

Zero Budget Natural Farming (ZBNF): A Sustainable way of Crop Production

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- Zero Budget Natural Farming (ZBNF) is a type of chemical-free farming where the total cost of growing and harvesting plants comes out to be zero (taking into consideration the costs incurred by the farmers are recovered through inter-cropping).
- The topic, ‘Zero Budget Natural Farming,’ gained prominence when Finance Minister Nirmala Sitharaman mentioned it in her 2019 budget speech, speaking of it as a source of doubling farmers’ income.
- It aims to bring down the cost of production to nearly zero and return to a pre-green revolution style of farming.
- It claims that there is no need for expensive inputs such as fertilisers, pesticides and intensive irrigation.
- Zero Budget Natural Farming (ZBNF) is the practice of growing crops without the use of any external inputs, such as pesticides and fertilisers.
- The phrase “Zero Budget” refers to all crops with zero production costs.

The farmers’ revenue is increased as a result of ZBNF’s guidance towards sustainable farming methods that help to maintain soil fertility, assure chemical-free agriculture, and ensure a cheap cost of production (zero cost). Simply said, ZBNF is a farming technique that emphasises cultivating crops in harmony with the environment. Under the specific programme known as Paramparagat Krishi Vikas Yojana (PKVY), the government has been encouraging organic farming.

- Subash Palekar (Indian Agriculturist and Padma Shri Recipient) is the father of Zero Budget Natural Farming. He developed it in the mid-1990s as an alternative to the Green Revolution methods.

Principles of Zero Budget Natural Farming:

The key principles of Zero Budget Natural Farming are



- Zero external inputs.
- Crops to cover the soil for 365 days (Living Root).
- Minimum soil disturbance.
- Biostimulants as essential catalyst.
- Utilize native seed for mixed farming.
- Mixed cropping.
- Incorporation of trees into the farm.
- Conservation of moisture and water.
- Bring animals into farming.

- More organic debris in the soil.
- Using plant extracts to control pest.
- No artificial pesticides, herbicides, or fertilisers.



ZBNF adoption on a large scale could have a negative influence on farmer income and food security. So it is necessary to conduct a proper scientific confirmation of ZBNF's



Concerns with Zero Budget Natural Farming:

Government spending is low: In 2018, the government introduced the Rashtriya Krishi Vikas Yojana, a centre piece programme for the Green Revolution, with an appropriation of Rs 3,745 crore for the fiscal year 2019–20. While just Rs 325 crore was allotted to the Paramparagat Krishi Vikas Yojana, which was created to encourage natural farming and soil health.

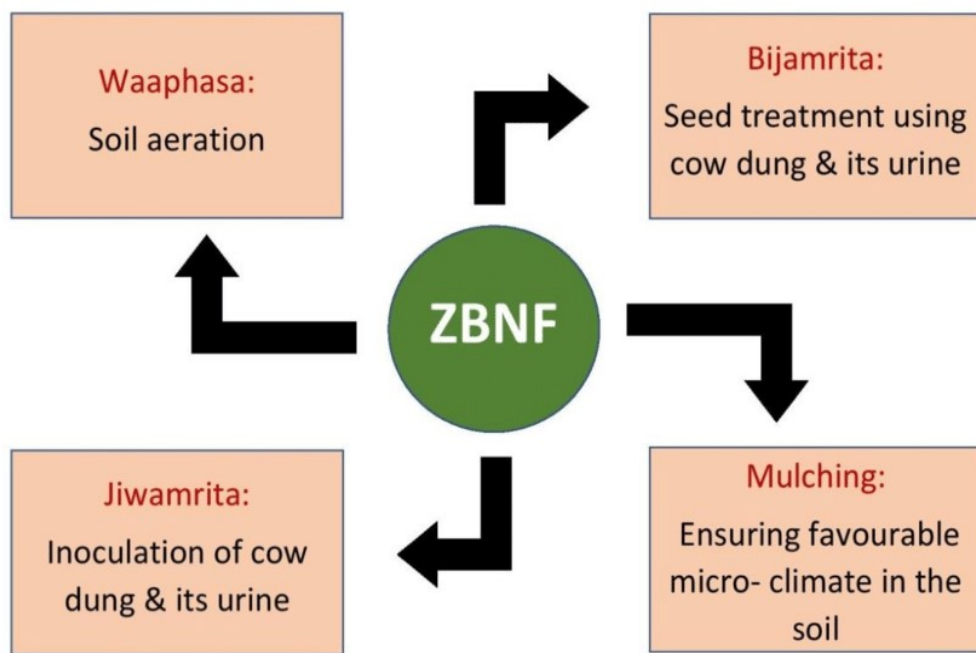
After observing that their ZBNF yields began to decline after a few years, many farmers switched back to conventional farming.

