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Natural Farming: Sustainable and Highly Cost-Effective Method

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An increasing body of research shows that natural farming sustainable intensification may boost crop yields by rebuilding the ecosystems surrounding and inside farms (Garibaldi et al., 2019 and Godfray et al., 2010). In some situations, sustainable intensification has reached a significant scale, affecting many farmers and hectares (Gunton et al., 2016 and Pretty et al., 2018). Numerous biotic and abiotic interactions in the soil and at root surfaces are crucial for plant health.

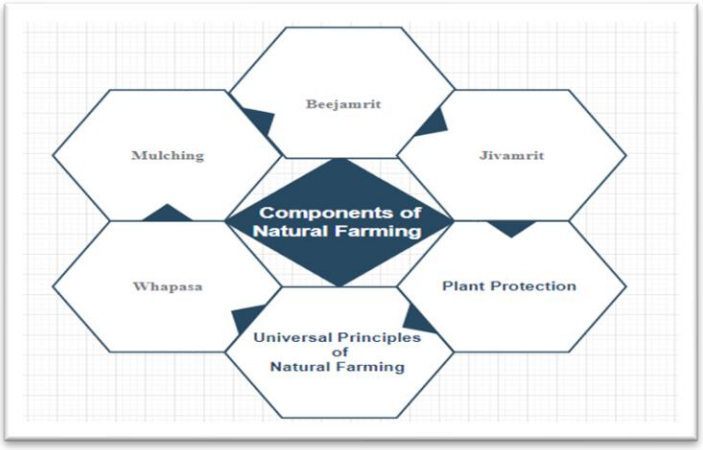
Chemical residues in food and the harm they have done to the environment are causing the public to become more concerned about potential health dangers. When it comes to their chemical, physical, and microbiological characteristics, what distinguishes soils that have been treated with agricultural pesticides from those that have not been treated? Does utilising organic fertilisers and pesticides eliminate the need for successful farming? What substitutes are there for the overwhelming reliance on chemicals in traditional farming?

Since 1980, Professor T. Higa has been studying a few beneficial microorganisms, which he refers to together as effective microorganisms, in order to find new approaches for a more sustainable agriculture. Natural farming, often known as agriculture without chemicals, has been promoted by Professor Higa. Using beneficial microorganisms to improve the health and quality of the soil is a crucial component of organic farming, which goes beyond simply avoiding the use of synthetic pesticides and fertilisers. The correct sort of bacteria may make soils synthetic, zymogenic, and disease-suppressive, according to Professor Higa (1988). Numerous issues and theories regarding the function of advantageous soil microbes in agriculture have been raised as a result of the development and use of efficient microorganisms.

Six Pillars of Natural Farming

1. Microbes from The Cow Dung Composition Break Down Complex Minerals, Releasing Nutrients

Jeevamrutha is the foundational principle of natural farming. Native Indian jaggery, new and used cow dung, water, pulse flour, soil, and cow breed are all combined to make it. This combination is an example of an organic fertiliser used on farmland. Cow dung microbes release nutrients and disintegrate complex minerals. Some of the constituents in these liquid formulations, such as cow dung, cow urine, legume flour, and jaggery, may be largely responsible for the presence of helpful bacteria. In addition to helpful bacteria, all of these compounds include critical macro- and micronutrients, a range of vitamins, vital amino acids, and molecules that promote development, such as indole acetic acid (IAA) and gibberlic acid (Palekar et al., 2006 and Sreenivasa et al., 2010).



A method known as "bijamrita" uses locally available ingredients to treat seeds. During the first phases of germination and establishment, it protects the crop against damaging soil-borne and seed-borne diseases. Devakumar et al. (2008) and Srinivas et al. (2010) claim that Jivamrita and Bijamrita contain a range of beneficial microbes, including fungi, actinomycetes, nitrogen fixers, and phosphorus solubilizers. Bijamrita is recommended by Indian tradition. The results of earlier research have shown that organic manures deliver the crucial nutrients required to improve crop growth and yield.

2. Native Seeds Provide Resilience to Neutralise Charge and Promote Biodiversity

Natural farming has a number of crucial components, including: Agriculture might become climate-smart, genetically varied, and sustainable by using indigenous crops for cultivation. Local landrace crops have a high level of climatic adaptation and are resistant to a wide range of serious pests and illnesses.

