WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Waste Decomposer – Immanent for Plant

Ms.Shweta S. Ganvir[1], Shradha S . Deshmukh[2]

1.Assistant Professor (Agronomy)
2. Assistant Professor(Agril.Extension)
P.R.PotePatil College of Agriculture,Amravati (MS.)444602

ABSTRACT -

As an alternative to currently available, commercial biocontrol agents and biofertilizers, waste decomposer was released for farmers by National Centre of Organic Farming for enhancing the crop productivity and plant disease management. The waste decomposer is a consortium of few beneficial bacteria, isolated from desi cow dung and can be easily multiplied with jaggery at farmer level. The waste decomposer exhibit multifaceted uses in agriculture including in situ composting of crop residues, quick composting of organic wastes, seed dressing, soil irrigant, biocontrol agent, biofertilizer, soil health reviver and micronutrient can be made by using of waste decomposer etc. It is bestowed with virtues such as low cost, easier multiplication, fast growth rate, superior shelf life and broad spectrum activity on phytopathogens. The jaggery propagated waste decomposer indicated the presence of cellulolytic, phosphate and potassium solubilizing; siderophore producing bacteria on selective culture media. The consortium is also abundant in nitrogen fixing bacteria (Azotobacter, Azospirillum, Rhizobium, Acetobacter) and Pseudomonas fluorescence. It can control different types of soilborne, seedborne, rootborne, shootborne and foliar diseases; insects and pests as a plant protection agent. The application of waste decomposer improves crop productivity due to its biofertilizer, biocontrol and mineral solubilizing action.

Keywords- Organic waste management, Crop production, and Soil health, Biocontrol agent, Diy Micronutrient,

Introduction-

Solutions to most of the problems faced in organic farming like unproductive soil, bad Soil health, Pests, Unsatisfactory Fruit quality. To solve this probleman alternative to currently available, commercial bio-control agents and biofertilizers, waste decomposer was released for farmers by National Centre of Organic Farming,Ghaziabad, Uttar Pradesh. It is a consortium of few beneficial microbes which is isolated by Krishan Chandra in 2004 from native cow dung for enhancing the crop productivity and plant disease management. NCOF has launched waste decomposer culture in 2015 and shelf life of waste decomposer has three years .It is used for quick composting from organic waste, soil health improvement and as plant protection agent. It contains beneficial microorganisms from Desi Cow Dung for soil health reviver. It can control all types of soil borne, foliar diseases, insects and pests as plant protection agent. It can be used in various ways such as quick composting of biowastes, foliar spray as biopesticide against most of the plant diseases for all types of agricultural and horticultural crops.

Waste decomposer application can eliminate up to 90% uses of all types of pesticides, fungicides and insecticide since it controls both root diseases and shoots diseases.

The waste decomposer is a consortium of few beneficial bacteria, isolated from desi cow dung and can be easily multiplied with jaggery at farmer level. The waste decomposer exhibit multifaceted uses in agriculture including in situ composting of crop residues, quick composting of organic wastes, seed dressing, soil irritant, biocontrol agent, biofertilizer, soil health reviver etc. It is bestowed with virtues such as low cost, easier multiplication, fast growth rate, superior shelf life and broad spectrum activity on phytopathogens. The jaggery propagated waste decomposer indicated the presence of cellulolytic, phosphate and potassium solubilizing; siderophore producing bacteria on selective culture media. The consortium is also abundant in nitrogen fixing bacteria (Azotobacter,Azospirillum, Rhizobium, Acetobacter) and Pseudomonas fluorescence. The lignocellulolytic action of waste decomposer on the crop residues aids in greenhouse gas mitigation. The biocontrol action of waste decomposer is possibly via nutrient and space competition; antagonistic action, extracellular lytic enzyme, antibiotic, siderophore, secondary metabolite production; and systemic resistance induction in plants. The application of waste decomposer improves crop productivity due to its biofertilizer, biocontrol and mineral solubilizing action. This is the most economical all in one, bio-fertilizer, bio-pesticide, quick bio-waste composter, and has many other uses in gardening and farming. Since the launch of Waste Decomposer more than 10 lakh farmers have used it and revived their fields and all of them witnessed no crop damage by pests and have got the good yields. It is often said by the farmers that the input cost has reduced to zero and their income is doubled by the usage of Waste Decomposer and farmers are happy to use this.

so that it is useful for farmers for growing crops and the farmers aware of agro chemical use as well as the effect of the awareness so farmers know the use agrochemicals, particularly pesticides, has become an integral part of the Compost, with no foul smell, not warm, dry, and very good in quality having high organic carbon content and other nutrient content.

