

IISS Newsletter



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From the Director's Desk...

Impact of Intensive Agriculture on Natural Resources and Opportunities for Sustainable Agriculture

Agriculture is a significant contributor to Gross Domestic Product (GDP) in India and provides employment to bulk of the people surpassing the contribution of the other sectors. The contribution of agriculture to GDP was 55.4% in 1950-51, and has been reduced to 18.5% in 2006-07. During the same period, with the introduction of green revolution, India has made remarkable progress in food security, poverty reduction and per capita income.



The Green Revolution technology consisted of a package of inputs, such as seeds of high-yielding varieties, chemical fertilizers, herbicides, pesticides, machineries like tractors, threshers, pump sets/motors, combine harvesters/ reapers and others. The availability of assured irrigation for fertile lands provided a conducive environment that enabled a

dynamic peasantry to accept innovation and new technology and reap the benefits of technology.

In India, Punjab led the green revolution. By the mid 1980s, except for the southern parts of Punjab, the state began to follow a 'wheat-paddy rotation' pattern in cultivation, and, as a consequence Punjab became the food bowl of the country. It increased cropping intensity from 126 % in 1960-62 to 185 % in 1996-97, as a consequence, the net sown area as a percentage of the geographical area rose from 75 to 85 during this period. However, the benefit of green revolution could not be extended to all crops or all regions of India. In terms of crops, it was confined to food grains while in regional terms, only Punjab and Haryana showed the best results of the Green Revolution. The eastern plains of West Bengal, western U.P., coastal A.P. and Tamil Nadu also showed reasonably good results.

The high productive varieties evolved were both water and fertilizer responsive. The indiscriminate use of water, fertilizer and pesticides over the years led to some of the following soil and environmental degradation and affected the crop yield sustainability.

- Imbalanced nutrient consumption ratio i.e. 6:2.4:1 (N: P₂O₅: K₂O) in 2006-07 as against favorable ratio of 4:2:1. The N fertilizer use efficiency has been only 30-35 % mainly because of imbalanced use of other nutrients and other inefficient agronomic practices

- Widespread nutritional disorders particularly Zinc deficiency in rice on sodic and calcareous soils having high pH, low organic matter, high available P or Si, high Mg : Ca ratio and low available Zn.

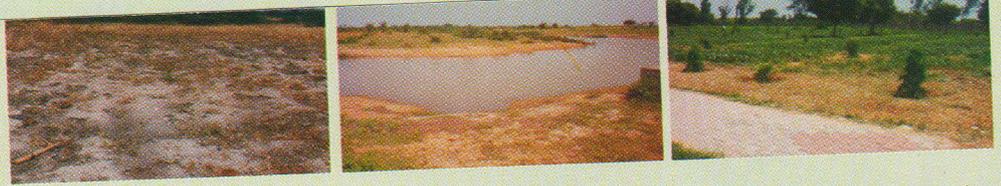
- Injudicious irrigation practices have led to salt build-up and eventual productivity decline in some of the farming lands. Groundwater levels are retreating in areas where more water is being extracted for irrigation than can be replenished by the rains. Heavy dependence on a few major cereal varieties has led to loss of biodiversity on farms.
- Presently ground water is used to irrigate almost 75% of total irrigated land in the country. However, over-exploitation of the resource is forcing fall in the ground water table in many regions of Haryana, Punjab, Tamil Nadu, Rajasthan and Union territories of Chandigarh, Delhi and Lakshadweep.
- In almost all the irrigation commands, the water table has a rising trend by 0.1-1.2 m/year. The benefits of the major and medium irrigation works were therefore, spectacular for the first 10-20 years, but these diminished with the occurrence of water logging and secondary salinity. It has been estimated that 4.5 m ha area in irrigation commands has been affected by water logging, thus, lowering the productivity of the lands.
- Eutrophication of water bodies due to high nitrate and phosphate concentrations, increasing levels of nitrates in drinking water sources, accumulation of heavy metals such as lead and cadmium in soils and water resources are the principal causes of environmental concerns due to fertilizer use in agriculture. Nearly 25 million hectares of land is suffering from acidity, which results in the deficiencies of P, Ca, Mg, Mo and B and toxicities of Al and Fe.

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Fourth Coming Events

- STCR Regional Workshop cum Training -
- Western Region at MPKV, Rahuri, Maharashtra
- Southern Region at ANGRAU, Hyderabad, Andhra Pradesh
- Eastern Region at RAU, Samastipur, Bihar on 21st and 22nd February, 2008.
- Northern Region at GBPUA&T, Pantnagar, Uttarkhand on March 14-15, 2008.
- National seminar on micro & secondary nutrients for balanced fertilisation and food security - 11th to 12th March 2008 at AAU, Anand



- Peri-urban agriculture around cities produces a sizeable amount of agricultural produce particularly vegetables based on urban waste sewage and sludge. These wastes along with plant nutrients and organic matter also contain many toxic substances including heavy metals, pesticide residues, pathogens etc. Uncontrolled decomposition/mineralization of the wastes during raking for cultivation also releases lot of GHGs, NO_3 and other organic pollutants. Soil and water resources and food crops may also get contaminated by the pollutant elements from fall-out of various industries and automobiles near highways in urban areas.
- The global warming is becoming an important issue worldwide. The increase in GHGs was 70% between 1970 and 2004. The global warming is visible from the observation that eleven of the last twelve years rank among the 11 warmest years since 1850. The mean earth temperature has changed by 0.74°C between 1906 and 2005.

