

IFA-FAI National Seminar on Sustainable Fertiliser Management for Soil Health

The International Fertilizer Industry Association (IFA), Paris and The Fertiliser Association of India (FAI), New Delhi in collaboration with Indian Council of Agricultural Research (ICAR) organised a National Seminar on “Sustainable Fertiliser Management for Soil Health” during March 16-17, 2015 at Hotel The Grand, New Delhi. Mr. Siraj Hussain, Secretary, Department of Agriculture and Cooperation, Ministry of Agriculture, New Delhi inaugurated the Seminar. Mrs. Esin Mete, President, IFA; Mrs. Charlotte Hebebrand, Director General, IFA and Mrs. Evelyn Nguleka, Chairperson, World Farmers Organization (WFO), Italy also addressed the delegates at the inaugural session. Dr. S.K. Chaudhari, Assistant Director General (Soil and Water Management), ICAR gave the key note address. Two hundred delegates representing Central & State Governments, ICAR, State Agricultural Universities, Krishi Vigyan Kendras and Fertiliser industry participated in the programme.

In his welcome address, Mr. Satish Chander, Director General, FAI mentioned that farmer is in the centre in all fertiliser industry's schemes/ programmes. Industry feels that route to healthy growth of industry is through the prosperity of farmers. Indian economy is growing well, however,

the agriculture sector has not been keeping pace with other sectors. The contribution of agriculture sector in GDP is around 15% whereas it provides employment to about 58% of country's workforce. Inclusive growth is very important and it can only come from growth of agriculture sector. Growth in agricultural production has essentially to come from increase in agricultural productivity through efficient use of inputs and natural resources.

The Prime Minister of India has given a call to address the two major factors critical to agricultural production i.e. soil and water. The seminar is one small step in addressing the dream of Prime Minister for sustainable agriculture. United Nations (UN) has also declared 2015 as the International Year of Soils. IFA is also working with FAO and other concerned organisations in this area.

Mr. Satish Chander mentioned that FAI is fully committed to the cause of soil health enhancement. Indian fertiliser industry is working closely with the farmers to improve their awareness on Fertiliser Best Management Practices (FBMPs). There are certain policy issues which need to be addressed by the government to keep the soil healthy. The issues include correcting fertiliser subsidy & pricing policy;

encouraging fertiliser industry to develop innovative fertiliser products; and promoting the integrated use of organic and mineral sources of plant nutrients.

In her opening remarks, Mrs. Charlotte Hebebrand recognised the contribution of the Green Revolution which enabled India to achieve self-sufficiency in foodgrain production. The increased use of fertiliser played an important role in increasing crop yields and reducing the prevalence of hunger in the country. Hunger in India is not caused by insufficient availability of food but because of low income of a significant segment of population.

She noted that there was ample scope to increase crop yields as the average crop productivity in India is much low compared to many Asian countries. The yield gap between actual and attainable yields needs to be narrowed down through transfer of improved farm technology at farmers' field. She expressed that knowledge transfer to farmers is a gigantic task as IFA has less than 200 producing member companies to serve about 2 billion farmers. It requires smart collaborations among the stakeholders. She also added that Information Technology (IT) could play an important role in transfer of improved technology.



Mr. Satish Chander, DG, FAI delivering the welcome address



Mr. Siraj Hussain, Secretary, Agriculture inaugurating the Seminar by lighting the lamp.

Mrs. Hebebrand expressed that farmers' awareness on site specific nutrient management (SSNM) and FBMPs needs be improved to bring increase in crop yields. Seeing is believing. There is need to demonstrate the benefits of balanced fertilisation at ground level in terms of increasing yields and farm profits. There are excellent examples of last mile delivery but more needs to be done in this area by central and state governments and fertiliser value chain.

Addressing the delegates, Mrs. Esin Mete stated that IFA and FAI have a long-standing fruitful collaboration. This seminar is a

new milestone in the joint effort to sustainable fertiliser management. She expected that the seminar would bring significant contribution in encouraging innovative products and practices to FBMPs; strengthening outreach to farmers for rapid dissemination of farm technology; ensuring adoption of FBMP's ; and underlining the need of policy reforms for sustainable fertiliser management.

Mrs. Mete informed that IFA has decided to improve fertiliser use efficiency and its effectiveness by working together with a range of stakeholders and forming innovative partnerships. IFA's

active involvement in the celebrations of the United Nations International Year of Soils is one such example of innovative partnership for better soil health. IFA is a member of the Global Soil Partnership. It has also launched a mini website called Nutrients4Soil.info curating resources on soils.

