**	**109**	**53**
150	**10**	**150**	**32**	**63**	**23**	**58**	**89**	**42**
200	**15**	**200**	**10**	**42**	**12**	**34**	**68**	**31**
250	**20**	**250**	**-**	**22**	**-**	**10**	**38**	**20**
300	**25**	**300**	**-**	**-**	**-**	**-**	**27**	**9**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 5.1 kg ha^{-1}; P_2O_5= ± 5.2 kg $ha^{-1}$and K_2O= ±3.9 kg ha^{-1}

Rahuri, (Maharashtra), Soybean

Crop : Soybean (Kharif) **Variety :JS-335**
Soil : Typic Haplustert **Situation : Irrigated**

Districts : Ahmednagar, Nasik, Pune, Satara, Sangli, Kolhapur, Solapur, Dhule

Basic Data

Without FYM					
Nutrient	NR (kg q^{-1})	CS (%)	CF (%)	CFYM (%)	**Targeted Yield Equations**
N	**6.44**	**63.84**	**93.75**	**-**	FN = 6.86 T – 0.68 SN
P_2O_5	**1.17**	**84.64**	**18.94**	**-**	**FP_2O_5 = 6.17 T – 4.46 SP**
K_2O	**3.58**	**11.76**	**90.20**	**-**	**FK_2O = 3.96 T – 0.13 SK**

With FYM					
N	**6.44**	**63.84**	**162.05**	**2.88**	**FN = 3.97 T – 0.39 SN – 0.09 FYM**
P_2O_5	**1.17**	**84.64**	**28.22**	**20.68**	**FP_2O_5 = 4.14 T – 2.95 SP – 1.5 FYM**
K_2O	**3.58**	**11.76**	**103.08**	**5.29**	**FK_2O = 3.47 T – 0.11 SK – 0.27 FYM**

Fertilizer prescription for targeted yields of Soybean for varying soil test values.

Soil test values (Kg ha^{-1})			Without FYM			With FYM (5 Mg FYM ha^{-1})		
			25 q ha^{-1} target			25 q ha^{-1} target		
N	P	**K**	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**104**	**127**	**73**	**60**	**85**	**63**
120	**8**	**300**	**90**	**119**	**60**	**52**	**79**	**52**
140	**10**	**400**	**76**	**110**	**47**	**44**	**73**	**41**
160	**12**	**500**	**63**	**101**	**34**	**36**	**67**	**30**
180	**14**	**600**	**49**	**92**	**21**	**29**	**61**	**19**
200	**16**	**700**	**36**	**83**	**25***	**21**	**56**	**25***
220	**18**	**800**	**22**	**74**	**25***	**13**	**50**	**25***

* Minimum dose of K_2O

1. Andhra Pradesh (Sunflower- Kharif)

Name of the Centre	**: Nandyal**	**Soil phosphorus range**	**: 4 – 44 kg ha^{-1}**
Soil	**: Vertisol**	**Soil potassium range**	**: 250 – 750 kg ha^{-1}**
Crop and Variety	**: Sunflower MSFH-17**	**FYM composition**	**: 0.75 : 0.6 : 1.2%**
Season developed	**: *Kharif,* 1997 (Magi season)**	**FYM rate**	**:**
Target range	**: 15 q ha^{-1} - 18 q ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 100 – 200 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 8.23 T – 0.46 SN, FP_2O_5 = 8.91 T – 4.24 SP, FK_2O = 3.80 T – 0.10 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			15 (q ha^{-1})			**18 (q ha^{-1})**		
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	4	250	77	17	32	102	143	43
110	8	300	73	100	27	98	126	38
120	12	350	68	83	22	93	110	33
130	16	400	64	66	17	88	93	28
140	20	450	59	49	12	84	76	23
150	24	500	54	32	7	79	59	18
160	28	550	50	15	2*	74	42	13
170	32	600	45	10*	2*	69	25	8
180	36	650	41	10*	2*	64	8*	8*
190	40	700	36	10*	2*	60	8*	8*
200	44	750	31	10*	2*	55	8*	8*

* maintainance of dose

Verification: The above equations are yet to be verified on the farmers' fields.

Applicability

Soil Testing Laboratories : Yemmiganur, Cuddapah and Anantapur

Soil type : Black soils

Crop : Hybrid Sunflower

Season developed : *Kharif*

Yield target : Upto 18 q ha^{-1}

Note : The above equations may be verified in black soils with three or four targets and pickup the best one for making recommendations.

2. Andhra Pradesh (Sunflower)

Name of the Centre : **Jagtial**
Soil : **Sandy clay loam**
Crop and Variety : **Sunflower Mahyco-8**
Season developed : ***Rabi,* 1994-95**
Target range : **15 q ha^{-1} - 18 q ha^{-1}**
Soil Nitrogen range : **150 – 400 kg ha^{-1}**
Soil phosphorus range : **10 – 60 kg ha^{-1}**
Soil potassium range : **150 – 650 kg ha^{-1}**
FYM composition : **0.75 : 0.6 : 1.2%**
FYM rate :
Green manure composition :
Green manure rate :

Fertilizer adjustment equations

FN = 11.44 T– 0.41 SN, FP_2O_5 = 7.49 T – 2.10 SP, FK_2O = 4.93 T – 0.18 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			15 (q ha^{-1})			**18 (q ha^{-1})**		
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
150	10	150	110	91	47	145	114	62
175	15	200	99	81	38	134	103	53
200	20	250	90	70	29	124	93	44
225	25	300	79	60	20	114	82	35
250	30	350	69	49	11	104	72	26
275	35	400	59	39	2*	93	61	17
300	40	450	49	28	2*	83	51	8
325	45	500	38	18	2*	73	40	8*
350	50	550	28	7	2*	63	30	8*
375	55	600	18	7*	2*	53	20	8*
400	60	650	8	7*	2*	43	9	8*

* maintainance of dose

Applicability

Soil Testing Laboratories : Nizamabad, Adilabad, Karimnagar and Warangal
Soil type : Sandy clay loam soil
Crop : Hybrid Sunflower
Season developed : *Rabi*
Yield target : Upto 18 q ha^{-1}

Note : The above equations may be tested in Nizamabad, Adilabad, Karimnagar and Warangal districts and in soils other than sandy clay loam with 3 or 4 targets and pick up the best one for adoption for making fertilizer recommendations.

1. Banglore, Karnataka (Sunflower)Zone-5 Good

Name of the Centre	**: Karnataka**	**Soil phosphorus range**	**: 10 – 60 kg/ acre**
Soil	**: Red**	**Soil potassium range**	**: 150 – 450 kg/ acre**
Crop and Variety	**: EC-68419**	**FYM composition**	**: 0.75%N: 0.6%P: 1.2%K**
Season : Kharif		**FYM rate**	**: 3t/acre**
Target range	**: 8q/acre**	**Green manure composition**	**:**
Soil Nitrogen range	**: 0.3% -0.5%**	**Green manure rate**	**:**
		Zinc Sulphate	**:4.0kg/acre**

Area of applicability : Bangalore, Kolar, Chitradurga and Tumkur districts.

Target yield equations:

F.N. = 5.12 T- 37.4 SN (OC %), F.P_2O_5 = 6.21 T- 0.68 SP_2O_5 Olsen's - P_2O_5)

F.K_2O = 5.62 T- 0.19 SK_2O (NH_4OAC - K_2O)

STV O.C. (%)	Fertilizer nitrogen (kg/acre)	STV Olsen's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
0.05	34	2.5	42	10	37
0.10	32	5.0	40	20	36
0.15	30	7.5	38	30	34
0.20	28	10.0	37	40	32
0.25	27	12.5	35	50	30
0.30	25	15.0	33	60	28
0.35	23	17.5	32	70	26
0.40	21	20.0	30	80	24
0.45	19	22.5	28	90	22
0.50	17	25.0	27	100	20
0.55	15	27.5	25	110	18
0.60	13	30.0	23	120	17
0.65	12	32.5	21	130	15

To increase or decrease the yield target by one q/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 5.00 kg/acre P_2O_5 = ± 6.25 kg/acre K_2O = ± 5.5 kg/acre

2. **Bangalore, Karnataka. Sunflower. Zone-3**

Name of the Centre	**: Karnataka**	**Soil phosphorus range**	**:10 – 60 kg /acre**
Soil	**: Black Clayey**	**Soil potassium range**	**:150 – 450 kg/acre FYM**
Crop and Variety	**: BSH-1**	**composition**	**: 0.75%N : 0.6%P : 1.2%K**
Season developed	**: Kharif**	**FYM rate**	**: 3 t/acre**
Target range	**: 10 q /acre**	**Green manure composition**	**:**
Soil Nitrogen range	**: 150 – 400 kg /acre**	**Green manure rate**	**:**
		Zinc Sulphate	**: 4.0kg/acre**

Applicability : Tungabhadra Command area of Bellary and Raichur districts

Target yield equation:

F.N. = 8.38 T- 0.57 SN ($KMnO_4$ - N), F.P_2O_5 = 8.05 T- 6.00 SP_2O_5 (Olsen's - P_2O_5)

F.K_2O = 9.87 T- 0.47 SK_2O (NH_4OAC - K_2O)

STV $KMnO_4$-N (kg/acre)	Fertilizer nitrogen (kg/acre)	STV Olsen's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
60	50	3.50	60	100	52
65	47	4.00	57	105	49
70	44	4.50	54	110	47
75	41	5.00	51	115	45
80	38	5.50	48	120	42
85	35	6.00	45	125	40
90	33	6.50	42	130	38
95	30	7.00	39	135	35
100	27	7.50	36	140	33
105	24	8.00	33	145	31
110	21	8.50	30	150	28
115	18	9.00	27	155	26
120	15	9.50	24	160	24
125	13	10.00	21	165	21
130	10	10.50	18	170	19
130	10	11.00	15	175	17
				180	14
				185	12

To increase or decrease the yield target by one q/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 8.25 kg/acre P_2O_5 = ± 8.00 kg/acre K_2O = ± 9.75 kg/acre

1. **Tamil Nadu : Sunflower**

Name of the centre	**: Bhavanisagar (Sub - Centre)**	**FYM composition (N:P:K)**	**:0.67:0.31:0.71% (Dry weight basis)**
Soil	**: Mixed black (Perianaickenpalayam)**		
Crop & Variety	**: Sunflower - Morden**	**FYM rate**	**: 12.5 t ha^{-1} (30 % moisture)**
Season developed	**: Kharif**		
Target range	**: 15 q ha^{-1}**		
Soil Nitrogen range	**: 150 - 240 kg ha^{-1}**	**Green manure composition**	**:-**
Soil phosphorus range	**: 8 - 26 kg ha^{-1}**	**Green manure rate**	**: -**
Soil potassium range	**: 150 - 240 kg ha^{-1}**		

Fertiliser Adjustment Equations

FN	=	9.60	T	-	0.49	SN	-	0.68 ON
FP_2O_5	=	4.20	T	-	1.87	SP	-	0.80 OP
FK_2O	=	9.24	T	-	0.45	SK	-	0.64 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 15 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
150	8	150	71	48	71
160	10	160	66	44	67
170	12	170	61	41	62
180	14	180	56	36	58
190	16	190	51	33	55
200	18	200	46	29	49
210	20	210	41	26	44
220	22	220	36	22	40
230	24	230	31	18	35
240	26	240	26	14	31

Blanket Recommendation: 40 : 20 : 20 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Black Clay Loam
Yield target : 15 q ha^{-1}
District(s) : Coimbatore, Salem, Tiruchirappalli
Grade : Good

1. West Bengale (Sunflower)

Name of the Centre	**: Kalyani**	**Soil phosphorus range**	**: 19 - 32 kg ha^{-1}**
Soil	**: Inceptisol**	**Soil potassium range**	**: 94 - 308 kg ha^{-1}**
Crop and Variety	**: Sunflower (PAC - 36)**	**FYM composition**	**: NA**
Situation	**: Irrigated**	**FYM rate**	**: NA**
Season developed	**: *Rabi*, 2004-05**	**Green manure composition**	**: NA**
Target range	**: 20 – 25 q ha^{-1}**	**Green manure rate**	**: NA**
Soil Nitrogen range	**: 290-341 kg ha^{-1}**		

Applicability : STLS of Murshidabad, Nadia, 24 parganas (N), Hooghly

Fertilizer adjustment equations:

FN = 31.4 T – 1.63 SN, FP_2O_5 = 8.98 T – 2.91 SP, FK_2O = 4.7 T –.041 SK

Fertilizer levels (kg.ha^{-1})	N	0, 40, 60, 80
	P_2O_5	0, 35, 45
	K_2O	0, 35, 45
Initial soil test values (kg.ha^{-1})	$KMnO_4$-N	290 - 341
	Olsen-P	19 - 32
	NH_4OAc-K	94 - 308
Yield (kg.ha^{-1})	Control plot	1600 - 1960
Treated plot	2500 - 2800	

Ready-reckoner* of fertilizer doses at varying soil test values for specific yield target

Available soil nutrients (kg.ha^{-1})			**Fertilizer nutrient required (kg.ha^{-1})**					
			Targeted yield 2.0 t.ha^{-1}			**Targeted yield 2.5 t.ha^{-1}**		
N	**P**	**K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
250	5	100	221	165	90	378	210	113
275	10	150	180	151	88	337	195	111
300	15	200	139	136	86	296	181	109
325	20	250	98	121	84	255	166	107
350	25	300	58	107	82	215	152	105
375	30	350	17	92	80	174	137	103

- No modification was made in the ready-reckoner.

1. Chhattisgarh

Crop - **Sunflower**
Soil type - Vertisol
Variety - Jwalamukhi
Season - *Rabi*, 2002-03
Area for Suitability - Raipur, Durg, Rajnandgaon, Kawardha, Bilaspur districts).

Fertilizer adjustment equations

FN = 9.09 Y – (0.45 SN+4.6 t FYM)
FP_2O_5 = 2010 - (4040100 – 16666Y) $^{1/2}$ – (2.75 SP + 4.2 t FYM)
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of sunflower (Jwalamukhi) in Vertisol (*Kanhar*).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kgha^{-1})**	**Yield Targets (q ha^{-1}) Sunflower (var. - Jwalamukhi)**					
		15		**20**		**25**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	4	69	52	114	74	160	95
175	8	58	41	103	63	149	84
200	12	46	30	92	52	137	73
225	16	35	19	81	41	126	62
250	20	24	8	69	30	115	51
275	24	13	7	58	19	104	40
300	28	2	7	47	8	92	29
350	32	2	7	24	7	70	18
400	36	2	7	2	7	47	7

Ready reckoners on soil test based fertilizer recommendations with INM (5 ton FYM) for specific yield targets of sunflower (Jwalamukhi) in Vertisol (*Kanhar*).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kgha^{-1})	Yield Targets (q ha^{-1}) Sunflower (var. - Jwalamukhi)					
		15		20		25	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	4	46	31	91	53	137	74
175	8	35	20	80	42	126	63
200	12	23	9	69	31	114	52
225	16	12	8	58	20	103	41
250	20	10	8	46	9	92	30
275	24	10	8	35	8	81	19
300	28	10	8	24	8	69	8
350	32	10	8	10	8	47	8
400	36	10	8	10	8	24	8

2. Crop - **Sunflower** **Soil type** - Inceptisol
Variety - Jwalamukhi
Season - *Rabi*, 2004-05
Area for Suitability - Raipur, Raigarh, Durg, Mahasamund, Dhamtari and Bilaspur districts)

Fertilizer adjustment equations
FN = 13.97 Y – (0.68 SN + 6.34 t FYM), FP_2O_5 = 183 - (33620 – 1429Y) $^{1/2}$ – (3.1 SP + 4.98 t FYM), FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of sunflower (Jwalamukhi) in Inceptisol (*Matasi*).

Alkaline KMnO4-N (kg ha-1)	**Olsen's P (kg ha-1)**	**Yield Targets (q ha-1) Sunflower (var. - Jwalamukhi)**					
		15		**20**		**25**	
		FN	**FP2O5**	**FN**	**FP2O5**	**FN**	**FP2O5**
150	4	108	60	177	100	247	148
175	8	91	48	160	87	230	139
200	12	74	35	143	75	213	130
225	16	57	23	126	62	196	120
250	20	40	11	109	50	179	111
275	24	23	11	92	38	162	102
300	28	6	11	75	25	145	92
350	32	6	11	41	13	111	83
400	36	6	11	7	11	77	71

Ready reckoners on soil test based fertilizer recommendations with INM (5 ton FYM) for specific yield targets of sunflower (Jwalamukhi) in Inceptisol (*Matasi*).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) Sunflower (var. - Jwalamukhi)					
		15		20		25	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	4	76	35	146	75	216	123
175	8	59	23	129	62	199	114
200	12	42	11	112	50	182	105
225	16	25	10	95	38	165	95
250	20	8	10	78	25	148	86
275	24	8	10	61	13	131	77
300	28	8	10	44	10	114	68
350	32	8	10	10	10	80	58
400	36	8	10	8	10	46	46

1. Jabalpur, Sunflower

Crop	:	Sunflower
Soil Type	:	**Medium black and Deep black**
Varieties	:	**Modern**
Yield (q ha^{-1})	:	**15 - 20**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N : 100-350 , P: 5- 40 ; K: 100-500**
Districts	**:**	Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,, Narsinghpur, Powarkheda, Sagar, Sehore, Ujjain.

