



Nanded Education Society's

Science College, Nanded

Tel: 02462-250 465, 251 648

www.sciencecollegenanded.org

(Affiliated to Swami Ramanand Teerth Marathwada University, Nanded)
(Reaccredited with "A" grade by NAAC with (CGPA 3.38) 3rd Cycle, CPE Status,
DST-FIST, Best College Award (SRTMUN))



Annual Quality Assurance Report 2022-23

Criteria- 7

Institutional Values and Best Practices

**7.3.1 - Portray the performance of the Institution in one area
distinctive to its priority and thrust**

Central Instrumentation lab with equipments



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PRINCIPAL
Science College, Nanded



Principal
PRINCIPAL
Science College, Nanded


Career Guidance Cell



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Science College, Maradai

Certificate Courses

Sr. No.	Name of the Courses	Duration of course
1.	Employment Communication Skills Using Language Lab	1 Month
2.	Advanced Python Programming	2 Months
3.	Structured Query Language (SQL)	3 Months
4.	Office Automation and Data Analysis	3 Months
5.	Soil Testing and Nutrient Analysis	2 Months
6.	Fresh Water Fish Culture Technology	3 Months
7.	Pisciculture	3 Months


PRINCIPAL
Sejanta College, Mandla

Bio-gas Plant



Solar Energy



Hames
PRINCIPAL
Science College, Nanded

Green House



Principal
PRINCIPAL
Science College, Nandur

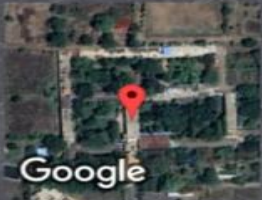
Soil Testing kit in the Laboratory



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 **GPS Map Camera**



Google

Nanded-Waghala, Maharashtra, India
AgroChemicals & Fertilizers Lab, N.E.S. Science College, Nanded 58G2+36F,
Vivek Nagar, Sneh Nagar, Nanded-Waghala, Nanded, Maharashtra 431602,
India
Lat 19.175113°
Long 77.299841°
12/12/23 03:26 PM GMT +05:30


PRINCIPAL
Science College, Nanded

Final Report of



SRTMU-RGSTC SPONSORED MRP

ENTITLED

**“MASS MULTIPLICATION OF MYCORRHIZAE FOR THE PRODUCTION OF COST
EFFECTIVE BIOFERTILIZER”**

SUBMITTED TO

**SWAMI RAMANAND TEERTH
MARATHWADA UNIVERSITY NANDED**

SUBMITTED BY



Dr. D. M. Jadhav

**Principle Investigator and Associate Professor
Post Graduate Department of Botany
Nanded Education Society's Science College Nanded-431605**

Acknowledgment.

It is my prime duty to express my sincere thanks to Hon. Vice Chancellor, Pro-Vice Chancellor of Swami Ramanand Teerth Marathwada University Nanded and officials of Rajiv Gandhi Science and Technology Commission, Mumbai for showing faith on the proposal submitted and granting financial assistance to do work on it.

With great pleasure I would like to express my sincere thanks to Principal of Nanded Education Society's Science College Nanded Prof. D. U. Gawai for encoring and permitting me to complete the sanctioned project in stipulated time. He has also extended his helping hands in giving valuable suggestions at regular intervals during the work.

I express my sincere thanks to Head Department of Botany, Microbiology and Biotechnology Prof. B. D. Gachande for permitting to work in department and providing necessary facilities for completion of project work.

I owe my sincere thanks to Dr. V. R. Marathe, Co-Investigator of the project for giving their valuable suggestions and ideas during the entire tenure of project work.

I also express sincere thanks to my fellow colleagues Prof. P.S. Borkar, Dr. V. B. Chavan, Dr. R. V. Sangvikar, Dr. P. G. Paul, Dr. A. T. Shinde, Librarian Dr. S. L. Jadhav, for their constant encouragement and giving feedback at regular time intervals.