Improving fertiliser management in India is a priority of IFA as India is the second largest fertiliser consuming country in the world. Mrs. Mete expressed that fertilizer management is highly influenced by fertiliser subsidy regimes. The current Indian fertilizer subsidy policy does not encourage balanced fertilisation. In addition to pricing and subsidy, outreach to farmers is also an essential component of sustainable fertiliser management. Farmers are capable of making appropriate nutrient management decisions when they have access to the right information, tools and incentives.

In her opening remarks, Mrs. Evelyn Nguleka mentioned that WFO, a farmer-based international organization, has around 70 member organisations of small, medium and large-scale farmers from about 50 countries in developing and developed world. Its mandate is to represent farmers and advocate on their behalf at international fora where policies and decisions affecting agricultural sector are made. She expressed that high population growth, changing climate and competitive markets are challenging the farmers more than ever. Introducing sustainable agricultural practices and increasing productivity are very important to farmers to tackle these new challenges.

Chairperson, WFO also stated that innovation is the base for development. Without research and innovation, farmers and agriculture won't be able to produce enough quality food while preserving the environment. Strengthening the involvement of young people and women is



Mr. S.S. Nandurdikar, Chairman, FAI, welcoming Mr. Siraj Hussain



Mr. Rakesh Kapur, Co-Chairman, FAI welcoming Mrs. Esin Mete, President, IFA

equally important. In order to achieve this, researchers, policy makers and private sector should consult the farmers, receive their inputs and develop feasible solutions.

In his keynote address on Water and Nutrient Management – Future Prospectives, Dr. S.K. Chaudhari stated that soil and water are on the top of government policy agenda. Therefore, this topic is of great relevance to Indian context. He mentioned that nutrients have been depleting due to more crop uptake without replenishing to that extent and this has been resulting in emergence of multinutrient deficiencies in soils. The crop response to fertilisers in terms of kg grain / kg nutrient has been declining over time and come down to less than 6 after 11th Five year plan.

Dr. Chaudhari informed that integrated nutrient management and conservation agriculture are the two most important priority areas of the government. Emphasis is being given on GIS based mapping which would be linked to fertiliser recommendations through Soil Health Cards (SHC) Scheme. Research efforts are being made on slow release fertilisers to improve N use efficiency and nano fertilisers to enhance efficiency of phosphorus. He expressed that

present fertiliser policy has skewed the NPK ratio in favour of nitrogen. The distortion in NPK consumption ratio is posing threat to soil health and food security. Revision in fertiliser policy is needed to correct distortion in nutrient pricing and promote balanced fertilisation.

Low and declining water and nutrient use efficiency is of serious concern and research efforts are being made to revert this trend. He pointed out that ground water research would remain the priority as share of ground water resource in total irrigated area is 60%. The other research priority areas / technologies are drip/sprinkler irrigation alongwith use of liquid fertilisers and biofertilisers through drip irrigation. It would be a great achievement if water and nutrient use efficiency could be increased by 10-15% by end of current 5 year plan. He observed that SHC scheme could be justified if nitrogen requirement is reduced by 20% by linking soil health with fertiliser recommendations.

In his inaugural address, Mr. Siraj Hussain, Secretary, Department of Agriculture and Cooperation, Ministry of Agriculture, New Delhi briefed about various issues and initiatives of the government. He mentioned that three categories of

issues concerning government are; fiscal deficit, soil health deterioration and environmental degradation. Application of mobile technology has improved the everyday life of poor people but mobility of N has affected soil and water resources. Environment is being adversely affected due to release of N in form of nitrate in ground water and ammonia in air. He informed that government is concerned of these issues and is taking correcting measures.

Briefing about governmental initiatives, Secretary (Agriculture) mentioned that an ambitious Soil Health Cards (SHC) Scheme has been launched to provide SHC to all farmers of country in next three years. The computerised data base is being prepared and made available which would help in promoting balanced use of fertilisers. There are various local practices like agroforestry which could help in improving soil health and conserving water. Fertiliser industry with government should take up the responsibility of scaling up the local skills.

Mr. Siraj Hussain pointed out that per hectare use of fertiliser in Europe and US is much less than China but difference in crop productivity is marginal. It means productivity could be increased with less use of fertiliser by adopting better practices. Role models are available in countries where fertiliser use has been rationalized and farming has become more sustainable. He informed that government is making substantial use of IT to reach the farmers and 9 million farmers have already been enrolled in e-portal of farmers. He advised fertiliser industry to collaborate with government and come up with complete package of advisory services.

