



AICRP on Soil Test Crop Response (AICRP STCR)

Project Title
Soil test and resource based integrated plant nutrient supply system for sustainable agriculture
Soil Test Crop Response (STCR) correlation studies at ICAR-CRIJAF, Barrackpore, West Bengal was initiated in 1971 through AICRP on STCR programme. Valuable information have been generated on prescription based fertilizer applications schedule for jute based cropping system (jute, rice and rabi pulses/potato) to get desired yield of crops which are being utilized for the farmers regarding judicious use of fertilizers for sustainable crop production.
Years of operation: 1971 to 2000 and from 2005 to continuing (as voluntary centre)
Objectives <ul style="list-style-type: none">• To develop relationship between soil test values and crop response to fertilizers in order to provide a calibration of fertilizer recommendation based on soil tests.• To evaluate the conjoint use of chemical fertilizers and organic manure for enhanced nutrient use efficiency.• To evaluate a basis for making fertilizer recommendations for a whole cropping sequence based on initial soil test values.• To develop linkages with extension agencies and soil testing laboratories for effective transfer of profitable IPNSS technology to the farmers.
Main field experiments on jute, rice and rabi pulse/ potato/onion were carried out under jute-rice-rabi pulses/ potato/onion sequence at CRIJAF, Barrackpore. Before taking test crops in the sequence, three fertility gradients viz. Strip-I, Strip-II and Strip-III were created by growing maize as an exhaustive crop with the differential doses of NPK/NKS fertilizers and seed rate. After creating the artificial fertility gradient, jute, rice, lentil, vegetable pea, mustard, potato and onion were grown as test crop using augmented RBD with 19 treatments (4 levels each of N, P & K / N, K &S) including 3 controls with and without organic manures.

Basic data and targeted yield equations

Basic data for nutrient requirement (NR), soil, fertilizer and organic efficiency were created. From basic data IPNS fertilizers prescription equations for jute, rice, wheat, lentil, mustard, mesta, sunnhemp, vegetable pea, potato and onion were developed for different varieties.

Soil test target yield equations developed for

Jute: JRC 212, JRO 632, JRO 7835, JRO 128, JRO 524, JRO 204, JRO 2407, JRO CO 58, JRO 8432

Rice: Jaya, Ratna, Pankaj, CR 1094, MTU 1010, Kshitish, Satabdi, Banskati, NDR 97, GS 3

Wheat: UP 262

Mesta: HC 583

Sunnhemp: SUIN 037

Lentil: B 256

Mustard: B9

Vegetable Pea: Azad P3

Potato: Kufri jyoti

Onion: Sukhsagar



Visit of QRT Team in STCR Field at ICAR-CRIJAF

A. Response of follow-up trials

Targeted yield equations developed at ICAR-CRIJAF were verified in the farmers' field through follow up trial. Numbers of follow-up trials on jute, rice, lentil, mustard, vegetable pea, potato and onion were conducted in farmers' field to test the validity of targeted yield equations which were generated from the main field experiments of the centre to achieve the desired yield targets of crops. The targeted yield tested for different crops were as follows:

1. Jute: 35 and 40 q ha⁻¹ of fibre production.
2. Rice: 40 and 50 q ha⁻¹ of grain production (short duration crops-100-110 days).
3. Lentil: 10 and 12 q ha⁻¹ of seed production
4. Vegetable pea: 100 and 110 q ha⁻¹ of green pod production.
5. Potato: 20 and 22 t ha⁻¹ of potato
6. Onion : 25 and 28 t ha⁻¹ of bulb

Targeted yield equations were achieved with (+) 10% yield deviations.

Follow up trials under TSP

Several follow up trials were undertaken in the tribal farmers' field under Tribal Sub Plan. Targeted yield equations of jute, rice, lentil and mustard were verified in tribal farmers field in different blocks of Bankura, Nadia and North 24 Parganas district. In most of the cases targeted yields were achieved with (+)(±)10% yield deviations.

Long Term Follow-up Experiment on Jute-Rice-Lentil Sequence And Microbial Activity

An experiment was initiated at CRIJAF in 2010-11 to study the long term effect of ST-TY equation based integrated nutrient management on achievement of target yield, and quality of soil under jute-rice-lentil sequence. The treatments were T₁- control, T₂-ST-TY (5 t ha⁻¹), T₃-ST-TY (4 t ha⁻¹), T₄-T₃+ -FYM (5 t ha⁻¹), T₅-T₃+ *Azotobacter*+ PSB, T₆-T₄+*Azotobacter*+PSB, T₇-FYM @ 5 t/ha, T₈-T₇+*Azotobacter*+PSB, T₉-Recommended dose of fertilizer (RDF), T₁₀-farmers practice (FP) and T₁₁- fallow . *Azotobacter* was used as biofertilizer in jute but in case of lentil *Rhizobium* was used instead of *Azotobacter*. Among all the treatments T₆ was found the best treatment in achieving yield target and maintaining soil quality. Integrated application of fertilizers as per ST-TY with FYM increased enzymatic activity over FP and RDF. Application of fertilizer as per ST-TY with INM increased the crop yield. Application of fertilizers as per ST-TY with FYM significantly increased the available nutrient status over RDF. However, inoculation of phosphate solubilizers along with FYM increased available P status in soil over all the treatments.



Field view of jute in STCR



Field view of paddy in STCR

STCR Team

PI: Dr. A.R. Saha

Co PI: Dr. B. Majumdar, Dr. S.P. Mazumdar, Dr. M.S. Behera