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Natural Farming: A Way towards Sustainability

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In India, the agriculture production between 1960 and 2015, increased more than five times due to adoption of new technologies like use of high yielding photo-insensitive, fertilizer and irrigation responsive varieties.Increased reliance on the chemical fertilizers led to increased incidence of specific insect pests associated to the crop to reduce the crop yields significantly. To control these insect pests arising out of the chemical led interventions a large quantity of agrochemicals were applied to the crop which were either harmful to the soil fauna or the human health.The success of the green revolution led to complete neglect about the use of organic inputs like FYM, compost and other beneficial inputs in the soil there by reducing the factorproductivity (decreased response of inputs like fertilizers on successive incremental doses of fertilizers and pesticides etc.) thereby forcingthe scientific community to rethink about new approaches of crop production. A focus again shifted back to use of organic materials like compost, FYM, vermicompost, crop rotations, biodynamic formulations like Beejamrit, Panchgavya, Cow dung and urine and Jeevamrit besides encouraging natural processes by use of cosmic energy through yoga and meditation to augment natural processes for meeting the nutritional needs as well as management of insect pests (Smith *et al*., 2020) and increased nutrient and water use efficiency in the agro-ecosystems and are expected to yield better quality farm products without hampering the soil health and long term productive capacity of the soil *i.e.* sustainability.
Recently, the Govt. of India have prioritized Organic farming, natural farming under Paramparagat Kheti scheme which also aims at maintenance of soil quality as well as sustainable yield by following different approaches of crop husbandry i.e. Natural or Organic farming.

Organic farming is a production system that sustains soil health, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. The different inputs required for practicing Organic farming are Farm Yard manure, Vermicompost, Him compost, Nadep Compost, Liquid Manures (Matkakhad, Himsol, Vermiwash), Bioformulations (Panchgavya), Botanicals (Agniastra, Darekastra, Ghaniri extract, Dashparni), Green manuring, Crop rotations, mineral rocks for nutrient management, whereas interculture, soil mulching, vertical mulch, soil solarization, mechanical tools, bio control agents and other non-monetory input management techniques (sowing dates, irrigation etc.) for weed control, use of biodynamic and other natural products like Neem powder, Neem products, Gomutra, bioagents etc for insect pest and disease managements.

Natural farming originated in Maharashtra in the early 2000s, pioneered by Mr. Subhash Palekar, an agriculturalist, through his on-farm experiments. Four integral aspects of Natural farming are identified as (Palekar, 2005; 2006) namely:

1. **Jivamrita** (a soil inoculant):
- acts as a catalytic agent for increasing microbial activity and organic matter. It also helps in preventing fungal and bacterial growth and in increasing earthworm activity
2. **Bijamrita** (a seed treatment):
- protects seedlings from seed borne diseases
- Naturally occurring beneficial microorganisms are found in cow dung
- These microorganisms are cultured in the form of beejamrut and applied to the seeds as inoculum
- It is reported that seed treatment with beejamrut protects the crop from harmful soil-borne pathogens and also helpful in producing IAA and GA_3
3. **Acchadana** (mulching): enhances decomposition and humus formation through activity of the soil biota activated.
4. **Whapasa** (soil aeration/moisture): It is the condition in which there are both air and water molecules present in the soil.
5. **Intercropping** with leguminous crop to maintain soil health

Similarities between Natural and Organic farming

- Natural and organic both are chemical free and more or less poison free farming methods.
- Both systems discourage farmers from using any chemical fertilizers, pesticides on plants and in all agricultural practices.
- Both farming methods encourage farmers to use local and native variety seeds
- Organic and natural farming methods promote non chemical and homemade pest control methods.

Differences between Natural farming and Organic farming

	Natural farming	Organic farming
1.	Neither chemical nor organic fertilizers are added to the soil	Organic fertilizers and manures like compost, vermicompost, cow dung manure, etc. are added
2.	Decomposition of organic matter by microbes and earthworms is encouraged right on the soil	Decomposed manures from plant and animal waste may be added
3.	No plowing, no tilting of soil and no fertilizers and	Organic farming requires basic agro practices like plowing, tilting, mixing of manures etc
4.	No weeding is done	Weed control by biological & mechanical methods
5.	No external expenses incurred	Expensive

The decreasing organic matter in the soil and other ill effects of soil health, indiscriminate use of fertilizers like urea and pesticides have resulted in adverse effect on human health through eutrophication losses and pesticide toxicity in the farm products (Khadse *et al*., 2017). Therefore, a need has been felt for organic products in the local markets owing to its better quality and positive effects on human health (Neera *et al*., 1992). The organic products fetch more profits (2-3 times usually) which can compensate the yield losses to a large extent and needs to be quantified for offering a sustainable model of new organic based production systems to the farmers in India. Following of the objectives to be achieved with natural farming:

➢ Objectives

1. To produce food of high quality

2. To work along with natural system rather than seeking to dominate them
3. To encourage and enhance biological cycles involving micro-organisms,fauna, plants and animals

➢ Advantages of natural farming

1. Reduced cost of cultivation
2. Improved soil quality
3. Low dependence on inputs
4. Freedom from chemicals
5. Reduced incidence of pests
6. No exposure to pesticides

➢ Disadvantages

1. Risk of crop failure
2. Need more engagements of farmers
3. Unawareness of this technique
4. Yield uncertainaity

Prospects of Natural Farming

In this system of farming, no monetary investment on the part of farmer is required for purchase of seeds, fertilizers and plant protection chemicals from the market. The farmer can produce his own seed or he may use seeds that are available with other farmers. More importantly, there is absolutely no place for fertilizers and plant protection chemicals. Dependence on hired labour is also reduced to the bare minimum as the system discourages intercultural operations (Devarint, 2016). The whole philosophy behind this system is to make the farmer self-reliant so that he is free from the clutches of money lenders and market dispensed high cost inputs. Thus, Natural farming allows use of cow products such as cow dung, ghee, cow urine for prepration of biodynamic formulation namely Beejamrit and Jeevamrit for use in crops for enhancing microbial activity in the soil for nutrient management besides the insect pest management. All these processes have positive influences on crop production system for achieving higher productivity (Andow and Hidaka, 1998).

Conclusion

Natural Farming inputs are very effective in improving soil health and enhancing crop yield. But integrated use of different sources of nutrition has advantageous effects on soil health, crop productivity and quality. If found to be successful, an enabling institutional mechanism should be set to promote this technology so that Indian farmers would benefit through cost reduction and yield enhancement.

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