

Avishkar
Participation
2021-22



Rayat Shikshan Sanstha's

D. P. Bhosale College, Koregaon

Department of Botany

Avishkar Participation: 2021-2022

Sr.No	Name of the Student	Title of Topic	Class
1.	Nikhil Madane	Antiseptic Spray for Personal Hygiene	B.Sc-I
2.	Pranali Tambe	Production of Bio-fertilizer Sticks	B.Sc-I
3.	Snehal Chavan	Synthesis of Capsulated BCAs	B.Sc-I
4.	Mahesh Sathe, Uday Mane	Production of Seed Paper	B.Sc-I
5.	Sawant C. S.	Sustainable development in agriculture and student	B.Sc-II
6.	Attar Museb	Initiatives in Waste Management	B.Sc-II

(Signature)

Head

Department of Botany

D. P. Bhosale College, Koregaon



National Science Day "28th February 2022"

Integrated Approach in Science and Technology for a sustainable future



Production of Bio-fertilizer Sticks

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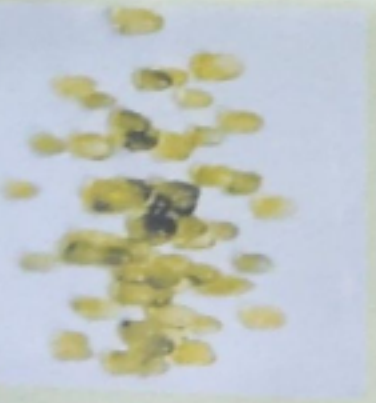
Introduction: Fertilizers sticks also known as the fertilizer spike are nothing but the fertilizers in the compresses form and they usually look like sticks. Fertilizers sticks are meant to provide nutrients to the soil. In biofertilizer sticks along with nutrients, natural biofertilizer such as *Cyanobacteria- Nostoc* is added. This bacterium will provide additional nitrate and ammonium sources/ nutrients to the plant. As biofertilizers doesn't have any adverse effect on living organisms and environment, it is an ecofriendly way to provide nutrients to the plant. The biofertilizers sticks are without chemical, therefore no need to costly fertilizers. It is an innovative and revolutionary product manufactured for providing necessary nutrients to plants, especially indoor, flowering plants. These sticks are composed in such a way that the can release the nutrients they contain over a long period. In addition to biofertilizer *Nostoc*, Neem leaves paste, Cow dung, Cow urine, Soybean husk/ Chickpea husk is added. To reduce smell of cow dung one can add flower essence or natural flowers having fragrance.

Material and Methods:

1. Collect fresh neem leaves, wash it and make Neem paste by adding water and using Grinder.
2. In this Neem paste add sufficient amount of Cow dung, Cow urine, Soybean husk, Fresh Fragrant flowers or Flower essence to reduce smell of cow dung.
3. Mix these ingredients well by using grinder and then spoon.
4. Now add powdered Biofertilizer *Nostoc* in this mixture.
5. After sufficient mixing prepare Biofertilizer sticks by using wooden Ice-cream sticks or Kaffi sticks.
6. Dry it for 2-3 days and are ready to apply.

Advantages:

1. Bio-fertilizer sticks are easy to use and promise sustainable and safe fertilization.
2. These Bio-fertilizer sticks can be used for indoor plants, green foliage plants, tomatoes and other vegetables in Kitchen gardens.
3. Notice- A Blue green alga fix atmospheric nitrogen into ammonia and make it available for absorption of plants.
4. Neem has natural anti-fungal, anti-bacterial and anti-insecticidal properties; therefore, it will protect the plant from fungal, bacterial pathogens and insects.
5. Cow dung and Cow urine provide additional organic matter to the plant, which will add nutrient content.
6. Soybean husk is agricultural waste. Instead of throwing, it can be used to provide nutrition to plants in form of Biofertilizer sticks.





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Antiseptic Spray for Personal Hygiene

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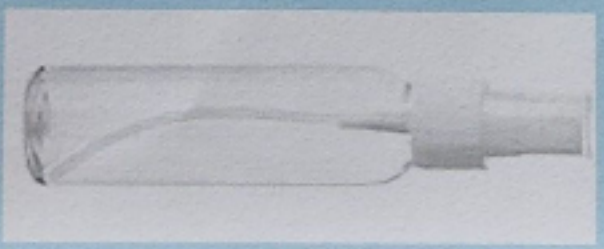


