



Zero Budget Natural Farming: A Way towards Sustainable Agriculture

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When health is absent, wisdom cannot reveal itself, art cannot manifest, strength cannot fight, wealth becomes useless and intelligence cannot be applied. The above quote is self-explanatory that health comes foremost in our lives but today the issue regarding general health of humans is far more than terrible. In India after green revolution, the use of chemical fertilizers and pesticides in India has increased. These expensive and overuse of chemicals are showing adverse impact on environment, soil, human health and purity of ground water. Latest reports from WHO points that more than 50% of eatables have chemicals which are carcinogenic in nature (Prasad, 2016). Most of the farmers in India are marginal and small landholding category, the major problem with them is that if they will invest more money to purchase inputs and not get satisfactory yield due to failure in managing the incidence of pests and diseases or due to unfavorable climatic conditions lead to an reducing income and increasing of debts.

Since seeing the many negative consequences of using pesticides in agriculture, farmers are increasingly turning to zero-budget natural farming (ZBNF). It has gained widespread popularity in southern India, especially in Karnataka, where it originated (Kumar, 2012). It is now rapidly spreading across India. This concept was pulled into the light by Shri Subhash Palekar in the Indian 1990s for which he was honored with Padma Shri in 2016. He met with the Japanese philosopher Fukuoka. They both came with methods of natural farming and encouraged the method of natural farming widely in Karnataka as zero budget natural farming. Zero budget natural farming promises to end a reliance on loans and drastically cuts production costs, ending the debt cycle for desperate farmers (Murall, 2016).

The word 'budget' is referred to as the credit and expenses, thus the phrase 'Zero Budget' means without using any credit, and without spending any money on purchased inputs. 'Natural farming' means farming with Nature and without chemicals, which conserves biodiversity and nurtures the balance.

Via diversification, microbial activities, nutrient recycling, and beneficial biological interaction, ZBNF is gaining traction in restoring soil quality for long-term crop production. BNF is a low-input, climate-resilient farming solution that allows farmers to use low-cost, locally sourced inputs while eliminating artificial fertilizers and pesticides for long-term agroecosystem management (Upadhyay *et al.*, 2019 & 2020).

"ZBNF is self-nourishing and symbiotic in nature."- Subash Palekar (Palekar, 2014).

The 4 pillars of ZBNF

ZBNF is based on what Palekar calls the four wheels of ZBNF, shown in Table 1. Bijamrita (a seed treatment) and Jivamrita (a soil inoculant) are microbial mixtures which are ready in under 48 h. For those who do not have access to water or labor, a dry version of Jivamrita called Ghanajivamrita is prescribed. Contrary to conventional agriculture, Palekar believes that the soil already has all the nutrients necessary for plant growth, and thus no external inputs need to be added; instead, the existing nutrients have to be “unlocked” and made bioavailable via jiwamruta (Palekar 2005)- this idea is called Annapurna by Palekar. Palekar claims that the urine and dung from one cow are enough for farming 30 acres of land, and so cow ownership by each individual farmer is not necessary. In places where local cows are not available, other alternatives of other animals like buffalos or even human urine can be used, but Palekar claims that indigenous cow breeds have the most and best microbes and are preferable. Some farmers we interviewed in Karnataka had found it hard to find native cows. Mulching in ZBNF takes various forms. “Live mulching” is promoted with cover crops of a mix of monocotyledons (like millets) and leguminous dicotyledons (like beans). The monocots provide nutrients like potash or phosphate, while the dicots help in nitrogen-fixing (Palekar 2006). Straw mulching is also promoted, using dry crop residue. Waaphasa means water vapor. Palekar claims that roots absorb water vapor and not water. He promotes a microclimatic condition around the roots, where there is a mix of air and water molecules and rejects over-watering. He prescribes watering only when the sun is high at noon for optimum whaaphasa formation. Palekar claims that up to 90% of water use can be reduced through ZBNF practices making it ideal for rain-fed farming (Palekar 2006). Palekar also prescribes a number of bio-pesticides (‘Neemastra’, ‘Agniasta’, ‘Bramhastra’ etc.) made through natural or organic or bio-products are only permitted to use in zero budget natural farming during the times of pest and disease outbreaks to protect the plants to reach economic injury levels. They are effective in controlling various seed, soil and air borne diseases and insects such as aphids, jassids, mealy bugs, white flies etc.