Composition of FYM : N(%) = 0.72 P_2O_5 (%) = 0.72 K_2O (%) = 0.75

Equation for Calculating the fertilizer nutrient Requirement:

FN = 12.54 T – 0.64 SN –0.59 ON; FP_2O_5 = 3.6T – 1.24 SP – 1.36 OP;

FK2O = 8.09 T – 0.30 SK– 35OK

Soil test Values (kg ha^{-1})			Target yield (q ha^{-1}) = 20					
			Without FYM			With 5 t FYM ha^{-1}		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**100**	**156**	**65**	**159**	**164**	**27**	**146**
150	**10**	**150**	**134**	**59**	**144**	**132**	**21**	**131**
200	**15**	**200**	**122**	**53**	**129**	**100**	**15**	**116**
250	**20**	**250**	**90**	**47**	**104**	**68**	**9**	**91**
300	**25**	**300**	**58**	**41**	**89**	**36**	**2**	**76**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 12.5kg ha^{-1}; P_2O_5= ± 3.6 kg $ha^{-1}$and K_2O= ±8.0 kg ha^{-1}

Grade : need to verify

Rahuri, (Maharashtra), Sunflower

Crop : Sunflower (Kharif) **Variety: SS-56**
Soil : Typic Haplusterts **Situation: Irrigated**

Districts :Ahmednagar, Dhule, Nandurbar, Jalna, Aurangabad, Nanded, Parbhani, Satara, Sangli, Pune

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**5.85**	**25.76**	**41.95**
P_2O_5	**4.62**	**191.50**	**64.36**
K_2O	**7.25**	**14.65**	**150.36**

Targeted Yield Equations

FN = 13.94 T – 0.61 SN

FP_2O_5 = 7.18 T – 6.82 SP

FK_2O = 4.82 T – 0.12 SK

Fertilizer prescription for targeted yields of sunflower for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			16 q ha^{-1} target			18 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
160	**8**	**250**	**123**	**59**	**45**	**150**	**74**	**54**
180	**10**	**300**	**110**	**45**	**39**	**137**	**60**	**48**
200	**12**	**350**	**97**	**31**	**33**	**124**	**46**	**42**
220	**14**	**400**	**84**	**17**	**27**	**111**	**32**	**36**
240	**16**	**450**	**71**	**25***	**21**	**98**	**25***	**30**

*** Minimum dose of P_2O_5**

1. Andhra Pradesh (Safflower)

Name of the Centre	**: Tandur**	**Soil phosphorus range**	**: 10 – 70 kg ha^{-1}**
Soil	**: Vertisol**	**Soil potassium range**	**: 125 – 400 kg ha^{-1}**
Crop and Variety	**: Safflower - Manjera**	**FYM composition**	**: 0.75 : 0.6 : 1.2%**
Season developed	**: *rabi*, 2003**	**FYM rate**	**:**
Target range	**: 20 q ha^{-1} - 25 q ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 80 – 320 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 9.04 T– 0.75 SN, FP_2O_5 =3.74 T – 0.85 SP, FK_2O = 5.76 T – 0.50 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
mnO$_4$ N	**Olsens' P**	**Amm. Ac-K**	**20 (q ha^{-1})**			**25 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
80	10	125	121	66	53	166	85	82
100	15	150	106	62	40	151	81	69
120	20	175	91	58	28	136	77	57
140	25	200	76	54	15	121	72	44
160	30	225	61	49	3	106	68	32
180	35	250	46	45	0	91	64	19
200	40	275	3	41		76	60	7
220	45	300	16	37		61	55	0
240	50	325	1	32		46	51	
260	55	350	0	28		31	47	
280	60	375		24		16	43	
300	65	400		20		1	38	
320	70			15		0	34	

Verification: The above equations are at to be verified on the farmers' fields.

Applicability	**:**	
Soil Testing Laboratories	:	Jadcherla, Mahabubnagar district
Soil type	:	Vertisol
Crop	:	Safflower – Manjera
Season developed	:	*rabi*
Yield target	**:**	**Upto 20 to 25 q ha^{-1}**

1. Bangalore, Karnataka (Safflower) Zone 3 &4. Good

Name of the centre	**: Hiriyur**	**Soil phosphorus range**	**: 10- 40kg/acre**
Soil	**: Black Clayey**	**Soil potassium range**	**: 60-120kg/acre**
Crop & Variety	**: A-1**	**FYM composition**	**: 0.6%N -0.3%P-0.4%K**
Season developed	**: *Rabi***	**FYM rate**	**: 2t/acre**
Target range	**: 6q /acre(Rainfed)**	**Green manure composition**	**:**
Soil nitrogen range	**: 0.3%-0.5%**	**Green manure rate**	**:**

Applicability : TungabhadraCommandarea of Bellary,Chitradurga, davangereandRaichur districts.

Target yield equations :

F.N. = 7.49 T- 68.9 SN (OC%), $F.P_2O_5$ = 11.83 T- 3.34 SP_2O_5 (Olsen's - P_2O_5)

$F.K_2O$ = 4.99 T- 0.20 SK_2O (NH_4OAC - K_2O)

STV O.C. (%)	**Fertilizer nitrogen (kg/acre)**	**STV Olsen's P_2O_5 (kg/acre)**	**Fertilizer phosphorus (kg/acre)**	**STV Amm.Ace. K_2O (kg/acre)**	**Fertilizer potash (kg/acre)**
			Target (6 q/acre)		
0.10	38	6	51	30	24
0.15	35	7	47	40	22
0.20	31	8	44	50	20
0.25	28	9	40	60	18
0.30	24	10	37	70	16
0.35	21	12	30	80	14
0.40	17	14	24	90	12
0.45	14	16	18	100	10
				110	8

To increase or decrease the yield target by one q/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 7.5 kg/acre P_2O_5 = ± 11.75 kg/acre K_2O = ± 5.0 kg/acre

1. Chhattisgarh

Safflower

Soil type - Vertisol
Variety - JSF-1
Season - *Rabi*, 2004-05

Area for Suitability - Chhattisgarh plains (Raipur, Durg, Rajnandgaon, Kawardha. Bilaspur districts)

Fertilizer adjustment equations

$FN = 14.55\ Y – (0.62\ SN + 5.56\ t\ FYM)$
$FP_2O_5 = 133 - (17689 – 1000Y)^{1/2} – (2.70\ SP + 4.34\ t\ FYM)$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of safflower (JSF-1) in Vertisol (Kanhar)

Alkaline $KMnO_4$-N(kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) Safflower (JSF-1)							
		10		12		14		16	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	90	37	119	49	148	64	177	84
175	6	81	29	110	41	139	56	168	76
200	9	72	21	101	33	130	48	159	68
225	12	62	13	91	25	120	40	150	60
250	15	53	5	82	17	111	32	140	51
275	18	44	5	73	9	102	24	131	43
300	21	35	5	64	5	93	16	122	35
350	24	16	5	45	5	74	7	103	27
400	28	15	5	27	5	56	5	85	16

Ready reckoners on soil test based fertilizer recommendations with INM (5 ton FYM) for specific yield targets of safflower in Vertisol (Kanhar)

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) Safflower (JSF-1)							
		10		12		14		16	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	62	16	91	28	120	42	149	62
175	6	53	7	82	20	111	34	140	54
200	9	44	2	73	12	102	26	131	46
225	12	34	2	64	3	93	18	122	38
250	15	25	2	54	2	83	10	112	30
275	18	16	2	45	2	74	2	103	22
300	21	7	2	36	2	65	2	94	14
350	24	7	2	17	2	46	2	75	5
400	28	7	2	7	2	28	2	57	2

1. Jabalpur, Safflower

Crop	:	Safflower
Soil Type	:	Medium black
Varieties	:	**JSF-1**
Yield (q ha^{-1})	:	**15- 18**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N: 100- 300 ; P: 5- 35 ; K: 100-500**
Districts	**:**	**Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Narsinghpur, Ujjain.**Grade : **Good**

Equation for Calculating the fertilizer nutrient Requirement:

FN= 9.11 T – 0.45SN SK **FP_2O_5 = 6.27 T – 2.19 SP** **FK_2O = 9.27 T – 0.38**

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			16			20		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**101**	**89**	**72**	**137**	**124**	**109**
150	**10**	**250**	**78**	**78**	**53**	**114**	**103**	**90**
200	**15**	**300**	**56**	**67**	**34**	**92**	**92**	**71**
250	**20**	**350**	**33**	**56**	**15**	**69**	**81**	**52**
300	**25**	**400**	**11**	**45**	**-**	**47**	**70**	**33**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 9.1 kg ha^{-1}; P_2O_5= ± 6.2 kg $ha^{-1}$and K_2O= ±9.2

1. Bhubneswar

Crop : Sesamum (cv. Nirmala)

General fertilizer recommendation : 40-20-20

Fertilizer adjustment equations

$FN = 13.4\ T - 0.5\ SN$, $F\ P_2O_5 = 12.3\ T - 3.1\ S\ P_2O_5$, $FK_2O = 12.4\ T - 1.4\ S\ K_2O$

Corrected ready reckoner of fertilizer doses at varying soil test values for specific yield targets.

Available soil nutrients (kg ha^{-1})			**Fertilizer nutrients required (kg ha^{-1})**								
			Targeted yield (6 q ha^{-1})			**Targeted yield (8 q ha^{-1})**			**Targeted yield (10 q ha^{-1})**		
N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
80	20	50	40	12	5	50	36	19	60	40	40
90	25	60	35	5	5	50	21	15	60	40	40
100	30	70	30	5	5	50	6	5	60	30	26
110	35	80	25	5	5	50	5	5	60	15	12
120	40	90	20	5	5	47	5	5	60	5	5
130	45	100	15	5	5	42	5	5	60	5	5
140	50	120	10	5	5	37	5	5	60	5	5

(NB : when the calculated fertilizer requirement values tend to zero, a minimum dose, say 10 kg ha^{-1} for N and 5 kg ha^{-1} each for P and K are added to the calculated values to bring the dose to a reasonable one).

Equation used by the Soil Testing Laboratory :
Bhubaneswar, Puri, Cuttack, Dhenkanal, Sambalpur, Sundargarh

Districts covered :
Khurda, Puri, Nayagarh, Cuttack, Angul, Dhenkanal, Sambalpur,Bargarh, Jharsududa, Sundargarh

1. Jabalpur, Niger

Crop	:	Niger
Soil Type	:	Shallow, Medium black and Deep black soils
Varieties	:	Ootakamund
Yield (q ha^{-1})	:	3-6
Applicability	:	**Range of soil test values (Kg ha^{-1}) - N: 100- 450; P: 5- 25 ; K: 100-**
Districts	**:**	Jabalpur ,Chindwara Grade : Good

Equation for Calculating the fertilizer nutrient Requirement:

FN= 11.8 T – 0..17 SN FP_2O_5 = 11.17 T – 3.52 SP FK_2O = 10.52 T – 0.16SK

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			6			8		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**54**	**49**	**31**	**77**	**71**	**52**
150	**10**	**250**	**45**	**32**	**23**	**68**	**54**	**44**
200	**15**	**300**	**37**	**14**	**15**	**60**	**36**	**36**
250	**20**	**350**	**28**	**-**	**7**	**51**	**18**	**28**
300	**25**	**400**	**20**	**-**	**-**	**43**	**-**	**20**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 11.8 kg ha^{-1}; P_2O_5= ± 11.1 kg $ha^{-1}$and K_2O= ±10.5 kg ha^{-1}

1. Jabalpur, Linseed

Crop	:	Linseed
Soil Type	:	Shallow, Medium black and Deep black soils
Varieties	:	**R-17**
Yield (q ha^{-1})	:	**12-18**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N: 100- 350; P: 5- 25 ; K: 100-500**
Districts	**:**	**Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,Narsinghpur, Powarkheda, Sagar, Ujjain** Grade : **Good**

Equation for Calculating the fertilizer nutrient Requirement:
FN= 8.48 T – 0.46SN **FP_2O_5 = 7.38 T – 5.08 SP** **FK_2O = 6.59 T – 0.25 SK**

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})					
			16			20		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**200**	**90**	**93**	**55**	**123**	**122**	**82**
150	**10**	**250**	**67**	**67**	**42**	**100**	**96**	**69**
200	**15**	**300**	**44**	**42**	**30**	**77**	**71**	**57**
250	**20**	**350**	**21**	**16**	**17**	**54**	**45**	**44**
300	**25**	**400**	**-**	**-**	**10**	**31**	**20**	**32**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 8.4 kg ha^{-1}; P_2O_5= ± 7.3 kg $ha^{-1}$and K_2O= ±6.5 kg ha^{-1}

1. Andhra Pradesh (Castor – Kharif)

Name of the Centre	**: Palem**	**Soil phosphorus range**	**: 5 - 115 kg ha^{-1}**
Soil	**: Inceptisol**	**Soil potassium range**	**: 175 - 450 kg ha^{-1}**
Crop and Variety	**: Castor - Kranthi**	**FYM composition (%)**	**: 0.75 : 0.60 : 1.2**
Season developed	**: *Kharif*, 1997**	**FYM rate**	**:**
Target range	**: 12 – 15 q ha^{-1}**	**Green manure composition**	**:**
Soil nitrogen range	**: 125 – 235 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 8.35 T– 0.40 SN, FP_2O_5 = 7.17 T – 2.88 SP, FK_2O = 3.02 T – 0.10 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			12 (q ha^{-1})			**15 (q ha^{-1})**		
mnO_4 N	**Olsens' P**	**Amm. Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
125	5	175	50	72	19	75	93	28
135	15	200	46	43	16	71	79	25
145	25	225	42	14	14	67	50	23
155	35	250	38		11	63	21	20
165	45	275	34		9	59		18
175	55	300	30		6	55		15
185	65	325	26		4	51		13
195	75	350	22			47		10
205	85	375	18			43		8
215	95	400	14			39		5
225	105	425	10			35		3
235	115	450	6			31		3

Verification: The above equations are at to be verified on the farmers' fields.

Applicability

Soil Testing Laboratories : Jadcherla, Miryalaguda

Soil type : Chalka soil

Crop : Castor – High yielding variety

Season developed : *Kharif*

Yield target : Upto 15 q ha^{-1}

1. Andhra Pradesh (Pigeonpea)

Name of the Centre	**: Tandur**	**Soil phosphorus range**	**: 3 - 36 kg ha^{-1}**
Soil	**: Vertisol**	**Soil potassium range**	**: 180 - 510 kg ha^{-1}**
Crop and Variety	**: Pigeon pea – LRG-30**	**FYM composition (%)**	**: 0.75 : 0.60 : 1.2**
Season developed	**: *Kharif*, 2007**	**FYM rate**	**:**
Target range	**: 15 – 20 q ha^{-1}**	**Green manure composition**	**:**
Soil nitrogen range	**: 190 – 410 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 4.71 T– 0.21 SN, FP_2O_5 = 5.83 T – 2.93 SP, FK_2O = 6.96 T – 0.31 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			15 (q ha^{-1})			**20 (q ha^{-1})**		
$KmnO_4$ N	**Olsens' P**	**Amm. Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
190	3	180	31	79	49	54	108	83
210	6	210	27	70	39	50	99	74
230	9	240	22	61	30	46	90	65
250	12	270	18	52	21	42	81	56
270	15	300	14	44	11	38	73	46
290	18	330	10	35	2	33	64	37
310	21	360	6	26		29	55	28
330	24	390		17		25	46	18
350	27	420		8		21	37	9
370	30	450				17	29	
390	33	480				12	20	
410	36	510				8	11	

Verification: The above equations are at to be verified on the farmers' fields.

Applicability :

Soil Testing Laboratories : Jadcherla, Mahabubnagar district

Soil type : Vertisol

Crop : Pigeonpea (Redgram) – LRG-30

Season developed : *Kharif*

Yield target : Upto 15 to 20 q ha^{-1}

1. Chattisgarh

Crop - Pigeonpea
Soil type - Vertisol,
Variety - Asha,
Season - *Rabi*, 1998-99

Area for suitability - Raipur, Durg, Rajnandgaon, Kawardha districts.

Fertilizer adjustment equations

FN = 25 N kg ha-1 as starter dose
FP_2O_5 = Critical value for SP = 13 kg P ha^{-1}
FK_2O = No K if SK >250 kg ha^{-1}

1. Jabalpur, Pigion pea

Crop	:	Arhar
Soil Type	:	**Medium black and Deep black**
Varieties	:	**JA-3,ICPL –No.148, Asha**
Yield (q ha^{-1})	:	**15 - 25**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **P: 5- 30 ; K: 100-400**
Districts	**:**	Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,, Narsinghpur, Powarkheda, Sagar, Sehore, Ujjain.