It is my sincere duty to express special thanks to Project Assistant Mr. Sandip Kanshette for doing hard work to complete the project in given time. Without his involvement it could not be possible for me to complete the work. I am also thankful to Mr. Sunil Darne, Mr. Pankaj Hingmire, Mr. Sachin Shinde, Mr. R. N. More and nonteaching staff of department for their kind support and help.

(Dr. D. M. Jadhav)

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To be filed by Principal Investigator/Project Coordinator

**Rajiv Gandhi Science and Technology Commission
Govt. of Maharashtra**

**Evaluation of the Scheme "Assistance for S & T Applications through
University System"**

Final Report

Title of the Project	MASS MULTIPLICATION OF MYCORRHIZAE FOR THE PRODUCTION OF COST EFFECTIVE BIOFERTILIZER.
Name of Institution	N.E.S. SCIENCE COLLEGE NANDED.
Name of University	Swami Ramanand Teerth Marathwada University Nanded.
Collaborating Institutions	Nil.
Principal Investigator	Dr. D. M. Jadhav.
Co-Investigators	Dr. V. R. Marathe
Project Duration	Two Years
Approved Budget	Total Budget: 5,00,000/-
Total Expenditure	4,43,552/- out of 5,00,000/-

To be filed by Principal Investigator/Project Coordinator

1. Brief report of the project/Highlights of project output: (Kindly See Annexure-I for Final Report)
2. Is Technology Transferred? If yes, please provide the details about the technology?

Almost all work towards achieving its objectives is completed.

3. In case there is no technology transfer, mention the steps necessary to get the technology to a level where technology can be transferred.

Through a workshop we are giving information regarding technique of mass production of Mycorrhiza Bio fertilizer to Farmers.
Through this we are introducing this bio fertilizer producing technology to farmer of this region.

4. Facilities created at the Institution implementing the project

Under the present research project following facilities were developed. (Kindly See Annexure-II)

1. Binocular Stereoscopic microscope
2. Labomed Research Microscope
3. Autoclave
4. Mycorrhiza Sieve Set

5. Number of papers/books/patents published based on work done under the project.

One research paper based on the work related to project are published with due acknowledgement of Swami Ramamand Teerth Marathwada University Nanded and Rajiv Gandhi Science and Technology Commission, Mumbai.
One poster entitled "Monoculturing of AM Fungus *Glomus mosseae* for its mass production" based on work has been published in International conference on Fungal Diversity & its Novel Applications held at S.M. Joshi College Hadpsar Pune on 09 April 2022
Based on remaining work we will publish few more papers. The reprints of published papers are attached here with this report.

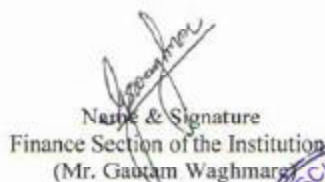
6. Any other information about the Project

We have successfully completed the project in stipulated time.



Name & Signature
Principal Investigator
(Dr. D. M. Jadhav)

PRINCIPAL INVESTIGATOR
SRTMUN Research Project (RGSTC Scheme)
Department of Botany
N.E.S. Science College, Nanded-431605



Name & Signature
Finance Section of the Institution
(Mr. Gautam Waghmare)



Name & Signature
Head of the Institution
(Dr. D. U. Gawai)

