



## Nature's Secrets Unveiled: The Science Behind Natural Farming

(\*Ravina P. Amipara and Bhaumik D. Makwana)

Gujarat Natural farming and Organic Agricultural University, Halol, Camp., Anand

\*Corresponding Author's email: [ravinaamipara3@gmail.com](mailto:ravinaamipara3@gmail.com)

Natural Farming is a chemical-free farming system rooted in Indian tradition enriched with modern understanding of ecology, resource recycling and on-farm resource optimization. It is considered as agroecology based diversified farming system which integrates crops, trees and livestock with functional biodiversity. It is largely based on on-farm biomass recycling with major stress on biomass mulching, use of on-farm cow dung-urine formulations; maintaining soil aeration and exclusion of all synthetic chemical inputs. Natural farming is expected to reduce dependency on purchased inputs. It is considered as a cost-effective farming practice with scope for increasing employment and rural development. Many states are already following natural farming and have developed successful models. State of Andhra Pradesh, Karnataka, Himachal Pradesh, Gujarat, Uttar Pradesh and Kerala are among the leading states. Currently, the acceptance and adoption of natural farming systems are at early stages and gradually gaining acceptance among the farming community. Natural farming aims at restoring soil health, maintenance of diversity, ensure animal welfare, stress on efficient use of natural/local resources and promote ecological fairness. Natural farming is an ecological farming approach where farming system works with the natural biodiversity, encouraging the soil's biological activity and managing the complexity of living organisms both plant and animal to thrive along with food production system.

### Current Scenario of Natural Farming in India

Many states have taken up initiatives for natural farming promotion Andhra Pradesh, Gujarat, Himachal Pradesh, Odisha, Madhya Pradesh, Rajasthan, Uttar Pradesh and Tamil Nadu are among the leading states. As of now more than 10 lakh ha. area is covered under natural farming in India.

### Current Scenario of Natural Farming in Gujarat

In Budget 2020-21, special financial assistance was announced for promoting Natural Farming practices under the Gujarat Atma Nirbhar package. Further, on 17 September 2020, two schemes were launched Sat Pagala Khedut Kalyaan and Pagala for Natural Farming by the Government of Gujarat. Details of Scheme 1: Rs. 900 monthly subsidy for the maintenance cost of one cow to a farming family practising Natural Farming. Details of Scheme, 2: Provision of Rs. 1248 subsidy to farmers for purchase of a Natural Farming kit to prepare *Jeevamrit*.

### Cow and Botanical Based Concoction of Natural Farming

Sr	Jeevamrit	Quantity	Beejamrit	Quantity
1	Water	200 liters	Water	20 liters
2	Cow urine	10 liters	Cow urine	5 liters
3	Cow dung	10 kg	Cow dung	5 kg

4	Soil under large tree	A handful	Lime	50 g
5	Pulse flour	2 kg	<b>Jeevamrit</b> : it can be used after 9-12 days.	
6	Jaggery	2 kg	<b>Beejamrit</b> : it can be used on the same day of preparation.	

**Beejamrit:** The seeds are treated with formulations prepared using cow dung and cow urine from native cow species.

**Benefits:**

- The seeds sown in the field may be affected by fungus and other seed born/soil borne diseases.
- The seed treatment using “Beejamrit” protects the seeds from diseases.

**Jeevamrit/Jeevamrutha:** **Jeevamrit** is prepared using cow dung and cow urine. It is used as an input for the plants. It is a fermented microbial culture obtained from cow dung, urine, jaggery, pulse flour and uncontaminated soil. This fermented microbial culture when applied to soil, adds nutrients to the soil besides acting as a catalytic agent to promote the activity of microorganisms and earthworms in the soil.

**Benefits:**

This culture stimulates microbial activity in the soil and enhances nutrient availability for the plants, protects the crops against soil pathogens and increases carbon content of the soil.

**Acchadana/ Mulching:** Mulching is the process of covering the top soil with crop wastes/organic waste or with cover crops.

