Introduction:

Natural Farming is a chemical-free alias traditional farming method. It is considered as agro-ecology based diversified farming system which integrates crops, trees and livestock with functional biodiversity. 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. This farming approach was introduced by **Masanobu Fukuoka**, a Japanese farmer and philosopher, in his 1975 book The One-Straw Revolution. In India, Natural farming is promoted as Bhartiya Prakritik Krishi Paddhati Programme (BPKP) under Paramparagat Krishi Vikas Yojana (PKVY).

Aim:

i. To make farming viable and aspirational by increasing net incomes of farmers on account of cost reduction, reduced risks, similar yields, incomes from intercropping.

ii. To drastically cut down production costs by encouraging farmers to prepare essential biological inputs using on-farm, natural and home-grown resources.

Significance of natural farming:

A) Minimized Cost of Production:

It is considered as a cost- effective farming practice with scope for raising employment and rural development.

B) Ensures Better Health:

As Natural Farming does not use any synthetic chemicals, health risks and hazards are eliminated. The food has higher nutrition density and therefore offers better health benefits.

C) Employment Generation:

It generates employment on account of input enterprises, value addition, marketing in local areas, etc. The surplus from natural farming is invested in the village itself, thereby stemming the migration of rural youth.

D) Environment Conservation:

It ensures better soil biology, improved agro-biodiversity and a more judicious usage of water with much smaller carbon and nitrogen footprints.

E) Reduced Water Consumption:

Natural Farming helps in making soil porous and increases the moisture content in the soil since the amount of water in the air is 10 times that of the amount of water in rivers. Natural Farming can transform agriculture for drought-prone areas in the country.

F) Rejuvenates Soil Health:

The most immediate impact is on the biology of soil—on microbes and other living organisms such as earthworms. Soil health depends entirely on the living organisms in it.

G) Livestock Sustainability:

The integration of livestock in the farming system plays an important role in Natural farming and helps in restoring the ecosystem. Eco Friendly bio-inputs, such as Jivamrit and Beejamrit, are prepared from cow dung and urine, and other natural products**.**

H) Improved yield:

Natural Farming aims to increase yields by maximizing production factors like labour, soil, equipment and by avoiding the use of non-natural inputs like fertilizers, herbicides and pesticides.

I) Resilience:

The changes in soil structure with the help of organic carbon, no/low tillage and plant diversity are supporting plant growth even under extreme situations like severe droughts and withstanding severe flood and wind damage during cyclones.

Components of Natural Farming

-Beejamrit.
-Jivamrit.
-Mulching.

-Whapasa.
-Plant Protection.

Types of natural farming:

Natural farming is related to fertility farming, organic farming, sustainable agriculture, agro-ecology, agro-forestry, eco-agriculture and permaculture, but should be distinguished from biodynamic agriculture.

Principle of natural farming:

1. **No Tillage**:

No plowing or turning of the soil. non-tillage is fundamental to natural farming. The earth cultivates itself naturally by means of the penetration of plant roots and the activity of microorganisms, small animals, and earthworms.

2. **No Chemical Fertilizer**:

Many interfere with nature and, try as they may, they cannot heal the resulting wounds. Their careless farming practices drain the soil of essential nutrients and the result is yearly depletion of the land. If left to itself, the soil maintains its fertility naturally, in accordance with the orderly cycle of plant and animal life.

3. **No Weeding or use of Herbicides**:

Weeds play their part in building soil fertility and in balancing the biological community. As a fundamental principle, weeds should be controlled, not eliminated.

4. **No Dependence on Chemicals**:

From the time that weak plants developed as a result of such unnatural practices as plowing and fertilizing, disease and insect imbalance became a great problem in agriculture. Nature, left alone, is in perfect balance. Harmful insects and plant diseases are always present, but do not occur in nature to an extent which requires the use of poisonous chemicals. The sensible approach to disease and insect control is to grow robust crops in a healthy environment.

Conclusion:

The narrow view of natural farming says that it is good to apply organic material to the soil and good to raise animals, and that this is the best and most efficient way to put nature to use. But in terms of personal practice though it is fine, with this way alone, the spirit of true natural farming cannot be kept alive. The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings.