Equations for Calculating the fertilizer nutrient Requirement:

FN= 4.87 T – 0.37 SN **FP_2O_5 = 5.34 T – 3.47 SP** **FK_2O = 3.61 T – 0.16 SK**

			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})			
	Soil test Values (kg ha^{-1})		20		25	
The application of 20 kg N ha^{-1} plus biofetriliser is recommended	P	K	P_2O_5	K_2O	P_2O_5	K_2O
	5	**200**	**90**	**40**	**116**	**58**
	10	**250**	**72**	**32**	**98**	**50**
	15	**300**	**55**	**24**	**81**	**42**
	20	**350**	**38**	**16**	**64**	**34**
	25	**400**	**20**	**8**	**46**	**26**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 4.8kg ha^{-1}; P_2O_5= ± 5.3 kg $ha^{-1}$and K_2O= ±3.6

Grade : Good

Rahuri, (Maharashtra), Pigeonpea

Crop : Pigeonpea (kharif) **Variety:ICPL-87**
Soil : Typic Haplusterts **Situation:Irrigated**

Districts : Jalgaon, Ahmednagar, Aurangabad, Jalna, Parbhani, Pune, Nanded, Akola, Buldhana, Wardha, Yeotmal, Satara, Sangli, Kolhapur.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**6.33**	**61**	**112.9**
P_2O_5	**1.58**	**57**	**27.6**
K_2O	**4.98**	**11**	**78.6**

Targeted Yield Equations

FN = 5.61 T – 0.54 SN

FP_2O_5 = 5.72 T – 4.73 SP

FK_2O = 6.33 T – 0.17 SK

Fertilizer prescription for targeted yields of pigeonpea for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			16 q ha^{-1} target			20 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**36**	**63**	**67**	**58**	**86**	**93**
120	**8**	**300**	**25**	**54**	**50**	**47**	**77**	**76**
140	**10**	**400**	**14**	**44**	**33**	**37**	**67**	**59**
160	**12**	**500**	**25***	**35**	**16**	**25**	**58**	**42**
180	**14**	**600**	**25***	**25**	**1**	**15**	**48**	**25**
200	**16**	**700**	**25***	**16**	**25***	**25***	**39**	**25***
> 200	**18**	**800**	**25***	**25***	**25***	**25***	**29**	**25***
> 200	**20**	**-**	**25***	**25***	**25***	**25***	**20**	**25***

* Minimum dose of N, P_2O_5 and K_2O

1. Jabalpur, Urad

Crop	:	Urad
Soil Type	:	**Shallow** , **Medium black and Deep black**
Varieties	:	**T-9**
Yield (q ha^{-1})	:	**12 - 15**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **P: 5- 30 ; K: 100-400**
Districts	**:**	Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,, Narsinghpur, Powarkheda, Sagar, Sehore, Ujjain

Equations for Calculating the fertilizer nutrient Requirement:

FN=7.82 T –0.39 SN FP_2O_5 = 5.36 T – 2.62 SP FK_2O =10.83 T – 0.44 SK

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})			
			12		15	
The application of 20 kg N ha^{-1} plus biofertiliser is recommended	P	K	P_2O_5	K_2O	P_2O_5	K_2O
	5	**200**	**51**	**42**	**67**	**74**
	10	**250**	**38**	**20**	**54**	**52**
	15	**300**	**25**	**-**	**41**	**30**
	20	**350**	**12**	**-**	**28**	**8**
	25	**400**	**-**	**-**	**14**	**-**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 7.8kg ha^{-1}; P_2O_5= ± 5.3 kg $ha^{-1}$and K_2O= ±10.8

Grade : Good

1. Jabalpur,Lentil

Crop	:	Lentil
Soil Type	:	**Shallow , Medium black and Deep black**
Varieties	:	**JL-1**
Yield (q ha^{-1})	:	**10 - 15**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N : 100-300 , P: 5- 40 ; K: 100-500**
Districts	**:**	Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,, Narsinghpur, Powarkheda, Sagar, Sehore, Ujjain.

Composition of FYM : N(%) = 0.72 P_2O_5 (%) = 0.72 K_2O (%) = 0.75

Equation for Calculating the fertilizer nutrient Requirement:

FN = 5.84 T – 0.159 SN –0.270 ON ; FP_2O_5 = 2.10T – 0.658 SP – 0.789 OP ;

FK_2O =4.40 T – 0.094 SK – 0.774K

Soil test Values (kg ha^{-1})			Target yield (q ha^{-1}) = 10					
			Without FYM			With 3 t FYM ha^{-1}		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**100**	**42**	**17**	**34**	**37**	**6**	**17**
150	**10**	**150**	**34**	**15**	**29**	**29**	**3**	**12**
200	**15**	**200**	**26**	**12**	**24**	**21**	**1**	**7**
250	**20**	**250**	**18**	**10**	**20**	**13**	**-**	**3**
300	**25**	**300**	**10**	**8**	**16**	**5**	**-**	**-**
350	**30**	**350**	**-**	**5**	**12**	**-**	**-**	**-**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 5.8kg ha^{-1}; P_2O_5= ± 2.1 kg $ha^{-1}$and K_2O= ±4.4 kg ha^{-1}

Grade : need to verify

Jabalpur, Gram

Crop	:	Gram
Soil Type	:	**Medium black and Deep black**
Varieties	:	**JG-74, JG-62, JG-315,JG-322**
Yield (q ha^{-1})	:	**20-35**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **P: 5- 30 ; K: 100-400**
Districts	**:**	Bhopal, Dhar, Jabalpur ,Indore, Khandwa, Khargone, Mandsaur,, Narsinghpur, Powarkheda, Sagar, Sehore, Ujjain

Equations for Calculating the fertilizer nutrient Requirement:

$FN= 3.73\ T – 0.18SN$ **$FP_2O_5 = 5.0\ T – 2.5\ SP$** **$FK_2O = 3.8\ T – 0.17\ SK$**

Soil test Values (kg ha^{-1})			Fertilizer nutrient requirement (kg ha^{-1}) for yield target (q ha^{-1})			
			20		25	
The application of 20 kg N ha^{-1} plus biofetriliser is recommended	P	K	P_2O_5	K_2O	P_2O_5	K_2O
	5	**200**	**87**	**42**	**112**	**61**
	10	**250**	**75**	**33**	**100**	**52**
	15	**300**	**62**	**25**	**87**	**44**
	20	**350**	**50**	**16**	**75**	**35**
	25	**400**	**37**	**8**	**62**	**27**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 5.7 kg ha^{-1}; P_2O_5= ± 2.2 kg $ha^{-1}$and K_2O= ±1.6

Grade : Good

Rahuri, (Maharashtra), Green gram

Crop : Green gram (Kharif) **Variety : S-8**
Soil : Typic Haplusterts **Situation: Rainfed**

Districts : Jalgaon, Akola, Buldhana, Amravati, Nanded, Wardha, Yeotmal, Satara, Sangli, Dhule.

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**6.8**	**27.5**	**149**
P_2O_5	**2.29**	**60.8**	**18.3**
K_2O	**4.82**	**6.2**	**136.4**

Targeted Yield Equations

FN = 4.56 T – 0.18 SN

FP_2O_5 = 12.51 T – 7.61 SP

FK_2O = 3.53 T – 0.05 SK

Fertilizer prescription for targeted yields of green gram for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			10 q ha^{-1} target			12 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**28**	**79**	**25**	**37**	**105**	**32**
120	**8**	**250**	**24**	**64**	**22**	**33**	**90**	**29**
140	**10**	**300**	**22**	**49**	**20**	**30**	**75**	**27**
160	**12**	**350**	**17**	**34**	**17**	**26**	**60**	**24**
180	**14**	**400**	**14**	**19**	**14**	**23**	**45**	**21**
200	**16**	**450**	**10**	**25***	**11**	**19**	**29**	**18**
220	**18**	**500**	**25***	**25***	**25***	**15**	**14**	**16**

* Minimum dose of N, P_2O_5 and K_2O

1. **Bangalore, Karnataka (Red gram) Zone-5**

Crop	**: Redgram**	**Soil phosphorus range**	**: 38 -164 kg/acre**
SOIL	**: Red lateritic**	**Soil potassium range**	**: 30 -120 kg/ acre**
Variety	**: TTB-7**	**FYM composition**	**: .0.5%N : 0.3P:0.5K**
Season	**: Kharif**	**FYM rate**	**: 3.00 t\ acre**
Target range	**: 8q/ acre**	**Green manure composition**	**:**
Soil Nitrogen range	**: 0.3% -.0.5%**	**Green manure rate**	**:**

Area of applicable **: Bangalore, Kolar and Tumkur districts.**

Target yield equation:
F.N. = 5.99 T- 90.924 SN (OC %), F.P_2O_5 = 6.19 T- 2.11 SP_2O_5 (Bray's - P_2O_5)

F.K_2O = 3.06 T- 0.317 SK_2O (NH_4OAC - K_2O)

STV O.C. (%)	**Fertilizer nitrogen (kg/acre)**	**STV Bray's P_2O_5 (kg/acre)**	**Fertilizer phosphorus (kg/acre)**	**STV Amm.Ace. K_2O (kg/acre**	**Fertilizer potash (kg/acre)**
0.30	21	6	37	10	21
0.35	16	8	33	15	20
0.40	12	10	28	20	18
0.45	7	12	24	25	17
		14	20	30	14
		16	16	35	13
		18	12	40	12
				45	10
				50	9
				55	7
				60	6

To increase or decrease the yield target by one q/Acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 6 kg/Acre **P_2O_5 = ± 6 kg/Acre** **K_2O = ± 3 kg/Acre**

Andhra Pradesh (Chickpea)

Name of the Centre	**: Nandyal**	**Soil phosphorus range**	**: 10 - 75 kg ha^{-1}**
Soil	**: Vertisol**	**Soil potassium range**	**: 200 - 525 kg ha^{-1}**
Crop and Variety	**: Chickpea – Annegiri**	**FYM composition (%)**	**: 0.75 : 0.60 : 1.2**
Season developed	**: *Rabi*, 2005**	**FYM rate**	**:**
Target range	**: 15 – 20 q ha^{-1}**	**Green manure composition**	**:**
Soil nitrogen range	**: 100 – 425 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 5.03 T– 0.27 SN, FP_2O_5 = 9.71 T – 1.82 SP, FK_2O = 6.23 T – 0.22 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			15 (q ha^{-1})			**20 (q ha^{-1})**		
$KmnO_4$ N	**Olsens' P**	**Amm. Ac-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	200	48	128	49	74	176	81
125	15	225	42	118	44	67	167	75
150	20	250	35	109	38	53	158	70
175	25	275	28	100	33	47	149	64
200	30	300	21	91	27	40	140	59
225	35	325	15	82	22	33	131	53
250	40	350	8	73	16	26	121	48
275	45	375		64	11	20	112	42
300	50	400		55	5	13	103	37
325	55	425		46		6	94	31
350	60	450		37			85	26
375	65	475		27			76	15
400	70	500		18			67	9
425	75	525		9			58	4

Verification: The above equations are at to be verified on the farmers' fields.

Applicability :

Soil Testing Laboratories : Nandyal, kurnool district

Soil type : Vertisol

Crop : Chickpea – Annegiri

Season developed : *Rabi*

Yield target : Upto 20 q ha^{-1}

1. Chhattisgarh

Crop – Chickpea (Rainfed condition)

Variety - Vijay
Soil type - Vertisol
Season - Rabi 2007-08

Area for suitability - Raipur, Durg, Rajnandgaon, Kawardha, Bilaspur districts

Fertilizer adjustment equations

FS = 5.37 Y – 2.80 SS – 0.24 FYM

FP_2O_5 =10.03 Y – 7.28 SP – 1.06 FYM

FK_2O = 21.37 Y – 0.65 SK – 0.61 FYM

Where FS, FP_2O_5 and FK_2O are fertilizer S P and K respectively. SS, SP and SK are soil test values for available S, P and K. Y = Yield target (q/ha) and FYM is Farm Yard Manure

Ready reckoner of fertilizer S, P_2O_5 and K_2O for specific yield of chickpea (Vijay) without FYM application in previous chickpea crop

SS Kg/ ha	SP Kg/ ha	SK Kg/ ha	Yield targets of chickpea (Vijay) q ha^{-1}								
			Fertilizer S (kg/ha)			Fertilizer P_2O_5 (kg/ha)			Fertilizer K_2O (kg/ha)		
			8	12	16	8	12	16	8	12	16
10	4	150	15	36	58	51	91	131	73	159	244
15	8	200	1	22	44	22	62	102	41	126	212
20	12	250	0	8	30	0	33	73	8	94	179
25	16	300	0	0	16	0	4	44	0	61	147
30	20	350	0	0	2	0	0	15	0	28	114
35	24	400	0	0	0	0	0	0	0	0	81
40	28	450	0	0	0	0	0	0	0	0	49
45	32	500	0	0	0	0	0	0	0	0	16
50	36	550	0	0	0	0	0	0	0	0	0

Ready reckoner of fertilizer N, P_2O_5 and K_2O for specific yield of chickpea (Vijay) with 5 t/ha FYM application in previous rice crop

SS Kg/ ha	SP Kg/ ha	SK Kg/ ha	Yield targets of chickpea (Vijay) q ha^{-1}								
			Fertilizer S (kg/ha)			Fertilizer P_2O_5 (kg/ha)			Fertilizer K_2O (kg/ha)		
			8	12	16	8	12	16	8	12	16
10	4	150	12	33	55	45	85	125	55	140	226
15	8	200	0	19	41	16	56	96	22	108	193
20	12	250	0	5	27	0	27	67	0	75	161
25	16	300	0	0	13	0	0	38	0	43	128
30	20	350	0	0	0	0	0	8	0	10	96
35	24	400	0	0	0	0	0	0	0	0	63
40	28	450	0	0	0	0	0	0	0	0	30
45	32	500	0	0	0	0	0	0	0	0	0
50	36	550	0	0	0	0	0	0	0	0	0

2. Chhattisgarh

Crop - **Chickpea**
Soil type - Vertisol,
Variety - JG – 74,
Season - *Rabi*, 1997-98

Area for suitability - Raipur, Durg, Rajnandgaon, Kawardha, Bilaspur districts.

Fertilizer adjustment equations

FN = General recommended dose (20 kg ha-1)
FP_2O_5 = Critical value for SP = 12 kg P ha^{-1}
FK_2O = No K if SK >250 kg ha^{-1}

Rahuri, (Maharashtra), Chickpea

Crop : Chickpea (Rabi) **Variety: Vishal**
Soil : Typic Haplusterts **Situation: Irrigated**

Districts : Ahmednagar, Jalgaon, Pune, Nasik, Nanded, Aurangabad, Beed, Jalna, Akola, Buldhana, Wardha, Yeotmal, Satara, Sangli, Kolhapur

Basic Data

Nutrient	NR (kg q^{-1})	CS (%)	CF (%)
N	**4.22**	**37**	**80.4**
P_2O_5	**2.94**	**92**	**76.1**
K_2O	**2.73**	**7**	**212**

Targeted Yield Equations

FN = 5.25 T – 0.46 SN

FP_2O_5 = 3.87 T – 2.77 SP

FK_2O = 1.29 T – 0.04 SK

Fertilizer prescription for targeted yields of chickpea for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			20 q ha^{-1} target			25 q ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**59**	**61**	**18**	**85**	**802**	**24**
120	**8**	**250**	**50**	**55**	**16**	**76**	**75**	**22**
140	**10**	**300**	**41**	**50**	**14**	**64**	**69**	**20**
160	**12**	**350**	**31**	**44**	**12**	**58**	**64**	**18**
180	**14**	**400**	**22**	**39**	**10**	**48**	**58**	**16**
200	**16**	**450**	**13**	**33**	**8**	**39**	**52**	**14**
220	**18**	**500**	**25***	**28**	**25***	**30**	**47**	**12**
240	**20**	**550**	**25***	**22**	**25***	**21**	**41**	**25***
260	**22**	**600**	**25***	**16**	**25***	**25***	**36**	**25***
> 260	**24**	**650**	**25***	**25***	**25***	**25***	**30**	**25***

* Minimum dose of N, P_2O_5 and K_2O

1. Bikaner,Mothbean

Name of the center	:	**ARS, Bikaner**	**Soil nitrogen range**	:	**80-160 kg ha^{-1}**
Soil	:	**Alluvial soils (Bhamatsar and Khiran series)**	**Soil Phosphorus range**	:	**10-50 kg ha^{-1}**
Crop and variety	:	**Mothbean (RMO-40)**	**Soil potassium range**	:	**170-330 kg ha^{-1}**
Season developed	:	**Kharif 1998 and 1999**			
Target range	:	**8-10 q ha^{-1}**			

Fertilizer adjustment equation

FN = 8.61T – 0.29 SN
FP_2O_5 = 8.91 T – 1.66 S P_2O_5
FK_2O = 17.58 T – 0.53 SK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for yield target of					
$KMnO_4$ N	Olsens' P	Amm.Ac. -K	8 q ha^{-1}			10 q ha^{-1}		
			N	P_2O_5	K_2O	N	P_2O_5	K_2O
80	10	170	28	37	15	40	55	40
90	15	190	26	29	10	40	46	40
100	20	210	23	20	10	40	38	29
110	25	230	20	12	10	37	30	19
120	30	250	17	10	10	34	21	10
130	35	270	14	10	10	31	13	10
140	40	290	11	10	10	28	10	10
150	45	310	10	10	10	25	10	10
160	50	330	10	10	10	22	10	10

Verification **: The above fertilizer adjustment equations were tried on the farmers' fields in Bikaner district with varying yield targets during kharif 2000 and all the yield targets could be achieved at the place tried**

Applicability

Soil testing laboratory : Bikaner
Soil : Sobhasar, Khiran, Jamsar, Bhamatsar series
Crop and variety : Mothbean (RMO-40)
Target range : 8-10 q ha^{-1}
Soil nitrogen range : 80-160 kg ha^{-1}
Soil phosphorus range : 10-50 kg ha^{-1}
Soil potassium range : 170-330 kg ha^{-1}

Horticulture crops

Vegetables crops

1. Bhubneswar

Crop : **Bhindi** Lady's finger (cv. B.O.2)

General fertilizer recommendation : 120-60-80

Fertilizer adjustment equations

FN = 6.8 T – 1.8 SN, F P_2O_5 = 2.2 T – 1.9 S P_2O_5, FK_2O = 4.7 T – 2.1 S K_2O

Corrected ready reckoner of fertilizer doses at varying soil test values for specific yield targets.