Loss of soil organic carbon is an important factor responsible for significant fatigue in the productivity under continuous cultivation, especially of rice-wheat cropping practiced on 11.5 Mha in the country particularly in the Indo-Gangetic plain. It is very exhaustive cropping system with nutrient removal of about 500 kg ha^{-1} of N, P_2O_5 and K_2O in one cropping cycle leading to negative nutrient balance. Declining nutrients in the soil also lowers the sequestration of carbon in the soil that leads to further decline in soil fertility.

Hence, in order to have food security, nutritional security and environmental safety of the country, sustainable management of natural resources is essential as discussed below.

Over the last 35 years, 50-55 per cent improvement in crop productivity could be attributed to fertilizer inputs. Consumption of fertilizers in India increased steadily over the years, but their use efficiency remained low (30-50% for N, 20-25% for P and 2-5% for Zn, Fe & Cu). The application of N alone caused reduction in response ratio from initial 12.5 to 5 over 30 years primarily due to deficiency of P and K. The response ratio increased with the application of P along with N, but its reduction with time was again conspicuous in the absence of K application. The ratio got stabilized at a higher level only with the balanced application of NPK.

The biologically active SOM is believed to be the key to the soil productivity when the fertility is biologically mediated. The use of the adequate levels of organic manures and inorganic fertilizers is indispensable for the successful integrated plant nutrient management systems and for maintenance of soil organic carbon. Studies revealed that when farmyard manure is added regularly, the deficiency of micronutrient is taken care of automatically, other wise $10-12 \text{ kg Zn/ha}$ needs to be applied to sustain the higher yield of various crops. When manure application is limited to $4-8 \text{ t/ha}$, application of zinc dose may be reduced to $3-6 \text{ kg/ha}$ thereby saving a chemical input by 50-75% without reduction in the yield.

The manganese and boron deficiencies have been found in Indo-Gangetic alluvial plains.. With continuous use of high-analysis fertilizers free from sulphur, the deficiency of sulphur has been widely observed. Its deficiency is becoming a major constraint for sustaining optimum yields of oilseed, pulse crops, onion and garlic. The crops grown in many areas are showing significant increase in yield ranging from $10-20 \text{ kg}$ and $5-10 \text{ kg grain per kg}$ of sulphur applied in oil seeds and pulse crops respectively in various agroecological zones of India.

With the progression towards global integration, the competitiveness of domestic cereal based agriculture can only be maintained through dramatic reductions in the cost per unit of production. Technologies for more efficient use of fertilizers, pesticides, and water use are available and could become worthwhile adopting to remove price distortions.

Diversification of crops and farming systems is becoming essential for maintaining soil health, water balance and overall productivity in many parts of the country, especially in Indo-Gangetic plain. Conservation tillage, agroforestry systems, and silvo-pastoral systems, are some of the many examples of agricultural production systems that can generate environmental benefits in the form of carbon sequestration, biodiversity conservation and watershed protection.

The benefit of combining payments for the provision of public environmental goods such as soil carbon sequestration or watershed protection for the adoption of best agricultural practices can eventually lead to increased agricultural productivity. Innovative approaches in agriculture such as improved water and fertilizer management in rice fields; improved management of livestock population and its diet; higher soil carbon sequestration through organic manures, minimal tillage and residue management; effective nitrification inhibitors, like neem-coated urea, fertilizer placement practices; energy efficient designs of machinery and conservation practices can mitigate the emission of GHGs from agricultural sector.

The research and development in agriculture has to focus on developing practicable tools and strategies to conserve moisture in-situ, recharge ground water, harvest water in arid and semi arid areas and develop strategies for multiple use of water especially for humid areas.

It is estimated that one third of fungal diversity of the globe exists in India. But only 50% of the fungi have been characterized so far. Similarly only 1% of the bacteria are culturable. With the advancement in strains identification for specific soil functions, their improvement through molecular tools for rapid growth rates and ability to withstand varied environmental conditions, it will be possible to augment and regulate the soil processes for the advantage of mankind.