**Benefits:**

Mulching materials decomposes and produces humus which conserves top soil, increases water retention capacity of the soil, decreases evaporation loss, encourages soil fauna besides enriching soil nutrient status and controlling weed growth.

**Mix Cropping:** is the method of growing two or more crops in the same piece of land in the same growing seasons instead of one crop.

**Benefits:**

- The risk of total crop failure due to uncertain monsoon is reduced.
- Chances of pest infestation are greatly reduced.
- Fertility of the soil is improved by growing two crops simultaneously.

**Waaphasa/ Moisture (Soil Aeration):** Good aeration is required in the soil for plant growth and development.

**Benefits:**

Due to the application of **Jeevamrit** and mulching, the aeration of the soil increases, thus improves humus content, water availability, water holding capacity and soil structure which is most suitable for crop growth especially during drought periods.

**Neemastra:**

**Use:** for control of insect- pest and ants

**Material required :**

Sr	Ingredient	Quantity
1	Neem leaves and crushed seed kernel	5kg
2	Cow urine	5 liters
3	Cow dung	1 kg
4	Water	100 liters



**Method:** Mix above mentioned ingredient in barrel and keep for 48 hours. Stir with a stick thrice a day and filter through a cloth before spraying.

**Brahmastra:**

**Use:** It is used to control large caterpillars and many other types of pests.

**Material required**

Sr	Ingredient	Quantity
1	Cow urine	10 liters
2	Neem leaves	3 kg
3	Karanj leaves	2 kg
4	Cilantro leaves	2 kg
5	Bael leaves	2 kg
6	Castor leaves	2 kg
7	Dhatura leaves	2 kg



**Method:** To make Brahmastra, select any of the above five ingredients. Grind all the leaves together well. Put this mixture in an earthen pot and boil it with 20 liters of water. When four boils come, take it off and keep it in the shade for two to three days to cool down. After this, mix cow urine in it and filter it with a cloth and keep it in an earthen pot to store. It is important to protect it from the sun.

**Agniastra:**

**Use :** For large sized insect pests

**Material required**

Sr	Ingredient	Quantity
1	Cow urine	10 liters
2	Spicy green chilli paste	500 g
3	Garlic paste	500 g
4	Crushed neem leaves	5 kg
5	Chewing tobacco	1 kg



**Method:** Mix above mentioned ingredients and boil it four time in a day and cool it for 48 hours. Mix 2-3 liters of *Agniastra* in 100 liters of water. Time limit of use is up to 6 months. For thrips, mix 200 liters of water, 1.5 liters of *Brahmastra*, 1.5 liters of *Agniastra* for spraying.

**Dashparni Ark:**

All kinds of sucking pests and caterpillars.

**Material required:**

Sr	Ingredient	Quantity	Sr	Ingredient	Quantity
1	Water	200 liters	13	Belpatra leaves	2 kg
2	Cow urine	10 liters	14	Mango leaves	2 kg
3	Cow dung	2 kg	15	Dhatura leaves	2 kg
4	Turmeric powder	500 g	16	Basil leaves	2 kg
5	Ginger pate	500g	17	Guava leaves	2 kg
6	Asafoetida powder	10 g	18	Desi bitter gourd leaves	2 kg
7	Chewing tobacco powder	1 kg	19	Papaya leaves	2 kg
8	Spicy chilli paste	1 kg	20	Turmeric leaves	2 kg
9	Garlic paste	500 g	21	Ginger leaves	2 kg
10	Neem leaves	2 kg	22	Acacia leaves	2 kg
11	Karanj leaves	2 kg	23	Custard apple leaves	2 kg
12	Castor leaves	2 kg	24	Ginger leaves	200 g

**Note :** Any 10 of the above mention plant parts can be added. The first five are important.

**Method :** Put all the above mentioned plant parts in a barrel and stir clockwise with a stick twice a day i.e., morning and evening. Keep this mixture in shade and protect it from water as well sunlight. Leave the mixture for 40 days to be ready and then filter it with a cloth.