While ZBNF has unquestionably contributed to maintaining soil fertility, its impact on increasing productivity and farmers' income is still inconclusive.

The long-term effect and viability of the ZBNF Model should be properly validated before it is widely pushed across the nation.

effectiveness.

Components of Zero Budget Natural Farming:



There are 4 components or pillars of zero budget natural farming.

1. Bijamreet
2. Jivamreet
3. Mulching
4. Waaphasa

There are four primary ZNBF components and models:

1. Bijamrita:

Beejamrut means Beej (seed) dipped in Amrut (magical liquid).

It is a treatment used for beej, seedlings or any planting material.

It is effective method to protect young roots from fungus and any soil-borne as well as seed borne diseases. These diseases affect crops mostly after monsoon.

While neem leaves and pulp, tobacco, as well as green chilli extracts are used to manage insects and pests, bijamrita is utilised to treat seeds.

Preparation Method:

- 1) Take 5 Kg cowdung in cloth & tie it with rope.
- 2) Dip this cowdung in the barrel / bucket which containing 20 Lt. of water upto 12 hours.
- 3) In other pot, add 50 gm of lime in one Ltr of water. Let it stabilize for overnight.
- 4) Next morning, squeeze the bundle of cowdung in same water thrice continuously, so that all essence of cowdung will get accumulated in it.
- 5) Add handful of soil from bund of field in that water and stir well.
- 6) Lastly add 5 Lt of cow urine & lime water (which is prepared earlier) and stir well. Beejamrut is ready to use.

Application:

- 1) Add beejamrut to seeds of any crop, coat them, mixing by hand, dry them and use for sowing.
- 2) For seedlings, just dip them in beejamrut and dry.

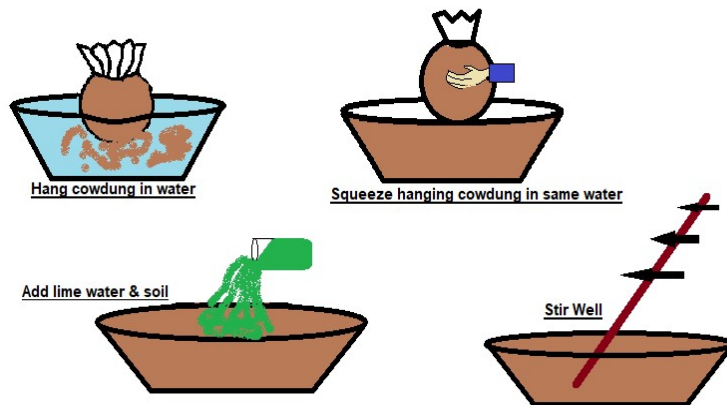
Uses:

Beejamrut protects seeds from soil-borne as well as seed-borne diseases which will affect crops. It acts as an anti-bacterial agent.

2. Jiwamrita/Jeevamrutha:

- Cow dung is a natural resource

PREPARATION OF BEEJAMRUT



utilised to restore the fertility and nutritional value of soil.

- One gram of cow dung may contain 300–500 billion helpful microorganisms.
- These bacteria help decompose the soil's biomass and transform it into readily usable nutrients for crops.
- Cow dung and cow urine are used to make Jiwamrita. It is a component of the plants' diet.
- It is a fermented microbial culture made from uncontaminated soil, jaggery, cow dung, urine, and pulse flour.
- When applied to soil, this fermented microbial culture enriches the soil with nutrients and acts as a catalyst to encourage the activity of earthworms and microorganisms.

Components:



Method of Preparation:

- 200 Litre of water taken in a barrel.
- Then 10 Kg Cow dung, 10 Lt. cow urine, 2 Kg jaggery, 2 Kg pulse flour and handful of farm soil added to it.
- Then it is mixed by making in a heap.
- It is allowed to ferment for 5-6 days.
- Then it is sprayed along with irrigation water.

