



Quality checking work in Biofertilizer company

An industrial training report submitted for the partial
fulfilment of the degree of master of science by,

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M.Sc. Biotechnology , Sem.4

ATMIYA UNIVERSITY

Yogidham gurukul, Kalawad Road, Rajkot, Gujarat,

36005

Under the guidance of

Hardik Dobariya

Lab supervisor

Radons crop care LLP.

(On letterhead of the Department)

CERTIFICATE

This is to certify that this training report entitled “**Biofertilizer**” was successfully carried out by Miss Himanshi Rajeshbhai Desai towards the partial fulfilment of requirements for the degree of Master of Science in Biotechnology of Atmiya University, Rajkot. It is an authentic record of her own work, carried out by her under the guidance of Mr. Praful Rank. Sabbanwar for a period of 3 months during the academic year of 2022- 23. The content of this report, in full or in parts, has not been submitted for the award of any other degree or certificate in this or any other University.

Signature

Mr.Hardik Dobariya

Signature

Mr. Praful Rank

DECLARATION

I hereby declare that, the project entitled is an outcome of my own efforts under the guidance of **Mr. Hardik Dobariya** in **Radons crop care LLP**. The report is submitted to Atmiya University Rajkot. For the partial fulfillment of the Master of Science 2021-2022. I also declare that this report has not been previously submitted to any other University.

HIMANSHI DESAI

Place: Kuvadava

Date: 31/03/2023

Acknowledgments

- I would like to express my gratitude to all the people behind the screen who helped me to transform an idea into a real application.

- I would like to express my heart-felt gratitude to my parents without whom I would not have been privileged to achieve and fulfill my dreams. I am grateful to our H.O.D. Dr. Nutan Prakash and Dr. Ragini Raghav who must ably run the institution and has the major hand in enabling me to do my project.

- I profoundly thank Mr. Gunjan Dobariya Manager of Radons Crop Care LLP. and Mr. Hardik Dobariya of Radons crop care who has been an excellent guide and also a great source of inspiration to my work.

- I also would like to thank my lab mates and my colleagues for their kind help and support.

- The satisfaction that a company the successful completion of the task would be great but incomplete without the mention of the people who made it possible with their constant guidance and encouragement crowns all the efforts with success.

- My special gratitude is to my brother, my sister and my family for their loving support. Lastly, and most importantly, I wish to thank my parents. They have always supported and encouraged me to do my best in all matters of life. To them I dedicate this report.

About company

Company name: Radons Crop Care LLP.

Location: Royal park 1 Ranpura road, Ahemdabad highway ,Ta. rajkot Dist. Rajkot , Gujarat, 360023.

Nature of Company: Biofertilizer

Product details

- ❖ Radons Crop care product in use many componants Rhizobium, Azotobactor, Phosphate Solubilizing Bacteria, potassium Solubilizing Bacteria,PH range, Fermented liquid, phosphate solubilizing fungal, Zinc Solubilizing bacteria, Nitrogen Fixing bacteria,Potassium Mobilizing Bacteria.

➤ Products

Bio-fertilizer-PSB

Azospirillum Bio-Fertilizer

Bio-Fertilizer -KMB

Azotobactor Bio-Fertilizer

Bio-Fertilizer - ZSB

Bio-Fertilizer

Rhizobium Bio-Fertilizer

Acetobactor Bio-Fertilizer

Carrier Based Consortia Bio-Fertilizer

Liquid Consortia Bio-Fertilizer

Objectives

Handle practical activity with minimum error by following Good Laboratory Practice. To gain knowledge about production process. To gain knowledge about documentation work of Biofertilizer company. Learn handling of weigh balance, Spectrophotometer, pH meter, Incubator, and Autoclave, Shaker. Gain knowledge about crops test Documentation work of biofertilizer.

➤ **Introduction:**

Biofertilizer technology is not a new concept. It involves inoculation of beneficial microorganisms that help nutrient acquisition by plants through fixation of nitrogen, solubilisation and mobilisation of other nutrients. Multivarious advantages of bio-fertilizers leads to its wide applicability in sustainable agriculture.

➤ **What is Biofertilizer**

Biofertilizers are the substance that contains microorganism's living or latent cells. Biofertilizers increase the nutrients of host plants when applied to their seeds, plant surface or soil by colonising the rhizosphere of the plant. Example: Azotobactor, Azospirillum, Rhizobium etc.