Research Highlights

Nitrate Contamination in Groundwater

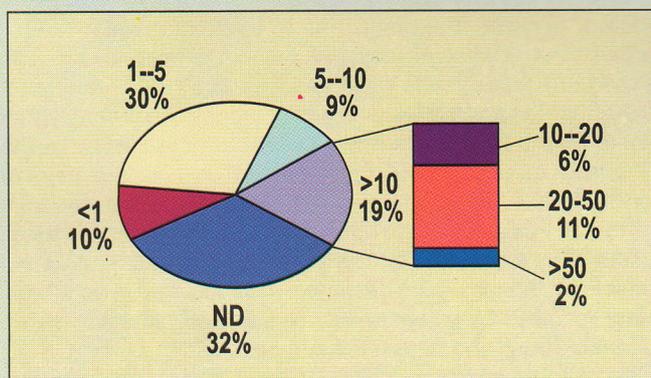
Nitrate contamination in groundwater samples of six heavily fertilized and intensively cultivated districts of the country viz., West Godavari, Hooghly, Ferozpur, Coimbatore, Jalgaon and Hoshangabad were evaluated during pre- and post-monsoon of 2006 and 2007.

Nitrate pollution in groundwater was found in four out of six districts of Ferozpur, Coimbatore, West Godavari and Hoshangabad. The extent of pollution varied between 8 to 20 per cent of total samples, the highest being in West Godavari and the lowest in Hoshangabad.

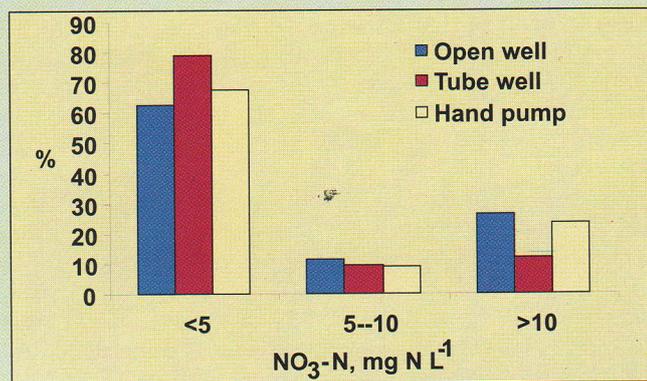


A highly nitrate-polluted open well in Hoshangabad

- ▶ Relationships between nitrate pollution and physico-chemical properties of soil and water have been worked out to delineate the effect of salinity on nitrate pollution. Collateral evidences have also been collected through survey to collate nitrate contamination with various anthropogenic activities. Strong correlation was found between salinity and nitrate levels in the samples of Ferozpur district.
- ▶ Preliminary results showed that the organic sources of nutrients including wash off of agricultural residues, human and animal excreta, especially near habitation area, rather than inorganic sources seem to have played the major role in nitrate contamination of ground water.



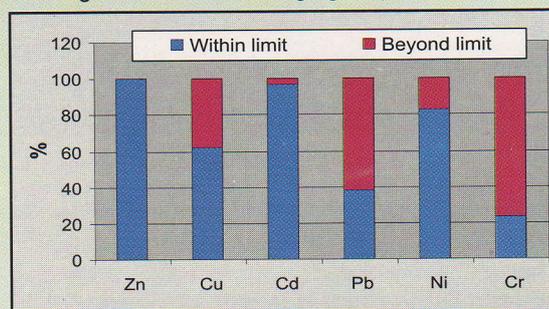
Extent of Nitrate Contamination in West Godavari



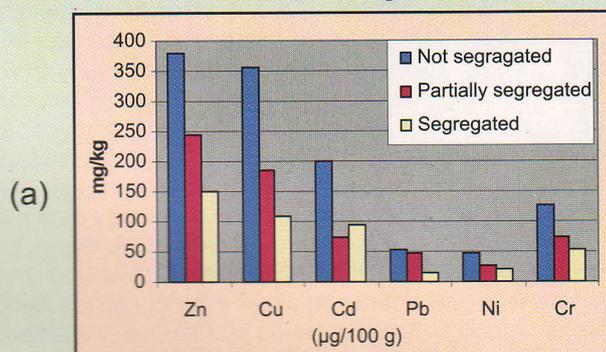
Extent of Nitrate Contamination in West Godavari

Heavy Metal Contents in Municipal Solid Waste Composts

A study was undertaken to characterize commercially marketed municipal solid waste (MSW) composts for heavy metal contents which is important for safeguarding the farmers' interest and for better planning of solid waste management. Heavy metal content varied widely among the compost samples collected. The contents ranged from 82 to 946 mg/kg Zn (median 252), 25 to 865

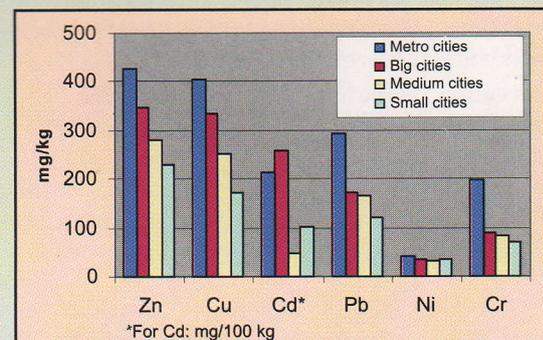


Quality of MSW compost samples with respect to heavy metal content in view of BIS guidelines