Introduction: The meaning of word "Antiseptic" is preventing the growth or action of micro-organisms such as fungi, bacteria, virus in or on living tissue such as skin. Number of antiseptic products are available in the market. But they are with chemical base. These chemicals are harmful for those micro-organisms but also cause some serious health problems in humans, such as allergy, chemical reaction. In nature, plants have potential to produce natural components having antiseptic properties and are able to prevent growth of micro-organisms. During the current COVID-19 pandemic self-care has become most important priority. Using sanitizers used taking steam has become daily habits. Though sanitizers are purely chemical based, we are using them regularly to prevent viral infection in this COVID pandemic. Many of these ingredients have medicinal properties and can be used for prevention of cold and cough. By considering these factors we have prepared Antiseptic Spray for Personal Hygiene which can protect you from viral infection, cough and cold. We have used medicinal components such as Eucalyptus oil, Neem leaves, Turmeric powder as a main ingredients and applied on tissue paper. Instead of above-mentioned properties additional medicinal properties of above-mentioned components are as follows:

Benefits of Eucalyptus: Heals wounds, Treats Respiratory problems, Relieves mental Exhaustion, Relieves Muscle Pain, Room Freshener, Treats Fever, Removes Intestinal worms, Dental care, Eliminates Lice, Manage Diabetes etc

Material and Methods:

1. Take few drops of eucalyptus oil and Water. Mix it well in a beaker.
2. Make paste of Neem leaves and add water in it. Strain it with the help of strainer or muslin cloth and prepared juice is added in Eucalyptus+Water mixture.
3. Add pinch of turmeric powder and Aloe vera gel into it.
4. Mix it well and pour in a spray bottle.
5. Take soft tissue paper roll, open it entirely and start spraying prepared mixture.
6. Keep it for drying for 5-6 hours.
7. After drying, Antiseptic Tissue Paper Rolls are ready to use. You can fold it and keep it in your pocket for daily use.



Advantages: All the components used for preparation of Antiseptic Tissue Paper Rolls are natural and are with medicinal properties. They don't have any serious side effect on human health. As they all are natural no allergies and chemical reactions can be reported. All material used are available in surrounding so cost is affordable or very low. These Antiseptic Tissue Paper Rolls are easy to carry and use. After use it can be degraded in the nature and it will add organic matter in the soil which will automatically be beneficial for the growth of plants present in the surrounding. Due to regular smell of Eucalyptus oil, neem juice, aloe vera and turic viral infection can be prevented effectively. Due to use of such Antiseptic Tissue Paper Rolls use of sanitizer can be minimized to some extent.



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Production of Seed Paper

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Introduction: Seed paper is a type of handmade paper that includes different plant seeds, wild flower, herb, petals or vegetable seeds. The seeds themselves can still germinate after the papermaking process and they can sprout when the paper is planted in soil.

Seed paper is a special eco-friendly paper made from post-summer materials. When you plant the paper in a pot or in the garden soil, the seeds in the paper will start germinating. By using this seed paper one can turn paper into flowering or fruiting plant. This is a good way to recycle used paper. A wide variety of flower, fragrance, colours, vegetable and tree seeds can also be used in seed paper for decorative purpose.

Due to increasing population and industrialization huge amount of waste material is produced. Disposal of such huge waste material is quite impossible task. Therefore, by using seed paper method one can produce creative and best way of recycling of waste paper. Large number of papers are removed to full fill demand of paper industry. This will also reduce cutting of trees in small amount. Invitations, Table Calendars, greeting cards, Wedding cards prepared using such paper, when planted in a pot or in garden soil, it will become a good memory of that beautiful moment.

Material and Methods:

1. Soak the waste paper pieces in the bowl of water overnight. Put the soaked paper into blender, add the water and blend it until the mixture is soupy. Add desired colours and again blend it.
2. Now add small seeds such as Basil, Marigold, flower petals, small flowers, leaves, fragrance to make seed paper attractive.
3. Pour this paper pulp mixture in a large tray, insert old photo frame into the tray and add paper pulp if required. Remove this frame filled with paper pulp and keep it for drying. After proper drying remove photo frame.

Advantages:

1. This paper is chemical free and sustainable way of recycling waste paper.
2. It is free of cost, doesn't require any costly material for production of seed paper.
3. Special occasions can be recreated in the form of Memory, as we can plant that invitation of event in a pot or in the garden. Germinating seed/flowering plant can be raised to restore memory.
4. Instead of buying costly greetings, one can prepare greeting card by using such attractive, fragrant seed paper.





Synthesis of Capsulated BCAs

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Introduction:

Biological control is a method of controlling pathogens and pests such as insects, mites, fungi using other living organism. The organisms which are used for the purpose of biological control is called as "Antagonists" or "Biological Control Agents". i.e BCAs.

For disease management variety of biocontrol agents are used. Among them *Trichoderma* is the most common fungal pathogen. Variety of products are prepared from various *Trichoderma* species for management of fungal diseases such as- Ginger soft rot, Turmeric rhizome rot, cucumber fruit rot etc.

