

Indigenous Technical Knowledge (ITKs); To Promote Organic Farming

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SUMMARY

The ITKs are adopting to reduce dependence on external inputs, to reduce the cost of cultivation and to propagate eco-friendly agriculture. Cow dung, cow urine, neem and jaggery have been used for various organic formulations and medicines of their germicidal and medicinal properties. Liquid organic formulations like bijamrut, jivamrut, panchagavya, amritpani and botanical pesticides like bramastra, neemstra are recommended for the farmers to use in agriculture. It's regular use for seed treatment, organic fertilizers, growth regulators, spraying will reduce dependence on use of chemicals and subsequently reduces pollution caused by chemical treatments.

INTRODUCTION

Indigenous technical knowledge is a community based functional knowledge system, developed, preserved and refined by generations of people through continuous interaction, observation and experimentation with their surrounding environment (Pushpangadan *et al.* 2002). These ITKs helps people to overcome uncertainty and prepare for possible adverse or favorable events. The basic characteristics of the ITKs provide for conservation and efficient utilization of resources by being eco-friendly, less capital intensive, cost effective, efficient byproduct and waste recycling and use. Organic farming is drawing attention of the world since past few years; it is environment friendly, sustainable way of farming with zero use of chemicals. Adoption to ecofriendly and sustainable farming practices like use of organic treatments can not only reverse the declining trend in global productivity but also help in environment protection (Naikwade *et al.* 2012). Organic farming reduces use of chemicals and protects plants from infection in natural way. Continuous use of inorganic fertilizers hazards the soil health in respect of physical, chemical and biological properties of soil. Therefore, it is necessary to minimize the application of inorganic fertilizers by substituting with organics. The liquid organic formulations like Panchagavya, Bijamrita, Jivamrita, Amritpani and botanical pesticides bramastra, neemstra are prepared from locally available ingredients in the farm and used in organic farming (Naikwade, 2019; Kumar *et al.* 2016; Bishnoi and Bhati, 2017). These are the rich sources of beneficial micro flora which support, stimulate the plant growth, help in getting better vegetative growth and also good quality yield (Devakumar *et al.* 2014). Jeevamrutha serves as a source of beneficial microorganisms (Devakumar *et al.*, 2014). Panchagavya is an organic formulation which promotes the growth and improved yield in different crops (Shailaja *et al.*, 2014). Organic farming, the innovative farming system can build on and enhance the traditional knowledge and practices of local and indigenous communities. This means farmer's knowledge of ecological systems, environment and their conventional wisdom has to play more role in making organic farming more sustainable.

Some Famous ITKs Developed for Organic Farming :

1) Bijamrut

It is a mixture of cow dung, cow urine and lime. It helps to make the seeds disease-pest resistant and to increase germination percentage.

Ingredients : Water (20 liters for 100 kg seed), cow dung (5 kg), cow urine (5 liters), soil (1 kg) and lime (50 gram).

Method of preparation : Take 5 kg cow dung in a cloth and tie it. Dip this in the 20 liters of water for overnight. Take 1 liter water and add 50 gm lime in it, let it stabilize for a night. Then next morning, squeeze bundle of the cow dung in that water, thrice continuously, so that all essence of cow dung will accumulate in that water. Then add 1 kg soil in that water solution and stir it well. Then add 5 liters cow urine in that solution and add the lime water and stir it well. Now Bijamrut is ready to treat the seeds.

Method of application : Spread seeds of any crops on cloth or clean ground surface. Sprinkle the bijamrut on the seeds by hand. Rub the seeds with the bijamrut, so that each seed is coated with the bijamrut. Dry it well in shade and use for sowing.

2) Jivamrut :

It is a mixture of cow dung, cow urine, jaggery, flour of pulses and soil from the farm bund. It helps to improve the soil fertility, promoting growth and flowering along with acting as a yield enhancer.

Ingredients : Cow dung (10 kg), cow urine (10 liters), jaggery (2 kg), flour of gram (2 kg), soil (1 kg) and water (200 liters).