Available soil nutrients (kg ha^{-1})			Fertilizer nutrients required (kg ha^{-1})								
			Targeted yield (50 q ha^{-1})			Targeted yield (60 q ha^{-1})			Targeted yield (70 q ha^{-1})		
N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
140	20	70	88	72	88	156	75	120	160	90	160
150	25	80	70	63	67	138	75	100	160	90	120
160	30	90	62	53	46	120	60	80	160	90	120
170	35	100	34	44	25	102	60	72	160	75	100
180	40	110	30	34	20	84	56	51	152	75	80
190	45	120	30	25	20	66	47	30	134	69	77
200	50	130	30	15	20	48	37	20	116	60	56
210	55	140	30	15	20	30	28	20	98	51	45
220	60	150	30	15	20	30	15	20	80	42	34
230	70	160	30	15	20	30	15	20	62	24	23

(NB : when the calculated fertilizer requirement values tend to zero, a minimum dose, say 30 kg ha^{-1} for N, 15 kg ha^{-1} for P and 20 kg ha^{-1} for K are added to the calculated values to bring the dose to a reasonable one).

Equation used by the Soil Testing Laboratory :
Bhubaneswar, Puri, Cuttack, Dhenkanal, Sambalpur, Sundargarh

Districts covered :
Khurda, Puri, Nayagarh, Cuttack, Angul, Dhenkanal, Sambalpur,Bargarh, Jharsududa, Sundargarh

1. Kerala, Bhindi (Okra) (Abelmoschus esculentus)

Variety - Arka anamika
Soil type - Laterite
Season - August 2005 to November 2005
Irrigation - Irrigated
Area of adaptability - Laterite soils of Kerala

Basic Data and Fertilizer Adjustment Equations for Targeted Yield for Bhindi 1st crop (Abelmoschus esculentus) variety: Arka anamika

Nutrient	Basic Data		
	N	P_2O_5	K_2O
Nutrient requirement,kg/q	0.33	0.05	0.36
Soil efficiency (%)	3.98	8.73	2.85
Fertilizer efficiency (%)	30.66	93.16	103.49
Organic Efficiency (%)	0.05	0.04	0.04

Targeted Yield Equations	T	SN	SP	SK	FYM
	80.98	**365.40**	**20.95**	**535.87**	**5**
FN = 1.08 * T - 0.13 * STVN - 0.00 * M				N=	39.70
FP = 0.06 * T - 0.09 * STVP - 0.00 * M				P=	2.59
FK = 0.34 * T - 0.03 * STVK - 0.00 * M				K=	13.12

Ready reckoner for target = 10 q/ha						
S.No.	**STV N**	**STV P**	**STV K**	**N**	**P_2O_5**	**K_2O**
1	82.20	22.50	160.50	0.00	0.00	0.00
2	84.20	24.50	165.50	0.00	0.00	0.00
3	86.20	26.50	170.50	0.00	0.00	0.00
4	88.20	28.50	175.50	0.00	0.00	0.00
5	90.20	30.50	180.50	0.00	0.00	0.00
6	92.20	32.50	185.50	0.00	0.00	0.00
7		34.50	190.50		0.00	0.00
8			195.50			0.00

Ready reckoner for target = 10 q/ha						
S.No.	**STV N**	**STV P**	**STV K**	**N**	**P_2O_5**	**K_2O**
1	82.20	22.50	160.50	0.00	0.00	0.00
2	84.20	24.50	165.50	0.00	0.00	0.00
3	86.20	26.50	170.50	0.00	0.00	0.00
4	88.20	28.50	175.50	0.00	0.00	0.00
5	90.20	30.50	180.50	0.00	0.00	0.00
6	92.20	32.50	185.50	0.00	0.00	0.00
7		34.50	190.50		0.00	0.00
8			195.50			0.00

1. Chhattisgarh

Okra (Ladies finger)

Soil type - Inceptisol
Variety - Parbhani
Season - *Kharif*, 2001

Area for Suitability - Chhattisgarh plains (Raipur, Raigarh, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

$FN = 1.99\ Y - 0.299\ SN$
$FP_2O_5 = 190 - (26549.8 - 117.6Y)^{1/2} - 3.31\ SP$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of okra (Parbhani kranti) in Inceptisol (*Matasi*).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) (Okra - Parbhani kranti)**					
		100		**125**		**150**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	154	58	204	71	254	86
175	6	147	49	196	61	246	76
200	9	139	39	189	51	239	66
225	12	132	29	181	41	231	56
250	15	124	19	174	31	224	46
275	18	117	9	167	22	216	36
300	21	109	6	159	12	209	26
350	24	94	6	144	6	194	16
400	27	79	6	129	6	179	6

Rahuri, (Maharashtra), Okra

Crop : Okra (Summer) **Variety: Arka anamika**
Soil : Typic Haplustert **Situation : Irrigated**

Districts : Ahmednagar, Nasik, Pune, Satara, Sangli, Kolhapur, Solapur, Dhule

Without FYM					
Nutrient	NR (kg t^{-1})	CS (%)	CF (%)	CFYM (%)	Targeted Yield Equations
N	**9.86**	**26.36**	**58.48**	**-**	**FN = 16.86 T – 0.45 SN**
P_2O_5	**3.60**	**82.67**	**34.90**	**-**	**FP_2O_5 = 10.31 T – 2.36 SP**
K_2O	**8.85**	**11.11**	**76.28**	**-**	**FK_2O = 11.60 T – 0.15 SK**

With FYM					
N	**9.86**	**26.36**	**63.47**	**14.77**	**FN = 15.54 T – 0.42 SN – 2.32 FYM**
P_2O_5	**3.60**	**82.67**	**37.45**	**10.68**	**FP_2O_5 = 9.61 T – 2.21 SP – 1.45 FYM**
K_2O	**8.85**	**11.11**	**79.99**	**14.63**	**FK_2O = 11.06 T – 0.14 SK – 1.46 FYM**

Fertilizer prescription for targeted yields of Okra for varying soil test values.

Soil test values (Kg ha^{-1})			Without FYM			With FYM (10 t FYM ha^{-1})		
			12 t ha^{-1} target			12 t ha^{-1} target		
N	P	**K**	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**157**	**110**	**109**	**121**	**88**	**90**
120	**8**	**300**	**148**	**105**	**94**	**113**	**83**	**76**
140	**10**	**400**	**139**	**100**	**79**	**104**	**79**	**62**
160	**12**	**500**	**130**	**95**	**64**	**96**	**74**	**48**
180	**14**	**600**	**121**	**91**	**59**	**88**	**70**	**34**
200	**16**	**700**	**112**	**86**	**34**	**79**	**65**	**20**
220	**18**	**800**	**103**	**81**	**19**	**71**	**61**	**25***

*** Minimum dose of K_2O**

1. Bhubneswar

Crop : Brinjal (cv. Utkal Anushree)
General fertilizer recommendation : 120-80-100

Fertilizer adjustment equations

$FN = 1.0\ T - 0.3\ SN$, $F\ P_2O_5 = 0.7\ T - 1.6\ S\ P_2O_5$, $FK_2O = 4.7\ T - 0.7\ S\ K_2O$

Corrected ready reckoner of fertilizer doses at varying soil test values for specific yield targets.

Available soil nutrients (kg ha-1)			Fertilizer nutrients required (kg ha-1)								
			Targeted yield (200 q ha^{-1})			Targeted yield (225q ha^{-1})			Targeted yield (250 q ha^{-1})		
N	**P_2O5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
140	20	60	150	80	98	180	120	100	200	120	120
150	25	70	150	80	91	180	100	100	200	120	120
160	30	80	150	80	84	177	100	100	200	120	100
170	35	90	149	80	77	174	100	94	199	100	100
180	40	100	146	76	70	171	80	87	196	100	100
190	45	110	143	68	63	168	80	80	193	102	98
200	50	120	140	60	56	165	78	73	190	94	91
220	55	130	134	52	49	159	70	66	184	86	84
250	60	140	125	44	42	150	62	59	175	78	77
280	65	150	116	36	35	141	54	52	166	70	70

(NB : when the calculated fertilizer requirement values tend to zero, a minimum dose, say 30 kg ha^{-1} for N, 20 kg ha^{-1} for P and 25 kg ha^{-1} for K are added to the calculated values to bring the dose to a reasonable one).

Equation used by the Soil Testing Laboratory :
Bhubaneswar, Puri, Cuttack, Dhenkanal, Sambalpur, Sundargarh

Districts covered :
Khurda, Puri, Nayagarh, Cuttack, Angul, Dhenkanal, Sambalpur,Bargarh, Jharsududa, Sundargarh

1. Chhattisgarh

Brinjal

Soil type - Inceptisol
Variety - Mukta kesi)
Season - *Rabi*, 2005-06

Area for Suitability - Chhattisgarh plains (Raipur, Raigarh, Mahasamund, Dhamtari, Bilaspur districts)

Fertilizer adjustment equations

$FN = 1.30\ Y – (0.55\ SN + 4.86\ t\ FYM)$
$FP_2O_5 = 115 - (13254.6 – 58.5Y)^{1/2} – (2.99\ SP + 6.25\ t\ FYM)$
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of Brinjal (Mukta Kesi) in Inceptisol (*Matasi*).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) Brinjal (Mukta Kesi)							
		150		175		200		225	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	113	39	145	51	178	67	210	96
175	6	99	30	131	42	164	58	196	87
200	9	85	21	118	33	150	49	183	78
225	12	71	12	104	24	136	40	169	70
250	15	58	3	90	15	123	31	155	61
275	18	44	3	76	6	109	22	141	52
300	21	30	3	63	4	95	13	128	43
350	24	2	3	35	4	68	4	100	34
400	28	2	3	7	4	40	4	73	25

Ready reckoners on soil test based fertilizer recommendations with INM (5 ton FYM) for specific yield targets of Brinjal (Mukta Kesi) in Inceptisol (*Matasi*).

Alkaline $KMnO_4$-N (kg ha^{-1})	Olsen's P (kg ha^{-1})	Yield Targets (q ha^{-1}) Brinjal (Mukta Kesi)							
		150		175		200		225	
		FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5	FN	FP_2O_5
150	3	88	8	121	20	153	35	186	65
175	6	74	2	107	11	139	26	172	56
200	9	61	2	93	2	126	17	158	47
225	12	47	2	79	2	112	8	144	38
250	15	33	2	66	2	98	2	131	29
275	18	19	2	52	2	84	2	117	20
300	21	6	2	38	2	71	2	103	11
350	24	6	2	6	2	43	2	76	2
400	28	6	2	6	2	16	2	48	2

Rahuri, (Maharashtra), Brinjal

Crop : Brinjal (Summer) **Variety: Krishna**
Soil : Typic Haplustert **Situation:Irrigated**

Districts : Ahmednagar, Nasik, Pune, Satara, Sangli, Kolhapur, Solapur, Dhule

Basic Data

Nutrient	NR (kg t^{-1})	CS (%)	CF (%)
N	**1.42**	**0.89**	**1.54**
P_2O_5	**15.64**	**89.78**	**4.82**
K_2O	**29.30**	**28.40**	**47.8**

Targeted Yield Equations

FN = 4.82 T – 0.53 SN

FP_2O_5 = 3.14 T – 7.32 SP

FK_2O = 3.21 T – 0.13 SK

Fertilizer prescription for targeted yields of brinjal for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			50 t ha^{-1} target			60 t ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**188.0**	**113.0**	**134.5**	**236.2**	**144.4**	**166.6**
120	**8**	**300**	**177.4**	**98.4**	**121.5**	**225.6**	**129.8**	**153.6**
140	**10**	**400**	**166.8**	**83.8**	**108.5**	**215.0**	**115.2**	**140.6**
160	**12**	**500**	**156.2**	**69.3**	**95.5**	**204.4**	**100.5**	**127.6**
180	**14**	**600**	**145.6**	**54.5**	**82.5**	**193.8**	**85.9**	**114.6**
200	**16**	**700**	**135.0**	**39.8**	**69.5**	**183.2**	**71.2**	**101.6**

1. Andhra Pradesh (Cabbage)

Name of the Centre	**: Rajendranagar**	**Soil phosphorus range**	**: 10 – 80 kg ha^{-1}**
Soil	**: Alfisol (sandy loam)**	**Soil potassium range**	**: 150 – 850 kg ha^{-1}**
Crop and Variety	**: Cabbage – Golden Acre**	**FYM composition**	**: 0.75 : 0.6 : 1.3**
Season developed	**: Rabi, 2005**	**FYM rate**	**:**
Target range	**: 150 q ha^{-1}– 200 q ha^{-1}**	**Green manure composition**	**:**
Soil Nitrogen range	**: 75 – 425 kg ha^{-1}**	**Green manure rate**	**:**

Fertilizer adjustment equations

FN = 1.574 T– 0.626 SN, FP_2O_5 = 0.606 T – 0.915 SP, FK_2O = 0.486 T – 0.095 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
Kmn O_4 N	**Olsens' P**	**Amm. Ac-K**	**150 (q ha^{-1})**			**200 (q ha^{-1})**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
75	10	150	189	82	59	268	112	83
100	15	200	174	77	54	252	108	78
125	20	250	158	73	49	237	103	74
150	25	300	142	68	44	221	99	69
175	30	350	127	64	40	205	94	64
200	35	400	111	59	35	190	89	59
225	40	450	95	54	30	174	85	55
250	45	500	80	50	26	158	80	50
275	50	550	64	45	21	143	76	45
300	55	600	48	41	16	127	71	40
325	60	650	33	36	11	112	66	36
350	65	700	17	32	7	96	62	31
375	70	750		27		80	57	26
400	75	800		22		65	53	21
425	80	850		18		49	48	17

Verification: The above equations are at to be verified on the farmers' fields of Ranga Reddy and other districts with yield targets of 150 and 200 q ha^{-1}

Applicability

Soil Testing Laboratories	:	Rajendranagar
Soil type	:	Sandy loam
Crop	:	Cabbage
Season developed	:	Rabi, 2005
Yield target	:	Upto 200 q ha^{-1}

Note : The above equations may be tested in soils other than Alfisol in the farmer's fields with 3 or 4 yield targets and pickup the best one for making fertilizer recommendation.

1. Bangalore, Karnataka(Cabbage)Zone-5

Name of the Centre	**: Bangalore**	**Soil phosphorus range**	**: 20-70kg/acre**
Soil	**: Red**	**Soil potassium range**	**: 75-160 kg/acre**
Crop and Variety	**: Cabbage (Golden Acre and Other HYV)**	**FYM composition**	**: 0.6%N-0.4%P-0.5K%**
		FYM rate	**: 10t/acre**
Situation	**: irrigated**	**Green manure composition**	**:**
Season developed	**: kharif**	**Green manure rate**	**:**
Target range	**: 100 q/acre**		
Soil nitrogen range	**: 0.4-0.8%**		

Area of applicability : Bangalore, Kolar and Tumkur districts.

Targeted Yield Equation

FN = 0.851 T – 87.08 SN (OC %)
FP_2O_5 = 0.563 T – 0.192 SP_2O_5 (Olsen's SP_2O_5)
FK_2O = 0.709 T –0.165 SK_2O (NH_4OAC-K_2O)
RYS = 47.103 kg

Fertilizer prescription for targeted yields of cabbage for varying soil test values.

