Technology 6: On-line Soil Fertility Maps of Different States and Fertilizer Recommendation System for Targeted Yields of Crops

The soil fertility data on N, P, and K index values at district level for the states of Andhra Pradesh, Maharastra, Chhattishgarh, West Bengal, Haryana, Orissa, HP, Karnataka, Panjab, Tamil Nadu and Bihar of India has been developed in MS-Access. The state boundary maps, which consist of districts were scanned in .tiff format and imported to Arc GIS system ver 9.0. The polyconic projection system with modified Everest Datum was followed for each state during the georeferencing. The state and district boundaries were digitized. The individual district ids were assigned in the layer to assign the attribute database. Through arc catalog the columns for N, P and K were added in the layer to enter the attribute data. As for as the attribute database is concern, the N, P, K index values of each district in state were imported from MS-Access and assigned to polygon attribute table (PAT) in the layer. From the attribute database, the different thematic layers have been reclassified to generate various thematic maps on N, P, K index values.

These IVs were classified in to three categories viz. (Low 0- 1.5, Medium 1.5-2.5 and High >2.5). STCR approach has been used to prescribe optimum doses of nutrients, based on available soil nutrients.

The calculated soil test values were incorporated into the developed fertility maps to prescribe nutrients for targeted yields. This application software was developed to recommend fertilizer doses for the targeted yield at the District level. This system has the facility to input actual soil test values at the farmers fields to obtain optimum doses. The application is a user-friendly tool. It will aid to the farmer in improving the efficiency (appropriate dose) of fertilizer use to achieve a specific crop yield. The system is explained with the example of Tamil Nadu state.

The system works as a ready reckonner to give prescription in the form of fertilizer available (eg. Urea, SSP, MOP etc.). In case of known fertility status one can give the known values for N, P and K and submit for calculation. This system provides real use of fertility maps to the users. It can be used up to field level also, if the farmer has the knowledge of his field fertility status and the target. It can be further narrowed down to block/village level depending on the availability of information. The experiments conducted at different locations in the states under STCR scheme suggest that a considerable amount can be saved if the fertilizers are prescribed using soil test values.