Table 1: Basic Pillars of ZBNF

S.No.	Methods	Preparation	Benefits
1.	Jivamrita/ Jeevamrutha	It is composed of the cow-dung (20 kg), urine (5-10 l), jaggery (20 kg) and dicot flour (2 kg) and is applied to the crops with each Irrigation cycle OR directly to the crops.	It provides nutrients, but most importantly, acts as a catalytic agent that promotes the activity of microorganisms in the soil, as well as increases earthworm activity. Jeevamrutha also helps to prevent fungal and bacterial plant diseases, the Jeevamrutha is only needed for the first 3 years of the transition, after which the system becomes self-sustaining.
2.	Bijamrita	It is basically made up of water (20l), cow dung (5kg), urine (5l), lime (50gm) and just a handful of soil.	Bijamrita is a seed treatment, equipped in protecting young roots from fungus as well as from soil-borne and seed-borne diseases.
3.	Acchadana- Mulching	It could be done by soil mulch, straw mulch or live mulch.	It conserves soil moisture, by reducing evaporation.
4.	Whapasa – moisture	The irrigation should be reduced and irrigation should be practiced only at noon, in alternate furrows.	Palekar challenges the idea that plant roots need a lot of water, in-fact, what roots need is water vapour, and therefore, Whapasa is the condition where there exist both air molecules and water molecules present in the soil.

Pest Management in ZBNF:

S. No.	Name of management formulae	Composition	Benefits
1.	Agniastra	It composed of 20 litres Local cow urine, 500 gm Tobacco, 500 gm of Green Chilli, 500gm of Local Garlic, 5kg Neem leaves pulp (crushed in urine). For 1acre spraying, 6-8 litres Agniastra left after boiling is taken in 200 litres water.	It is effective against the pests like leaf roller, stem borer, fruit borer, and pod borer.
2.	Brahmastra	It composed of 10 lit local cow urine, 5 kg Neem leaves, Guava, Mango, Neem and Castor (Eranda) leaves pulp crushed (2-2 kg each). It is prepared by crushed and boiled in desi cow urine. For 1acre 2.5-3 litres solution mix in 200 lit water and used as spray.	It is used to control all of sucking pests, fruit borer, and pod borer.
3.	Neemastra	It is made up of local cow urine (5 litres), cow dung (5 kg) and neem leaves (5 kg) water (100 litres). It is prepared by mixing all materials and use after 48-72 hours for 1acre.	It is used for sucking pests and mealy bug.
4.	Dashparni ark	It composed of 200 litres Water, 20 litres local cow urine, 2 kg Cow Dung, 500 gm Turmeric powder, 500gm ginger paste, 200 gm Asafoetida (Heeng) Powder, 1kg Tobacco powder, 1 kg of Green Chilli paste, 1 kg Garlic paste, 2-2 kg, leaves of 10 plants Castor (Eranda), Neem karang, Custard apple, Bael, aak, datura, mango, guava, marigold, turmeric. Then mix all material then use this solution for 1acre after 28 days.	It is used to control all of sucking pests and borers.

Table 4: Other formulations in ZBNF

S. No.	Name of formulae	Composition	Benefits
1.	Jungle ki Kandi	One year old cow dung cake 15 kg and 50 litres of water. Mix well in drum and place in shade for 4 days and spray the solution for 1 acre after four days in 200 litres of water.	It acts as growth promoter (gibberellic acid).
2.	Saptdhanyankur ark	100 gm of each sesame, green gram, black gram, lobia, coffee, mash, wheat seeds. Soaked and sprouted seeds of these are crushed in 200 litres of water & place it for 2 hrs. After 2 days drain out solution out of it and spray within 48 hrs in 1 acre area in 200 litres of water.	It develops shining in fruits, vegetables and seed crops.

Conclusion

The external production cost in ZBNF is zero or very low. This farming system requires no monetary commitment on the part of the farmer for the procurement of seeds, fertilizers, and plant safety chemicals. Natural Farming products are of high quality, have a pleasant flavor, and produce a higher yield. ZBNF is heavily reliant on its four wheels. It is important to understand the relationships of different components in a given environment when monitoring pests in ZBNF. This farming method would have a positive impact on all the natural resources of our environment, soil, and human health, as well as the purity of groundwater also managed. Sustainable land resource management is also a critical factor in reducing the pressures on all-natural resources and ensuring long-term crop production.

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