(a)

(b)



Variation in heavy metal contents in MSW compost prepared (a) from segregated or non-segregated raw materials and (b) in different types of cities

mg/kg Cu (median 198), trace to 8.4 mg/kg Cd (median 1.0), 9 to 190 mg/kg Ni (median 25), 14 to 401 mg/kg Cr (median 69) and 19 and 662 mg/kg Pb (median 229). Considering the permissible limit values of heavy metal in composts, 38, 3, 18, 76 and 62% samples contained high levels of Cu, Cd, Ni, Cr and Pb respectively. Composts prepared from segregated wastes contained less heavy metals as compared to those prepared from partially segregated or non-segregated wastes. Also, their contents in the MSW composts from metro cities were, in general, higher as compared to the composts prepared in other cities. This is probably because MSW composts in metro cities are manufactured from unsegregated wastes containing higher amount of inert and other toxic substances.



Vermicomposting of segregated wastes in heaps at Suryapet (AP)

Aminoacid and Hexoseamine as Indices of N Mineralization

Four years of soybean-wheat cropping without fertilizer/manure application resulted in depletion of total hydrolysable N by 8.5% in surface and 6.4% in subsurface soil as compared to its initial status. The extent of depletion of non-hydrolysable N in both surface (2.5%) and subsurface (1.2%) soil was very less as compared to hydrolysable N. On the other hand, repeated applications of inorganic fertilizers alone or in combination with different organic manures and farmyard manure (FYM) application alone improved the status of hydrolysable N fraction in both surface and subsurface soils mainly through the improvement in aminoacid, hexoseamine N and hydrolysable ammonical N. The unidentified hydrolysable N and non-hydrolysable N fractions in both surface and subsurface soils were not affected by four years of application of fertilizers and manures. About 3-6% of total N in surface soils and 2-5% subsurface soils got mineralized under waterlogged incubation conditions. Among N fractions amino acid and hexose amine N were better correlated with the soil mineralizable N and N uptake by soybean and wheat crops indicating aminoacid and hexoseamine N may be used as indices of soil N mineralization in Vertisols under intensive cropping.

Conservation Tillage Improves Soil Properties

Adoption of conservation tillage practices significantly improved physical environment of the surface soil. Infiltration characteristics (infiltration rate, cumulative infiltration and sorptivity of soil) measured after soybean were significantly higher under no tillage compared to conventional tillage treatment owing to better aggregation of the surface soil. Imposition of the tillage treatments and applied nitrogen levels

significantly influenced the organic carbon content of soil. The soil organic carbon (SOC) of conservation tillage plots was significantly higher than the conventional tillage plots. Among the N levels SOC at 150% and 100% recommended N levels was significantly higher than the SOC at 50% N level up to 15 cm depth.

Soil Organic Carbon as A Function of Soil and Climatic Parameters

A functional relationship (multiple linear regression equation) was developed to estimate SOC as a function of climatic parameters (maximum, minimum temperatures and rainfall) and soil parameters (clay content). Using the average data set for these parameters as base value for the year 1980 for different India Grid Locations, the changes in the values of these parameters under A2b scenario have been predicted using IPCC Had CM3 model. The SOC stocks at different grid locations have been predicted for the year 2020, 2050 and 2080 based on values of rainfall, maximum and minimum temperatures for these years. The prediction indicated that maximum increase in SOC stock will be in IPCC Had CM3 India Grid Location No.83 which corresponds to eastern part of Maharashtra and part of Chhattishgarh. On the other hand, the maximum decrease in SOC stock is predicted for the India Grid Location No.147 covering southern Kerala and southern Tamil Nadu.

Soil Biological Activities Enhanced with the Integrated Nutrient Management (INM) System

Application of various organic nutrient sources improved the biological and biochemical properties of soil. Contents of microbial biomass, C, N, P and soil respiration were recorded higher with the application of organic manures than conventional chemical nutrients. The contents were maximum in cattle dung manure treatment, whereas in other organic manures (phosphocompost and vermicompost) these were at par. Similarly, the highest biological and biochemical activities were recorded where organic sources of nutrients were applied in combination with chemical fertilizers compared to chemical fertilizers (100% NPK) alone. The maximum biological activity was obtained with 50% NPK + 5 t FYM ha⁻¹ followed by 50% NPK + 1 t poultry manure ha⁻¹ and 50% NPK + 5 t urban compost ha⁻¹.

Recycling Of Organic Wastes Using Fungal Inoculants

Six different organic wastes namely cotton stalk, sugarcane trash, pigeon pea straw, soybean straw, vegetable straw and wheat straw were inoculated with fungi @500 g mycelial mat per tonne of material. The content of C:N ratio, hot water soluble carbon and carbohydrates decreased progressively with passage of time. It was observed that C: N ratio, hot water soluble carbon and hot water soluble carbohydrates varied from 14:1 to 21:1, 0.23 to 0.45% and 0.98 to 1.13 %, respectively. The CEC/TOC ratio increased from 3.3 to 5.3: 1 at 120 days of decomposition. Also the lignin/ cellulose ratio increased from 2.1 to 4.5:1 from these composts. Application of bio-inoculum substantially improved maturity of compost over un-inoculated control and the maximum decomposition occurred in vegetable waste followed by wheat straw, pigeon pea, soybean straw, sugarcane trash and cotton stalk compost.