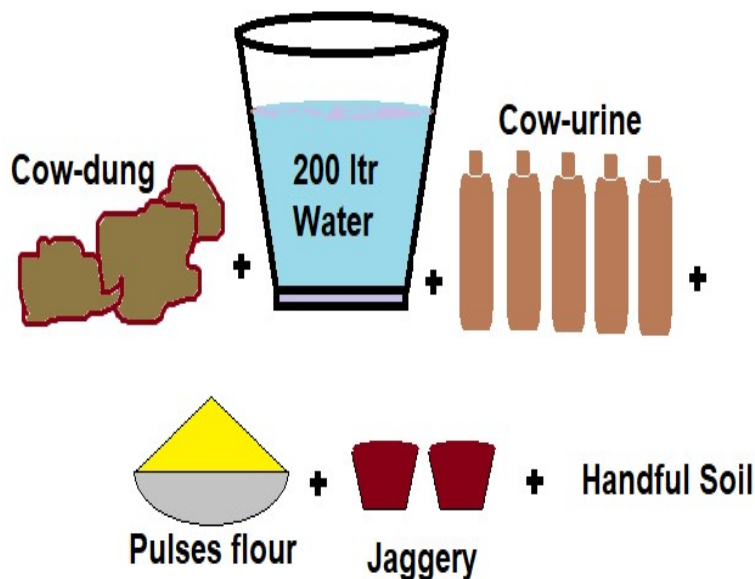
Application:

For 1 hectare of land, 500 litres of jeevamrutha should be applied twice a month.

After three years, the system become self-sustaining. A single native cow is adequate 30 acres of land.

Benefits:

By promoting soil microbial activity, this



culture improves the availability of nutrients to plants, shields crops from soil diseases,

- It also controls weed growth.



and raises the carbon content of the soil.

(Application of Jeevamrutha along with irrigation water)

3. Acchadana/Mulching: The process of mulching involves adding cover crops, organic debris, or agricultural residue to the topsoil.

Benefits:

- Decomposing the materials used for mulching results in humus.
- It not only improves soil nutritional



status but also conserves topsoil, boosts soil water retention, reduces evaporation loss, and promotes soil fauna.

Mulching/Acchadana

<p style="text-align: center;">Soil Mulch</p> <p style="font-size: small;">Palekar suggests avoiding deep ploughing.</p>	<p style="text-align: center;">Straw Mulch</p> <p style="font-size: small;">Palekar suggests, it can be composed of the dead material of any living being (plants, animals, etc).</p>	<p style="text-align: center;">Live Mulch</p> <p style="font-size: small;">(symbiotic intercrops and mixed crops)</p> <p style="font-size: x-small;">According to Palekar, monocotyledons and dicotyledons grown in the same field, to supply all essential elements to the soil and crops.</p>



4. Waaphasa/Moisture (Soil Aeration): For plants to grow and thrive, the soil must have adequate aeration.



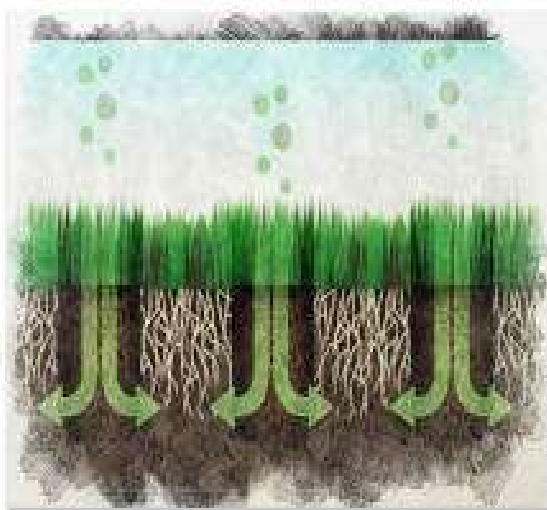
Benefits:

- Applying Jiwamrita and mulching promotes soil aeration, humus content, availability of water, water retention capacity, and soil structure, all of which are essential for crop growth, particularly during dry spells.
- Filter using cloth & ferment for 48 hours.
- Ready to spray on leaf roller, stem borer, fruit borer etc.
- It takes near about 21 days to prepare the solution.