Method of preparation : Take 10 kg cow dung and 10 liters cow urine and add it in 200 liters of water and mix well with the help of wooden stick. Then add 2 kg jaggery, 2 kg pulses flour and 1 kg soil from the farm in it. Keep this solution for fermentation for 5 to 7 days and stir the solution well every day morning, cover the container by gunny bag or any thick cloth. Now Jivamrut is ready for application.

Method of application : The ready solution is to be applied to the crops through irrigation water or directly to the crops. It can be applied through drip irrigation with the help of venture (filtration equipment). Spray 10 per cent filtered Jivamrut on the crops.

3) Amritpani :

It is a instant soil fertility enhancer and also used for seed treatment.

Ingredients : Cow dung (10 kg), honey or jaggery (500 gm), ghee (250 gm) or mustard oil (250 ml) and water (200 liters).

Method of preparation : Mix 500 gm of honey, 250 gm ghee and 10 kg cow dung. It is diluted with 200 liters of water. The solution should stored in container and stirred twice a day for a week.

Method of application : To increase soil fertility 200 liters of amritpani should be used per acre along irrigation water. For seed treatment use 20 parts amritpani solution and 80 parts water. Seed or seedling treatment with amritpani can be done for better germination and management of soil born diseases.

4) Panchagavya :

It is an organic product having the potential for promoting growth and providing immunity in plant system. It is used in seed and seedling treatment and it is act as a soil fertility enhancer by applying through irrigation water.

Ingredients : Fresh cow dung (7 kg), cow urine (10 liters), cow milk (3 liters), cow curd (2 liters), water (10 liters), jaggery (3 kg) and cow ghee (1 kg).

Method of preparation : Mix the cow dung (7 kg) and cow ghee (1 kg) in morning and evening hours and keep it for 3 days. After 3 days mix cow urine (10 liters) and water (10 liters) and keep it for 15 days with regular mixing both in morning and evening hours. After 15 days mix cow milk (3 liters), cow curd (2 liters), jaggery (3 kg) and panchagavya will be ready after 30 days.

Method of application : The solution of Panchagavya can be mixed with irrigation water at 50 litres per hectare either through drip irrigation or flow irrigation. The 3 per cent solution of Panchagavya can be used to soak the seeds or dip the seedlings before planting for 20-30 minutes, used to dip the seeds before drying and storing them and spraying also.

5) Bramashtra :

It is a complete organic pesticide prepared with the Indian traditional methodology by cow urine and five varieties of leaves like neem, custard apple, papaya, guava and pomegranate and useful against sucking pests, pod borers and fruit borers.

Ingredients : Neem leaves (3 kg), cow urine (10 liters), custard apple leaves, papaya leaves, pomegranate leaves, guava leaves (2 kg each) and water 100 liters.

Method of preparation : Crush 3 kg neem leaves in 10 liters cow urine. Crush 2 kg custard apple leaves, 2 kg papaya leaves, 2 kg pomegranate leaves and 2 kg guava leaves in water. Mix the two and boil 5 times at same interval till it becomes half. Keep for 24 hours, then filter squeeze the extract. This can be stored in bottles for 6 months. Dilute 2-2.5 litre of this extract to 100 litre for one acre.

Method of application : Use as foliar spray.

6) Neemastra :

It is a very good mixture to fight the dangers of nymph-sucking insects and mealybugs.

Ingredients : Neem leaves (5 kg), cow urine (5 liters), cow dung (2 kg) and water (100 liters).

Method of preparation : Crush 5 kg neem leaves in water. Add 5 liters cow urine and 2 kg cow dung. Ferment for 24 hrs with intermittent stirring. Filter squeeze the extract and dilute to 100 liters for one acre.

Method of application : Use as foliar spray.

CONCLUSION

Liquid organic formulations are easy to prepare from locally available ingredients in the farm and the cost of production is very less. These are the rich sources of beneficial micro flora which support, stimulate the plant growth, help in getting better germination and vegetative growth, improve the soil fertility, increase resistance against insects-pest and good quality yield. Neemastra and bramastra like broad spectrum botanical pesticides are useful against sucking pests. It's regular use for crop protection and crop production will reduce dependence on use of chemicals and subsequently reduces pollution caused by chemical treatment.

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