

Organic Fertilizer (Jeevamrit) and Organic Pesticide (Beejamrit)

CLIMATE SMART AGRICULTURE
TECHNOLOGY BRIEF



INTRODUCTION

Zero Budget Natural Farming System (ZBNFS) is an agricultural practice where the investment of the farmers is minimum that means farmers can easily adopt it with less investment (using local materials available in their locality). Since this farming system was developed by an Indian agriculture expert, Subash Palekar, it is also referred as Subash Palekar Natural Farming (Ganesan, 2013). ZBNFS is based on the principle that soil has all the nutrients required for the plants around its root zone but they cannot be absorbed by the plants easily. So, organic pesticide and organic fertilizer could be appropriate options which enhance the microbial activity in soil and increase the uptake of the nutrient by the plant. Plants depend on soil only for 1.5–2.5 percent of nutrients required for them and remaining amounts are taken from air, water and sunlight (Chore, 2016).

JEEVAMRIT

Jeevamrit is a organic fertilizer prepared by fermenting the mixture of cow/buffalo dung and urine. It provides nutrient to the plants and improves the activity of beneficial microorganisms and earthworm in soil. During the fermentation process for bacteria present in the cow dung and urine uses the nutrient from the flour dust and multiplies in their numbers. A handful of soil is taken exactly from the place where it is to be applied because by doing so the beneficial microorganism of the same soil can be multiplied that can give effective results. It also decreases the number of harmful fungus and bacteria in the soil hence it is beneficial for farmers. According to Palekar, there is a saying that after continuous use of Jeevamrit for three years, the soil itself becomes full of the micro nutrients required for the plant (Prasada, 2016).

Materials Required



Drum of 100 ltr



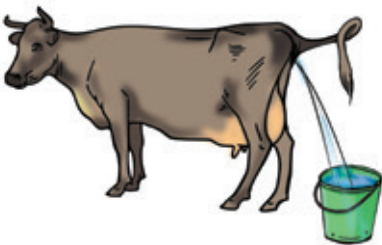
5 kg cow dung



500 g pulse flour



500 g jaggery



5 ltr cow urine



250 g soil

Figure 1: Materials required for the preparation of Jeevamrit

Procedure (Vasu, 2015)

- ◆ On the day of Jeevamrit preparation, dissolve 500 g jaggery in 1 ltr of water in the early morning.
- ◆ Put 5 ltr of cow urine and 5 kg of cooled fresh cow dung in a clean bucket and mix it well to make paste where there should not be an aggregate of cow dung in it.
- ◆ Then add 250 g soil (soil from the place where it is to be applied or from the root zone of *Ficus religiosa* (Peepal tree), 500 g of pulse flour and 1 ltr of jaggery liquid in the paste of cow dung and cow urine prepared before and stir it properly. The soil from the root zone of Peepal tree contains lots of beneficial micro-organisms whereas jaggery and pulse flour are nutrient sources for those beneficial micro-organisms to multiply.
- ◆ Afterwards, put the mixture in a 100 ltr drum containing 85 ltr of water. Stir it regularly for 12 times in clockwise and 12 times in anti-clockwise direction for seven days and cover it properly after stirring. It is recommended to use neem stick for stirring as it increases the efficacy of Jeevamrit against insects.
- ◆ After nine days of fermentation, Jeevamrit can be used for seven days.

Using Jeevamrit in the Field

The Jeevamrit can be applied directly on the surface of the crops. 200 ml of Jeevamrit is mixed with 800 ml of water and is sprayed on the crops. In case of its direct application in soil, 200 l of Jeevamrit is sufficient for eight ropani or 12 katthas (about 1 acre) of land (Greenkosh, 2017). Based on the crop development stage, particularly during flowering stage and harvesting days, it is recommended to use it in the evening at the interval of 7-15 days. Since this Organic fertilizer helps in increasing the activity of beneficial microorganisms including earthworms, this can be used for all types of crops (Greenkosh, 2017).

Advantages

- ◆ It can be prepared in a short time with little technical knowledge.
- ◆ It enhances the activity of micro-organisms in the soil and keeps the soil healthy.
- ◆ It decreases the incidence of diseases and pests in the crops and increases the strength of the crops.
- ◆ It provides plants with 13 nutrients which ultimately help in proper growth and development of crop (Vasu, 2015).

Cost

To prepare Jeevamrit, minimum cost is required. It can be prepared from the local materials available in our locality.



Table 1: Estimated cost for the preparation of 100 litres of Jeevamrit.

S.N.	Particulars	Unit	Quantity	Rate (NPR)	Amount (NPR)
1	Drum (100 ltr.)	no	1	400	400
2	Cow Dung	kg	5	6	30
3	Cow Urine	ltr	5	10	50
4	Pulse Flour	kg	0.5	200	100
5	Jaggery	kg	0.5	200	100
6	Soil	kg	0.25	0	0
Total					680

(The above mentioned cost are based on the rate practiced at local level. The cost may vary from place to place.)