Biofertilizer for Disadvantaged Districts

The All India Network Project on Biofertilizers, OUAT, Bhubaneswar centre successfully carried out demonstrations on Biofertilizer technologies for 7 vegetable crops with 25 tribal families in village Majhisahi of Dt. Dhenkanal, Orissa. The soils are acidic (pH 5.1-5.4) and medium with respect to organic carbon, available N, P and K. Farmers practice (FP) was compared with recommended practice (RP) using fertilizers, or with Bioinoculation only (BI-Azotobacter, Azospirillum and Phosphate solubilizing bacteria) and with recommended practices and Bioinoculation (RP + BI). The yield increase in vegetables was the best with integration of fertilizers and biofertilizers (RP+BI) in all cases and ranged from 78 to 298% increase in yield of fresh produce over farmers practice. Biofertilization alone increased the yields of fresh produce by 6 to 87% over farmers practice and from 14 to 54% over recommended practices. Table showing yield benefits is given below.

Yields of selected vegetables grown with improved nutrient management practices in Dt. Dhenkanal, Orissa (AINP on BF, OUAT, Bhubaneswar).

S.No.	Treatment	Elephant Foot Yam q/ha	Yam q/ha	Tomato q/ha	Onion q/ha	Carrot q/ha	Cucumber q/ha	Bean q/ha
1	FP	103.4	50.3	164.6	212	67.5	39.6	65.2
2	BI	147.5 (43)	914 (82)	189.2 (15)	234 (10)	126.5 (87)	42.0 (6)	76.6 (18)
3	RP	264.8 (156)	154.3 (207)	248.6 (51)	283 (33)	164.5 (144)	67.8 (71)	119.8 (55)
4	RP + BI	409.0 (296)	200.1 (298)	298.2 (81)	379 (78)	207 (207)	77.2 (95)	158.2 (87)

*Figures in parenthesis represent % yield increase over farmers' practice

Impact of Fertilizer and Manure on Microbial Population in Alfisol under LTFE

The data presented in Table showed decline in microbial population (Bacteria, actinomycetes and azotobacter) with increase in nutrient rate from 50 to 150 per cent. However, positive effect was noted on fungi population. It is further interesting to note that application of fertilizer together with manure resulted in increased population of bacteria, actinomycetes and azotobacter. On the contrary, application of FYM had adverse effect on fungi compared to other three micro fauna. Application of lime also had positive effect on population of these microorganisms.

Microbial counts as affected by different nutrient management options under LTFE at Palampur

Treatments	Bacteria (CFU X 10 ⁷ /g soil)	Actinomy-cetes (CFU X 10 ³ /g soil)	Azotobacter (CFU X 10 ³ /g soil)	Fungi (CFU X 10 ⁴ /g soil)
Control	9.53	19.76	127.83	4.45
100% N	4.55	46.33	11.86	6.98
100% NP	7.96	24.33	45.50	5.13
50% NPK	24.56	52.40	55.16	4.39
100% NPK	11.49	20.30	17.50	7.83
150% NPK	6.94	5.75	14.61	8.06
100% NPK (-S)	13.76	34.63	14.6	5.04
100% NPK + Zn	18.23	8.86	15.93	2.61
100% NPK+ Lime	18.88	87.86	92.66	0.45
100% NPK+FYM	28.08	73.20	226.16	2.78

Awards and Honours

- ❖ **Dr. S. Kundu**, Head, ESS - Hari Om Ashram Award (ICAR) for 2007 for Natural Resources Management
- ❖ **Dr. Ranjit Kumar**, Senior Scientist - Lal Bahadur Shastri Young Scientist Award, 2005-06 (ICAR) in Social Science



Dr. Ranjit Kumar receiving the award

- ❖ **Dr. D. Damodar Reddy**, Principal Scientist- Elected Councilor of Indian Society of Soil Science, New Delhi for the year 2008 and 2009
- ❖ **Dr. D.L.N.Rao**, Network Coordinator, AINP on Biofertilizers - Nominated as member, Institute Management Committee of NBAIM, Mau., U.P.
- ❖ **GV Lakshmi and AK Biswas**, Senior Scientist, best poster award for the paper "Nitrate in groundwater in intensive agricultural areas of West Godavari: a case study" presented at the International Symposium on Management of Coastal Ecosystem: Technological Advancement and Livelihood Security organized by Indian Society of Coastal Agricultural Research, Kolkata during Oct. 27-30, 2007.
- ❖ **A.B.Singh,, P. Ramesh, N.R. Panwar and S.Ramana**, second Best Poster Award for the paper " Effect of organic nutrient sources on yield, quality and soil biological properties under soybean-wheat cropping system in vertisols" presented at International Symposium on Organic Farming and Renewable Sources of Energy for Sustainable Agriculture at RCA, MPUAT, Udaipur during November, 19-21, 2007

