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Zero Budget Natural Farming: An Agricultural Revolution

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Abstract

A farmer who practises zero budget natural farming (ZBNF) does not need to buy fertilizers and pesticides from the market to ensure the healthy growth of plants. It is a sustainable way to farm that aids farmers in maintaining soil fertility, restores soil health to assure chemical-free agriculture and low production costs, and thereby doubles their income. Although the method encourages chemical-free farming, there is still insufficient data to determine its efficacy. It is one of the most promising farming options or techniques in the face of unpredictable extreme weather. As it does not encourage numerous intercultural activities, as a result the engagement of hired manual labourers, it is a low cost and climate resilient farming techniques where all the inputs are locally available. This practice takes less time and effort than organic farming tasks.

Introduction

Zero Budget Natural Farming (ZBNF), as the name suggests, is an agricultural practise in which crop plants are grown and harvested at no expense. A back to the basics agrarian movement is helping to increase the popularity of the ZBNF concept, which was first put forth by Maharashtrian Agriculturalist Padmashri Subhash Palekar in the middle of the 1990s as an alternative to the Green Revolution's methods based on chemical fertilizers, pesticides, and intensive irrigation. Zero Budget Natural Farming (ZBNF) is an alternative low-input, climate-resilient farming method that has emerged in India and throughout the world to lower input costs and increase yields for farmers from locally available sources/ inputs by doing away with chemical fertilizers and enhancing soil fertility (Bharucha *et al*., 2020). According to research by Palekar, the expense of external inputs like pesticides and fertilisers is the main driver of farmer debt and suicides globally. The high cost of production and high interest rates on credit might be greatly decreased by using traditional farming techniques. The Food and Agriculture Organization of the United Nations claims that a zero budget natural farming is an alternate way to substantially reduce farming expenses, which might help to break the debt cycle of farmers around the world (Singh *et al*., 2018).

Principles of ZBNF

Zero Budget Natural farming strives to grow plants by encouraging farmers' independence, safeguarding the environment, and fostering coexistence between humans, animals, and plants for a sustainable development. The fundamental principle underlying natural farming is to guide the farmers in practicing sustainable farming, which helps to maintain soil fertility to assure chemical-free agriculture and low production costs.

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- Year-round crop production.
- Minimal soil disturbance.
- Bio stimulants, which act as vital catalysts.
- The use of plant extracts for pest control.
- No artificial pesticides, herbicides, or fertilisers.
- Accessible resources found in nature.
- Reduces the possibility of failure.
- A consistent source of revenue.
- Non-toxic manufacturing.

Fundamental Practices of Zero Budget Natural Farming

The following is a list of the practices of natural farming:

- Jeevamruta/ Jivamrita/ Jeevamrit
- Beejamruta/ Bijamrita/ Beejamrit
- Acchadana/ Mulching
- Waaphasa/ Moisture
- Ghanjeevamrit
- Neemashtra
- Agniashtra
- Brahmashtra
- Mixed leaf extract (decoction)
- Chilli-garlic extract
- Dashparni extract

Jeevamruta/ Jivamrita/ Jeevamrit

Jeevamrit is used to guard against bacterial and fungal diseases. This can be kept for a year and used for irrigation or foliar spray applications (Khadse and Rosset, 2019). It can be made in a 250 litres plastic barrel by adding 10 kg of fresh cow dung, 10 litres of native cow urine, 2 kg of Jaggary, 2 kg of pulse flour (besan, chickpea flour), and 150 g of undisturbed forest or bund soil to 200 litres of water and properly mixing. Drums should be kept in shade with a gunny bag, cotton fabric, or plastic mosquito net covering them. Twice daily, in the morning and evening, stir the mixture for 5 to 10 minutes with a wooden stick. Jeevamrit can be used up to 12 days after preparation and is suitable for application on the ninth day. Other beneficial microorganisms that are already present in the soil are attracted to and have their activities increased by the Jeevamrit culture mixture (Khadse and Rosset, 2019). One acre of land requires 200 litres of Jeevamrit. Use irrigation water to apply or a 10% foliar spray once every two months.