➤ **Types of Biofertilizer**

1. Bacterial :

- 1.1 Symbiotic nitrogen fixers : Rhizobium, Azospirillum spp
- 1.2 Free living nirogen fixers : Azotobacter, klebsiella etc.

2. Fungal :

- 2.1 VAM

3. Algal :

- 3.1 BGA in association with Azolla
- 3.2 Anaben, Nostoc, Ocillatoria

4. Aquatic fern

5. Earthworms

➤ **Test of Biofertilizer**

1. Fungicides:

- 1.1 Trichoderma
- 1.2 Beauveria

2. Bacteria :

- 2.1 Phosphate
- 2.2 Pseudomonas
- 2.3 Zinc

Trichoderma Fungicides

- ❖ Trichoderma species promotes the growth of plants and limits the growth of plant pathogens.
- ❖ Trichoderma species are effective biofungicides, enzymatically degrading other fungi, producing anti-microbial compounds that kill pathogenic fungi, and outcompeting pathogenic fungi for space and nutrients.
- ❖ Trichoderma fungicides test in jower.
- ❖ Requiriements :
 1. Sorghum
 2. Motherculture of trichoderma
 3. Pipette
 4. Conical flask
 5. Cotton plug
 6. Talk powder
 7. Distilled water
 8. Spirit lamp
 9. Potato dextrose agar medium

➤ Procedure

- ❖ Take 100 ml Distilled water.
- ❖ Add 3.9 gram PDA medium prepared and some part of culture in transferred in to flask.
- ❖ Autoclave 121c for 30 minute.
- ❖ Add 10ml Trichoderma mother culture through inoculation needle under laminar air flow.
- ❖ Seal flask with cotton plug and keep it in incubator for 4 to 5 day at 27c.
- ❖ After 5 days flask is fully filled with trichoderma culture.
- ❖ harvest sorghum seed in to talkpowder.

➤ **Result :**

- ❖ Perform this experiment and observe the growth of trichoderma culture.



Beauveria

- ❖ Beauveria is a fungus that grows naturally in soil throughout the world and acts as a pathogen on various insects species, causing white muscadine disease, therefore, it belongs to the entomopathogenic fungi.
- ❖ Maximum Growth in 6-7 PH and 25-30c temperature.
- ❖ Requiriements :
 1. Rice
 2. Motherculture of beauveria
 3. Pipette
 4. Conical flask
 5. Cotton plug
 6. Talk powder
 7. Distilled water
 8. Spirit lamp
 9. Potato dextrose agar medium

➤ Procedure

- ❖ Take 100 ml Distilled water.
- ❖ Add 3.9 gram PDA medium prepared and some part of culture in transferred in to flask.
- ❖ Autoclave 121c for 30 minute.
- ❖ Add 10ml Beauveria mother culture through inoculation needle under laminar air flow.
- ❖ Seal flask with cotton plug and keep it in incubator for 4 to 5 day at 27c.
- ❖ After 5 days flask is fully filled with trichoderma culture.
- ❖ harvest rice seed in to talkpowder.

➤ **Result :**

- ❖ Perform this experiment and observe the growth of beauveria.



growth



Matured g

➤ **Bacteria**

- ❖ Phosphate maximum growth in 5 - 7.5 PH.
- ❖ Pseudomons maximum growth in 6 -7.5 PH.
- ❖ Zinc maximum growth in 6.5 -7.5 PH.
- ❖ Excess ph become reduce to with buffer.

➤ **Phosphate**

- ❖ Requiriements :