**Shelf life:** 6 months

**Quantity of water:** 200 liters **Quantity of *Dashparni Ark*:** 5-6 liters

### **Important practices, essential for adoption of Natural Farming includes:**

- No external inputs,
- Local seeds (use of local varieties).
- On-farm produced microbial formulation for seed treatment (such as *Beejamrit*).
- On-farm made microbial inoculants (*Jeevamrit*) for soil enrichment.
- Cover crops and mulching with green and dry organic matter for nutrient recycling and for creating a suitable micro-climate for maximum beneficial microbial activity in soil.
- Mixed cropping managing diversity on farm through integration of trees.
- Management of pests through diversity and local on-farm made botanical concoctions (such as *Neemastra*, *Brahmastra*, *Agniastra*, *Dashparni ark* etc).
- Integration of livestock, especially of native breed for cow dung and cow urine as essential inputs for several practices and Water and moisture conservation.

### **Features of Natural Farming**

1. According to natural farming principles, plants get 98% of their supply of nutrients from the air, water, and sunlight. And the remaining 2% can be fulfilled by good quality soil with plenty of friendly microorganisms. (Just like in forests and natural systems)
2. The soil is always supposed to be covered with organic mulch, which creates humus and encourages the growth of friendly microorganisms.
3. Farm made bio-cultures named '*Jeevamrit*, *Beejamrit* etc.' are added to the soil instead of any fertilizers to improve microflora of soil. *Jeevamrit*, *Beejamrit* are derived from very little cow dung and cow urine of desi cow breed.
4. It holds the promise of enhancing farmers' income while delivering many other benefits, such as restoration of soil fertility and environmental health, and mitigating and/or reducing greenhouse gas emissions.
5. The system requires cow dung and cow urine obtained from Indian breed cow only. Desi cow is apparently the purest as far as the microbial content of cow dung, and urine is considered.
6. In natural farming, neither chemical nor organic fertilizers are added to the soil. In fact, no external fertilizers are added to soil or given to plants whatsoever.
7. In natural farming, decomposition of organic matter by microbes and earthworms is encouraged right on the soil surface itself, which gradually adds nutrition in the soil, over the period.
8. In natural farming there is no ploughing, no tilling of soil and no fertilizers, and no weeding is done just the way it would be in natural ecosystems.
9. Natural, farm-made pesticides like *Dashparni ark* and *Neemastra* are used to control pests and diseases.
10. Weeds are considered essential and used as living or dead mulch layer.
11. Multi-cropping is encouraged over single crop method.

### **Way Forward**

- NITI Aayog is one of the foremost promoters of Natural Farming method.
- Courses related to Natural Farming and Organic Farming, extension activities, research works are conducted by Gujarat Natural Farming and Organic Agricultural university, Halol, camp., Anand, Gujarat.

- The Andhra Pradesh Government experience is also being monitored closely to judge the need for further public funding support for Natural Farming.
- The Indian Council of Agricultural Research is also studying the Natural Farming method practiced by basmati and wheat farmers in some parts of India, evaluating the impact on productivity, economics and soil health including soil organic carbon and soil fertility.
- If found to be successful, an institutional mechanism needs to be created to promote the technology across the farming community.

### References

1. <http://naturalfarming.dac.gov.in/NaturalFarming/Concept>
2. <https://sbi.co.in/documents/2182813/4777159/ZERO+BUDGET+NATURAL+FARMIN G+KISAN+WORLD.pdf>
3. <https://vikaspedia.in/agriculture/best-practices/sustainable-agriculture/climate-smartagriculture/zero-budget-natural-farming-in-andhra-pradesh>.
4. <https://www.unep.org/news-and-stories/press-release/andhra-pradesh-become-indias-firstzero-budget-natural-farming-state> 8.
5. Natural farming (Prakrutik Krushi Margdarshika)- Achary Devrat.