Farmers' Day

Under the ACIAR Project, a Farmers' Day was organized on September 5, 2007 at Rangai village, Vidisha district. About 200 male farmers and 20 female farmers from Vidisha, Raisen, Rajgarh and Bhopal districts participated to know about the project activities, to share their experiences and to get first hand information about the on-farm trials on INM. Dr. R.C.Dalal, Australia was the Chief Guest and Dr.A.Subba Rao, Director, IISS presided over the function. Project Scientists from IISS and BAIF interacted with the farmers. At the outset, Dr. K.Sammi Reddy, Operation Leader introduced the ACIAR project activities to the farmers. Then few farmers shared their experiences and reiterated that they are highly benefited by the optimization of FYM and fertilizers through Integrated and Balanced Nutrient Management technology developed in the project. Mr. Sanjiv Verma, a host farmer narrated how he could take up soybean in his field with the adoption of Balanced Fertilization (NPKSZn)

and Land Configuration through Broad Bed Furrow (BBF) in waterlogged field which was otherwise not feasible. It not only helped him to get 25% higher seed yield over the farmers' practice but also envisaged rainwater harvesting into the near by farm pond. Farmers also visited baby trials on balanced and integrated nutrient management. At the end a question-answer session was organized where Dr. A. Subba Rao, Director, IISS, Dr. R. C. Dalal, Australia and other scientists from IISS & BAIF have clarified many queries put up by the farmers related to vermi-composting, soybean varieties, pests & diseases, seed treatment, burning of crop residues, herbicides, micronutrient application etc.



Mr. Rakesh Verma, host farmer, Rangai sharing his experiences



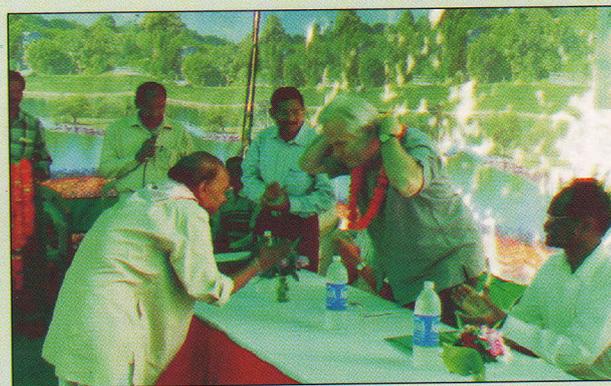
Farmers discussing with the scientists about the on-farm trials on INM during the Farmers' Day

Farmers' Meet

Australian High Commissioner Visits ACIAR Project Village

His Excellency Mr. John McCarthy, Australian High Commissioner to India visited ACIAR project village Rangai, Vidisha district on 24 October 2007. On this occasion a "Farmers' Meet Programme" was organized to enable the high commissioner and project scientists to interact with the farmers. About 100 male and 20 female farmers from Vidisha and Raichur districts participated in the meeting. Dr. A. Subba Rao, Director, IISS welcomed the High Commissioner, Farmers and Scientists and appraised the gathering about the IISS activities. Later Dr. K. Sammi Reddy, Operational Leader has explained about the activities of the ACIAR project in the village and the technologies developed in the project with the help of posters. Mr. Rammanohar Verma, a host farmer shared his experiences of

the ACIAR project. Later Mr. McCarthy randomly picked up some male and female farmers and asked their experiences about the project. Host farmers told that they were highly satisfied with the project activities and non-host farmers requested him to extend the project activities to other villages. Female farmers told that they need training in different areas such as organic manure management, seed inoculation, biofertilizer storage etc. The High Commissioner has appreciated the improved nutrient management technologies developed, Village Seed Bank activity etc and asked the project scientists to organize the training programmes to the male and female farmers. Mr. McCarthy thanked all the farmers particularly female farmers for their enthusiasm towards the ACIAR project and distributed the Australia India Friendship badges to the farmers to commemorate the occasion.