3. Adaptive Mixed-Crop Systems for Natural Farming

Mixed cropping was the primary goal of the first systematised agricultural production in order to more efficiently use resources and lower failure risks (Plucknet et al., 1986). Intercropping, sometimes referred to as mixed cropping, is the simultaneous planting of two or more crop species or cultivars in the same area. Through this practise, losses brought on by possible disease and insect infestation are reduced while the production stability and resource consumption efficiency are increased. Increased plant density per unit area, differences in pest and disease resistance, and changes in plant species' and cultivars' susceptibilities to stress are all advantages of mixed cropping. Due to the increased surface area that the leaves and roots cover, dense plant stands maximise radiation, water, and nutrient collection. (Morris et al., 1993; Keating et al., 1993)

4. Mulching Encourages Earthworms, Microorganisms, and Lowers Water Footprints

Mulching is the practise of covering the soil's surface with both live and dead plants, which helps to retain moisture, cool the soil around plant roots, minimise runoff, stop soil erosion, and restrict the growth of weeds. Earthworms and bacteria can use less water in agriculture when mulch is used. Weeds are among the most problematic agronomic issues in natural farming, and they also pose a substantial barrier to the widespread adoption of this method of farming (Bond et al., 2001). Since it lessens the predominance of weeds in crops, mulching is becoming a more popular weed management technique (Bilalis et al., 2003). This is especially important for growing healthy and secure plant sources of food in an organic farming system. In agricultural crop production, plant remnants are widely used as mulch, which has a variety of negative consequences on the agroecosystem (Blanco et al., 2007). It also helps prevent soil moisture from evaporating. The spontaneous breakdown of organic mulch replenishes the organic material in the soil. As mulch decomposes, the delayed nutrient release better matches plant requirements. It was discovered that the usage of straw mulch and grass mulch tended to enhance the amount of potassium and phosphorus that was readily available in the soil. Organic mulch that breaks down quickly provides vital nutrients that help plants.

5. Mulching Encourages Humus Formation, Suppresses Weeds, And Significantly Lowers Crop Water Needs by Allowing Earthworms to Continually Aerate and Percolate the Soil

The act of mulching involves covering a soil surface with any organic or inorganic material. Less weed growth, less soil erosion, compaction, moisture retention, and better temperature regulation are a few advantages. To reduce erosion and save water, mulching is utilised in areas with little rainfall. Despite the fact that natural mulches including leaves, straw, tree trimmings, grass clippings, bark clippings, and compost have been utilised for millennia, the introduction of synthetic materials in the last 65 years has altered how mulching is done and the advantages associated with it. The use of synthetic mulches to produce a variety of priceless works is covered in a number of resources. Plastic mulches are completely resistant to water in comparison.

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regions. While natural mulches such as leaves, straw, tree waste, grass clippings, bark clippings and compost have been used for centuries, during the last 60 years the arrival of synthetic materials have changed the means and profits of mulching. There is so much resources available on effect of synthetic mulches makes a huge volume of valuable works. Comparatively plastic mulches are fully impermeable to water. Therefore, it confines the losses of water and erosion of soil through-out the soil surface by preventing rapid evaporation from the surface of soil and the upsurge of water comprising salt, which is important in countries which has high salt content water resources. In this way it plays a productive part in conserving water (Sharma and Bhardwaj, 2017) of mulching are controlling erosion and saving water in low rainfall regions. While natural mulches such as leaves, straw, tree waste, grass clippings, bark clippings and compost have been used for centuries, during the last 60 years the arrival of synthetic materials have changed the means and profits of mulching. There is so much resources available on effect of synthetic mulches makes a huge volume of valuable works. Comparatively plastic mulches are fully impermeable to water. Therefore, it confines the losses of water and erosion of soil through-out the soil surface by preventing rapid evaporation from the surface of soil and the upsurge of water comprising salt, which is important in countries which has high salt content water resources. In this way it plays a productive part in conserving water (Sharma and Bhardwaj, 2017) of mulching are controlling erosion and saving water in low rainfall regions. While natural mulches such as leaves, straw, tree waste, grass clippings, bark clippings and compost have been used for centuries, during the last 60 years the arrival of synthetic materials have changed the means and profits of mulching. There is so much resources available on effect of synthetic mulches makes a huge volume of valuable works. Comparatively plastic mulches are fully impermeable to water. Therefore, it confines the losses of water and erosion of soil through-out the soil surface by preventing rapid evaporation from the surface of soil and the upsurge of water comprising salt, which is important in countries which has high salt content water resources. In this way it plays a productive part in conserving water (Sharma and Bhardwaj, 2017) of mulching are controlling erosion and saving water in low rainfall regions. While natural mulches such as leaves, straw, tree waste, grass clippings, bark clippings and compost have been used for centuries, during the last 60 years the arrival of synthetic materials have

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The Role of Earthworms and Bacteria in Natural Farming

Microbes from the composition of cow manure break down complex minerals, releasing Earthworms mix and aggregate the soil, encourage microbial development, and improve the soil's ability to retain water. By aerating, fragmenting, and expanding the surface area of the organic matter accessible to the microbes, earthworms and bacteria work together to hasten decomposition.

Conclusion

Natural farming has certainly impacted Indian agriculture for the better. These six natural farming pillars, together with additional plant protection techniques, form the basis of the natural farming practises that are most frequently applied. There are several recommended techniques for natural farming. Mulching and other types of irrigation are the techniques that are most frequently utilised. There is always space for advancement and innovation in methods like mulching. Even if the crop production could or might not be larger than it would be under conventional farming, it was also obvious that all of the crop cultivation expenditures had been greatly decreased. Natural farming techniques may or may not appear to increase yields, but they will

unquestionably increase farmers' incomes through cost savings and sustainability over the long run.

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