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Science College, Nanded



Annexure-I

1. Brief report of the project/Highlights of project output (Final Report).

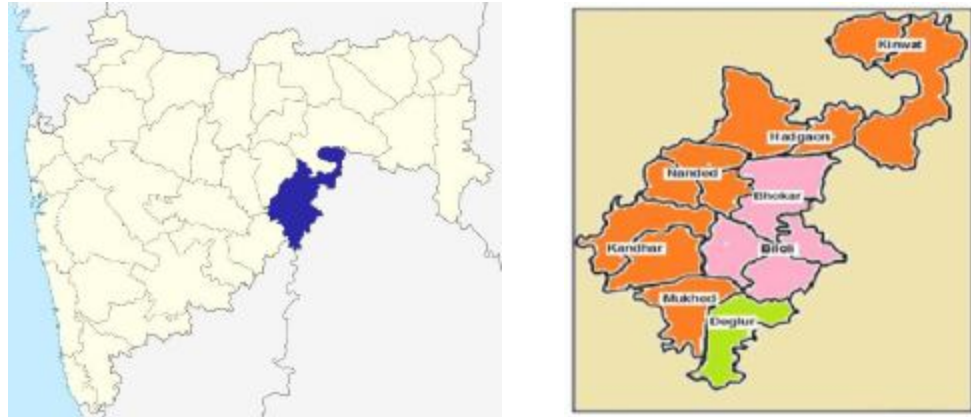
Initially we would like to express our sincere thanks to **Rajiv Gandhi Science and Technology Commission, Mumbai and Swami Ramanand Teerth Marathwada University Nanded** for the sanction of this research project. In present project work we are going to isolate the effective mycorrhiza from soil of Nanded for its mass production in the benefits of farmer community.

As per the sanction letter from Swami Ramanand Teerth Marathwada University Nanded, the project was implemented in the middle of June 2020. Since from sanction, our project faced two phases of major lockdown, therefore we could not work as per our expectations. After normalizing the conditions, we have worked with full speed to achieve the objectives of the project.

Nanded lies between 180 15 ' to 190 55' North latitudes and 770 to 78025' East longitudes. It covers an area of 10,332 sq km. Nanded District lies in the eastern part of Maharashtra state as well as the eastern portion of Marathwada region, which corresponds to Aurangabad Division. Nanded is the second largest city in Marathwada after Aurangabad. This region receives total rain fall 924 mm per year with average relative humidity ranging from 22 to 68 %. Nanded is bounded on the North by Yavatmal district of the Vidarbha region, on the Eastern side lies Adilabad, Nirmal, Nizamabad & Kamareddy district of Telangana state, and on the South lies Bidar of Karnataka state. Nanded also shares its boundaries with Latur on South West, Parbhani and Hingoli districts on the West. The area presents undulating topography with uneven hills, plateau, gentle slopes and valley planes. The Godavari River flows through the district. Physiographically, the district can be divided into 2 major parts, the hilly region on the North and North East and low-lying area on the banks of the rivers Godavari, Manjra, Manyad, Penganga.

The main occupation of peoples of this area is agriculture. Godavari

river is the main which irrigate this region along with other rives.



Map of Nanded Region

Mycorrhiza: -

Mycorrhizas are symbiotic relationships between fungi and plant roots. More than 80% of the species of higher plants have these relationships. They are as common on crop plants such as cereals, peas, tomatoes, onions, apples, strawberry, etc as in wild plant communities, and in several cases they have been shown to be important or even essential for healthy plant growth and yield. To a large degree, mycorrhiza is symbiotic/mutualistic relationships, in which the fungus obtains at least some of its sugars from the plant, while the plant benefits from the efficient uptake of mineral nutrients or water by the fungal hyphae.

They are considered natural bio fertilizers, since they provide the host with water, nutrients, and pathogen protection, in exchange for photosynthetic products. The process of re-establishing the natural level of AMF richness can represent a valid alternative to conventional fertilization practices, with a view to sustainable agriculture. The main strategy that can be adopted to achieve this goal is the direct re-introduction of AMF propagules (inoculum) into a target soil. Since indigenous AMF have been demonstrated to be equally or even better performing than commercial or culture collection isolates, farmers should be encouraged to autonomously

produce their AMF inoculum, starting from native soils. In this regard we need to transfer the technology of on field AMF production to farmers using their local resources. This makes the bio fertilization technology more likely to be affordable for farmers with affordable cost. By keeping the similar view in mind the we are working on this project.