Is Vermicomposting used in Zero Budget Natural Farming?

No, Vermicomposting which is a method of using earthworms as a means to enhance organic waste conversion; is not supported in Zero Budget Natural Farming.

Palekar mentioned that European Red Wiggler (The most common composting Earthworm) that is used in vermicomposting absorb toxic metal and poisons the soil.



Insect Pest Management:

1.Agniastra:

This is a complete organic product from cow urine.

Preparation method:

- Take 200 Lt. of water.
- Add 10 Kg Cow dung & 10 Litre of cow urine.
- Add 1 Kg tobacco, 500 gm green chilli and 500 gm local garlic.
- Boil the solution 5 times continuously.

Dose:

- 1 litre mixed with 50 litre of water and then spray.
- Don't mix with any other chemicals.



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- Use once in 4 days interval for 1st & 2nd application.
- Best time of application is early morning and evening hours.

2.Brahmastra:

Preparation:

- Take a pot.
- Add 10 litre cow urine, crush 3 kg neem leaves & add this neem pulp in this water.
- Add custard apple, guava, pomegranate, papaya & *Lantana camara* leaves to it.
- Boil the solution 5 times.
- Filter using a cloth, fermented for 24 hours.
- Then it is ready to spray on trees to control sucking pest, pod borer and fruit borer.

Dose:

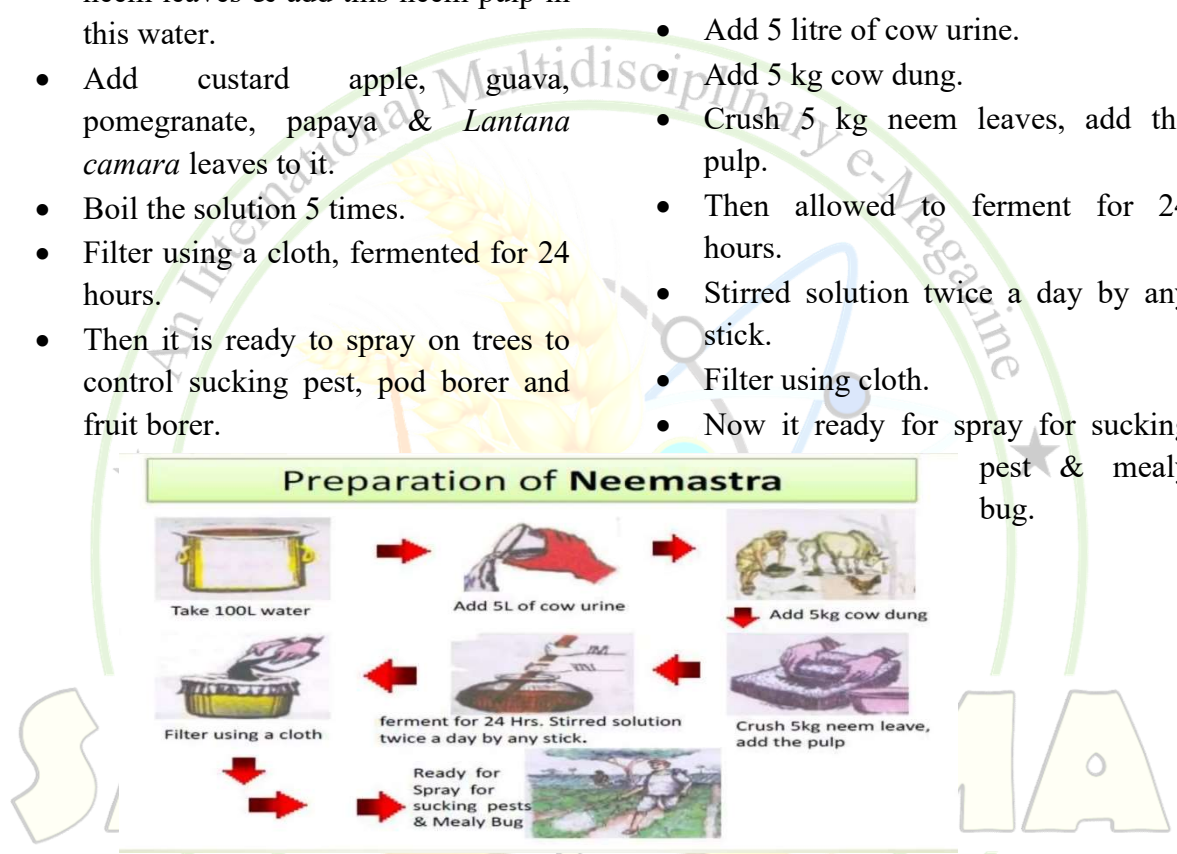
2% solution of brahmastra is sprayed in the field i.e., 2 litre in 100 litre of water.

