



Zero Budget Natural Farming: Thinking beyond Organic Farming

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Across the world, agriculture is facing multiple setbacks, in the form of extreme weather events like floods and droughts or factors such as soil degradation, soil salinity and water shortage. To feed the global population of 9.6 billion by 2050, as projected by a United Nations report, scaling up food production is important. Ensuring food security, producing more with less resources and building the resilience of smallholder farmers are also important in creating a food-secure future. Considering these issues, NITI Ayog (Government of India), realizing that declining productivity and profitability of the small and marginal farmer's has been looking for alternative farming systems so that could be more decreased inputs and cost with profitable. Some of the alternative methods are Agnihotra Farming, Amrutpani Farming, Vedic Farming, Homoeo Farming and Zero Budget Natural Farming. In these type of farming, all inputs are to be locally resourced from in and around the village (or perhaps within the farm) in a symbiotic way. This is a dynamic system wherein outputs are likely to be inputs to at least one of the other outputs. More importantly, as none of the inputs are sourced from outside the system then there is no cost, and it is this that is referred to as zero budget natural farming (ZBNF).

The word zero budgets mean no credit or without spending any money on purchased agricultural inputs. Another term natural farming is a method of chemical-free agriculture drawing from traditional indian practices. In other sense, natural farming shows the importance of the synergistic effect of both plant and animal products on crop establishment, to build soil fertility and microorganisms (smith *et al.*, 2020). Natural farming is working with nature produced good food, and keeping healthy over selves, it is also known as donothing farming because the farmer is considered as a facilitator and the real work can be done by nature. No-tillage, no chemical fertilizer, no pesticides in this farming. It was started 1st time in Japan by M. Fukuoka, and his results showed that yields from natural farming are similar to chemical farming but without soil erosion also maintains soil fertility for a longer time (Devarinti, 2016).

Natural farming minimizes the external inputs to farmland which degenerate the soil nature, increases microbial population better soil aeration and good water retention capacity (Andow & Hidaka, 1998; Neera *et al.* 1992). Padma Shri recipient Mr. Subhash Palekar 1st time adapted this zero budget natural farming system in the Indian 1990s which is an alternative to the Green revolution. He revealed that Zero budget natural farming (ZBNF) is a grassroots movement that aims to improve farm viability by reducing costs. In Andhra Pradesh alone, 17 523,000 farmers have converted 13% of productive agricultural area to ZBNF. However, sustainability of ZBNF is questioned because external nutrient inputs are limited, which could cause a crash in food-production. ZBNF is likely to reduce soil degradation and could provide yield-benefits for low-input farmers. Nitrogen-fixation, either by free-living nitrogen-fixers in soil or symbiotic nitrogen-fixers in legumes, is likely to provide the major portion of nitrogen available to crops. However, even with maximum

potential nitrogen-fixation and release, only 52-80% of the national average nitrogen applied as fertilizer is expected to be supplied.

It is a farming practice that believes in natural growth of crops utilize on farm input. The four wheels of ZBNF are Bijamrita, Jiwamrita, Mulching and Waaphasa.



1. Jeevamrutha/Jivamrita: This is a fermented microbial culture prepared from locally available natural resources for the purpose of being applied to the soils/plants at different stages of their growth. It is a form of bio-fertilizer, a catalytic agent, promoting microorganism and earthworm activity in the soil. The 48 hour fermentation process multiplies aerobic and anaerobic bacteria present in the cow dung and urine, as they eat up organic ingredients, and a handful of undisturbed soil acts as inoculate of native species of microbes and organisms. Its application acts as a preventive measure against fungal and bacterial diseases. It can be applied through irrigation water or through foliar spray. While transiting from conventional input-intensive agriculture, the application of *Jeevamrutha* to the soils and plants is required only for the first three years because after that the system becomes self-sustaining.

2. Beejamrutha/Bijamrita: This is a concoction prepared from locally available natural resources for the propose of treatment for seeds, seedlings or any planting material. It reduces the possibility of seed infestation by pests and protects young roots from fungus, soil-borne diseases, and seed-borne diseases that generally affect the plants after monsoon. In the ingredients, the dung and urine from the indigenous breed cow act as a powerful fungicide, and anti-bacterial agent, respectively

3. Acchadana/Mulching: Mulching with organic residues or live mulching reduces tillage and consequently labour requirements, suppresses weeds, promotes humus formation and enhances the water holding capacity of the soil. Mulching enhances the biological activity and replenishes the nutrient base of the soil. Adequate mulching keeps the top and sub soil moist and enhances the water holding capacity of the soil and also reduces water loss due to evaporation so that the crop will be better equipped to tide over drought conditions. It is necessary to create the micro-climate under which micro-organisms can well develop, that is 25 to 32 °C temperature, 65 to 72 % moisture. It creates darkness and warmth in the soil. It conserves humidity of the soil, cools it and protects its micro-organisms. Mulching promotes humus formation, suppresses weeds and maintains the water requirement of crops.

4. Whapasa/Moisture: It is an appropriate mix of water and air in the soil or the relevance of soil moisture. It aims ar conserving water and the precise application of water-based on crop

water requirement. Application of water in alternative furrows because of all roots of plants not absorb efficiently, younger horizontal and vertical roots absorb more amount of water than older one and nutrients by older roots. In soil, out of soil mineral and organic matter, there is an equal proportion of water and air present. If a higher amount of water application leads to hold air space in the soil and plant suffers oxygen deficiency it may lead to cause death of plants except water loving plants like rice.

Conclusion

ZBNF 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. Although the economic yield in treatments comprised of ZBNF inputs was lower but their low cost of cultivation make these treatments comparable with other treatments in terms of benefit: cost ratio. Scientific validation of ZBNF technology should be undertaken through multi locational field trials. 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.

References

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