STV O. C (%)	Fertilizer nitrogen (kg/acre)	STV Olsen's P_2O_5 (kg/acre)	Fertilizer phosphorus (kg/acre)	STV Amm.Ace. K_2O (kg/acre)	Fertilizer potash (kg/acre)
0.40	50	5	55	60	61
0.50	42	10	54	80	58
0.55	37	15	53	100	54
0.60	33	20	53	120	51
0.65	29	25	52	130	50
0.70	24	30	51	140	48
0.75	20	35	50	150	46
0.80	15	40	49	160	45
0.85	11	45	48	170	43
0.90	7	50	47	180	41
0.95	2	55	46	190	40
1.00	0	60	45	200	38

To increase or decrease the yield target by one q/acre the variations to be made in the fertilizer recommendations are as follows:

N = ± 0.8 kg/acre P_2O_5 = ± 0.6 kg/acre K_2O = ± 0.7 kg/acre

1. Tamil Nadu: Cabbage

Name of the centre : **Coimbatore**
Soil : **Irugur series**
Crop & Variety : **Hybrid-Questo**
Season developed : **2003-04**
Season developed : **Kharif**
Target range : **700 q ha^{-1}**
Soil Nitrogen range : **180 - 300 kg ha^{-1}**
Soil phosphorus range : **10 - 22 kg ha^{-1}**
Soil potassium range : **200 - 500 kg ha^{-1}**

FYM composition (N:P:K) : **:0.43:0.26:0.51% (Dry weight basis)**
FYM rate : **15 t ha^{-1} (30 % moisture)**
Green manure composition :
Green manure rate :

Fertilizer Adjustment Equations

FN = 0.55 T - 0.89 SN - 0.76 ON
FP_2O_5 = 0.29 T - 2.75 SP - 0.80 OP
FK_2O = 0.36 T - 0.31 SK - 0.56 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield targets of cabbage

Initial soil test values (kg ha^{-1})			**Nutrients to be added (kg ha^{-1}) for an yield target of 700 q ha^{-1}**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**FN**	**FP_2O_5**	**FK_2O**
180	10	200	225	176	190
200	12	250	207	170	175
220	14	300	189	165	159
240	16	350	171	159	144
260	18	400	154	154	128
280	20	450	136	148	113
300	22	500	118	143	97

Blanket Recommendation: 100 : 125 : 25 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Red – sandy clay loam
Yield target : 700 q ha^{-1}
District(s) : Coimbatore, Dindigul
Grade : Good

Rahuri, (Maharashtra), Cabbage

Crop : Cabbage (Rabi) **Variety: Golden acre**
Soil : Typic Haplusterts **Situation: Irrigated**

Districts : Ahmednagar, Nasik, Pune, Satara, Sangli, Kolhapur, Solapur, Dhule

Basic Data

Nutrient	NR (kg t^{-1})	CS (%)	CF (%)
N	**6.04**	**15.30**	**72.90**
P_2O_5	**1.58**	**34.20**	**33.50**
K_2O	**6.33**	**15.20**	**94.80**

Targeted Yield Equations

FN = 8.28 T – 0.21 SN

FP_2O_5 = 4.72 T – 2.34 SP

FK_2O = 6.68 T – 0.19 SK

Fertilizer prescription for targeted yields of cabbage for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			30 t ha^{-1} target			40 t ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**227.4**	**128**	**162**	**310**	**175**	**229**
120	**8**	**300**	**223.2**	**123**	**143**	**306**	**170**	**210**
140	**10**	**400**	**219.0**	**118**	**124**	**302**	**165**	**191**
160	**12**	**500**	**214.8**	**114**	**105**	**298**	**108**	**172**
180	**14**	**600**	**210.6**	**109**	**86**	**293**	**156**	**153**
200	**16**	**700**	**206.4**	**104**	**67**	**289**	**151**	**134**

IPNS Based Fertiliser Recommendations

1. Chattisgarh

Crop – Cauliflower
Variety - Sungro Pusi (OP)
Soil Type - Vertisol
Season - Rabi 2007-08

Area for suitability - Raipur, Durg, Bilaspur districts

Fertilizer adjustment equations

FN = 1.44 Y – 0.29 SN – 0.09 FYM
FP2O5 = 0.37 Y – 0.74 SP – 0.05 FYM
FK2O = 0.57 Y – 0.05 SK – 0.02 FYM

Where FN, FP_2O_5 and FK_2O are fertilizer N P and K respectively. SN, SP and SK are soil test values for available N P and K. Y = Yield target (q/ha) and FYM is Farm Yard Manure

Ready reckoner of fertilizer N, P_2O_5 and K_2O for specific yield of cauliflower (Sungro Pusi) without FYM application

SN Kg/ ha	SP Kg/ ha	SK Kg/ ha	Yield targets of cauliflower(Sungro Pusi) q ha^{-1}								
			Fertilizer N (kg/ha)			Fertilizer P_2O_5 (kg/ha)			Fertilizer K_2O (kg/ha)		
			100	125	150	100	125	150	100	125	150
150	4	150	100	136	172	34	43	52	50	64	78
175	8	200	93	129	165	31	40	49	47	62	76
200	12	250	85	121	157	28	37	46	45	59	73
225	16	300	78	114	150	25	34	43	42	57	71
250	20	350	71	107	143	22	31	40	40	54	69
275	24	400	63	99	135	19	28	37	38	52	66
300	28	450	56	92	128	16	25	34	35	50	64
325	32	500	49	85	121	13	22	31	33	47	61
350	36	550	41	78	114	10	19	28	30	45	59

Ready reckoner of fertilizer N, P_2O_5 and K_2O for specific yield of cauliflower Sungro Pusi) with 10 t/ha FYM application

SN Kg/ ha	SP Kg/ ha	SK Kg/ ha	Yield targets of cauliflower(Sungro Pusi) q ha^{-1}								
			Fertilizer N (kg/ha)			Fertilizer P_2O_5 (kg/ha)			Fertilizer K_2O (kg/ha)		
			100	125	150	100	125	150	100	125	150
150	4	150	92	128	164	31	40	50	47	61	75
175	8	200	85	121	157	28	38	47	44	58	73
200	12	250	77	113	149	25	35	44	42	56	70
225	16	300	70	106	142	22	32	41	39	54	68
250	20	350	63	99	135	19	29	38	37	51	65
275	24	400	55	91	127	16	26	35	35	49	63
300	28	450	48	84	120	14	23	32	32	46	61
325	32	500	41	77	113	11	20	29	30	44	58
350	36	550	33	69	105	8	17	26	27	42	56

Rahuri, (Maharashtra), Cauliflower

Crop : Cauliflower (Rabi) **Variety : Namdhari N0. 90**
Soil : Typic Haplustert **Situation : Irrigated**

Districts : Ahmednagar, Nasik, Pune, Satara, Sangli, Kolhapur, Solapur, Dhule

Basic Data

Without FYM					
Nutrient	NR (kg t^{-1})	CS (%)	CF (%)	CFYM (%)	**Targeted Yield Equations**
N	**3.38**	**17.23**	**39.47**	**-**	**FN = 6.83 T – 0.35 SN**
P_2O_5	**0.83**	**43.17**	**19.54**	**-**	**FP_2O_5 = 4.25 T – 2.21 SP**
K_2O	**3.0**	**6.15**	**76.86**	**-**	**FK_2O = 3.90 T – 0.08 SK**

With FYM					
N	**3.38**	**17.23**	**56.30**	**10.47**	**FN = 6.0 T – 0.30 SN – 1.44 FYM**
P_2O_5	**0.83**	**43.17**	**21.12**	**5.08**	**FP_2O_5 =3.92 T – 2.04 SP – 1.20 FYM**
K_2O	**3.0**	**6.15**	**97.66**	**13.75**	**FK_2O = 3.07 T – 0.06 SK – 1.12 FYM**

Fertilizer prescription for targeted yields of cauliflower for varying soil test values.

Soil test values (Kg ha^{-1})			Without FYM			With FYM (10 t FYM ha^{-1})		
			25 t ha^{-1} target			25 t ha^{-1} target		
N	P	**K**	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**136**	**93**	**82**	**106**	**74**	**54**
120	**8**	**300**	**128**	**89**	**74**	**100**	**70**	**48**
140	**10**	**400**	**122**	**83**	**66**	**94**	**66**	**42**
160	**12**	**500**	**115**	**80**	**58**	**88**	**62**	**36**
180	**14**	**600**	**108**	**75**	**50**	**82**	**57**	**30**
200	**16**	**700**	**101**	**71**	**42**	**76**	**53**	**24**
220	**18**	**800**	**94**	**66**	**34**	**70**	**49**	**18**

1. Andhra Pradesh (Colocassia)with & without IPNS based

Name of the Centre : **Nellore**
Soil : **Alluvial soil**
Crop and Variety : **Colocassia-KCS-2**
Season/Year developed : **2002-2003**
Target range : **20 – 25 t ha^{-1}**
Soil Nitrogen range : **100 – 360 kg ha^{-1}**
Soil phosphorus range : **5 – 70 kg ha^{-1}**
Soil potassium range : **125 – 450 kg ha^{-1}**
FYM composition :
FYM rate : **10 t ha^{-1}**
Green manure composition :
Green manure rate :

Fertilizer adjustment equations

FN = 12.11 T – 0.53 SN- 0.32 FYM N

FP_2O_5 = 6.70 T – 1.84 SP- 0.36FYM P

FK_2O = 14.45 T – 0.64 SK- 0.075 FYM K

1. Bhubneswar

Crop : Potato (cv. Ashoka)
General fertilizer recommendation : 120-60-120

Fertilizer adjustment equations.

FN = 1.8 T – 1.1 SN F, P_2O_5 = 0.5 T – 1.8 S, P_2O_5 FK_2O = 1.1 T – 1.3 S K_2O

Corrected ready reckoner of fertilizer doses at varying soil test values for specific yield targets.

Available soil nutrients (kg ha-1)			Fertilizer nutrients required (kg ha-1)								
			Targeted yield (250 q ha^{-1})			Targeted yield (275q ha^{-1})			Targeted yield (300 q ha^{-1})		
N	**P_2O5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
140	20	60	240	89	180	240	90	180	240	90	140
160	25	70	240	80	180	240	90	180	240	90	210
180	30	80	240	71	150	240	84	180	240	90	210
200	35	90	210	62	150	240	75	180	240	87	210
220	40	100	180	53	145	240	66	150	240	78	180
240	45	120	180	44	132	210	57	150	240	69	180
260	50	140	164	35	119	209	48	146	240	60	150
280	55	160	142	26	106	187	39	133	232	51	150
300	60	180	120	17	93	165	30	120	210	42	148
320	65	200	98	15	80	143	21	107	188	33	135

(NB : when the calculated fertilizer requirement values tend to zero, a minimum dose, say 30 kg ha^{-1} for N, 15 kg ha^{-1} for P and 30 kg ha^{-1} for K are added to the calculated values to bring the dose to a reasonable one).

Equation used by the Soil Testing Laboratory :
Bhubaneswar, Puri, Cuttack, Dhenkanal, Sambalpur, Sundargarh

Districts covered :
Khurda, Puri, Nayagarh, Cuttack, Angul, Dhenkanal, Sambalpur,Bargarh, Jharsududa, Sundargarh

1. **Chhattisgarh**

Crop - Potato
Soil type - Vertisol
variety - JH-222
Season - *Rabi*, 2000-01

Area for suitability - Raipur, Durg, Bilaspur districts.

Fertilizer adjustment equations

FN = 1.67 Y – 0.36 SN
FP_2O_5 = 0.54-Y – 2.27 SP
FK_2O = No K if SK >250 kg ha^{-1}

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of potato (JH-222) in Vertisol (Kanhar).

Alkaline $KMnO_4$-N (kg ha^{-1})	**Olsen's P (kg ha^{-1})**	**Yield Targets (q ha^{-1}) Potato (var. - JH-222)**					
		120		**160**		**200**	
		FN	**FP_2O_5**	**FN**	**FP_2O_5**	**FN**	**FP_2O_5**
150	3	146	58	213	80	280	101
175	6	137	51	204	73	271	94
200	9	128	44	195	66	262	88
225	12	119	38	186	59	253	81
250	15	110	31	177	52	244	74
275	18	101	24	168	46	235	67
300	21	92	17	159	39	226	60
350	24	74	10	141	32	208	54
400	28	56	1	123	23	190	44

Rahuri, (Maharashtra), Potato

Crop : Potato (Rabi) **Variety: Khufri Jyoti**
Soil : Typic Ustorthent **Situation:Irrigated**

Districts : Pune, Ahmednagar, Aurangabad, Nasik

Basic Data

Without FYM					
Nutrient	NR (kg q^{-1})	CS (%)	CF (%)	CFYM (%)	**Targeted Yield Equations**
N	**0.44**	**11.37**	**28.40**	**-**	**FN = 1.549 T – 0.40 SN**
P_2O_5	**0.075**	**19.98**	**8.27**	**-**	**FP_2O_5 = 0.906 T – 5.53 SP**
K_2O	**0.47**	**5.04**	**35.81**	**-**	**FK_2O = 1.315 T – 0.17 SK**

With FYM					
N	**0.44**	**11.37**	**36.44**	**3.11**	**FN = 1.207 T – 0.315 SN – 0.81 FYM**
P_2O_5	**0.075**	**19.98**	**8.54**	**1.35**	**FP_2O_5 =0.878 T – 5.35 SP – 0.71 FYM**
K_2O	**0.47**	**5.04**	**39.84**	**4.09**	**FK_2O = 1.180 T – 1.156 SK – 0.76 FYM**

Fertilizer prescription for targeted yields of potato for varying soil test values.

Soil test values (Kg ha^{-1})			Without FYM			With FYM (10 t FYM ha^{-1})		
			175 q ha^{-1} target			175 q ha^{-1} target		
N	P	**K**	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**231**	**125**	**196**	**171**	**113**	**175**
120	**8**	**300**	**223**	**114**	**179**	**165**	**104**	**152**
140	**10**	**400**	**251**	**103**	**162**	**158**	**93**	**137**
160	**12**	**500**	**207**	**92**	**145**	**152**	**82**	**121**
180	**14**	**600**	**199**	**81**	**128**	**146**	**72**	**105**
200	**16**	**700**	**191**	**70**	**111**	**140**	**61**	**90**
220	**18**	**800**	**183.0**	**59.0**	**94.12**	**133.2**	**50.2**	**74.1**

Yield Targeting in Potato with IPNS based STCR

1. Jabalpur, Pea

Crop	:	Pea
Soil Type	:	**Shallow , Medium black and Deep black**
Varieties	:	**JP -885**
Yield (q ha^{-1})	:	**15 - 25**
Applicability	:	Range of soil test values (Kg ha^{-1}) ; **N : 100-350 , P: 5- 40 ; K: 100-500**
Districts	**:**	Jabalpur ,Indore, Khandwa, Khargone, Narsinghpur, Powarkheda, Sehore, Ujjain.

Composition of FYM : N(%) = 0.72 P_2O_5 (%) = 0.72 K_2O (%) = 0.75

Equation for Calculating the fertilizer nutrient Requirement:

FN = 7.54T – 0.76 SN –1.04ON; FP_2O_5 = 3.88T – 1.51SP –1.48OP;

FK2O = 6.38 T – 0.24 SK – 0.667K

Soil test Values (kg ha^{-1})			Target yield (q ha^{-1}) = 20					
			Without FYM			With 5 t FYM ha^{-1}		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**5**	**100**	**156**	**65**	**159**	**164**	**27**	**146**
150	**10**	**150**	**134**	**59**	**144**	**132**	**21**	**131**
200	**15**	**200**	**122**	**53**	**129**	**100**	**15**	**116**
250	**20**	**250**	**90**	**47**	**104**	**68**	**9**	**91**
300	**25**	**300**	**58**	**41**	**89**	**36**	**2**	**76**

To increase or decrease the yield targets by one quintal per hectare the variations to be made in N= ± 7.5 kg ha^{-1}; P_2O_5= ± 3.8 kg $ha^{-1}$and K_2O= ±6.3 kg ha^{-1}

Grade : need to verify

1. Kerala, Sweet Potato

Variety - Varun
Season - June-July to September-October
Irrigation - Rain fed
Soil type - Laterite
Area of adaptability - Laterite soils of Kerala

Basic data and Fertilizer Adjustment Equations for sweet potato, variety Varun

Nutrient	Basic Data		
	N	**P_2O_5**	**K_2O**
NR (kg/t of rhizome)	2.18	0.87	7.67
CS (%)	19.54	85.56	68.37
CF (%)	71.85	68.63	89.12
COM (%)	14.11	18.55	30.77

Fertilizer Adjustment Equations	
With FYM	**With out FYM**
F N = 3.04T – 0.27SN – 0.20ON	F N = 3.04T – 0.27SN
FP2O5 = 1.27T – 2.85SP – 0.62OP	FP2O5 = 1.27T – 2.85SP
FK2O = 8.60T – 0.93SK – 0.42OK	FK2O = 8.60T – 0.93SK

Ready reckoner N required for different yield targets of sweet potato.

Soil available N (Kg ha^{-1})	Fertilizer N to be applied (Kg ha^{-1})					
	with 7.5 t ha^{-1} of FYM			with 15 t ha^{-1} of FYM		
	30 t ha^{-1}	40 t ha^{-1}	50 t ha^{-1}	30 t ha^{-1}	40 t ha^{-1}	50 t ha^{-1}
100	56.25	86.65	117.05	48.30	78.70	109.10
150	42.75	73.15	103.55	34.80	65.20	95.60
200	29.25	59.65	90.05	21.30	51.70	82.10
250	15.75	46.15	76.55	7.80	38.20	68.60
300	2.25	32.65	63.05	0.00	24.70	55.10

Ready reckoner P required for different yield targets of sweet potato.