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NATURAL FARMING

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Introduction:

Panchagavya, an organic product has the potential to play the role of promoting growth and providing immunity in plant system. Panchagavya consists of nine products viz. cow dung, cow urine, milk, curd, jaggery, ghee, banana, Tender coconut and water. When suitably mixed and used, these have miraculous effects.

Preparation:

Add and mixed thoroughly cow dung (7kg) and cow ghee (1 kg) to a wide mouthed mud pot, concrete tank or plastic can and keep it for 3 days. The container should be kept open under shade. The content is to be stirred twice a day both in morning and evening.

After 3 days mix cow urine (10 lt) and water (10 lt) to the same container and keep it for 15 days with regular mixing both in morning and evening hours.

After 15 days add cow milk (3 lt), cow curd (2 lt), tender coconut water (3 lt), jiggery (3 kg) and well ripened poovan banana (12 nos) and mixed well and panchagavya will be ready after 30 days.

Care should be taken not to mix buffalo products. The products of local breeds of cow is said to have potency than exotic breeds). It should be kept in the shade and covered with a wire mesh or plastic mosquito net to prevent houseflies from laying eggs and the formation of maggots in the solution.

Physico chemical and biological properties of Panchagavya

Panchagavya possess almost all the major nutrients, micro nutrients and growth harmones (IAA & GA) required for crop growth. Predominance of fermentative microorganisms like yeast and lactobacillus might be due to the combined effect of low pH, milk products and addition of jaggery as substrate for their growth.

Chemical composition		
pH	:	5.45
EC dSm2	:	10.22
Total N (ppm)	:	229
Total P (ppm)	:	209
Total K (ppm)	:	232
Sodium	:	90
Calcium	:	25
IAA (ppm)	:	8.5
GA (ppm)	:	3.5

The low pH of the medium was due to the production of organic acids by the fermentative microbes.

Beneficial effects on commercial crops

Mango

- Induces dense flowering with more female flowers
- Irregular or alternate bearing habit is not experienced and continues to fruit regularly
- Enhances keeping quality by 12 days in room temperature
- Flavour and aroma are extraordinary

Acid lime

- Continuous flowering is ensured round the year
- Fruits are plumpy with strong aroma
- Shelf life is extended by 10 days

Banana

- In addition to adding with irrigation water and spraying, 3% solution (100 ml) was tied up at the naval end of the bunch after the male bud is removed. The bunch size becomes uniform. One month earlier harvest was witnessed. The size of the top and bottom hands was uniformly big.

Turmeric

- Enhances the yield by 22%
- Extra long fingers
- Ensure low drainage loss
- Narrows the ratio of mother and finger rhizomes
- Helps survival of dragon fly, spider etc which in turn reduce pest and disease load
- Sold for premium price as mother/seed rhizome
- Enriches the curcumin content

Vegetables

- Yield enhancement by 18% and in few cases like Cucumber, the yield is doubled
- Wholesome vegetables with shiny and appealing skin
- Extended shelf life
- Very tasty with strong flavor.

Recommended dosage

A) Spray system

3% solution was found to be most effective compared to the higher and lower concentrations investigated. Three litres of Panchagavya to every 100 litres of water is ideal for all crops. The power sprayers of 10 litres capacity may need 300 ml/tank. When sprayed with power sprayer, sediments are to be filtered and when sprayed with hand operated sprayers, the nozzle with higher pore size has to be used.

B) Flow system

The solution of Panchagavya can be mixed with irrigation water at 50 litres per hectare either through drip irrigation or flow irrigation

C) Seed/seedling treatment

Soaking for 20 minutes @3% solution of Panchagavya is sufficient for planting. Rhizomes of Turmeric, Ginger and sets of Sugarcane can be soaked for 30 minutes before planting.

D) Seed storage

3% of Panchagavya solution can be used to dip the seeds before drying and storing them.

