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**Popular Article**

**Thriving Fields: Green Fodder Production with Zero Budget Natural Farming**

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**Introduction**

 The modern-day agriculture and livestock rearing based on intensive farming practices were initially believed to be the best way to increase production and meeting the growing feed and food demands. Green revolution has uplifted the use of high yielding varieties, chemical fertilizers and pesticides, thereby, deteriorating soil health and population of beneficial microbes (Koner and Laha, 2021). Besides, these practices have led to tremendous degradation of environmental quality. Injudicious use of fertilizers has reduced soil quality and lowered the microbial count of soil. The extensive spraying of pesticides, herbicides, growth regulators, etc., has lot of ill implications. In addition to the deteriorating soil and plant health, animals and humans feeding onto the crops are also affected, causing serious health issues (John and Babu, 2021).

Green fodder plays major role in livestock farming, there by feeding on good quality fodder is necessary for growth, production and reproduction and to maintain the health of the animals. In the process towards quality fodder production a shift from inorganic to organic or natural sources is becoming indispensable. In the endeavour, natural farming-based fodder production has tremendous potential and the measures to popularise this have to be promoted.

The term “Natural farming” was conceptualized by Masanobu Fukuoka (1913–2008) which is known as “Do-nothing farming” because he believed that the farmer is the facilitator and the real work can be done by nature. It was based on 5 principles: No tillage, No fertilizer, No pesticides or herbicides, No weeding and No pruning. The system works along with the natural biodiversity of the farm, encouraging the complexity of living organisms that shapes each particular ecosystem to thrive along with food plants (Kumar et al., 2023).

 In the 1990s, Padma Shri Mr. Subhash Palekar from India modified Fukuoka’s Natural farming into a system known as Zero Budget Natural Farming (ZBNF). The word “zero budget” mean “no credit or no expenses”, i.e., without any credit or spending any money on purchased agricultural inputs. He concentrated on low input use technologies in agriculture obtained from available on-farm resources and those are beneficial for soil health.

**Pillars of ZBNF**

There are four basic pillars of ZBNF

1. **BEEJAMRIT**

Beejamrit, an age-old sustainable agricultural practice, serves as a protective shield for seeds, seedlings, and other planting materials against fungal infections. This technique involves the application of a fermented microbial solution abundant in beneficial microbes crucial for plant health. By treating seeds with Beejamrit, the aim is to facilitate the colonization of roots and leaves by these beneficial microbes, thereby promoting robust growth and development in plants.

**Inputs needed:** 5 kg cow dung, 5 litre cow urine, 50-gram lime, 1kg bund soil, 20 litre water (for 100 kg seed)

**Preparation of Beejamrit**

**Step 1:** Place 5 kg of cow dung in a cloth and secure it with tape. Submerge the cloth in 20 liters of water for up to 12 hours.

**Step 2:** Meanwhile, mix one liter of water with 50 grams of lime and let it stand overnight.

**Step 3:** The next morning, squeeze the bundled cow dung in the water three times to thoroughly infuse its essence into the water.

**Step 4:** Introduce approximately 1 kg of soil into the water solution and stir thoroughly.

**Step 5:** Combine 5 liters of desi cow urine with the solution and the limewater, stirring well to ensure proper mixing.

For seed treatment application: Coat the seeds of any fodder crop with Beejamrit by hand, ensuring thorough mixing. Allow the coated seeds to dry completely before sowing. In the case of leguminous seeds with thin seed coats, simply dip them briefly in Beejamrit and then let them dry before sowing.

1. **JIVAMRIT**

Jivamrit serves as a biostimulant by enhancing the activity of soil microorganisms and encouraging the growth of phyllospheric microorganisms when applied to foliage. It functions as a catalyst for microbial activity, priming the soil for increased productivity. Additionally, it boosts the population of native earthworms, further enhancing soil health and fertility.

**Preparation of Jivamrit**

Combine 10 kg of fresh cow dung, 5-10 liters of cow urine, 50 grams of lime, 2 kg of jaggery, 2 kg of pulses' flour, 1 kg of uncontaminated soil, and 200 liters of water in a large container. Stir the mixture thoroughly and allow it to ferment for 48 hours in the shade. Stir the mixture twice daily with a wooden stick, once in the morning and once in the evening, for 5-7 days until it is ready.

**Application of Jivamrit**

Apply the prepared mixture every fortnight by either directly spraying it on the crops or mixing it with irrigation water. For fruit plants, apply the mixture directly on individual plants. Store the mixture for up to 15 days before use.

**3**. **ACCHADANA**

Acchadana, also known as mulching, involves covering the topsoil with crop residues or cover crops. As these materials decompose, they create humus, which helps conserve topsoil, improve water retention, reduce evaporation, promote soil fauna, enhance soil nutrient levels, and suppress weed growth. There are two main types of mulches:

**1. Crop Residue Mulch:** This type includes dried vegetation, farm stubble, and biomass waste. It shields the soil from intense sunlight, cold, rain, and helps safeguard seeds from birds, insects, and animals.

**2. Live Mulch:** Live mulching involves growing short-duration crops alongside the main crop in a multi-cropping or intercropping system. It's recommended to alternate between monocotyledonous and dicotyledonous crops to ensure a diverse nutrient supply. For instance, monocots like wheat and rice contribute nutrients such as potash, phosphate, and sulfur, while dicots like pulses fix nitrogen. This approach reduces the reliance on specific types of plant nutrients and promotes sustainable nutrient management.

4.**WHAPASA**

Good aeration is required in the soil for plant growth and development. Whapasa is the method of providing irrigation at the noon time in alternate furrows. Application of jeevamruta and mulching ensures soil aeration, thereby increasing humus content, water availability, water holding capacity and soil structure which is essential for crop growth.

**Scope and potential of ZBNF in fodder production**

Zero budget natural farming (ZBNF) is a grassroot movement that aims to improve farm viability by reducing costs.

1. **Conserving nature** – It avoids chemical sprays and use of bio-formulations which improves microbial content and water retention capacity in soils. It promotes the growth of soil natural micro-organisms which improves soil quality and hence encourages in luxurious growth of fodder crops.
2. **Social livelihood improvement –** The cost of production is nil as farmers use on-farm resources and avoid buying inputs from outside, besides there are no expenditure on fertilizers and pesticides. Thus, reduced costs of cultivation, higher yields, gained income from intercrops and a slightly higher selling price improves economy.
3. **Health risk management –** ZBNFreduces the exposure of animals to chemically treated foods and hence reduce health hazards associated with the use of chemicals. It also improves the quality of milk, eggs, meat, etc., obtained from such animals which feed on naturally produced fodders.
4. **Carbon sequestration -** One tonne of residue burning produces 400 kg of carbon, if the residues are retained or incorporated into soil it will supply carbon to the soil and help to produce more yield.

**Conclusion**

Zero budget natural farming based green fodder not only contributes to environmental sustainability but also promotes the well-being of both livestock and humans. By utilizing natural methods and minimizing the need for external inputs, this approach reduces production costs while enhancing profitability. Additionally, it supports a holistic ecosystem balance, fostering healthier soil, water, and biodiversity. Overall, embracing such practices aligns with broader goals of sustainable agriculture, ensuring long-term viability for farming communities and food systems.

**Reference**

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