

VISION FOR SOIL HEALTH 2021

CONCERNS AND OPPORTUNITIES

Soil is the most precious gift of nature to humankind which provides us the basic needs like food, nutrition and good environment. It is essential that the soil remains healthy so as to provide ecosystem services effectively and on a sustainable basis. Some attributes like fertility, compaction, bio-wealth and low erodibility are the indicators of good soil health. The soil organic carbon (SOC) is the basic foundation to support and sustain soil health. Often led by faulty land use and gross mismanagement/over-exploitation, the SOC content gets diminished. This sets in motion a vicious cycle of events that spark fall in soil health. Wearing down of soil health costs an annual loss of more than 20 million tons or 1% of the global annual foodgrain production. Worldwide, 1.5 billion people and 42% of the poorest of the poor live on degraded lands. Share of India in global degraded land area is about 10% and of population that thrives on degraded land is 17%.

Organic recycling is fundamental to improving and sustaining soil health. India has vast potential of organic waste resources, recycling of which is vital for supplementing plant nutrients and maintenance of soil health. Organic recycling in agriculture is limited in our country because of several competitive uses of crop residues, animal waste, etc. as well as burning

of crop residues due to economies of scale. The Government of India has launched a mission on soil health and undertaken a massive effort to provide soil health cards to all farmers. It is critical to know as to how best the soil health information could be used to provide rational fertilizer recommendation on both spatial and temporal scales to the farmers ensuring sustained soil health. The hazards of soil degradation and presence of pollutants in the soil adversely affect the soil health. The issue concerning soil degradation and pollutants has not been addressed on a priority basis to save our farmland's capacity to produce food, feed, and fuel for the growing population.

Among different strategies for improving and sustaining soil health, balanced plant nutrition has a key role to play. The balanced fertilization as a prerequisite of high nutrient use efficiency has been well recognized for a long time. However, the acceptance and adoption of balanced fertilization at farmers' level is far from the expectation. The major



Dr RS Paroda

issues that restricted the adoption of balanced fertilization includes policy towards highly subsidized urea and lack of easily available and usable tools that can allow farmers and their advisors to implement balanced fertilization quickly in their fields.

The onslaught on soil quality is the act of all stakeholders – farmers, builders and common folks. The same stakeholders are the part of the protection and conservation programs too. Farmers are not adequately empowered with the right knowledge and know-how for sustainable soil health management. Also, there is lack of convergence and coordination of diverse R&D programs, interventions and investments spread across institutions, agencies and development departments which need to be welded together for time-bound output and impact.

Create an enabling environment for fertilizer use efficiency

- The scientists must work hand-in-hand with farmers to validate practicality of their findings on improving the conventional methods of fertilizer management. Also, the extension services need to be improved for adoption of efficient methods of fertilizer application and management.
- Evolve institutional mechanisms and prioritize investments for linking Integrated Farming Systems (IFS) and Sustainable Intensification (SI) options for improving soil health, human nutrition and to reduce environmental footprints.
- Reduce sole dependence on chemical fertilizer sources and enhance the use of organic manures so as to increase nutrient use efficiency and factor productivity.
- Support small farm mechanization for proper fertilizer placement to minimize gaseous and runoff losses of fertilizers, improve NUE, reduce environmental footprints and increase farm productivity as well as income.
- Promote small scale industry



for manufacturing appropriately designed fertilizer nutrient mixes by dry granulation (compaction)

- The agri-input dealerships need to be licensed only to those who undergo specialized vocational training for common field problem diagnostics and relevant agro-input management.
- Launch a scheme to incentivize good environmental services by the farmers/ farmer groups, who without sacrificing productivity maintain soil health through efficient nutrient management practices.

Mainstream organic recycling

- Maximize returns of various organic sources by: (a) evolving community/village biogas units to replace dung as fuel, (b) enacting legislative measures that obligate total ban on burning of vegetative materials of all kinds, (c) adopting short duration multipurpose varieties of legumes as catch crops in cereal-cereal rotations, (d) popularizing conservation agriculture practices, (e) promoting the integrated soil and nutrient management practices, and (f) rewarding and incentivizing those who are adopting the above measures.
- Concerted efforts need to be made to prioritize investments and redesign interventions responding to farmers' specific needs and aspirations under conservation agriculture (CA).

- Adoption of CA be linked to utilizing leftover straw as mulch. In order that residue does not impede zero-till sowing operations, the support be extended to make available the necessary machinery for cutting and evenly spreading straw on the ground using straw spreader and Happy seeders for direct drilling. Such an arrangement could be in the form of custom-hire basis or on cooperative basis.
- There is an urgent need to target at least 10% replacement of chemical fertilizers by bio-fertilizers in the next 5 years for which there is need to strengthen quality standards, efficient production methods, shelf-life enhancing storage, and proper distribution and marketing.

Invest in arresting soil degradation

- Develop location and situation specific land use alternatives that are more competitive and less exploitative of natural resources than those currently in practice.
- With pre-identified indicators, quantitatively assess soil degradation and classify soils as per degree of severity. An integrated approach combining professional criterion and indigenous methods of soil health analysis and cure is seen to be more acceptable requiring less lag time.

(Source: The Trust for Advancement of Agricultural Sciences (TAAS))