Objectives of the project: Following are the proposed objectives for undertaken project

1. Collection of Soils for Mycorrhizal spores from the fields of Nanded.
2. Identification of Mycorrhizal fungi.
3. Mass multiplication of selected mycorrhizal fungi on suitable hosts.
4. Effect of mycorrhizal fungi on Wheat variety developed by Parbhani Agriculture University.
5. Production and popularization of cost effective biofertilizer.

Steps towards achieving objectives of the project:

- 1. Collection of Soils for Mycorrhizal spores from the fields of Nanded.**

This is primitive part of the research in which we have given field visits to different area nearby Nanded region for the collection of soil samples. Different locations that we have visited includes Sonkhed, Loha, Kandhar, Naigaon, Mukhed, Ardhapur, Hadgaon, Dharmabad, Himayatnagar, Biloli, Kinwat etc. the field visits were made in the months of October, November, December, January, February and March. The rhizosporic soil sample were collected in polythene bags and brought to laboratory for the isolation of mycorrhizal spores.



Field Visits for Collection of Soil Samples



Field Visits for Collection of Soil Samples



Field Visits for Collection of Soil Samples



Field Visits for Collection and Collected Samples

Isolation of Mycorrhizal Spores:

In laboratory isolation of mycorrhizal spore was done as per method described by Gerdemann and Nicolson (1963). Hundred gram of soil sample was weighed and thoroughly mixed with water 500 ml by stirring with the glass rod. The mixture was allowed to stand till soil particles settled down. The suspension was then passed through series of sieves stacked in descending order of their mesh sizes viz. 500 to 45 μ m from top to bottom. This procedure was repeated for three to four times. The contents of sieves were washed with the running tap water and washings were collected in a separate dish for each sieves. Collected contents in each dish were observed for presence of Mycorrhiza spores under the stereo zoom Microscope CZM-6.



Isolation of Mycorrhizal Spores as per method Described by Gerdemann and Nicolson (1963).



Isolation of Mycorrhizal Spores as per method Described by Gerdemann and Nicolson (1963).



Isolation and observation of Mycorrhizal Spores as per method Described by Gerdemann and Nicolson (1963).

Identification of Mycorrhizal Spores:

Mycorrhizal spores isolated from soil samples were collected separately on the basis of their morphological features like colour, shape, hyphal attachments etc. Intact as well as broken spores were isolated using capillary tube and hydraulic micropipette (1.0 to 50 microliter) and mounted on microscopic slides using lacto glycerol and observed by putting cover slip over it using Labomed make binocular microscope. Each spore was photographed through Camera. Identification of AM species was done using manual given by Schenk and Perez (1990), by referring dedicated research papers in the field of mycorrhiza and also by using authentic web resources available on mycorrhiza specific web link INVAM worksheet (<http://invam.caf.wvu.edu>).



Observation of Mycorrhizal Spores under Labomed Binocular Microscope for their identification.




Measurement of Mycorrhizal Spore:







Measurement of each spore is important because it gives additional clues for identification of spores. We know that identification of mycorrhizal spores can be done by observing characters like colour, shape, hyphal attachments etc. Measured size like diameter of each spore provides additional data for identification. Measurement of each spore is taken by using standard micrometric procedure. All the spores are measured under the magnification of $10\times \times 10\times$. In this procedure one monocular microscope was calibrated by using ocular and stage micrometer. The calibration factor was determined. The value of calibration factor was later multiplied with the occupied divisions of ocular micrometer by the mycorrhizal spore.










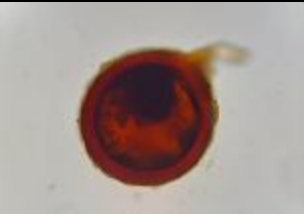


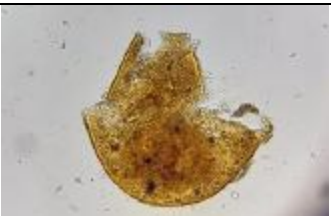
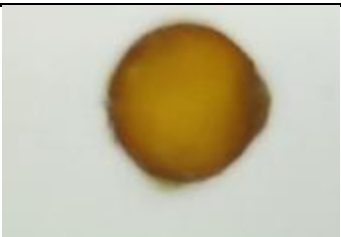
Monocular Microscope with stage and ocular micrometer used in measurement of mycorrhiza spore