Mr. Hussain mentioned that fertiliser industry has contributed in Green Revolution which resulted in substantial increase in yields of rice, wheat and other cereals in irrigated areas of the



Session I – (L-R) Dr. Ashok Gulati, Dr. B.S. Dwivedi, Mr. S.S. Nandurdikar, Dr. S. Nand and Dr. A.K. Saxena

country. Private seed companies have also played an important role in developing hybrid seeds. He expressed that rainfed areas which account for about 60% of cultivated area still face enormous challenges. Efforts should be made to bring more area under irrigation by improving water productivity. He informed that substantial funds are available under Pradhan Mantri Krishi Sinchai Yojana to take water to every field. He hoped that fertiliser industry would not confine itself to fertiliser alone but would advise the farmers on complete farm solutions.

Dr. R.K. Tewatia, Addl. Director (Agricultural Sciences), FAI proposed vote of thanks at the end of inaugural session.

In the 2-day seminar, 17 presentations were made in 5 technical sessions by leading national and international experts. The Technical Session-I on “Fertiliser Subsidies and Soil Health” was chaired by Mr. S.S. Nandurdikar, Chairman-FAI and MD, PPL, Gurgaon. Four papers namely “IFA-IFDC-FAI Study on Fertiliser Subsidies: Key Findings” by Dr. Ashok Gulati, Infosys Chair Prof. for Agriculture ICRIER, New Delhi; “Fertiliser Subsidy: An Instrument to Improve Soil Health through Balanced Fertilisation” by Dr. S. Nand, DDG, FAI; “Role of Bioinoculants and Organics in Sustainable Fertiliser Management” by Dr. A.K. Saxena, Head, Division of Microbiology,

IARI, New Delhi and “Rejuvenation of Soil Health: Way Forward” by Dr. B.S. Dwivedi, Head, Division of Soil Science and Agricultural Sciences, IARI, New Delhi, were presented in the session.

The Technical Session-II on “Fertiliser Best Management Practices (FBMPs)” was chaired by Dr. J.C. Katyal, Ex-VC-CCSHAU, Hisar. Three papers namely “Development of FBMPs: Global Experience” by Dr. Kaushik Majumdar, Director, South Asia Programme, IPNI, Gurgaon; “Fertigation: A Tool for Efficient Fertiliser and Water Management” by Dr. Gershon Kalyan, Chief Agronomist and Head, Agronomic Department, ICL Fertilizers, Beer Sheva, Israel; “Managing Water and Fertiliser for Sustainable Agricultural Intensification” by Dr. Bharat Sharma, Scientist Emeritus (Water Resources), IWMI, New Delhi were presented in the session.

The Technical Session-III on “Enhanced Efficiency of Fertilisers” was chaired by Mr. Kapil Mehan,

Group CEO (Agribusiness), ZACL, Gurgaon. Three papers namely “Foliar Nutrition of Crops” by Mr. Alfredo Daniele Sgrignuoli, Valagro, Italy; “Improving NUE through Slow / Controlled Release Fertilisers” by Mr. Zhai Jidong, Chief Operating Officer, Kingenta, China and “Status and Prospects of Speciality Fertilisers in India” by Mr. B.B. Singh, Asstt. Vice President (Corporate Affairs), TCL, Noida were presented in the session.

The Technical Session-IV on “Outreach to Farmers” was chaired by Dr. R.B. Singh, Chancellor, Central Agricultural University, New Delhi. Four presentations namely “Strengthening Outreach to Farmers: Expectations of Indian Farmers” by Dr. Krishan Bir Chaudhary, President, Bharatiya Krishak Samaj, New Delhi; “Strengthening Outreach to Farmers: Farmers Cooperatives (NCUI) Initiatives” by Dr. Dinesh, CEO, National Cooperative Union of India, New Delhi; “Transfer and Adoption of Fertiliser Best Management Practices: From Basic to Innovative Approaches” by Mr.



Session II (L-R) – Dr. R.K. Tewatia, Dr. Bharat Sharma, Dr. J.C. Katyal, Dr. Kaushik Majumdar and Dr. Gershon Kalyan



Session III (L-R) – Dr. R.K. Tewatia, Mr. A.D. Sgrignuoli, Mr. Kapil Mehan, Mr. Zhai Jidong and Mr. B.B. Singh

Raymund Illustre, Atlas Fertilizer Corporation, Manila, Philippines and “Indian Fertiliser Industry in Service of Farmers” by Mr. A. Roy, Marketing Director, IFFCO, New Delhi were made in the session.