A farmer welcoming His Excellency Mr. John McCarthy, Australian High Commissioner during the Farmers' Meet Programme



Director, IISS discussing the ACIAR project activities with the High Commissioner

Events

National Workshop of AICRP on STCR

National Workshop of AICRP on Soil Test Crop Response Correlation was organized at Indian Institute of Soil Science from 28th to 29th, September, 2007 to review the research progress of various collaborating centres. Dr. N.N. Goswami, Ex-Vice Chancellor CSAUAT, Kanpur was the chief guest of the workshop. Dr. P.D. Sharma, ADG (Soil), Dr. A. Subba Rao, Director, IISS and Dr. V.K. Gupta, National Professor, IASRI were also present during the workshop. Several publications and technical bulletins brought out by various centers were also released during the workshop for the benefit of researchers, managers, state agencies and farming community. The



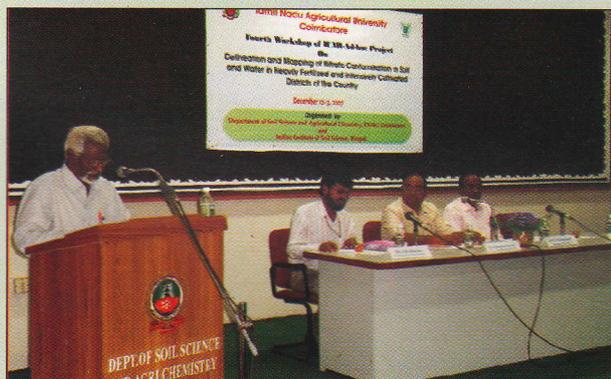
progress of the work carried out and the constraints faced in the execution of the assigned work by the different centers was critically reviewed and the future plan of work was suggested.



Release of Publications during the workshop

Annual Workshop of Project 'Nitrate Contamination in Soil and Water'

The fourth Annual Workshop of the ICAR Ad-hoc Scheme on "Delineation and mapping of nitrate contamination in soil and water in heavily fertilized and intensively cultivated districts of the country" was held at TNAU, Coimbatore during December 12-13, 2007 to deliberate upon the results of nitrate contamination in water samples collected during pre-monsoon of 2007. Apart from the research team of IISS, Bhopal, scientists from other centers, namely, PAU, Ludhiana, Dr.PDKV, Akola, APAU, Bapatla, BCKV, Kalyani and TNAU, Coimbatore participated in the meeting. Dr. S. Natarajan, Director (CSCMS) was the Chief Guest of the workshop.



Inaugural address by the Chief Guest

National Seminar on "Standards and Technology of Value Added/ Fortified /Customized Fertilizers as A Source of Plant Nutrients"

A National seminar on "Standards and Technology of Value Added/ Fortified /Customized Fertilizers as A Source of Plant Nutrients" sponsored by the Ministry of Agriculture, Department of Agriculture and Cooperation (DOAC), Govt. of India was organized by the Indian Institute of Soil Science, Bhopal from September 26-27, 2007.

Dr. N. Tripathi, Ex. Director, Central Fertilizer Quality Control and Training Institute, Faridabad inaugurated the seminar. In his inaugural address, he highlighted the overall scenario of fortified and customized fertilizers. The guest of honour Dr. R.K. Tewatia, FAI discussed about fertilizer use scenario in India and also gave emphasis on problems and prospects of fortified fertilizers. Dr. G.

Chakraborty, DOAC, New Delhi discussed about regulatory mechanisms of quality control in the use of customized fertilizers and also about role of central/state governments. Dr. Subba Rao, Director, IISS, highlighted the importance of Customized and value added fertilizers in Indian agriculture. During this auspicious seminar Dr. M.M. Pandey, Director, CIAE was also present. Finally a panel of experts brought out the recommendations and proceedings of national seminar.



Inauguration of the National Seminar

New Appointments

- ❖ Dr. K. B. Hebbar, on selection by ASRB, joined the Institute as Principal Scientist (Plant Physiology) on 12 July, 2007. Earlier he served as Sr. Scientist at Central Institute for Cotton Research, (CICR) Nagpur.
- ❖ Dr. S. Elamathi joined the Institute as Scientist on 22nd October 2007 after completing FOCARS at NAARM.
- ❖ Dr. Blaise Desouza, on selection by ASRB joined the institute as Principal Scientist (Agronomy) on 22nd December, 2007. Earlier he served as Sr. Scientist at CICR, Nagpur.
- ❖ Dr. S. Kundu, Principal Scientist joined as Head, Division of Environmental Soil Science on 24/12/2007.

Promotions

- ❖ Dr. P. Ramesh, Senior Scientist promoted to Principal Scientist w.e.f. 05-12-2006
- ❖ Mr. M.S.Hedau- promoted to Assistant w.e.f. 29/11/2007
- ❖ Mr. Bansilal Sarsodia- promoted to UDC w.e.f. 29/11/2007
- ❖ Mr. Anurag- promoted to UDC w.e.f. 29/11/2007

Joining

- ❖ Dr. R.K. Singh re- joined the institute on 26th July, 2007 after completion of his Ph. D programme from G. B. Pant University of Agriculture and Technology, Pant Nagar.

Transfer

- ❖ Dr.K.G.Mandal, Scientist (SS), left the institute on his selection as senior Scientist at WTC- ER, Bhubaneswar on 24/07/2007.
- ❖ Ms. Vidya Shree Bharti, Scientist, transferred to Central Institute for Fisheries Education, Mumbai on 22nd December 2007.

Distinguished Visitors

- ❖ Dr. Ram C. Dalal, Sr. Principal Scientist, Queensland Dept. of Natural Resources and Water, Brisbane visited under the ACIAR Project from September 4-6, 2007.