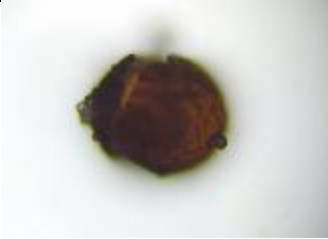
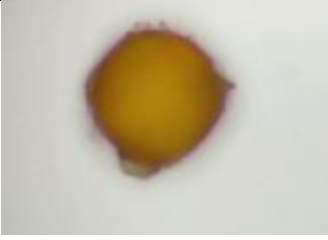

Identified Spores: Mycorrhizal spores observed and identified in the current study are presented in following table.

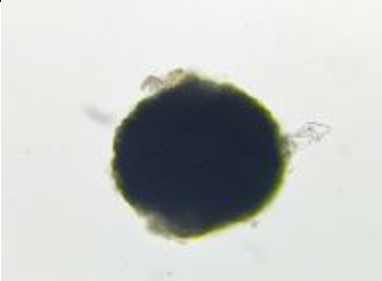




Sr. No	Name of Spore	Image	Diameter in μm
1	<i>Acalospora dilatata</i>		110 μm
2	<i>Acalospora niclosonii</i>		123 μm
3	<i>Acaulospora foveata</i>		262 μm





4	<i>Acaulospora lacunose</i>		105 μm
5	<i>Acaulospora tuberculata</i>		130 μm
6	<i>Glomus fecundisporum</i>		177 μm
7	<i>Glomus lacteum</i>		193 μm
8	<i>Scutellospora biornata</i>		210 μm
9	<i>Glomus versiformae</i>		110 μm

10	<i>Glomus intradices</i>		187 μm
11	<i>Glomus halonatum.</i>		153 μm
12	<i>Gigaspra margarita</i>		365 μm
13	<i>Pascispora scintillans</i>		226 μm
14	<i>Glomus aggregatum</i>		96 μm
15	<i>Glomus fasciculatum</i>		125 μm

16	<i>Glomus macrocarpum</i>		115 μm
17	<i>Glomus deserticola</i>		160 μm
18	<i>Acaulospora morrowiae</i>		90 μm
19	<i>Glomus mosseae</i>		115 μm
20	<i>Acaulospora kitinensis</i>		137 μm
21	<i>Acaulospora laevis</i>		156 μm

22	<i>Acaulospora koskei</i>		120 μm
23	<i>Acaulospora mellea</i>		94 μm
24	<i>Acaulospora spinosa</i>		174 μm
25	<i>Diversispora globifera</i>		165 μm
26	<i>Entrophospora infrequens</i>		121 μm

27	<i>Gigaspora albida</i>		274 μm
28	<i>Glomus ambisporum</i>		96 μm
29	<i>Glomus flavisporum</i>		135 μm
30	<i>Glomus pansihalos</i>		142 μm
31	<i>Glomus constrictum</i>		153 μm

32	<i>Diversispora epigaea</i>		122 µm
33	<i>Scutellispora calospora</i>		114 µm
34	<i>Glomus clarum</i>		167 µm
35	<i>Acaulospora scrobiculata</i>		136 µm