Prescription of optimum doses

On running the application with an Internet browser the page shown below will be displayed. All three images are click able thumbnail to the corresponding larger images
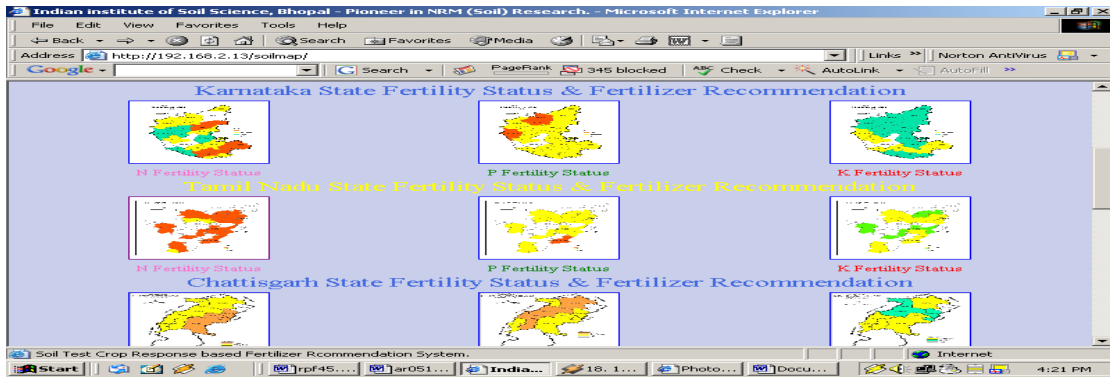
of N, P and K status. On clicking any of the links, the corresponding larger image will be displayed on the screen as shown below (for Nitrogen of Tamil Nadu)
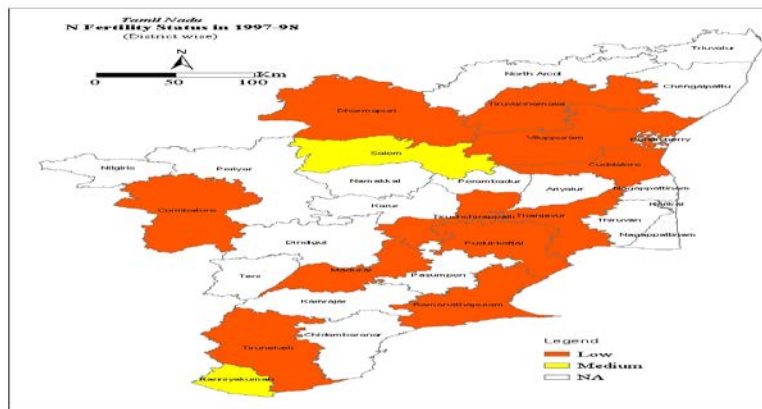
Each district on the maps is uniquely identifiable and upon clicking any district the relevant page for that district will be displayed. On clicking Coimbatore district in the N status map and proving data (sequentially in order soil type, crop, crop variety, season and target (say 40 q/ha)) the page displayed is:
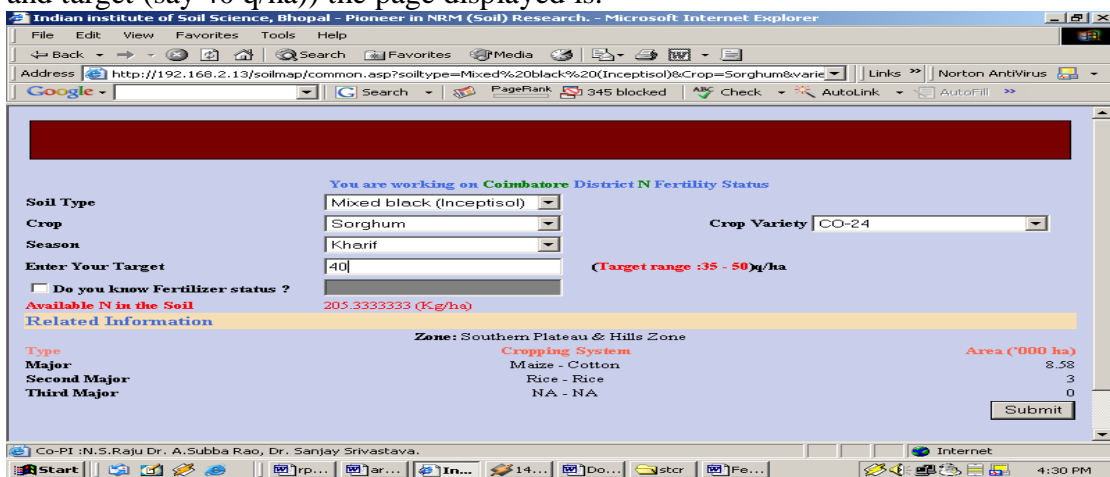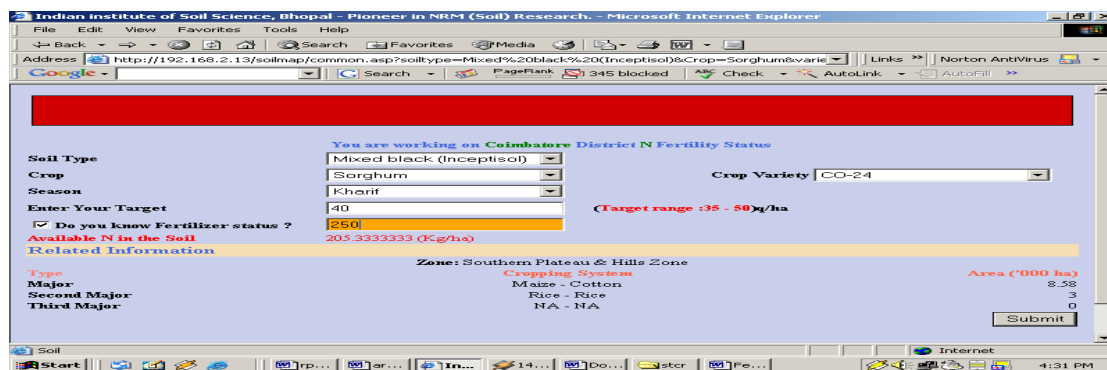
After submitting target we will get recommendation as follows:
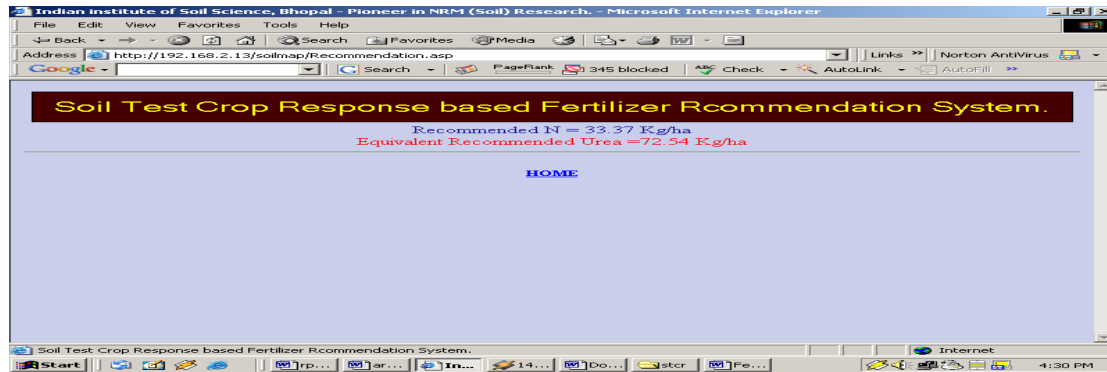
We see that the system suggests that for obtaining 40 q/ha yield of Sorghum in the district Coimbatore 33.37 kg N is required (equivalent to 72.54 kg Urea).