The Technical Session-V on “Sustainable Fertiliser Management – Panel Discussion” was chaired by Mr. J.L.N. Srivastava, Former Secretary, Agriculture, DAC and Managing Trustee, IFFCO Foundation, Gurgaon. Two presentations namely “Research Agenda for Sustainable Fertiliser Management” by Dr. S.K. Chaudhari, ADG (Soils & WM), ICAR, New Delhi and “Industry Programmes for Sustainable Fertiliser Management” by Dr. Naresh Prasad, Deputy General Manager (Technical Services), Chambal Fertilisers & Chemicals Limited, New Delhi were made in the session.

The concluding session was chaired by Mrs. Charlotte Hebebrand, Mr. Kapil Mehan, Mr. Satish Chander and Mr. J.L.N. Srivastava also addressed the delegates in concluding session.

Mr. Kapil Mehan mentioned that Indian fertiliser industry and Indian agriculture are facing various types of challenges. Besides natural resources, there is policy uncertainty which is a man made problem. Nutrient based subsidy (NBS) scheme was introduced with half-heartedness and one nutrient (nitrogen) was left out of NBS. The selective implementation of NBS caused huge stress on soil health and is contrary to the theme ‘Sustainable Fertiliser Management for Soil Health’ of the Seminar. There is urgent need of policy reforms in fertiliser sector as the present fertiliser pricing policy has harmed Indian farmers, soils and environment.

Mr. Mehan expressed that enabling environment, whether regulatory or marketing needs to be created to promote balanced fertiliser use. There is need of R&D efforts in product innovation and to bring down N loss to environment. He informed that IFA has taken some initiatives on 4Rs Nutrient Stewardship which are

adding value in terms of increase in yield, quality and profits. Emphasising the need of last mile delivery, Mr. Mehan mentioned that fertiliser industry needs to have a concrete plan for farmers’ education because every gain in nutrient use efficiency results in saving of money to farmer.

Mr. Satish Chander, DG, FAI mentioned that issues concerning Indian fertiliser industry and farmers are clear. There are solutions to address the issues. He expressed that FAI was trying with the government to push these solutions.

Mr. J. L.N. Srivastava stated that integrated approach involving land, water, drainage, environment, cropping system etc is needed for sustainable management. Moreover, total synergy among all these factors is required to get the desired results.

Mrs. Charlotte Hebebrand mentioned that the United Nations (UN) has declared the year 2015 as International Year of Soils to pay greater attention to soil health. Soil is foundation for food security but international community does not view the soil this way. The seminar is very timely to highlight the importance of soil health. She expressed that research community has a larger responsibility and it should issue joint statement regarding decline in soil health. Change in policy agenda is needed and research community should explain the importance of soils. Food security would be an issue



Session IV (L-R) – Dr. R.K. Tewatia, Dr. Drishan Bir Chaudhary, Dr. Dinesh, Dr. R.B. Singh, Mr. Raymund Illustre and Mr. A. Roy



Session V (L-R) – Mr. Satish Chander, Mr. J.L.N. Srivastava, Dr. S.K. Chaudhari and Dr. Naresh Prasad

if timely attention is not paid to soils.

Briefing about the solutions, Mrs. Hebebrand mentioned that policy needs to be fixed first. Speciality products do offer solution but they remain to be niche products. India is lagging behind in use of speciality products. Indian fertiliser industry should promote greater use of these products. Including these products in government subsidy scheme would help faster market development.

Bridging the trust deficit is most important and is possible through better communication among the stakeholders. They should not only talk of fertiliser management but farming management is the Take Away of the seminar. All aspects of soil health including soil organic carbon should be

considered and need of organics and biofertilisers should be stressed alongwith the fertilisers.

Dr. R.K. Tewatia, Addl. Director (Agricultural Sciences), FAI proposed a vote of thanks at concluding session of the programme.

The important conclusions and recommendations emerged from deliberations and discussions in the symposium are mentioned hereunder:

Conclusions

1. The biggest challenge for Indian agriculture is to meet the growing demand for food in a sustainable manner. The over exploitation and mismanagement of natural resources and poor adoption of farm technology has made the task of increasing crop

productivity more difficult. Further increase in food production has to come from shrinking land and water resources.

2. Water is a scarce and highly mismanaged resource threatening the very survival of life on earth. Efficient management of irrigation water is crucial for agriculture as the Indian demand for irrigation water is estimated to increase by 35% by 2050.

3. India has witnessed considerable increase in fertiliser consumption and has become second largest consumer of fertilisers in world. However, the per hectare fertiliser use in India is relatively low compared to neighbouring countries and it is highly imbalanced. Soil fertility depletion due to imbalanced and inefficient use of fertilisers has become a major constraint in improving yields.

4. Continuous nutrient mining has emerged as a serious soil health problem threatening the foundation of sustainable agriculture. The deficiency of atleast 6 nutrients (N, P, K, S, Zn, B) has become widespread in Indian soils. The practice of clean cultivation and burning of crop residues has depleted soil organic carbon which is essential component of soil health.