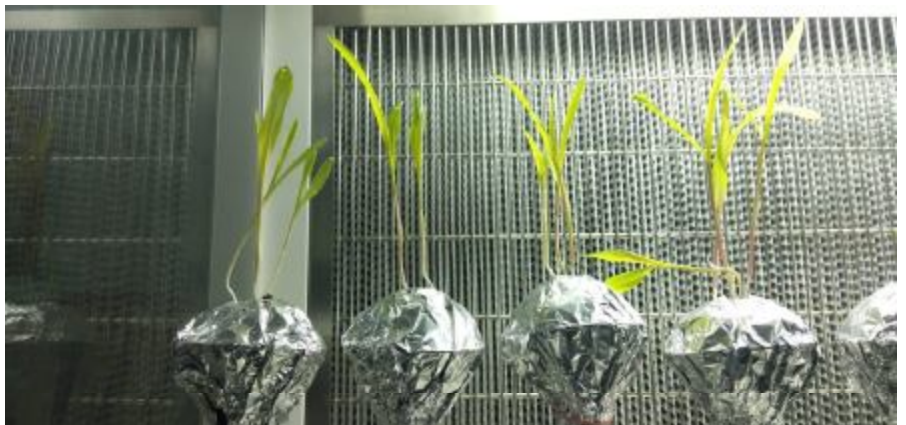
Pure culturing of AM spore for mass multiplication:

Almost 35 different mycorrhizal fungal spores were identified in present study. Among all *Glomus mosseae* was found to very common in all sample studied. Therefore, by considering its common occurrence in diversified habitats we decided to pure culture multiply the same on different herbaceous host as per method described by Gerdemann (1963) in glass funnel. The mycorrhizal spores were collected by wet sieving and decantation method. Later spores of *Glomus mosseae* are

picked by hydraulic micropipette in a small watch glass. The spores were surface sterilized by washing for three to four times with sterile distilled water using small brush under stereo zoom microscope. All the required material were properly sterilized using autoclave. Cotton plug was fixed in the neck of big sized funnel. The funnel is filled with mixture of soil and sand in 1:1 ratio and is warped with aluminum foil and sterilized for 45 min at 121⁰C and 15 lbs pressure. The surface sterilized spores are transferred in the center of funnel by making little whole using micropipette. In the whole later added 4-5 surface sterilized and washed seeds of Maize, Bajara, and Tomato. After that funnel were kept on conical flask containing sterile distilled water. Later on after emergence of seedlings the tiny plants were transferred to the pot containing sterilized sand:soil mixture. After four weeks the roots were observed for colonization. In the present experiment all the selected plants showed colonization of mycorrhizal spores.



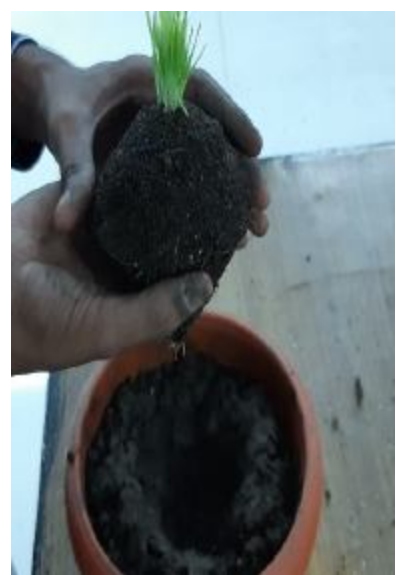
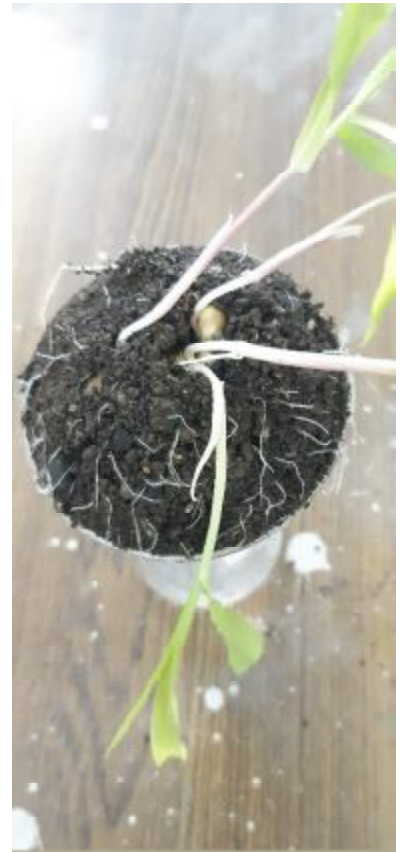
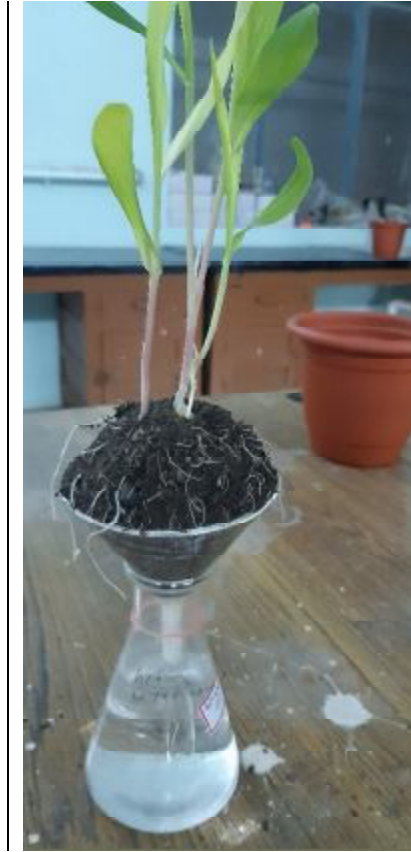
Funnel Culture Experiments for Pure Culture of *Glomus mosseae*