Waste decomposer – An essential requirement

One of the key causes of concern in developing countries is Municipal Solid Waste Management and Farm Waste Management. India generated roughly 62 Million tonnes of Municipal solid waste (450 g/capita/day) in 2015 and it is rising with the population explosion. And also, India produces 500 Million tons of crop residues per year. Furthermore, approximately 92 million tons of crop waste is burned every year in India. The burning of crop residues has become a major environmental problem that causes health problems and also contributes to global warming. Composting is one of the effective sustainable techniques that could help to curtail these issues. So, Waste Decomposer could help in the reduction of a huge volume of organic waste by converting them into compost (*in-situ* composting of crop residues and quick composting of biowastes) quicker than the conventional composting methods. Waste decomposer application of 1000 litres per acre changes the biological and physical properties of all soil types (acidic and alkaline) within 21 days of application and helps to generate earthworm population in the soil up to 4 lakh in 1-acre soil within six months. It could also be used in various ways such as drip irrigation, biofertilizer, biocontrol agents, and Soil health retriever, foliar spray as a biopesticide for all types of agricultural and horticultural crops.

Objective

Some objectives among preparation of waste decomposer is as fallows

1.Waste decomposer technology is an alternative for all the chemical fertilizers , in fact waste decomposer impounds them and can useful for organic farming.

2.To provide nutrients and protection measures to plant in organic farming in low cost.

3.Low cost and quick composting technology for converting bio-waste or farm waste into organic manure.

4.It is not require any equipment and technical knowledge for its production and application ,so it is reliable in organic farming.

Procedure for Mass multiplication of Waste Decomposer

The Waste decomposer could be mass multiplied by a simple technique that is practically applicable to the farmers. This protocol is standardized by Krishan Chandra in 2015.

- Take 2 kg jaggery and mix it in a plastic drum containing 200 litres of water.
- Then take 1 bottle of decomposer (30 g) and pour all its contents in a plastic drum containing jaggery solution. Avoid direct contact of contents with hands.
- Mix it properly with a wooden stick for uniform distribution of waste decomposer in the drum.
- Cover the drum with a paper or cardboard and stir it every day once or twice.
- After 5 days, the solution of the drum turns creamy.
- The farmers could prepare the waste decomposer solution again and again from the above-formed solution by the addition of 20 litres of waste decomposer solution into a drum with 2 kg of jaggery and 200 litres of water. So, again it would be ready in 7 days.
- Farmers can prepare continuously this solution from this waste decomposer for lifetime.
-

Fig.1: Mass multiplication of Waste Decomposer

Applications of waste decomposer

1. Composting –

- The mass multiplied solution of waste decomposer could be used to decompose bio-waste into organic manure.
- 18 – 20 cm thick layers of 1-ton bio-wastes such as agricultural wastes, kitchen wastes, cow dung, etc. are piled on the ground.
- Wet the waste with the solution of waste decomposer.
- Again another 18 – 20 cm thick layer of bio-waste is spread and again wet with waste decomposer solution.
- The above processes are repeated until the piling goes 30 – 45 cm higher.
- Turn the pile at every 7 days interval for uniform composting and add more solution at every turning.
- Maintain 60% moisture during the entire period of composting. If required again add a solution.
- The compost gets ready to use after 30 – 40 days.
- This tends to a healthy composting process and the high-quality compost could be obtained with high organic carbon and other nutrients.
- 2.Seed treatment: Simply spray or sprinkle waste decomposer solution uniformly over the seeds. You can even soak the seeds if you are doing this on a large scale. This works on all types of seeds. Keep the treated seeds in shade for about 30 minutes and then plant the seeds. Seed treatment with waste decomposer shows 98% early and uniform germination and provides protection against various seed borne diseases and also plays a role in strengthening the plants defence mechanisms.

2. Fertilizer and Soil Treatment:

- Watering with waste decomposer solution significantly changes the biological as well as the physical properties of all type of soil within 21 days of application and it also helps to generate earthworm population in the soil which is so beneficial.
- You can dilute the waste decomposer in 1:2 ratio with water, that is one part waste decomposer to 2 parts water and water your plants once every 15 days or even once in a month.
- This is also proven to control many soil borne diseases in crops.

3.Foliar spray:

- It acts as a potent bio pesticide when sprayed on plants.
- You need to dilute it to 1:3 ration to use it as a foliar spray.
- This helps control a variety of fungal, bacterial and viral diseases in crops when sprayed once in 10 days for 4 times in the growth cycle of a crop.

4.*In –situ* composting of crop residue-

- Approximately, 200litres of waste decomposer liquid could be used for 1 acre crop residue as *in-situ* composting.

5. Biopesticide-

- The mass multiplied liquid waste decomposer culture is cultured in a ratio of 1:3 with water and applied as a foliar spray to control all types of soil borne, foliar diseases, insects and pests.

6.Drip Irrigation-

- Approximately ,200litres of waste decomposer solution is enough for 1 acre land and they could be applied through irrigation by mixing it with water . It could revive soil health and acts as biofertilizer.