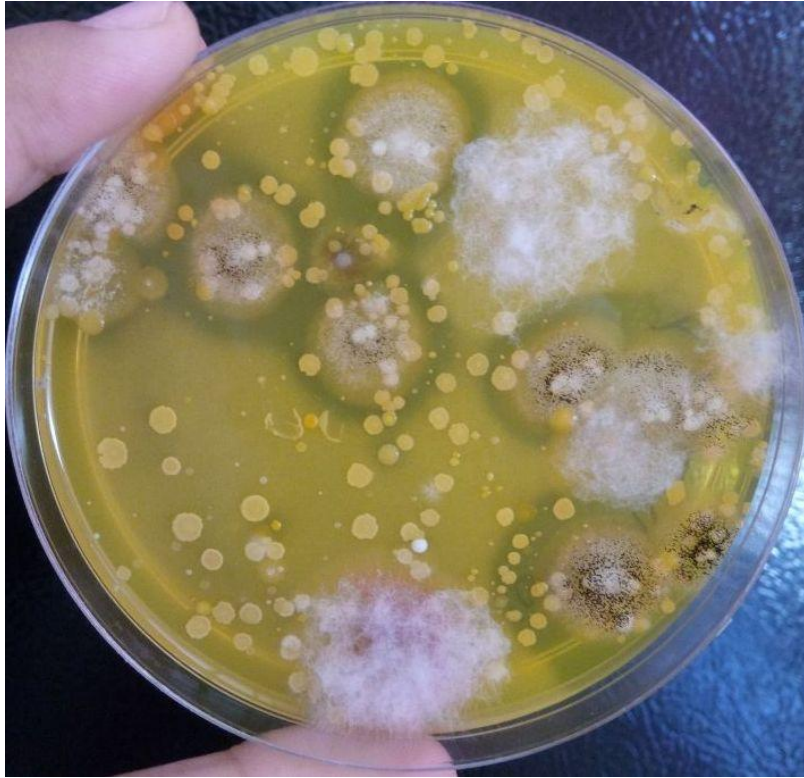
1. Phosohate culture
2. Microscope
3. Distilled water
4. Pipette
5. Nutrient broth
6. Conical flask
7. Spectrophotometer
8. Ph meter

➤ **Procedure**

- ❖ Take 100ml distilled water in flask.
- ❖ Add 1.3 gram nutrient broth.
- ❖ Autoclave 121c for 30 minutes.
- ❖ After 36 hours inoculate phosphate culture.
- ❖ Incubate 32c temperature for 24 hours.
- ❖ After 24 hours mixwell in shaker.
- ❖ 3 days in every 6 hours check OD.
- ❖ Check the growth in microscope.

➤ **Result:**

- ❖ Perform this experiment and observe the growth of phosphate culture.



Pseudomonas

❖ Requirement:

1. pseudomonas culture
2. Microscope
3. Distilled water
4. Pipette
5. Nutrient broth
6. conical flask
7. Spectrophotometer
8. PH meter

➤ Procedure:

- ❖ Take 100ml distilled water in flask.
- ❖ Add 1.3 gram nutrient broth.
- ❖ Autoclave 121c for 30 minutes.
- ❖ After 36 hours inoculate 10 ml pseudomonas culture.
- ❖ Incubate 32c temperature for 24 hours.
- ❖ After 24 hours mixwell in shaker.
- ❖ 3 days in every 6 hours check OD.
- ❖ Check the groth in microscope.

- **Result:** Perform this experiment and observe the growth of Pseudomonas culture.



Zinc

❖ Requirement:

1. Zinc culture
2. Microscope
3. Distilled water
4. Pipette
5. Nutrient broth
6. Conical flask
7. Spectrophotometer
8. Ph meter

❖ Procedure

- ❖ Take 100ml distilled water in flask.
- ❖ Add 1.3gram nutrient broth.
- ❖ Autoclave 121c for 30 minutes.
- ❖ After 36 hours inoculate 10ml zinc culture.
- ❖ Incubate 32c temperature for 24 hours.
- ❖ After 24 hours mixwell in shaker.
- ❖ 3 days in every 6 hours check OD.
- ❖ Check the growth in Microscope.

➤ **Result**

- ❖ Perform this experiment and observe the growth of zinc culture.



company made this products

Custodian is free living Zinc Solubilizing Bacteria (ZSB) that secrete organic acid compounds in rhizosphere region which mobilize and transform unavailable form of Zinc into available form Zn in all soil with diverse pH range. It decrease dependence on chemical fertilizer significantly, plays an essential role of enzyme activation, protein synthesis, photosynthesis, water retention, immunity development, soil biodiversity and induces enhanced growth, quality produce and higher yield. It's suitable for all crops.

Composition:
 Zinc Solubilizing Bacteria (ZSB) 1×10^7 cell/ml
 Fermented Liquid Quantity Sufficient
 pH range 6.5 to 7.5

Application:

- 1 Litre per acre via drip irrigation.
- Mix 1 Litre of Alankar with 500 kg of organic manure and broadcast uniformly in 1 acre.
- Add 1 to 5 ml of Alankar with sufficient water in horticulture and ornamental plant depending of the age of plant.
- Apply in cereals, pulses, oil seeds, vegetables, fruits, Horticulture crops.

Culture of Microorganism Produced through Biotechnological Process-Fermentations.