Further Reading

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Vasu, S. 2015. Jeevamrit means one solution and many benefits. <https://savitahiremath.com/2015/04/12/soil-recipe-2-Jeevamrit-means-one-solution-and-many-benefits/-drip-irrigation>

BEEJAMRIT

Beejamrit is a Organic Pesticide that is mainly used for seed treatment of different crops like rice, wheat, maize, vegetables, fruits, etc (Prasada, 2016). Furthermore, it can also be used for treating the saplings of different fruits like mango, banana, litchi, apple, peach, pear etc before transplanting. In fact, Beejamrit helps to prevent young growing roots from being infected by fungus and protects the saplings from damping off and other diseases that appear after rainy season. Besides, Beejamrit

improves the soil quality by increasing the activity of soil micro-organisms and helps plants to uptake micro-nutrients from the soil. Beejamrit is prepared from the mixture of cool fresh cow dung, cow urine, lime and soil. This Organic Pesticide can be the best option for seed and sapling treatment as this can be prepared easily with less technical knowledge.

Materials Required



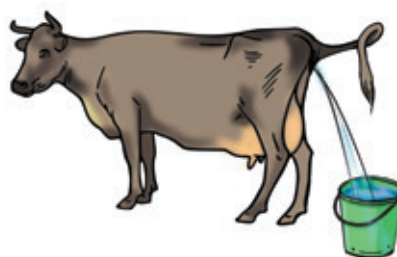
5 ltr Water



1.25 kg Cow Dung



12.5 g Lime



1.25 ltr Cow Urine



Hand Full of Soil

Figure 2: Materials required for the preparation of Beejamrit

Procedure of Preparing Beejamrit



Process 1: Cover 1.25 kg of cow dung with fine cotton clothes and dip it in a 5 ltr of water for 12 hours.



Process 2: Add 12 g of lime in a small bucket containing 250 ml of water and keep it for 12 hours.



Process 3: Take out cow dung covered with cotton clothes and squeeze all the liquid out.



Process 4: Mix the solution of lime with the liquid squeezed in figure 5 and add handful of soil and stir it nicely.

(ZBNF, 2018)

The mixture obtained from 'Process 4' should be stirred 12 times in a clockwise direction and vice-versa and covered properly after stirring. For stirring, it is recommended to use neem stick as it increases the efficacy of Beejamrit against insects. After this, Beejamrit will be ready for use. However, it is recommended to keep it for more than 48 hours before use for good result.

Using Beejamrit in the Field

For the seed treatment, seeds should be soaked properly in Beejamrit and then stirred with hands for 2 minutes. After drying under shade for six hours, seeds will be ready for sowing in the field (Rahangdale, 2016). Treated seed with Beejamrit in the morning is recommended to sow in the evening.



Advantages

- ♦ It can be prepared in a short time with less technical knowledge.
- ♦ It promotes the development of plants.
- ♦ It controls seed and soil borne diseases.
- ♦ It increases the production of crops.

Cost

Beejamrit used for the seed treatment can be prepared with the local materials available in our vicinity. Estimated cost for the preparation of Beejamrit is depicted below. With this estimation we can prepare 10 litres of Beejamrit.

Table 2: Estimated cost for the preparation of Beejamrit

S.N.	Particulars	Unit	Quantity	Rate (NPR)	Amount (NPR)
1	Bucket (10 ltr)	no	1	200	200
2	Water	ltr	5	0	0
3	Cow Dung	kg	1.25	6	7.5
4	Cow Urine	ltr	1.25	10	12.5
5	Lime	g	12	1	12
6	Soil	handful	1	0	0
Total					232

(The above mentioned cost are based on the rate practiced at local level. The cost may vary from place to place.)

Limitations

It cannot be stored for longer duration.

Contribution of Jeevamrit and Beejamrit to CSA

Organic fertilizer (Jeevamrit) and Organic Pesticide (Beejamrit) are considered to be climate smart agriculture (CSA) practices which have positive role to cope with the negative impacts of climate change. The use of Organic fertilizer reduces the haphazard use of chemical fertilizers which contributes in the reduction of greenhouse gases emission. It also saves the cost of purchase of chemical fertilizers. The application of Organic Pesticides increases microbial activity in the soil thus enhances the quality of the soil. Similarly, the use of Organic Pesticide improves the seed germination capacity and overall growth and development of the crops that contributes in uplifting the livelihood of an individual and enhancing food security.

Implications

Local Initiatives for Biodiversity, Research and Development (LI-BIRD) has implemented SAMARTHYA project with the financial support of CARE Nepal in Dhangadimai, Siraha and Belka municipalities of Udayapur district in Nepal. The project has directly benefitted eight farmer groups covering 113 households. The group members are provided with trainings on Organic fertilizer and Organic Pesticide. According to one of the beneficiary farmers, "Healthy seedlings obtained from the seeds treated with Beejamrit and Jeevamrit can be prepared in a short period of time and it helps in the overall crop development". Farmers have preferred this technology as it is cost effective, less time consuming and can be prepared with less technical difficulties.

Further Reading

ZBNF. 2018. Beejamrita/Beejamritha. <http://www.zbnfmart.com/bijamrita/>

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