Periodicity:

Pre flowering phase	Once in 15 days, two sprays depending upon duration of crops
Flowering and pod setting stage	Once in 10 days, two sprays
Fruit/Pod maturation stage	Once during pod maturation

Time of application of Panchagavya for different crops

Crops	Time schedule
Rice	10,15,30 and 50th days after transpalnting
Black gram	Rainfed: 1st flowering and 15 deays after flowering Irrigated: 15, 25 and 40 days after sowing
Green gram	15, 25, 30, 40 and 50 days after sowing
Groundnut	25 and 30th days after sowing
Bhendi	30, 45, 60 and 75 days after sowing
Tomato	Nursery and 40 days after transplanting: seed treatment with 1 % for 12 hrs
Onion	0, 45 and 60 days after transplanting

Effect of Panchagavya

Leaf

Bigger leaves and denser canopy developed.

Stem

The trunk produces side shoots and capable of carrying maximum fruits to maturity. Branching is comparatively high.

Roots

The rooting is profuse and dense. Further they remain fresh for a long time.. All such roots help maximum intake of nutrients and water.

Yield

The harvest is advanced by 15 days in all the crops.It not only enhances the shelf life of vegetables, fruits and grains, but also improves the taste.

Drought Hardiness

A thin oily film formed on the leaves and stems, to reduce evaporation of water. The deep and extensive roots developed by the plants allow to withstand long dry periods. the irrigation water requirement reduced by 30% and to ensure drought hardiness.

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PANCHAGAVYA IN AGRICULTURAL SYSTEM OF NATURAL FARMING

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Panchagavya for animal health

Panchagavya is a living elixir of many micro organisms, bacteria, fungi, proteins, carbohydrates, fats, amino acids, vitamins, enzymes, known and unknown growth promoting factors micronutrients trace elements antioxidant and immunity enhancing factors.

When taken orally by animals, the living micro organisms in the Panchagavya stimulate the immune system and produce lot of antibodies against the ingested microorganisms. It acts like vaccine. This response of the body increases the immunity of animals and humans and thus helps to prevent illness and cures disease. It slows down the aging process and restores youthfulness. The other factors present in Panchagavya improve apetite, digestion and assimilation and elimination of toxins in the body. Constipation is totally cured. Thus the animals become hale and healthy with shining hair and skin. The weight gains are impressive.

Pigs

Panchagavya was mixed with drinking water or feed at the rate of 10 ml – 50 ml/pig depending upon the age and weight. The pigs became healthy and disease free, gained weight at a faster rate. The feed to weight conversion ratio increased tremendously.

Goats and Sheep

The goats and sheep became healthy and gained more weight in a short period after having administered 10 ml to 20 ml Panchagavya per animal per day depending upon the age.

Cows

By mixing Panchagavya with animal feed and water at the rate of 100 ml per cow per day, cows become healthier with increased milk yield, fat content and SNF. The rate of conception increased. The retained placenta, mastitis and foot and mouth disease became things of the past. Now the skin of the cow is shiny with more hair and looks more beautiful. Instead of spraying urea on paddy straw (hay) before staking, sprayed 3 percent solution of Panchagavya, layer after layer during the staking and allowed it to ferment. The cows preferred such hay compared to unsprayed hay stock.

Poultry

When mixed with the feed or drinking water at the rate of 1 ml per bird per day, the birds became disease-free and healthy. They laid bigger eggs for longer periods. In broiler chickens the weight gain was impressive and the feed-to-weight conversion ratio improved.

Fish

Panchagavya was applied daily with fresh cow dung in fish ponds. It increased the growth of algae, weeds and small worms in the pond, thus increasing the food availability to fish. The only precaution is that fresh water must be added to the ponds at frequent intervals. Otherwise, the growth of algae, weeds and other organisms will compete with the fish for available soluble oxygen in water. Alternatively, mechanical agitators can also be used to increase the oxygen content in the water. In ten months time each fish grew to a weight of 2 to 3 kgs. with reduced death rate of small fingerlings and increased weight of marketable fish, the fisheries became more profitable.

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PANCHAGAVYA IN LIVESTOCK FARMING UNDER NATURAL FARMING

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