- ❖ His Excellency Mr. John McCarthy, Australian High Commissioner visited ACIAR Project village in Vidisha district on October 24, 2007.

visited the University of Queensland, Brisbane, Australia during 11-26 November 2007 to undergo training on computer simulation modeling and to participate in review meeting of the ACIAR project (SMCN/2002/032).

Visits Abroad

- ❖ Dr. K. Sammi Reddy, Operational Leader, ACIAR project

Scientists' participation in Conference/Seminar/Training/Group Discussion

Name	Programme	Venue	Period
Dr. Brij Lal Lakaria and Dr. K.M. Hati	7 days training programme on "Leadership and Personality Development"	NAARM, Hyderabad	5-12 July, 2007
Dr. Sangeeta Lenka	21 days Summer School on "Excess rainfall management for sustainable agriculture in Vertisols"	CIAE, Bhopal	18 th August to 7 th September, 2007
Dr. A Subba Rao and Dr. Sanjay Srivastava	Presented a lead paper "Customized and value added fertilizers" in National seminar on "Standards and Technology of Value added /fortified /customized fertilizers as a source of plant nutrients"	IISS, Bhopal	September 26-27, 2007
All scientists of IISS, Bhopal	Attended National Seminar on Standards and Technology of Value Added / Fortified / Customized Fertilizers as Source of Plant Nutrients	IISS, Bhopal	September 26-27, 2007
Dr. K.N.Tiwari, Y. Muralidharudu, and Abhishek Rathore	Delivered Invited paper in National seminar on "Standards and Technology of Value added /fortified /customized fertilizers as a source of plant nutrients"	IISS, Bhopal	26 th -27 th , September 2007
Dr. K. Sammi Reddy	Delivered an invited lecture on "Soil Health and Sustainable Agriculture" at National Seminar on Steps Towards Sustainable Agriculture.	DBS Konkan Krishi Vidyapeeth, Dapoli, organized by (ISEST), Mumbai.	September 27, 2007
Dr. S. Srivastava and R H Wanjari	Regional Seminar on Recent Advances in Potassium Nutrition Management for Soybean Based Cropping Systems	National Research Centre on Soybean, Indore	September 28-29, 2007.
Dr. P. Ramesh	National Symposium on Integrated Farming Systems & Its Role Towards Livelihood Improvement	ARS, RAU, Jaipur	October 26-28, 2007
Drs. A.K. Biswas, J.K. Saha, Tapan Adhikari and R H Wanjari	International Symposium on Management of Coastal Ecosystem: Technological Advancement and Livelihood Security	Indian Society of Coastal Agricultural Research, at Science City, Kolkata	October 27-30, 2007
Dr. D.L.N.Rao	Delivered the 34 th R.V.Tamhane Memorial Lecture on "Microbial Diversity, Soil Health and Sustainability"	72 nd Annual Convention of the Indian Society of Soil Science at Birsa Agricultural University, Ranchi	November 2, 2007
Drs. A.K. Biswas, M. C. Manna, A. B. Singh, N.R. Panwar & S.K. Behera	72 nd Annual Convention of the Indian Society Soil Science	BAU, Ranchi	November 2-5, 2007
Dr. P. Ramesh	Winter School on Organic Farming in Rainfed and Tribal Area: strategies for Cost Effective Production of Quality Inputs	CRIDA, Hyderabad	November 7-27, 2007
Drs. P. Ramesh N.R. Panwar and A. B. Singh	International Symposium on Organic Farming and Renewable Sources of Energy for Sustainable Agriculture	RCA, MPU A&T, Udaipur	November 19-21, 2007
Drs M. C. Manna, A.B. Singh and R.H. Wanjari	Attended Bharatiya Vigyan Sammelan	MPCOST, Bhopal	November, 23-23, 2007
Drs M. C. Manna, A.B. Singh and K.B. Hebbar	Participated in Science Children Congress	Maharshi Vidya Mandir Bhopal	November, 29-30, 2007
Drs. S. Ramana and Tapan Adhikari	Heavy metal contamination in soil and their remediation by physico-chemical and biological methods	TNAU, Coimabatore	December 05-14, 2007
Dr. D.L.N. Rao	Participated in a expert consultation workshop on "Biodiversity Conservation in Madhya Pradesh : Development of Training Modules"	Indian Institute of Forest Management, Bhopal	December 18, 2007.
Dr. Ajay	Fourth MP Science Congress	Holkar Science College, Indore	December 26 – 27, 2007

Editors : Dr. K.B. Hebbar and Dr. S. Elamathi

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Dr. A. Subba Rao, Director,

Indian Institute of Soil Science

Nabibagh, Berasia Road, Bhopal, Madhya Pradesh-462038

Web Site : <http://www.iiss.mp.nic.in> E-mail : director@iiss.ernet.in Phone : +91 755 2730946 Fax : + 91 755 2733310