In case a farmer in the district is having actual knowledge of his field fertility status we will see how the recommendations are changed. Now, suppose the available N is 250 Kg/ha in the field and other parameters are taken exactly as above (see below)

After submitting the target of 40 q/ha. We will get recommendation as follows:
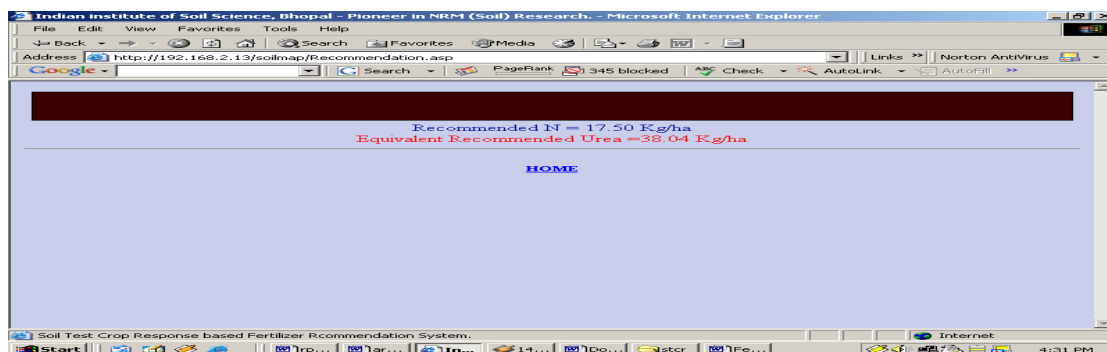
We see that recommendation has changed with change in available soil nitrogen. Similarly one can obtain the recommendations for P and K.