Beejamruta/ Bijamrita/ Beejamrit

For treating seed, seedlings, and young planting material, use Beejamrit. Young roots can be protected from fungus, soil-borne diseases, and seed-borne diseases with its help. It can be prepared by hanging 5 kg of indigenous fresh cow dung in 20 litres of water for 12 hours after being wrapped in a cloth and taped together. Take one litre of water, add 50 g of lime to it, and let it sit overnight. To extract material, squeeze this bundle of cow dung three times in water. Stir the mixture well before adding the soil from the unaltered bunds or forest. 5 litres of local cow pee should be added along with the lime water, and the mixture should be well-stirred. The seeds can be treated using Beejamrit. Any crop's seeds are mixed with bijamrit, allowed to dry in the shade, and then sown. Leguminous crop seeds are simply dipped and immediately dried. Bijamrit, like Jivamrita, has some helpful bacteria that are useful for plant protection as well as for promoting plant growth and development (Smith *et al*., 2020).

Acchadana/ Mulching

The process of mulching involves adding cover crops, dried leaves, or crop residue to the top soil. It prevents soil erosion, enhances soil aeration, maintains soil moisture, boosts soil water retention capacity, promotes soil fauna, improves soil nutritional status, and inhibits weed growth.

Waaphasa/ Moisture

When both air and water molecules are present in the soil, the situation is referred to as waaphasa. In order for plants to grow and develop properly, the soil must have adequate aeration. It increases soil aeration, which raises humus content, soil structure, and good water holding capacity, all of which are best for agricultural plant growth, especially during dry spells.

Ghanjeevamrit

With the help of beneficial organisms that fix or mobilize NPK, ghanjeevamrit enhances the soil. It is applied to boost soil fertility. Ghanjeevamrit is made by combining 250 g of soil from undisturbed bunds or forests with 100 kg of native cow dung (air dried for 4-5 days), 1 kg of jaggery, 1 kg of pulse flour, 3 litres of native cow urine. This can be made like a cake when all the ingredients are added and kept. This can be applied to fields after 10 days of preparation. Apply ghanjeevamrit at the prescribed dose of 250 kg ha^{-1} prior to sowing. Store in a cool, dry area for up to six months at the best.

Neemashtra

Neemashtra is a neem and cow urine liquid composition. It takes about two to four days to prepare neemashtra on a farm. To suppress insect pests like aphids, jassids, mealy bugs, thrips, whiteflies, tiny caterpillars, and other sucking pests, fresh neemashtra is sprayed on crops. 5 kg of fresh neem leaves and 5 kg of neem seed kernels can be combined to create a liquid mixture (3-8 months old). The materials should be crushed into tiny, fine particles. In a plastic

barrel, combine the crushed leaves and/or kernels with 100 litres of water. Combine 1 kg of native cow dung and 5 litres of local cow urine. Using a wooden stick, vigorously blend the ingredients for two to three minutes. Spray on a one-acre crop while covering the drum's mouth with a fine mesh or piece of cloth. One hectare of crop needs to be sprayed with 250 litres of solution.

Agniashtra

An herbal remedy called agniashtra is made from neem leaves, chilli fruit, garlic, and cow urine. It is used to control fruit borers, stem borers, and other kinds of crop caterpillars. Take 5 kg of fresh neem leaves and 0.5 kg each of green chilli and garlic. Crush all three ingredients to get a smooth paste. Crushed ingredients should be mixed well with 20 litres of local cow urine. For about 20 minutes, stir the mixture occasionally with a wooden stick while it is boiling. For roughly 48 hours, let the content cool. Use a fine cotton cloth to filter the contents. After being diluted in 250 litres of water, 5 to 6 litres of agniashtra are enough to spray on a hectare of crop.