3. Neemastra:

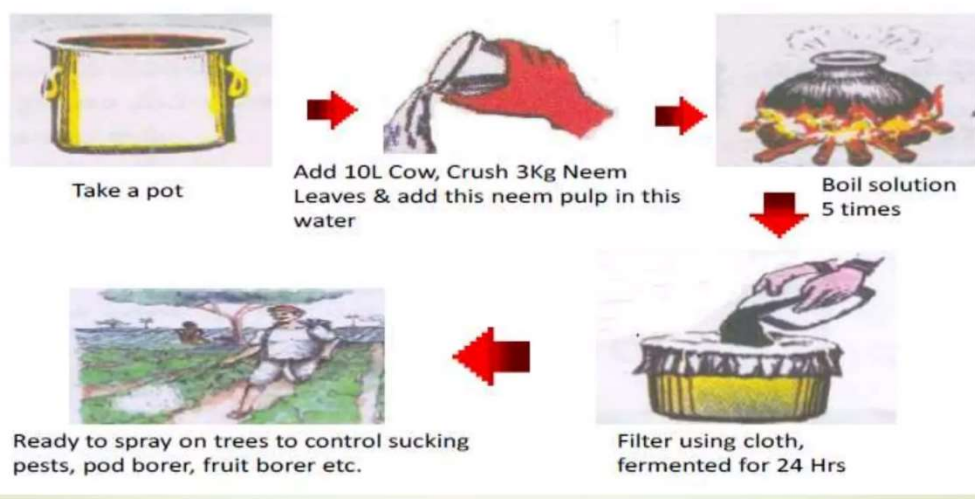
Neemastra is prepared from neem based byproducts like neem leaves, pulp etc. along with cow urine.

Preparation:

- Take 100 litre of water in a container.
- Add 5 litre of cow urine.
- Add 5 kg cow dung.
- Crush 5 kg neem leaves, add the pulp.
- Then allowed to ferment for 24 hours.
- Stirred solution twice a day by any stick.
- Filter using cloth.
- Now it ready for spray for sucking pest & mealy bug.



Preparation of Bramhastra





Dose:

The dose of Neemastra is 2-3 % i.e., 2 litre in 100 litre of water and spray on the leaves.

Zero Budget Natural Farming and Farmers' Income:

- The major characteristic of Zero Budget Natural Farming is that the cost of production is zero and farmers do not have to buy any inputs to initiate this method of farming.
- Against the conventional methods, the Zero Budget Natural Farming used only 10 percent of the water that is used in the former method.
- As it promotes the use of the Indian local breed of the cow for 30 acres of land, it makes it possible for farmers to earn profits earlier than expected.
- Palekar suggested that with Zero Budget Farming One can make an income of ₹6 lakh an acre in irrigated areas and ₹1.5 lakh in non-irrigated areas.
- As the Zero Budget Natural Farming covers all types of agro-climatic areas, it is mentioned to be suitable for all kinds of crops.
- Farmers can get more yields in the first year only giving them a benefit.
- The Zero Budget Farming is also seen to ease out the debt pressure on the farmers as they don't have to take loans to buy any inputs for their farming.
- Farmers are expected to earn more money per acre and the chances of migration from villages to cities can also lessen.

Benefits of Zero Budget Natural Farming:

- For all crops, ZBNF methods use between 50 and 60 per cent less water and electricity compared to non-ZBNF methods.