Soil available P (Kg ha^{-1})	Fertilizer P_2O_5 to be applied (Kg ha^{-1})					
	with 7.5 t ha^{-1} of FYM			with 15 t ha^{-1} of FYM		
	30 t ha^{-1}	40 t ha^{-1}	50 t ha^{-1}	30 t ha^{-1}	40 t ha^{-1}	50 t ha^{-1}
5	0.00	12.37	25.07	0.00	0.00	0.89
10	0.00	0.00	10.82	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00

Ready reckoner K required for different yield targets of sweet potato.

Soil available K (Kg ha^{-1})	Fertilizer K_2O to be applied (Kg ha^{-1})					
	with 7.5 t ha^{-1} of FYM			with 15 t ha^{-1} of FYM		
	30 t ha^{-1}	40 t ha^{-1}	50 t ha^{-1}	30 t ha^{-1}	40 t ha^{-1}	50 t ha^{-1}
100	142.95	228.95	314.95	120.90	206.90	292.90
150	96.45	182.45	268.45	74.40	160.40	246.40
200	49.95	135.95	221.95	27.90	113.90	199.90
250	3.45	89.45	175.45	0.00	67.40	153.40
300	0.00	42.95	128.95	0.00	20.90	106.90

1. Kerala, Cassava (Tapioca)

Crop - Cassava, Variety: M4
Variety - M4
Season - August September to June July
Soil type - Laterite
Irrigation - Irrigated

Area of adaptability - The laterite soils of Kerala (65% Total geographical area of Kerala is occupied by laterite soils. Laterite soils are found in all the 14 districts of the state.)

Targeted yield equations of Cassava, Variety: M4

FN = 12.10 T – 0.74 SN, FP_2O_5 = 05.04 T – 2.02 SP, FK_2O = 11.93 T – 1.10 SK

Ready reckoner for target of 35 t/ha for cassava crop

Sl. No.	STV N kg/ha	STV P kg/ha	STV K kg/ha	N kg/ha	P_2O_5 kg/ha	K_2O kg/ha
1	100	10.00	100.00	346.00	156.20	307.55
2	150	20.00	150.00	309.00	136.00	252.55
3	200	30.00	200.00	272.00	115.80	197.55
4	250	40.00	250.00	235.00	95.60	142.55
5	300	50.00	300.00	198.00	75.40	87.55
6	350	60.00	350.00	161.00	55.20	32.55
7	400	70.00	400.00	124.00	35.00	0.00
8	450	80.00	450.00	87.00	14.80	0.00
9	500	90.00	500.00	50.00	0.00	0.00
10	550	100.00		13.00	0.00	
11	600			0.00		

1. Andhra Pradesh (Tomato)

Name of the centre : **Rajendranagar**
Soil : **Alfisol**
Crop & Variety : **Tomato – Pusa rabi**
Season developed : **2002-03**
Target range : **15 – 20 t ha^{-1}**
Soil Nitrogen range : **100 – 200 kg ha^{-1}**
Soil phosphorus range : **5 – 50 kg ha^{-1}**
Soil potassium range : **125 – 350 kg ha^{-1}**
FYM composition :
FYM rate : **10 t ha^{-1}**
Green manure composition :
Green manure rate :

Fertilizer adjustment equations

FN = 15.48 T – 2.28 SN- 0.681 FYM N, FP_2O_5 = 1.78 T – 1.14 SP- 0.383 FYM P

FK_2O = 6.82 T – 1.02 SK- 0.082 FYM K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 200 q ha^{-1}**					
Kmn	**Olsen-**	**Amm**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**		
O_4-N	**P**	**Aoc-K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	5	125	236	48	77	206	42	70
110	10	150	214	42	52	183	36	44
120	15	175	191	36	26	160	31	19
130	20	200	168	31		137	25	
140	25	225	145	25		115	19	
150	30	250	122	19		92	14	
160	35	275	100	14		69	8	
170	40	300	77	8		46		
180	45	325	54			23		
190	50	350	31					
200			8					

Applicability

Soil Testing Laboratories : Ranga Reddy and Mahabubnagar districts
Soil type : Sandy clay loam
Crop : Tomato-Pusa Rubi
Season developed : *Rabi*
Yield target : Up to 150-200 q ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

Rahuri, (Maharashtra), Tomato

Crop : Tomato (Summer) **Variety : Dhanshree**
Soil : Typic Ustorthent **Situation: Irrigated**

Districts : Ahmednagar, Nasik, Pune, Satara, Sangli, Kolhapur, Solapur, Dhule

Basic Data

Without FYM					
Nutrient	NR (kg t^{-1})	CS (%)	CF (%)	CFYM (%)	**Targeted Yield Equations**
N	**2.40**	**21.00**	**45**	**-**	**FN = 5.33 T – 0.46 SN**
P_2O_5	**0.70**	**75**	**18**	**-**	**FP_2O_5 = 3.88 T – 4.16 SP**
K_2O	**3.10**	**15**	**60**	**-**	**FK_2O = 5.16 T – 0.25 SK**

With FYM					
N	**2.40**	**25**	**58**	**12**	**FN = 4.13 T – 0.43 SN – 1.13 FYM**
P_2O_5	**0.70**	**78**	**28**	**6**	**FP_2O_5 =2.5 T – 2.78 SP – 0.57 FYM**
K_2O	**3.10**	**20**	**90**	**15**	**FK_2O = 3.44 T – 0.22 SK – 0.75 FYM**

Fertilizer prescription for targeted yields of tomato for varying soil test values.

Soil test values (Kg ha^{-1})			Without FYM			With FYM (20 t FYM ha^{-1})		
			30 t ha^{-1} target			30 t ha^{-1} target		
N	P	K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**114**	**91**	**105**	**70**	**53**	**52**
120	**8**	**300**	**105**	**84**	**80**	**61**	**47**	**30**
140	**10**	**400**	**96**	**75**	**55**	**52**	**42**	**25***
160	**12**	**500**	**86**	**66**	**30**	**44**	**36**	**25***
180	**14**	**600**	**77**	**55**	**25***	**35**	**30**	**25***
200	**16**	**700**	**68**	**50**	**25***	**27**	**25**	**25***
220	**18**	**800**	**59**	**42**	**25***	**18**	**19**	**25***

* Minimum dose of K_2O

1. **Biknaer Clusterbean Vegetable**

Name of the center	:	**ARS, Bikaner**	**Soil nitrogen range**	:	**90-170 kg ha^{-1}**
Soil	:	**Alluvial soils (Bhamatsar and Khiran series)**	**Soil Phosphorus range**	:	**20-60 kg ha^{-1}**
Crop and variety	:	**Clusterbean vegetable (M-83)**	**Soil potassium range**	:	**170-330 kg ha^{-1}**
Season developed	:	**Kharif-2003**	**FYM composition**	:	
Target range	:	**20-25 q ha^{-1}**	**FYM rate**	:	**5 t ha^{-1}**

Fertilizer adjustment equation

FN = 11.40 T – 1.22 SN – 3.35 FYM
FP_2O_5 = 6.60 T – 1.91 S P_2O_5 – 1.84 FYM
FK_2O = 9.22 T – 0.90 SK_2O – 2.75 FYM

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) with 5 t ha^{-1} FYM for yield target of					
$KMnO_4$	Olsens'	Amm.Ac.	20 q ha^{-1}			25 q ha^{-1}		
N	P	-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
90	20	170	60	60	10	60	60	18
100	25	190	60	60	10	60	60	10
110	30	210	53	52	10	60	60	10
120	35	230	41	43	10	60	56	10
130	40	250	29	33	10	52	46	10
140	45	270	17	24	10	39	37	10
150	50	290	10	20	10	27	27	10
160	55	310	10	20	10	15	20	10
170	60	330	10	20	10	10	20	10

Applicability

Soil testing laboratory : Bikaner
Soil : Sobhasar, Khiran, Jamsar, Gajner series
Crop and variety : Clusterbean vegetable (M-83)
Target range : 20-25 q ha^{-1}
Soil nitrogen range : 90-1760 kg ha^{-1}
Soil phosphorus range : 20-60 kg ha^{-1}
Soil potassium range : 170-330 kg ha^{-1}

1. **Bikaner, Guar**

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**80-160 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Bhamatsar and Khiran series)**	**Soil Phosphorus range**	**:**	**15-55 kg ha^{-1}**
Crop and variety	**:**	**Guar (RGC-986)**	**Soil potassium range**	**:**	**170-330 kg ha^{-1}**
Season developed	**:**	**Kharif 2000**			
Target range	**:**	**15-18 q ha^{-1}**			

Fertilizer adjustment equation

FN = 5.38T – 0.46 SN
FP_2O_5 = 5.07 T – 2.46 SP_2O_5
FK_2O = 4.86 T – 0.34 SK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha-1)			**Fertilizer nutrient required (kg ha^{-1}) for yield target of**					
			15 q ha^{-1}			**18 q ha^{-1}**		
$KMnO_4$ N	**Olsens' P**	**Amm.Ac. -K**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
80	**15**	**170**	**44**	**39**	**15**	**60**	**54**	**30**
90	**20**	**190**	**39**	**27**	**15**	**55**	**42**	**23**
100	**25**	**210**	**35**	**20**	**15**	**51**	**30**	**16**
110	**30**	**230**	**30**	**20**	**15**	**46**	**20**	**15**
120	**35**	**250**	**26**	**20**	**15**	**42**	**20**	**15**
130	**40**	**270**	**21**	**20**	**15**	**37**	**20**	**15**
140	**45**	**290**	**16**	**20**	**15**	**32**	**20**	**15**
150	**50**	**310**	**12**	**20**	**15**	**28**	**20**	**15**
160	**55**	**330**	**7**	**20**	**15**	**23**	**20**	**15**

Applicability

Soil testing laboratory : Bikaner
Soil : Sobhasar, Khiran, Gajnar, Bhamatsar series
Crop and variety : Guar (RGC-986)
Target range : 15-18 q ha^{-1}
Soil nitrogen range : 80-160 kg ha^{-1}
Soil phosphorus range : 15-55 kg ha^{-1}
Soil potassium range : 170-330 kg ha^{-1}

1. Bhubneswar

Crop : Pumpkin (cv. Guamal)

General fertilizer recommendation : 75-75-75

Fertilizer adjustment equations

$FN = 4.9\ T - 1.2\ SN$, $F\ P_2O_5 = 2.7\ T - 2.7\ S\ P_2O_5$, $FK_2O = 2.0\ T - 0.5\ S\ K_2O$

Corrected ready reckoner of fertilizer doses at varying soil test values for specific yield targets.

Available soil nutrients (kg ha^{-1})			Fertilizer nutrients required (kg ha^{-1})								
			Targeted yield (50 q ha^{-1})			Targeted yield (60 q ha^{-1})			Targeted yield (70 q ha^{-1})		
N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
80	15	60	76	55	40	124	81	60	150	108	80
100	20	80	52	41	30	100	68	50	150	94	70
120	25	100	28	27	20	76	54	40	126	81	60
140	30	120	20	20	20	52	41	30	102	68	50
160	35	140	20	20	20	28	28	20	78	52	40
180	40	160	20	20	20	24	20	20	54	38	30
200	50	180	20	20	20	20	20	20	30	24	20

(NB : when the calculated fertilizer requirement values tend to zero, a minimum dose, say 20 kg ha^{-1} each for N, P and K are added to the calculated values to bring the dose to a reasonable one).

Equation used by the Soil Testing Laboratory :
Bhubaneswar, Puri, Cuttack, Dhenkanal, Sambalpur, Sundargarh

Districts covered :
Khurda, Puri, Nayagarh, Cuttack, Angul, Dhenkanal, Sambalpur,Bargarh, Jharsududa, Sundargarh

1. Kerala

Crop - Cucumber

Variety - Mudicode local
Season - January to March
Irrigation - Irrigated
Soil type - Laterite

Area of adaptability - Laterite soils of Kerala (65% Total geographical area of Kerala is occupied by laterite soils. Laterite soils are found in all the 14 districts of the state.)

Fertilizer Adjustment Equations

F N = 3.24T - 0.095SN, FP_2O_5 = 1.64T - 1.332SP, FK_2O = 3.16T - 0.068SK

Ready reckoner for fertilizer doses at varying Soil Test Values for specific yield target of Cucumber {Oriental pickling melon- (Cucumis melo conomon)}. Var. Mudikkode

Soil available Nutrients (kg ha-1)			Fertilizer nutrient required (kg ha^{-1}) for fresh Cucumber {Oriental pickling melon- (*Cucumis melo var. conomon*)} yield target of								
			20t ha^{-1}			25t ha^{-1}			30t ha^{-1}		
$KMnO_4$ N	Bray`s P	Amm Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	5	100	55.30	26.20	56.40	71.50	34.42	72.20	87.70	42.54	88.00
150	7	200	50.55	23.54	49.60	66.75	31.75	65.40	82.95	39.97	81.20
200	9	300	45.80	20.87	42.80	62.00	29.09	58.60	78.20	37.30	74.40
250	12	400	41.05	16.88	36.00	57.25	25.09	51.80	73.45	33.31	67.60
300	14	500	36.30	14.21	29.20	52.50	22.43	45.00	68.70	30.64	60.80
350	16	600	31.55	11.55	22.40	47.75	19.76	38.20	63.95	27.98	54.00
400	18	700	26.80	8.88	15.60	43.00	17.10	31.40	59.20	25.31	47.20

1. Kerala

Crop - Sala Cucumber

Variety - AAUC-2
Season - January to March
Irrigation - Irrigated
Soil type - Laterite

Area of adaptability - Laterite soils of Kerala (65% Total geographical area of Kerala is occupied by laterite soils. Laterite soils are found in all the 14 districts of the state.)

Fertilizer adjustment Equation

FN = 6.10 T – 0.31 SN, FP_2O_5 = 0.60 T – 1.38 SP, FK_2O = 1.30 T – 0.06 SK

Ready reckoner for fertilizer doses at varying Soil Test Values for specific yield target of Salad Cucumber Var. AAUC-2

Soil available Nutrients (kg ha-1)			Fertilizer nutrient required (kg ha^{-1}) for fresh Salad Cucumber yield target of								
			20t ha^{-1}			25t ha^{-1}			30t ha^{-1}		
$KMnO_4$ N	Bray`s P	Amm Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	5	100	91.00	5.10	20.00	121.50	8.10	26.50	152.00	11.10	33.00
150	7	200	75.50	2.34	14.00	106.00	5.34	20.50	136.50	8.34	27.00
200	9	300	60.00	0.00	8.00	90.50	2.58	14.50	121.00	5.58	21.00
250	12	400	44.50	0.00	2.00	75.00	0.00	8.50	105.50	1.44	15.00
300	14	500	29.00	0.00	0.00	59.50	0.00	2.50	90.00	0.00	9.00
350	16	600	13.50	0.00	0.00	44.00	0.00	0.00	74.50	0.00	3.00
400	18	700	0.00	0.00	0.00	28.50	0.00	0.00	59.00	0.00	0.00
450	20	800	0.00	0.00	0.00	13.00	0.00	0.00	43.50	0.00	0.00
500	22	900	0.00	0.00	0.00	0.00	0.00	0.00	28.00	0.00	0.00

1. Kerala, Ash Gourd

Variety - ***KAU local***
Season - **May-June to August-September**
Irrigation - **Rain fed**
Soil type - **Laterite**
Area of adaptability - **Laterite soils of Kerala**

Basic data and Fertilizer Adjustment Equations for ash gourd var. KAU local

Nutrient	Basic Data		
	N	P_2O_5	K_2O
NR (kg/t of rhizome)	1.55	0.43	5.20
CS (%)	1.57	4.45	1.25
CF (%)	9.83	11.31	62.56
COM (%)	3.22	0.50	5.59

Fertilizer Adjustment Equations	
With FYM	**With out FYM**
F N = 15.79T–0.16SN–0.33ON	F N = 15.79T–0.16SN
FP_2O_5 = 3.77T–0.90SP–0.10OP	FP_2O_5 = 3.77T–0.90SP
FK_2O = 8.31T–0.024SK–0.11OK	FK_2O = 8.31T–0.024SK

Ready reckoner N required for different yield targets of ash gourd.

Soil available N (Kg ha^{-1})	Fertilizer N to be applied (Kg ha^{-1})					
	with 15 t ha^{-1} of FYM			with 30 t ha^{-1} of FYM		
	10 t ha^{-1}	15 t ha^{-1}	20 t ha^{-1}	10 t ha^{-1}	15 t ha^{-1}	20 t ha^{-1}
100	115.67	194.62	273.57	89.43	168.38	247.33
150	107.67	186.62	265.57	81.43	160.38	239.33
200	99.67	178.62	257.57	73.43	152.38	231.33
250	91.67	170.62	249.57	65.43	144.38	223.33
300	83.67	162.62	241.57	57.43	136.38	215.33

Ready reckoner P required for different yield targets of ash gourd.