Various mechanisms are developed by *Trichoderma* species for implementation of biocontrol strategy. Such as antibiosis, mycoparasitism, secretion of cell wall degrading enzymes, production of antibiotics and competition for nutrients & space. this characteristic of *Trichoderma* species is used in present investigation to achieve ecofriendly, cost effective, simple method of disease management. It is also effective when used with compatible agrochemicals under the Integrated Disease Management Strategy (IDM).



Material and Methods:

For the manufacture of Capsulated BCAs, powdered Fungal Biological control agent *Trichoderma viride* or *Trichoderma harzianum* is used. Soybean husk is used as binder and the paste is prepared from this powdered BCAs powder.

With the help of tray used for making pills, small rounded pills of this mixture/ paste were prepared. These pills encapsulated by using any nutrient medium containing appropriate amount of agar. As agar is a solidifying agent, after few minutes' agar starts to solidify and pills are ready to store in a container.



Advantages:

1. It is an ecofriendly way of disease management as use of synthetic agrochemicals is completely avoided/ prevented.
2. Due to coating of nutrient medium containing agar, Fungal Biocontrol agent will immediately start to grow. Therefore, effect will be seen as soon as capsulated BCAs are applied to the field crop. As compared to chemical pesticides these capsulated BCAs are less costly.
3. These capsulated BCAs are easy to handle as compared to liquid and solid agrochemicals and application method is much simpler.



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Initiatives in Waste Management

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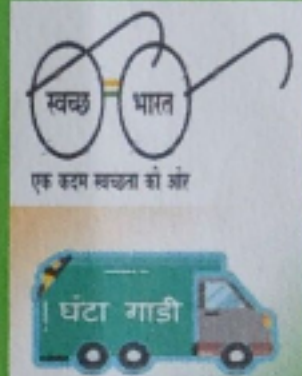
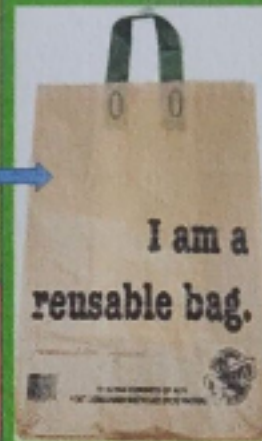
There is an urgent need for proper waste management

In India, plastic bags are used on daily bases and thus they are dumped in most Indian landfills and it is dangerous for the environment. According to the policy, they provide a daily doorstep collection of biodegradable waste for composites, because in India, we need manure to maintain soil fertility

There are many new technological inventions of waste disposal machines which are used by municipalities but there are some techniques through which we can help solve this problem at our level such as recycling, landfill, combustion, change the waste to energy, composting etc.

Avoid This

Use This



With the discussion with local governing authorities I wish to implement this idea at our gram panchayat level. I have also told them to use natural and biodegradable products made from recycled materials as well as farm waste like straws, bagasse as much as possible. I tried to make these products for small scale and distribute them. Output of the study is reduction in waste which leads to reduction in pollution.

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Role of Students in Sustainable Agriculture

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Agriculture is an important sector in Indian economy contributing about 17% of GDP; also rank first in the world with highest cropped area. The agricultural practices such as chemicals, hybrids, GMD's lead to degradation of wild varieties, residual effects, conversion of agricultural land into saline, degraded wastelands, percolation of hazardous chemical to nearby waterbodies, threatens life in water as well as productivity of aquatic ecosystem. The chemical residues in fruits and vegetable can lead to life threatening diseases like cancer.



Green revolution in India has brought a lot of significant changes with new techniques & tools which has positively helped the sector. It is basically initiated to increase the production to feed the hungry, malnourished population. The major crops cultivated in the era of Green revolution were Maize, Wheat, Rice, Barley, Sorghum and millets. In this era number of traditional varieties of crops were vanished from farmers fields due to focus on cultivation of high yielding varieties (HYV) and subsidized emphasis for hybrid monoculture by the government.



- Organic farming provides a natural way of crop cultivation by using environment friendly, animal and plant based local organic resources that are highly enriched in nutrients required for crop plants. It enhances the microbial activities and increases soil health.
- Bio pesticides are pesticides derived from naturally occurring sources
- Bio fertilizers helps to increase the soil fertility and productivity. Such as *Nostoc*, *Azotobacter* and *Pseudomonas* are extensively used for farming. It helps to increase the soil fertility and productivity. It also enriches the soil and the micro-organisms in the soil which in turn increases the crop production.
- Bio-enzymes like *EarthZyme* and *TerraZyme* are also used for the crops. This helped my family At village level through *bachat* gat if we implement all those activities it will also help our villagers.