- 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.
- This would break the debt cycle for many small farmers and help to envisage the doubling of farmer's income.
- when chemical-intensive farming is resulting in soil and environmental degradation, a zero-cost environment friendly farming method is definitely a timely initiative.
- The ZBNF method promotes soil aeration, minimal watering, intercropping, bunds and topsoil mulching and discourages intensive irrigation and deep ploughing.
- The primary reason for debt and suicide amongst farmers is the rising expense of external inputs (seeds, fertilisers, pesticides, and herbicides). Over half of all farmers are in indebtedness, and nearly 70% of households in the agricultural sector spend more than they make, according to data from the National Sample Survey Office (NSSO).
- The cost of production could be decreased and agriculture could be turned into a "zero budget" endeavour since under ZBNF there is no requirement of spending money or taking out loans for external inputs.
- This will enable many small farmers to escape the debt cycle and pave the way for the income of farmers to double.
- Organic foods thus avoid diseases which used to be caused by non-organic foods, in a long run will not only make people healthy but also



reduce the burden on the healthcare infrastructure in general.

- It suits all crops in all agro-climatic zones.

Demerits of Zero Budget Natural Farming:

- The concept of Zero Budget Natural Farming is not well-accepted by the scientific community.
- National Academy of Agricultural Sciences scientists mentioned that India cannot rely on Zero Budget Natural Farming as there is no scientific validation of the techniques used in Zero Budget Farming.
- Decline in yields during conversion period.

- As against the name suggests, the farming method does bear a minimum input cost.
- The maintenance of the local cow breed is difficult as against those that are used currently.
- Organic certification of the crops planted by the Zero Budget Natural Farming will face another hurdle and it might lead to a difficulty in selling the products to the organic brands.

Govt. Initiatives:

1. PKVY – Paramparagat Krishi Vikash Yojana 2015-16.
2. MOVCDNER – Mission on Value Chain Development for North East Region,2016.
3. BPKP – Bharatiya Prakritik Krishi

How is Jeevamrutha applied in Zero Budget Natural Farming?

About 200 litres of jeevamrutha is sprayed twice a month per acre of land. After three years, the system is supposed to become self-sustaining.

Which quality of cow is needed in Zero Budget Natural Farming?

According to Palekar, a local Indian breed cow is sufficient for 30 acres of land.

- Many farmers have reverted to conventional farming after seeing their ZBNF returns drop after a few years.
- While ZBNF has definitely helped preserve soil fertility, its role in boosting productivity and farmers' income isn't conclusive yet.
- ZBNF advocates the need of an Indian breed cow, whose numbers are declining at a fast pace. (According to Livestock Census, the country's total population of indigenous and nondescript cattle has dropped by 8.1%)

- Padhati, Component of PKVY in 2020-21.
- 4. Andhra Pradesh planned to become India's 1st state to practice 100 % natural farming over 80 lakh hectares of land, converting the State's 60 lakh farmers by 2024.
- 5. Training given to farmers' of Chhatisgarh, Kerala, Karnataka, Tamil nadu, AP, Himachal Pradesh, MP & Jharkhand.

Conclusion:

- Savings on cost of seeds, fertilizers and plant protection chemicals has been substantial.
- Because of continuous incorporation of organic residues and



replenishment of soil fertility helps to maintain soil health.

- The new system of farming has freed the farmers from debt trap.
- It also build up sense of confidence to make farming an economically viable and sustainable in long run.

Sources:

<https://www.thehindu.com/sci-tech/agriculture/what-is-zero-budget-natural-farming/article28733122.ece>

<https://thewire.in/agriculture/budget-2019-zero-budget-natural-farming>

Babu R, Yogananda. Faculty (Agriculture), ANSSIRD, Mysore. “Action Research Report on Subhash Palekar’s Zero Budget Natural Farming, 2008.

Khadse A, Rosset PM. Zero Budget Natural Farming in India-From Inception to Institutionalization, Agroecology and Sustainable Food Systems, 2019

<https://www.thehindu.com/news/national/govt-should-stop-promoting-zero-budget-natural-farming-pending-proof-scientists/article29386358.ece>

<https://www.thehindu.com/opinion/op-ed/the-seeds-of-sustainability/article24213217.ece>

<http://www.fao.org/agroecology/detail/en/c/443712/>

Palekar S. The Principles of spiritual Farming II. 2nd ed. Amravati: Zero Budget Natural, 2006.