Brahmashtra

It is a concoction made with botanicals and cow urine. It is used as a natural insecticide to control both large and small insects, including fruit and pod borers, thrips, aphids, and jassids. Take 2 kg of karanj (*Pongamia pinnata*) leaves and 3 kg of fresh neem leaves. If karanj leaves are not readily available, smash 5 kg of neem leaves into little pieces. 2 kg each of custard apple and datura leaves should be crushed into tiny pieces. Combine all of the aforementioned crushed leaves with 10 litres of local cow pee. For 20 to 25 minutes, boil the mixture. For 48 hours, let the mixture cool. Use a fine cotton cloth to filter the contents. To spray one hectare, combine 5-6 litres of filtrate with 250 litres of water. Use a 4% foliar spray if the infection is severe. Natural pesticides brahmashtra can be store for 6 months.

Mixed Leaf Extract (Decoction)

It is also a formulation of cow urine and botanicals that is made with leaves of custard apple, papaya, guava, and other leaves that are readily available on the farm. Mixed leaf extract can be used to control many types of fruit/ pod borers and sucking pests. Take 3 kg of neem leaves and 2 kg each of papaya, guava, custard apple, and pomegranate leaves. The leaves should be finely crushed. Combine the above-mentioned crushed leaves with 10 litres of native cow. Once the volume is cut in half, boil the mixture of urine. For 24 hours, let the mixtures for cooling. Use a fine cotton cloth to filter the contents. Fill bottles with the filtrate. After dilution in 250 litres of water, 5 to 6 litres of extract are enough to spray on one hectare of crop.

Chilli-Garlic Extract

As the name suggests, it contains cow urine, neem, and basharam (*Ipomea carnea*) leaves and is a combination of chilli and garlic. It is helpful to control many caterpillar species, including leaf rollers, stem, fruit, and pod borers. Make a paste with 500 g of each hot chilli and garlic bulb. Crush 1 kg of besharam leaves and 5 kg of neem leaves into powder. Combine the 10 litres of local cow urine with the aforementioned crushed leaves. Boil the mixture until it has reduced in volume by half, and then let it cool for 24 hours. Use a fine cotton cloth to filter the contents. Fill bottles with the filtrate. For a hectare of spraying, combine 5 to 6 litres of filtrate with 250 litres of water.

Dashparni Extract

To manage various types of insect pests in crops and orchards, dashparni extract is helpful. Neem leaves weigh 5 kg, and 2 kg of leaves from each of the any other 10 plant species are used to prepare it. Take 10 litres of native cow urine, 10 kg of native cow dung, 500 g each of turmeric, garlic, and ginger paste, 1 kg each of tobacco leaf powder, and 1 kg each of hot chilli paste. The leaves were broken into little pieces. All materials were combined in a shaded 200 litres water drum. Use a wooden rod to stir the mixture three times daily while allowing it to ferment for 30 to 40 days. Filter the material with a fine cotton cloth. The filtrate should be kept in containers and consumed within six months of storage. For a one-hectare crop, mix 5 to 6 litres of dashparni extract with 250 litres of water.

Benefits of Zero Budget Natural Farming

- When compared to non-ZBNF approaches, ZBNF methods utilise between 50% and 60% less water and electricity for all crops.
- Through multiple aerations, ZBNF greatly lowers methane emissions.
- By using mulching, it is also possible to prevent the burning of residue.
- In ZBNF, cultivation costs are lower.
- As ZBNF is a completely chemical-free technique, it is environmentally friendly and produces organic yields which fetch the farmers' higher profits than from normal agricultural yields.
- It suits all crops in all agro-climatic zones.

Conclusion

A "back to the basics" approach to modern agriculture through natural farming on a zero budget has a number of benefits. ZBNF was developed with a very optimistic mindset to help the farming community. Since the ZBNF movement keeps farm expenses to a minimum and helps farmers become self-sufficient, it has not only increased agricultural productivity but also improved the socioeconomic standing of adopters (Das and Avasthe, 2020). Since it just uses

internal inputs, there is less need to obtain loans for farming activities. As a result, it reduces suicide and debt among the small and marginal farming communities. In the Union Budget for 2022-2023, it is suggested that chemical-free, organic farming be encouraged nationwide, starting with 5 km wide land corridors along the Ganges. Additionally, the budget suggested that ZBNF courses be included to agricultural universities' curricula.

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