Frank Notes

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Managing Soil Resources for Sustainable Agriculture

Soil is wonderful gift of Mother Nature for sustaining life on earth. The life on planet 'Earth' owes its existence to the presence of soil on its surface and no other planet so far is known to have soil on its surface. The formation of soil on earth's surface is a very very slow and complex process. It takes thousands of years to develop just a few inches of soil on earth's surface. The few inches of top soil has sustained the plant, animal and human life on earth for thousands of years.

Arable land, being a finite resource, is under severe stress due to increasing population, over exploitation of land and water resources and climate change. At present, about 1/3rd of global soil resources are under degradation. The situation in Indian context is even worse where human pressure on soil has reached critical limits. The per capita availability of agricultural land declined from 0.48 ha in 1951 to 0.13 ha in 2011 and is projected to decline to 0.08 ha in 2035. Besides decreasing per capita land availability, diversion of best productive agricultural lands to non-agricultural uses has further eroded the base of this highly valuable and non-renewable resource.

The mismanagement and over-exploitation of soil resource is manifested in widespread land degradation. About 37% of total geographical area in India is affected by one or the other form of land degradation. Of the total degraded area of 120.7 million hectare (Mha), 104.2 Mha is arable land. The area affected by water and wind erosion is 73.3 and 12.4 Mha, respectively. While about 11 Mha of arable land suffers from acute soil acidity (pH <5.5), around 6.74 Mha is under salt affected soils. It is estimated that over 5.34 billion tonnes of soil is lost through water erosion only resulting in a loss of about 8 million tonnes (Mt) of plant nutrients (NPK) annually.

This brings out the criticality of the issue of soil health in view of ever-declining arable land and accelerated deterioration of top soil. Hence, there is a need for utmost attention to be paid to improvement of soil health by all stakeholders including governments, farmers, input suppliers and all those involved in the development of agriculture in the world.

Soil health is greatly influenced by human interventions including cultivation. The wrong agricultural practices, deforestation and pollution have led to the problem of soil degradation and erosion. Inadequate and imbalanced use of fertilisers and lack of availability of sufficient organic manures have resulted in deterioration of soil health with multinutrient deficiencies. Besides primary nutrients, the deficiencies of secondary and micronutrients have become widespread in Indian soils. The increasing deficiencies of secondary and micronutrients have started affecting the crop response to applied primary nutrients (NPK).

Maintenance of soil health is vital for sustainable agricultural production. Improvement in organic matter content of soil is important for microbial activity and overall health of soil. High organic carbon content in soil also promotes root development, ensures adequate retention and release of water and nutrients, and responds favourably to soil management practices.

Soil health management is receiving attention nationally and internationally. The Hon'ble Prime Minister has given a clarion call to address the problem of soil health degradation in India. An ambitious Soil Health Card Scheme has been launched by the Government to provide the soil health cards to all the 140 million farmers of the country in next three years.

Recognising the role of soil in global food security, the 68th UN General Assembly declared 2015 as the International Year of Soils (IYS). The IYS 2015 aims to increase awareness and understanding of the

importance of soil among all stakeholders and promote more sustainable use of soil. FAI has joined this global initiative and has undertaken a number of activities / events to achieve the objectives of IYS 2015. The aim of these activities is to raise public awareness on the importance of soil and advocate sustainable soil management. The activities also bring together the scientists to arrive at prescriptions for adopting the agriculture and other practices for sustenance of soil health.

The Fertiliser Association of India in collaboration with International Fertiliser Industry Association (IFA) organised a Seminar on 'Sustainable Fertiliser Management for Soil Health' during 16-17 March, 2015, New Delhi. It was one of the co-organisers of National Dialogue on Efficient Nutrient Management for Improving Soil Health held during 28-29 September, 2015, New Delhi. The FAI is also devoting a session in Annual Seminar 2015 to the theme 'Soil Health Enhancement'. A mass awareness campaign has been launched by fertiliser companies to highlight the importance of soils for healthy life.

{ Maintenance of soil health is vital for sustainable agricultural production system. }

This special issue on soil health is also one of the initiatives of FAI to highlight the need of managing soil resources for sustainable agricultural development. The special issue includes six lead papers covering important aspects including soil resources, soil biotechnology, fertiliser management, soil testing and policies for proper use of fertilisers. We hope that all those concerned with agriculture including scientists, policymakers, extension workers and farmers will find the content of the special issue relevant and useful. ■