Advantages of waste decomposer

- Waste decomposer application 1000 liter per acre changes biological and physical properties of all type of soil (acidic and alkaline) within 21 days of application and it helps to generate earthworm population in the soil upto 4 lakh in 1 acre land in just six months.
- All biodegradable material like agricultural waste, animal waste, kitchen waste,city waste decomposer in 40 days.
- Seed treatment with waste decomposer shows 98% early and uniform germination and provides protection before seedling emergence.
- Foliar spray with waste decomposer controls all type of bacterial, fungal and viral diseases effectively in different crops.
- Farmers can do farming with use of waste decomposer without using chemical fertilizer and pesticides.
- There is no need of Urea, DAP and MOP when waste decomposer is applied.
- Waste decomposer application eliminate upto 90% all types of pesticides fungicides and insecticide since it controls both root and shoot diseases.
- It can help to reduce the amount of pollution that is produced by producing garbage.

Disadvantages of waste decomposer

- Waste decomposer cannot be used in hot climate and dry soil because of base fertilizer is the microbes.
- Moisture should be maintained in soil while application of waste decomposer.
- For application of waste decomposer through drip irrigation require regular maintaine in order to keep them running properly.
- Waste decomposer will make farmers dependent on a private company or government agencies who manufacture it for mother culture bootles.

Products can prepare by using of waste decomposer

1. **DIY micronutrient-**
    - DIY micronutrient loaded organic fertilizer using this product. It is rich organic fertilizer using this waste decomposer, as recommended by the national center for organic farming.
    - The basic principle of making this micro nutrient fertilizer is: Adding foods that are rich in proteins, vitamins and major and minor elements including Nitrogen, phosphorous, potassium, iron, copper, zinc, calcium, magnesium, boron and so on.
    - Adding these into the waste decomposer results in breakdown of these elements into soluble forms by the microorganisms, enzymes and organic acids present in waste decomposer.
    - For making of micronutrient require protein rich pulses

Procedure for preparation of DIY micronutrient-

We will prepare this in around 25 liters of waste decomposer solution.

1. Atleast 3 varieties of Oil seeds like 100 gms each of sunflower seeds, mustard seeds, flax seeds, or any other like soya, castor oil seeds, nigella seeds or any 3 varieties.

2. 3 varieties of Pulses or lentils of your choice like Red Lentil (Masoor dal), Yellow or Green split gram (Moong dal), Bengal gram (Chana dal), You can also take Red gram (Arhar dal), Black gram (urad dal) and so on.

3. Some 4 to 5 old iron nails or any small pieces of junk iron stuff.

4. Some copper source – like some old copper wires extracted from wires lying in your junk yard or any old copper vessel if you have one.

5. Some Zinc source – like one or two dry cells which are made up of zinc container.

- Firstly, powder these seeds and pulses, this helps in faster decomposition. Add these into 25 litres of waste decomposer. Now add iron nails, then copper wires, then the zinc source. Mix it well and leave it for 10 days. Do not forget to stir this once daily.
- After 10 days, your potent nutrient rich organic fertilizer is ready.

Applications of diy micronutrient

- You can use it in 2 ways. One, as a liquid fertilizer to water your plants and secondly as a foliar spray to instantly feed your plants through leaves stomata.
- For watering your plants, you need to dilute this to 1:5. That is one part of this liquid to 5 parts of water.
- Where as for foliar feed, you can dilute this to 1:10 and spray thoroughly on your plants including the undersides of your leaves, because the stomata or the leaf openings are more concentrated at the bottom side of leaves.

Conclusion

Conclusively**,** Waste Decomposer has an immense potential to undergo effective organic waste management, crop production, and soil health revival due to its beneficial multifunction's. It is an eco-friendly, cost-effective, and beneficial product that could work as a great component for Clean India Movement (Swachh Bharat Mission) by converting bio-waste into organic manure. Hence, it could also give some additional revenue through the marketing of compost produced by the addition of the Waste Decomposer.

References

1.Bhuvaneshwari S, Hettiarachchi H and Meegoda JN. (2019). Crop residue burning in India: Policy challenges and potential solutions. *International Journal of Environmental Research and Public Health* **16**(5): 832.

2.Sharma KD and Jain S. (2019). Overview of municipal solid waste generation, composition, and management in India.*Journal of Environmental Engineering* **145**(3): 04018143.

3.Verma LK, Singh P, Nag NK, Tomer S and Singh J. (2020). Chapter-7 Organic Farming for Eco-Friendly Crop Production & Sustainable Agriculture Development.*Chief Editor Dr. RK Naresh***91**: 121.

4.https://ncof.dacnet.nic.in/Training_manuals/Training_manuals_in_English/Waste-Decomposer-Eng.pdf.

5.http://planningcommission.nic.in/reports/genrep/rep_wte1205.pdf

6.T.GokulKannan(2020).Waste decomposer –Multifunctional Microbial Consortium.Popular Article ,Krishi Science,KS-1483.

7. Kora Aruna Jyothi (2021) Applications of Waste Decomposer in Plant Health Protection, Crop Productivity and Soil Health Management, Chapter: 22 In book: Application of Microbes in Environmental and Microbial Biotechnology: Springer Verlag, Singapore

8.https://krishiscience.in/