Soil available P (Kg ha^{-1})	Fertilizer P_2O_5 to be applied (Kg ha^{-1})					
	with 15 t ha^{-1} of FYM			with 30 t ha^{-1} of FYM		
	10 t ha^{-1}	15 t ha^{-1}	20 t ha^{-1}	10 t ha^{-1}	15 t ha^{-1}	20 t ha^{-1}
5	25.40	44.25	63.10	17.60	36.45	55.30
10	20.90	39.75	58.60	13.10	31.95	50.80
15	16.40	35.25	54.10	8.60	27.45	46.30
20	11.90	30.75	49.60	4.10	22.95	41.80
25	7.40	26.25	45.10	0.00	18.45	37.30

Ready reckoner K required for different yield targets of ash gourd.

Soil available K (Kg ha^{-1})	Fertilizer K_2O to be applied (Kg ha^{-1})					
	with 15 t ha^{-1} of FYM			with 30 t ha^{-1} of FYM		
	10 t ha^{-1}	15 t ha^{-1}	20 t ha^{-1}	10 t ha^{-1}	15 t ha^{-1}	20 t ha^{-1}
100	69.15	110.70	152.25	57.60	99.15	140.70
150	67.95	109.50	151.05	56.40	97.95	139.50
200	66.75	108.30	149.85	55.20	96.75	138.30
250	65.55	107.10	148.65	54.00	95.55	137.10
300	64.35	105.90	147.45	52.80	94.35	135.90

1. Andhra Pradesh (Turmeric)

Name of the centre : Jagtial
Soil : Incepisol (Sandy clay loam)
Crop & Variety : Turmeric – PCT-13
Season developed : *Kharif*, 2005
Target range : 30 – 40 q ha^{-1}
Soil Nitrogen range : 100 – 380 kg ha^{-1}
Soil phosphorus range : 10 – 70 kg ha^{-1}
Soil potassium range : 150 – 400 kg ha^{-1}
FYM composition :
FYM rate :
Green manure composition :
Green manure rate :

Fertilizer adjustment equations

FN = 14.31 T – 1.73 SN, FP_2O_5 = 4.01 T – 1.66 SP

FK_2O = 12.22 T – 1.17 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for Yield target of					
Kmn	Olsen-	Amm	150 q ha^{-1}			200 q ha^{-1}		
O_4-N	P	Aoc-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	10	150	257	104	191	400	144	313
120	15	175	222	95	162	365	135	284
140	20	200	188	87	132	331	127	255
160	25	225	153	79	103	296	119	225
180	30	250	119	70	74	262	110	196
200	35	275	84	62	44	227	102	167
220	40	300	50	54	15	193	94	137
240	45	325	15	45		158	85	108
260	50	350		37		124	77	79
280	55	375		29		89	69	49
300	60	400		21		55	61	20
320	65			12		20	52	
340	70			4			44	

Applicability

Soil Testing Laboratories : Nizamabad, Adilabad and Karimnagar
Soil type : Sandy clay loam
Crop : Turmeric – PCT-13
Season developed : *Kharif*
Yield target : Up to 40 q ha^{-1}

Note: The above equations may be tested in Nizamabad, Adilabad and Karimnagar districts and in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making fertilizer recommendations.

2. Andhra Pradesh (Turmeric)

Name of the centre : Utukur, Kadapa District
Soil : Alfisol
Crop & Variety : Turmeric – Mydukur
Season developed : *Kharif*, 2005
Target range : 30 – 40 q ha^{-1}
Soil Nitrogen range : 100 – 340 kg ha^{-1}
Soil phosphorus range : 10 – 90 kg ha^{-1}
Soil potassium range : 150 – 550 kg ha^{-1}
FYM composition :
FYM rate :
Green manure composition :
Green manure rate :

Fertilizer adjustment equations

FN = 13.62 T – 1.66 SN, FP_2O_5 = 3.74 T – 1.48 SP

FK_2O = 9.29 T – 0.68 SK

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for Yield target of					
Kmn	Olsen-	Amm	150 q ha^{-1}			200 q ha^{-1}		
O_4-N	P	Aoc-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	10	150	243	97	177	379	135	270
120	15	175	209	90	160	346	127	253
140	20	200	176	83	143	312	120	236
160	25	225	143	75	126	279	113	219
180	30	250	110	68	109	246	105	202
200	35	275	77	60	92	213	98	185
220	40	300	43	53	75	180	90	168
240	45	325	10	46	58	146	83	151
260	50	350		38	41	113	76	134
280	55	375		31	24	80	68	117
300	60	400		23	7	47	61	100
320	65	425		16		14	53	83
340	70	450		9			46	66
	75	475					39	49
	80	500					31	32
	85	525					24	15
	90	550					16	

Applicability

Soil Testing Laboratories	:	Kadapa
Soil type	:	Alfisol (Sandy loam)
Crop	:	Turmeric – Mydukur
Season developed	:	*Kharif*
Yield target	:	Up to 40 q ha^{-1}

Note: The above equations may be tested in Kadapa district in Alfisol soils with three or four targets and pick up the best one for adoption for making fertilizer recommendations.

1. **Kerala, Turmeric**

Crop - Turmeric
Variety - *Kanthy*
Season - April May to December January
Irrigation - Rain fed
Soil type - Laterite

Area of adaptability - Laterite soils of Kerala (65% Total geographical area of Kerala is occupied by laterite soils. Laterite soils are found in all the 14 districts of the state.)

Fertilizer Adjustment Equations

F N = $4.70T – 0.63SN$, $FP_2O_5 = 1.77T – 4.48SP$, $FK_2O = 10.49T - 0.45SK$

Ready reckoner for fertilizer dozes at varying Soil Test Values for specific yield target of Turmeric, variety: Kanthy.

Soil available Nutrients (kg ha-1)			Fertilizer nutrient required (kg ha^{-1}) for fresh turmeric rhizome yield target of								
			20t ha^{-1}			25t ha^{-1}			30t ha^{-1}		
$KMnO_4$ N	Bray`s P	Amm Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	5	100	31	13	164	55	22	217	78	31	270
150	7	200	00	4	119	23	13	172	47	22	225
200	9	300	00	00	74	00	4	127	15	13	180
250	12	400	00	00	29	00	00	82	00	00	135
300	14	500	00	00	00	00	00	37	00	00	90
350	16	600	00	00	00	00	00	00	00	00	45
400	18	700	00	00	00	00	00	00	00	00	00

Rahuri, (Maharashtra), Turmeric

Crop : Turmeric (Kharif) **Variety : Salem**
Soil : Typic Haplustert **Situation : Irrigated**

Districts :Kolhapur, Sangli, Satara

Basic Data

Without FYM					
Nutrient	NR (kg q^{-1})	CS (%)	CF (%)	CFYM (%)	Targeted Yield Equations
N	**1.20**	**19.27**	**10.80**	**-**	FN = 11.10 T – 1.78 SN
P_2O_5	**0.35**	**56.47**	**7.47**	**-**	**FP_2O_5 = 4.54 T – 7.55 SP**
K_2O	**2.70**	**27.21**	**49.93**	**-**	**FK_2O = 5.40 T – 0.545 SK**

With FYM					
N	**1.20**	**19.27**	**21.98**	**5.71**	**FN = 6.45 T – 0.88 SN – 2.55 FYM**
P_2O_5	**0.35**	**56.47**	**8.71**	**10.3**	**FP_2O_5 = 4.03 T – 6.48 SP – 0.59 FYM**
K_2O	**2.70**	**27.21**	**59.78**	**11.1**	**FK_2O = 4.52 T – 0.45 SK – 1.40 FYM**

Fertilizer prescription for targeted yields of Turmeric for varying soil test values.

Soil test values (Kg ha^{-1})			Without FYM			With FYM (20 t FYM ha^{-1})		
			70 q ha^{-1} target			70 q ha^{-1} target		
N	P	**K**	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**599**	**273**	**269**	**313**	**231**	**198**
120	**8**	**300**	**563**	**257**	**215**	**295**	**218**	**153**
140	**10**	**400**	**528**	**242**	**160**	**277**	**206**	**108**
160	**12**	**500**	**492**	**227**	**106**	**260**	**193**	**63**
180	**14**	**600**	**457**	**212**	**51**	**242**	**180**	**18**
200	**16**	**700**	**421**	**197**	**25***	**225**	**167**	**25***
220	**18**	**800**	**385**	**182**	**25***	**207**	**154**	**25***

* Minimum dose of K_2O

Rahuri, (Maharashtra), Chilli

Crop : Chilli (Rabi) **Variety: Phule Jyoti**

Soil : Typic Haplustert **Situation:Irrigated**

Districts : Ahmednagar, Nasik, Pune, Satara, Sangli, Kolhapur, Solapur, Dhule

Basic Data

Without FYM					
Nutrient	NR (kg t^{-1})	CS (%)	CF (%)	CFYM (%)	**Targeted Yield Equations**
N	**13.09**	**14.14**	**26.07**	**-**	**FN = 50.23 T – 0.54 SN**
P_2O_5	**4.91**	**57.51**	**18.14**	**-**	**FP_2O_5 = 27.09 T – 3.17 SP**
K_2O	**13.61**	**11.33**	**37.30**	**-**	**FK_2O = 36.48 T – 0.30 SK**

With FYM					
N	**13.09**	**14.14**	**35.15**	**11.90**	**FN = 37.25 T – 0.40 SN – 3.38 FYM**
P_2O_5	**4.91**	**57.51**	**19.34**	**7.28**	**FP_2O_5 =25.40 T – 2.97 SP – 1.88 FYM**
K_2O	**13.61**	**11.33**	**40.02**	**8.28**	**FK_2O = 34.00 T – 0.26 SK – 1.66 FYM**

Fertilizer prescription for targeted yields of chilli for varying soil test values.

Soil test values (Kg ha^{-1})			Without FYM			With FYM (10 t FYM ha^{-1})		
			7 t ha^{-1} target			7 t ha^{-1} target		
N	P	**K**	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**297.6**	**170.6**	**195.3**	**186.9**	**141.1**	**169.4**
120	**8**	**300**	**286.8**	**164.2**	**165.3**	**178.9**	**135.2**	**143.4**
140	**10**	**400**	**276.0**	**157.9**	**135.3**	**170.9**	**129.3**	**117.4**
160	**12**	**500**	**265.2**	**151.5**	**105.3**	**162.9**	**123.3**	**91.4**
180	**14**	**600**	**254.4**	**145.2**	**75.3**	**154.9**	**117.4**	**65.4**
200	**16**	**700**	**243.6**	**138.9**	**45.3**	**146.9**	**111.4**	**39.4**
220	**18**	**800**	**232.8**	**132.5**	**15.3**	**138.9**	**105.5**	**13.4**

1. Andhra Pradesh (Onion) IPNS Based

Name of the centre	**:Rajendaranagar**	**Soil phosphorus range**	**: 10 – 110 kg ha^{-1}**
Soil	**: Alfisols**	**Soil potassium range**	**: 100 – 350 kg ha^{-1}**
Crop and Variety	**: Onion / Nasic Red**	**FYM composition**	**:**
Season developed	**: *Rabi,* 1999-2000**	**FYM rate**	**: 10 t ha^{-1}**
Target range	**: 150 q ha^{-1}– 200 q ha^{-1}**	**Vermi Compost composition**	**:**
Soil Nitrogen range	**: 100 – 300 kg ha^{-1}**	**Vermi Compost rate**	**: 2 t ha^{-1}**

Fertilizer adjustment equations

FN = 0.745 T – 0.38 SN- 0.23 FYM N

FP_2O_5 = 1.15 T – 2.59 SP- 0.830 FYM P

FK_2O = 1.08 T – 0.31 SK- 1.410 FYM K

Fertilizer adjustment equations

FN = 0.745 T – 0.38 SN- 0.469 VC N

FP_2O_5 = 1.15 T – 2.59 SP- 0.75 VC P

FK_2O = 1.08 T – 0.31 SK- 0.98 VC K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 200 q ha^{-1}**								
Kmn O_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With Vermicompost @ 2 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	111	204	185	83	167	79	100	194	170
120	20	125	103	178	177	76	141	72	93	168	163
140	30	150	96	152	170	68	115	64	85	143	155
160	40	175	88	126	162	61	89	56	78	117	147
180	50	200	81	101	154	53	63	48	70	91	139
200	60	225	73	75	146	45	37	41	62	65	132
220	70	250	65	49	139	38	11	33	55	39	124
240	80	275	58	23	131	30		25	47	13	116
260	90	300	50		123	23		17	40		108
280	100	325	43		115	15		10	32		101
300	110	350	35		108	7			24		93

Verification: The above equations are to be verified on the farmers' fields of Ranga Reddy and other districts with yield targets of 150 and 200 q ha^{-1}

Applicability

Soil Testing Laboratories : Rajendranagar
Soil type : Alfisol Sandy loam
Crop : Onion – Nasic Red
Season developed : *Rabi*
Yield target : Up to 200 q ha^{-1}

Note: The above equations may be tested in soils other than Alfisol sandy loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

2. Andhra Pradesh (Onion) IPNS BASED

Name of the centre	**: Rajendaranagar**	**Soil phosphorus range**	**: 10 – 200 kg ha^{-1}**
Soil	**: Alfisols**	**Soil potassium range**	**: 100 – 500 kg ha^{-1}**
Crop and Variety	**: Onion / Nasic Red**	**FYM composition**	**:**
Season developed	**: *Rabi,* 2000-2001**	**FYM rate**	**: 10 t ha^{-1}**
Target range	**: 200 q ha^{-1}**	**Vermi Compost composition**	**:**
Soil Nitrogen range	**: 100 – 560 kg ha^{-1}**	**Vermi Compost rate**	**: 2 t ha^{-1}**

Fertilizer adjustment equations

FN = 0.83 T – 0.30 SN- 0.34 FYM N

FP_2O_5 = 0.96 T – 1.76 SP- 0.66 FYM P

FK_2O = 1.86 T – 0.75 SK- 0.77 FYM K

Fertilizer adjustment equations

FN = 0.83 T – 0.30 SN- 0.55 VC N

FP_2O_5 = 0.96 T – 1.76 SP- 0.78 VC P

FK_2O = 1.86 T – 0.75 SK- 0.93 VC K

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) for production of 200 q ha^{-1}**								
KmnO_4-N	**Olsen-P**	**Amm Aoc-K**	**Only Chemical fert.**			**With Fym @ 10 t ha^{-1}**			**With Vermicompost @ 2 t ha^{-1}**		
			N	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	10	100	136	174	297	102	145	205	122	163	278
120	20	125	130	157	278	96	127	186	116	146	259
140	30	150	124	139	260	90	110	167	110	128	241
160	40	175	118	122	241	84	92	148	104	110	222
180	50	200	112	104	222	78	74	130	98	93	203

Soil available nutrients (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for production of 200 q ha^{-1}								
Kmn O_4-N	Olsen-P	Amm Aoc-K	Only Chemical fert.			With Fym @ 10 t ha^{-1}			With Vermicompost @ 2 t ha^{-1}		
			N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
200	60	225	106	86	203	72	57	111	92	75	184
220	70	250	100	69	185	66	39	92	86	58	166
240	80	275	94	51	166	60	22	73	80	40	147
260	90	300	88	34	147	54	4	55	74	22	128
280	100	325	82	16	128	48		36	68	5	109
300	110	350	76		110	42		17	62		91
320	120	375	70		91	36			56		72
340	130	400	64		72	30			50		53
360	140	425	58		53	24			44		34
380	150	450	52		35	18			38		16
400	160	475	46		16	12			32		
420	170	500	40			6			26		
440	180		34						20		
460	190		28						14		
480	200		22						8		
500			16						2		
520			10								

Verification: The above equations are to be verified on the farmers' fields of Ranga Reddy and other districts with yield targets of 150 and 200 q ha^{-1}

Applicability

Soil Testing Laboratories : Rajendranagar
Soil type : Alfisol Sandy loam
Crop : Onion – Nasic Red
Season developed : *Rabi*
Yield target : Up to 200 q ha^{-1}

Note: The above equations may be tested in soils other than Alfisol sandy loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

Verification: The above fertilizer adjustment equations were tested in the farmers' fields of Guntur district during *kharif* 1997 for yield targets of 25 and 30 q ha^{-1}. All the yield targets were attained at the places tested.

Applicability

Soil Testing Laboratories : Guntur, Ongole, Vijayawada and Khammam
Soil type : Black sols
Crop : Chillies high yielding varieties
Season developed : *Kharif*
Yield target : Upto 30 q ha^{-1}

Ready Reckoner of Fertilizer Doses at Varying Soil Test Values for Specific Yield Target

Soil available nutrients (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for production of 20 t ha^{-1}					
Kmn	Olsen-	Amm	Only Chemical fert.			With Fym @ 10 t ha^{-1}		
O_4-N	P	Aoc-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	5	125	189	125	209	175	120	203
120	10	150	179	116	193	164	111	187
140	15	175	168	106	177	154	101	171
160	20	200	157	97	161	143	92	155
180	25	225	147	88	145	132	83	139
200	30	250	136	79	129	122	74	123
220	35	275	126	70	113	111	65	107
240	40	300	115	60	97	101	55	91
260	45	325	104	51	81	90	46	75
280	50	350	94	42	65	79	37	59
300	55	375	83	33	49	69	28	43
320	60	400	73	24	33	58	19	27
340	65	425	62	14	17	48	9	11
360	70	450	51	5	1	37	0	0

Verification: The above equations are to be verified on the farmers' fields of Nellore district with yield targets of 20 and 25 t ha^{-1}

Applicability

Soil Testing Laboratories	:	Nellore and Ongole
Soil type	:	Sandy clay loam
Crop	:	Colocasia –KCS-2/RCNA-1 or high yielding varieties
Season developed	:	*Rabi*
Yield target	:	Up to 20-25 t ha^{-1}

Note: The above equations may be tested in soils other than sandy clay loam in the farmers' fields with three or four targets and pick up the best one for making recommendations.