KEEP IN COOL, DRY PLACE AWAY FROM HEAT & OPEN FLAME.
 રૂઠું સૂકું અને ઠંડાં જગ્યાએ રાખવાનું છે.

WARRANTY: Since the use of the product is beyond our control. We cannot assume any responsibility other than uniform quality of the product.

WARNING: Do not use near water sources. Keep out of the reach of children.

FOR AGRICULTURE USE ONLY
CAUTION: NOT TO BE USED ON CROPS OTHER THAN SPECIFIED ON THE LABEL / LEAFLET!

Batch No.:
 22 4,
 16 4.

Date of Mfg.:
 2022 01 20
 2022 01 20

Expiry Date:
 2023 01 20
 2023 01 20

MAAR No.:
 (Inkane of farmer)
 જાણકારી આપવા માટે,
 સર્કલ નં. 0000
 સંપર્ક સંખ્યા: 079-382245
 (સર્કલ નં. 0000)

EMPTY PACKAGES/CONTAINERS SHOULD BE DESTROYED AFTER USE.

Manufactured & Marketed by
Radons
 CROP CARE LLP
 Royal Industrial Park, Ahmedabad Highway,
 R.S. No. 161P2/164P1-P2, Plot No. 23/24,
 Ranpur Road, At. Ranpur - 382 245 (Gujarat)

Custodian is free living Nitrogen fixing Acetobacter that secrete organic acid compounds in ground region which mobilize and transform unavailable form of Nitrogen into available form like NH_4 in all soil with diverse pH range. It decrease dependence on chemical fertilizer significantly, plays an essential role of enzyme activation, protein synthesis, photosynthesis, water retention, immunity development, soil biodiversity and induces enhanced growth, quality produce and higher yield. It's suitable for all crops.

Composition:
 Acetobacter Bacteria 1×10^7 cell/ml
 Fermented Liquid Quantity Sufficient
 pH range 3.5 to 6.0

Application:

- 1 Litre per acre via drip irrigation.
- Mix 1 Litre of Alankar with 500 kg of organic manure and broadcast uniformly in 1 acre.
- Add 1 to 5 ml of Alankar with sufficient water in horticulture and ornamental plant depending of the age of plant.
- Recommended to use In Sugarcane.

Culture of Microorganism Produced through Biotechnological Process-Fermentations.

KEEP IN COOL, DRY PLACE AWAY FROM HEAT & OPEN FLAME.
 રૂઠું સૂકું અને ઠંડાં જગ્યાએ રાખવાનું છે.

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 Ranpur Road, At. Ranpur - 382 245 (Gujarat)

Custodian is free living Nitrogen fixing Azotobacter that secrete organic acid compounds in rhizosphere region which mobilize and transform unavailable form of Nitrogen into available form like NH_4 in soil with diverse pH range. It decrease dependence on chemical fertilizer significantly, plays an essential role of enzyme activation, protein synthesis, photosynthesis, water retention, immunity development, soil biodiversity and induces enhanced growth, quality produce and higher yield. It's suitable for all crops.

Composition :
 Nitrogen Fixing Bacteria (Azotobacter) 1×10^7 cell/ml
 Fermented Liquid Quantity Sufficient
 pH range 6.5 to 7.5

- Application:**
- 1 Litre per acre via drip irrigation.
 - Mix 1 Litre of Alankar with 500 kg of organic manure and broadcast uniformly in 1 acre.
 - Add 1 to 5 ml of Alankar with sufficient water in horticulture and ornamental plant depending of the age of plant.
 - Apply in cereals, pulses, oil seeds, vegetables, fruits, Horticulture crops.

Culture of Microorganism Produced through Biotechnological Process-Fermentations.



CUSTODIAN

Azotobacter Bio-Fertilizer
 Nitrogen Fixing Bacteria 1×10^7 cell/ml



KEEP IN COOL, DRY PLACE AWAY FROM HEAT & OPEN FLAME.

WARRANTY : Since the use of the product is beyond our control. We cannot assume any responsibility other than uniform quality of the product.

FOR AGRICULTURE USE ONLY
CAUTION: NOT TO BE USED ON CROPS OTHER THAN SPECIFIED ON THIS LABEL & LEAFLET

Batch No.:
 20 42
 24 41

Date of Mfg.:
 2024 01 01

Expiry Date:
 2024 01 01

Radons Crop Care LLP
 2024 01 01



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