Concluding Session (L-R) – Mr. Satish Chander, Mr. J.N.L. Srivastava, Mrs. Charlotte Hebebrand and Mr. Kapil Mehan

5. The fertiliser use efficiency (FUE) in general is low in India. The low FUE not only affects crop yields and farmers' profits but also poses threats to the environment.

6. One of the major issues concerning nutrient management is inadequate and ineffective soil testing service. The adoption of soil test based recommendations is very poor at field level and majority of farmers use fertiliser based on their own perception or as advised by their progressive peers.

7. There exists a vast gap in actual and attainable yields of most crops and low adoption of improved technology is largely responsible for this gap. The farmers' awareness on fertiliser best management practices is poor. The adoption of soil test based recommendations by farmers has not gone beyond 5-7 per cent.

8. The selective implementation of nutrient based subsidy (NBS) scheme on P&K fertilisers w.e.f. 01.04.2010 has aggravated the problem of imbalance fertiliser use. The NPK use ratio distorted from 4.7:2.3:1 in 2010-11 to 6.7:3.1:1 in 2011-12 and 8.2:3.2:1 in 2012-13. It has hardly improved since then. The current imbalance in nutrient use is posing a threat to soil health, crop yields and farmers' profitability.

9. The discriminatory pricing policy which has created distortion in nutrient (N, P, K) prices is largely responsible for distortion in NPK consumption ratio. Indian farmers are pampered to use more nitrogen due to very low retail price of urea compared to P&K fertilisers.

10. The challenge of nutrient management is being addressed by the International Fertiliser Industry Association (IFA) and its members in a proactive manner through Nutrient Stewardship initiatives with emphasis on the 4Rs (right nutrient source at the right rate, at the right time, in the right place) and development of special products with built-in

enhanced efficiency. Various institutions in India and abroad have already done commendable work in developing products and practices which improve FUE.

Recommendations

1. Rejuvenation of soil health through integrated use of fertilisers, organic manures and biofertilisers is the need of hour for agricultural sustainability. Good understanding of farm, farmers and farming systems is needed for improving soil health. Suitable farm machines, monitoring and motivation are needed to stop the practice of burning of straw.

2. Soil testing is the first and most important step to ensure balanced fertilisation. The scheme of Government of India on Soil Health Cards (SHC) will generate very useful data which can be used for promoting balanced use of fertiliser and also for product innovation.

3. The concept of balanced fertilisation has not gone beyond NPK. There is need to apply all the limiting nutrients including secondary and micronutrients to get optimum yield. Emphasis should be given on site specific nutrient management.

4. The concept of nutrient management is simple and is based on 4R (right source, right rate, right time and right place) Nutrient Stewardship. Fine tuning of 4R strategies in specific crop growing environments and farming systems is required through further research.

5. Tools like Nutrient Expert, Leaf Color Chart (LCC) have shown good promise to rationalise fertiliser prescriptions. Such tools need to be perfected and promoted to popularise their wider adoption.

6. Development of innovative fertiliser products helping achieve higher nutrient use efficiency has not received much attention. There is need to strengthen fertiliser product research on slow an

controlled-release fertilisers, fertilisers stabilised with inhibitors, products for fertigation and foliar sprays, nano-formulations and low grade indigenous sources.

7. The Indian fertiliser industry is committed to ensure on-farm implementation of FBMPs through its agricultural extension services. However, there is urgent need of strengthening partnership and collaborations among concerned extension agencies and others involved in outreach to farmers for rapid transfer of improved technology. The use of ICT can play an important role in this area.

8. Improving water productivity through more crop per drop is a national slogan. The adoption of water conservation technologies (zero tillage, conservation tillage) and energy efficient irrigation methods like sprinkler irrigation and drip irrigation need to be encouraged through government programmes and schemes. The use of laser land leveler and fertigation should be popularised to improve water and fertiliser use efficiency.

9. There is an annual burden of more than US\$ 12 billion on government exchequer on account of fertiliser subsidy. This huge amount of subsidy should be utilised to promote balanced fertilisation by keeping balance in retail prices of primary nutrients (N, P, K). Subsidy support should also be provided on production and marketing of city compost to improve organic content of soil, which is essential for improving physical and biological properties of soils.

10. Favourable fertiliser pricing policy is needed to ensure balanced use of fertilisers. Right policy frame work should be put in place by bringing reforms in fertiliser sector. Direct payment of subsidy to farmers and deregulation of fertiliser prices (including urea) seems to be a politically feasible and operationally possible option. ■