1. Uttarakhand (Onion)

Name of the Centre	**:**	**Olsen's-P**	**: 10-40 kg ha^{-1}**
Soil	**: Mollisols and Inceptisols**	**Amm. Acetate-K**	**: 140-200 kg ha^{-1}**
Crop and Variety	**: Nasik Red**	**FYM composition (%)**	**: 0.35-0.24-0.36**
Situation	**: Irrigated**	**FYM rate**	**: 10 t/ha**
Season developed	**: Rabi**	**Green manure composition**	**:----**
Target range	**: 300-350 q/ha q ha^{-1}**	**Green manure rate**	**: ----**
Alkaline $KMnO_4$-N	**: 150-210 kg ha^{-1}**		

Fertilizer adjustment equation for yield targets (kg/ha)

F N (N kg/ha) =0.62 x YT (q/ha) –0.691SN-2.07FYM-N
F P (P kg/ha) = 0.136x YT (q/ha) –0.45SP-0.598FYM-P
F K (K kg/ha) =0.237 x YT (q/ha) –0.306SP-0.188FYM-K

Ready reckoners for 350 q/ha yield targets of Onion (Nasik Red) based on soil test fertilizer recommendations with 10 t/ha FYM.

Initial Soil Test Value (kg/ha)			**Nutrient added (kg/ha) for an yield target of 350 q**		
N	**P**	**K**	**N**	**P**	**K**
150	10	150	41.94	28.75	30.36
170	20	170	28.12	24.25	24.24
190	30	190	14.30	19.75	18.12
210	40	210	0.48	15.25	12.00

Applicability:U.S. Nagar, Haridwar, Nainital and some parts of Western U.P.

1. Tamil Nadu: Onion

Name of the centre : **Coimbatore**
Soil : **Red (Inceptisol)**
Crop & Variety : **Onion var CO 4**
Season developed : **Kharif**
Target range : **170 q ha^{-1}**
Soil Nitrogen range : **160 – 300 kg ha^{-1}**
Soil phosphorus range : **10 – 24 kg ha^{-1}**
Soil potassium range : **200 – 340 kg ha^{-1}**

FYM composition (N:P:K) : **0.35 : 0.12 : 0.35 % (Dry weight basis)**
FYM rate : **25 t ha^{-1} (30% moisture)**
Green manure composition : **-**
Green manure rate : **-**

Fertilizer Prescription Equations

FN = 0.99 T - 0.37 SN - 0.58 ON
FP_2O_5 = 0.58 T - 1.43 SP - 0.69 OP
FK_2O = 0.67 T - 0.25 SK - 0.44 OK

Ready reckoner of fertilizer doses at varying soil test values for specific yield target

Initial soil tests (kg ha^{-1})			**Nutrients required (kg ha^{-1}) for an yield target of 170 q ha^{-1} of fresh bulb**		
KMnO4-N	**Olsen-P**	**NN NH_4OAc-K**	**N**	**P_2O_5**	**K_2O**
160	10	200	109	85	64
180	12	220	101	83	59
200	14	240	94	80	54
220	16	260	87	77	49
240	18	280	79	74	44
260	20	300	72	71	39
280	22	320	64	68	34
300	24	340	57	65	29

Blanket Recommendation: 60 : 60 : 30 (kg N : P_2O_5 : K_2O ha^{-1})

Recommendation domain

Soil type : Red – sandy loam
Yield target : 170 q ha^{-1}
District(s) : Coimbatore, Dindigul, Erode, Karur, Madurai, Namakkal, Salem, Theni, Tiruchirappalli
Grade : Good

Rahuri, (Maharashtra), Onion

Crop : Onion (Rabi) **Variety:N-2-4-1**
Soil : Typic Haplusterts **Situation:Irrigated**

Districts : Nasik, Ahmednagar, Pune, Satara, Dhule, Solapur, Jalgaon, Aurangabad, Beed, Latur.

Basic Data

Nutrient	NR (kg t^{-1})	CS (%)	CF (%)
N	**1.13**	**11.25**	**21**
P_2O_5	**1.17**	**55**	**29**
K_2O	**2.04**	**7.37**	**66.2**

Targeted Yield Equations

FN = 5.40 T – 0.54 SN

FP_2O_5 = 4.00 T – 4.32 SP

FK_2O = 3.10 T – 0.13 SK

Fertilizer prescription for targeted yields of onion for varying soil test values.

Soil test values (kg ha^{-1})			Fertilizer prescriptions (kg ha^{-1})					
			25 t ha^{-1} target			30 t ha^{-1} target		
N	P	K	**N**	P_2O_5	K_2O	N	P_2O_5	K_2O
100	**6**	**200**	**81**	**74**	**52**	**108**	**94**	**67**
120	**8**	**300**	**70**	**65**	**39**	**97**	**85**	**54**
140	**10**	**400**	**59**	**57**	**26**	**86**	**77**	**41**
160	**12**	**500**	**49**	**48**	**25***	**76**	**68**	**28**
180	**14**	**600**	**38**	**39**	**25***	**65**	**60**	**25***
200	**16**	**700**	**27**	**30**	**25***	**54**	**51**	**25***

* Minimum dose of K_2O

1. Pantanagar (Garlic)

Crop & Var.	**: Garlic (Pant Lohit)**	Soil phosphorus range	:
Soil	:	Soil potassium range	:
Soil	:	FYM composition	:
Situation	:	FYM rate	:
Target range	: q ha^{-1}	Green manure composition	:
Soil Nitrogen range	:	Green manure rate	:

Fertilizer adjustment equations of STCR experiments for different crops under IPNS

F N (N kg/ha) = 2.9 x YT (q/ha) – 1.28SN-0.227FYM-N
F P (P kg/ha) = 0.90x YT (q/ha) –1.68SP-0.47FYM-P
F K (K kg/ha) =1.27 x YT (q/ha) –0.64SP-0.048FYM-K

Ready reckoners on soil test based fertilizer recommendations for specific yield targets of garlic

Initial soil tests (kg ha^{-1})			**Nutrient added (kg ha^{-1}) for an yield target of 15 q ha^{-1}**		
$KmnO_4$ N	**P**	**K**	**N**	**P_2O_5**	**K_2O**
100	10	100	215	81	71
125	15	125	185	76	59
150	20	150	154	72	46
175	25	175	123	67	34
200	30	200	92	62	21
225	35	225	61	57	8
250	40	250	30	52	5
275	45	275	10	47	5
300	50	300	10	42	5
325	55	325	10	37	5
350	60	350	10	32	5
375	65	375	10	10	5
400	70	400	10	10	5

1. Kerala, Ginger

Crop - Ginger

Variety - Maran
Season - April May to December January
Irrigation - Rain fed
Soil type - Laterite

Area of adaptability - Laterite soils of Kerala (65% Total geographical area of Kerala is occupied by laterite soils. Laterite soils are found in all the 14 districts of the state.)

Fertilizer Adjustment Equations

$FN = 7.80T - 0.37SN$, $FP_2O_5 = 2.80T - 0.64SP$, $FK_2O = 10.60T - 0.83SK$

Ready reckoner for fertilizer dozes at varying Soil Test Values for specific yield target of fresh ginger rhizome in the rain fed condition.

Soil available nutrients (kg ha-1)			Fertilizer nutrient required (kg ha^{-1}) for yield target of								
			15t ha^{-1}			20t ha^{-1}			25t ha^{-1}		
$KmnO_4$ N	Bray`s P	Amm Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
140	10	50	65	36	117	104	50	170	143	64	223
160	15	75	58	32	96	97	46	149	135	60	202
180	20	100	50	29	75	89	43	128	128	57	181
200	25	125	43	26	54	82	40	107	121	54	160
220	30	150	36	23	33	75	37	86	114	51	139
240	35	175	28	20	12	67	34	65	106	48	118
260	40	200	21	16	0	60	30	46	99	44	99

Fruit crops

Kerala, Banana

Crop - Banana
Variety - Nendran Banana
Season - August September to July August
Irrigation - As it is one-year crop, the crop must be irrigated during the dry period
Soil type - Laterite

Area of adaptability - Laterite soils of Kerala (65% Total geographical area of Kerala is occupied by laterite soils. Laterite soils are found in all the 14 districts of the state.)

Fertilizer Adjustment Equations
FN = 83.49T-7.69SN, FP_2O_5 = 19.34T-34.93SP, K_2O = 121.18T-5.38SK

Ready Reckoner for Fertilizer Dozes at Varying Soil Test Values for specific Yield Target of Banana (Nendran)

Soil available nutrients (kg ha^{-1})			Fertilizer nutrient required (kg ha^{-1}) for yield target of								
			20t ha^{-1}			25t ha^{-1}			30t ha^{-1}		
$KmnO_4$ N	Bray`s P	Amm Ac-K	N	P_2O_5	K_2O	N	P_2O_5	K_2O	N	P_2O_5	K_2O
100	6	100	901	177	1886	1318	274	2492	1736	370	3097
150	8	200	517	108	1348	933	205	1954	1351	301	2556
200	10	300	132	38	810	549	135	1416	967	231	2021
250	12	400	0	0	272	164	65	878	582	161	1483
300	14	500	0	0	0	0	0	340	195	91	945
350	16	600	0	0	0	0	0	0	0	21	407
400	18	700	0	0	0	0	0	0	0	0	0

Medicinal aromatic plants

Bikaner, Cumin

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**70-160 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Bhamatsar and Khiran series)**	**Soil Phosphorus range**	**:**	**20-60 kg ha^{-1}**
Crop and variety	**:**	**Cumin (RZ-209)**	**Soil potassium range**	**:**	**170-330 kg ha^{-1}**
Season developed	**:**	**Rabi 2004-05 and 2005-06**	**FYM composition**	**:**	**0.73% N, 0.31% P_2O_5 and 0.44% K_2O**
Target range	**:**	**8-10 q ha^{-1}**	**FYM rate**	**:**	**5 t ha^{-1}**

Fertilizer adjustment equation

FN = 15.82T – 0.40 SN – 0.76 ON
FP_2O_5 = 9.91 T – 0.68 S P_2O_5 – 1.20 OP_2O_5
FK_2O = 10.07 T – 0.16 SK_2O – 0.84 OK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) with 5 t ha^{-1} FYM for yield target of**					
			8 q ha^{-1}			**10 q ha^{-1}**		
$KMnO_4$ N	**Olsens' P_2O_5**	**Amm.Ac. - K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
70	**20**	**170**	**74**	**47**	**35**	**106**	**67**	**55**
90	**25**	**190**	**66**	**44**	**32**	**98**	**64**	**52**
100	**30**	**210**	**62**	**40**	**28**	**94**	**60**	**49**
110	**35**	**230**	**58**	**37**	**25**	**90**	**57**	**45**
120	**40**	**250**	**54**	**33**	**22**	**86**	**53**	**42**
130	**45**	**270**	**50**	**30**	**19**	**82**	**50**	**39**
140	**50**	**290**	**46**	**27**	**16**	**78**	**47**	**36**
150	**55**	**310**	**42**	**23**	**12**	**74**	**43**	**33**
160	**60**	**330**	**38**	**20**	**9**	**70**	**40**	**29**

Verification **: The above fertilizer adjustment equations were tried on the farmers' fields in Bikaner district with varying yield targets during Rabi 2007-08 and all the yield targets could be achieved at the place tried**

Applicability

Soil testing laboratory : Bikaner
Soil : Sobhasar, Khiran, Jamsar, Bhamatsar series
Crop and variety : Cumin (RZ-209)
Target range : 8-10 q ha^{-1}
Soil nitrogen range : 70-160 kg ha^{-1}
Soil phosphorus range : 20-60 kg ha^{-1}
Soil potassium range : 170-330 kg ha^{-1}

Bikaner, Isabgol

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**70-160 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Adsar and Khiran series)**	**Soil Phosphorus range**	**:**	**20-60 kg ha^{-1}**
Crop and variety	**:**	**Isabgo (RI-89)**	**Soil potassium range**	**:**	**170-330 kg ha^{-1}**
Season developed	**:**	**Rabi 2005-06 and 2006-07**	**FYM composition**	**:**	**0.66% N, 0.38% P_2O_5 and 0.47% K_2O**
Target range	**:**	**10-12 q ha^{-1}**	**FYM rate**	**:**	**5 t ha^{-1}**

Fertilizer adjustment equation

FN = 9.35T – 0.33 SN – 0.65 ON
FP_2O_5 = 6.53 T – 0.76 S P_2O_5 – 0.86 OP_2O_5
FK_2O = 6.95 T – 0.13 SK_2O – 0.47 OK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) with 5 t ha^{-1} FYM for yield target of**					
			10 q ha^{-1}			**12 q ha^{-1}**		
$KMnO_4$ N	**Olsens' P_2O_5**	**Amm.Ac. - K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
70	**20**	**170**	**49**	**34**	**36**	**68**	**47**	**50**
90	**25**	**190**	**42**	**30**	**34**	**61**	**43**	**48**
100	**30**	**210**	**39**	**26**	**31**	**58**	**39**	**45**
110	**35**	**230**	**36**	**22**	**29**	**54**	**35**	**42**
120	**40**	**250**	**32**	**19**	**26**	**51**	**32**	**40**
130	**45**	**270**	**29**	**15**	**23**	**48**	**28**	**37**
140	**50**	**290**	**26**	**11**	**21**	**45**	**24**	**35**
150	**55**	**310**	**23**	**7**	**18**	**41**	**20**	**32**
160	**60**	**330**	**19**	**3**	**16**	**38**	**16**	**29**

Verification **: The above fertilizer adjustment equations were tried on the farmers' fields in Bikaner district with varying yield targets during Rabi 2007-08 and all the yield targets could be achieved at the place tried**

Applicability

Soil testing laboratory	: Bikaner
Soil	: Sobhasar, Khiran, Jamsar, Adsar series
Crop and variety	: Isabgol (RI-89)
Target range	: 10-12 q ha^{-1}
Soil nitrogen range	: 70-160 kg ha^{-1}
Soil phosphorus range	: 20-60 kg ha^{-1}
Soil potassium range	: 170-330 kg ha^{-1}

Bikaner, Fennel

Name of the center	**:**	**ARS, Bikaner**	**Soil nitrogen range**	**:**	**100-180 kg ha^{-1}**
Soil	**:**	**Alluvial soils (Adsar and Khiran series)**	**Soil Phosphorus range**	**:**	**30-70 kg ha^{-1}**
Crop and variety	**:**	**Fennel (RF-125)**	**Soil potassium range**	**:**	**210-370 kg ha^{-1}**
Season developed	**:**	**Rabi 2006-07 and 2007-08**	**FYM composition**	**:**	**0.73% N, 0.35% P_2O_5 and 0.70% K_2O**
Target range	**:**	**25-30 q ha^{-1}**	**FYM rate**	**:**	**5 t ha^{-1}**

Fertilizer adjustment equation

FN = 8.93T – 0.61 SN – 1.52 ON
FP_2O_5 = 3.95 T – 0.94 S P_2O_5 – 1.36 OP_2O_5
FK_2O = 4.37 T – 0.17 SK_2O – 0.72 OK_2O

Ready Reckoner of fertilizer doses at varying soil test values for specific yield target

Soil available nutrient (kg ha^{-1})			**Fertilizer nutrient required (kg ha^{-1}) with 5 t ha^{-1} FYM for yield target of**					
			25 q ha^{-1}			**30 q ha^{-1}**		
$KMnO_4$ N	**Olsens' P_2O_5**	**Amm.Ac. - K_2O**	**N**	**P_2O_5**	**K_2O**	**N**	**P_2O_5**	**K_2O**
100	30	210	107	47	48	151	67	70
110	35	230	101	42	45	145	62	67
120	40	250	95	37	42	139	57	63
130	45	270	88	33	38	133	52	60
140	50	290	82	28	35	127	48	57
150	55	310	76	23	31	121	43	53
160	60	330	70	20	28	115	38	50
170	65	350	64	20	25	109	34	46
180	70	370	58	20	21	103	29	43

Applicability

Soil testing laboratory: Bikaner
Soil : Adasar, Sobhasar, Khiran, Jamsar, Gajnar series
Crop and variety : Fennel (RF-125)
Target range : 25-30 q ha^{-1}
Soil nitrogen range : 100-180 kg ha^{-1}
Soil phosphorus range: 30-70 kg ha^{-1}
Soil potassium range : 210-370 kg ha^{-1}