Funnel Culture Experiments for Pure Culture of *Glomus mosseae*

Transfer of Content of funnel culture in to pots:

After six to seven days of seedling growth in funnel culture, the content was later transferred in to pots containing mixture of sand and soil for further establishment of mycorrhiza in root.



Funnel Culture Experiments growth of Maize and Bajara Seeds



Transfer of Funnel content of maize seedling and roots in pot



Experimental Set up for culturing of Glomus

Root Colonization Experiments:

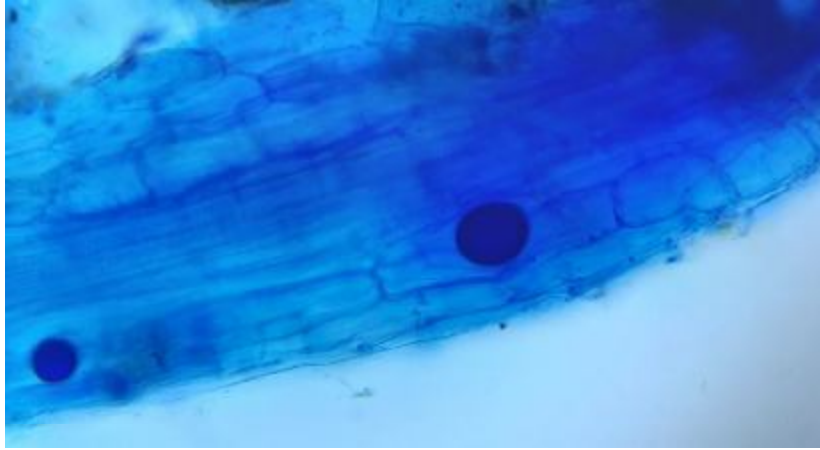
After four weeks of growth in pots the root colonization experiments were performed. The grown plants of Maize, Bajara and Tomato were uprooted from pots. Roots were cutted in to small pieces of about 1.00 cm length. Fine roots were fixed in the formalin acetic acid alcohol solution (90:5:5) after washing thoroughly to determine the root infection. Roots were autoclaved in KOH solution for 45 minutes (10 per cent), cleaned in distilled water and neutralized with HCl (2 per cent) and stained in lacto phenol, trypan blue (0.05 per cent). The stained root segments were placed clean glass slide and observed under stereo zoom and binocular microscope (Labomed make). The observed root segments of all these plants were shown positive mycorrhizal colonization for *Glomus mosseae*. The root segments showed presence of vesicle, arbuscule and many filaments of coenocytic mycelium. Because of positive colonization of these plants by Mycorrhiza, these host plants can be used for mass multiplication purpose.



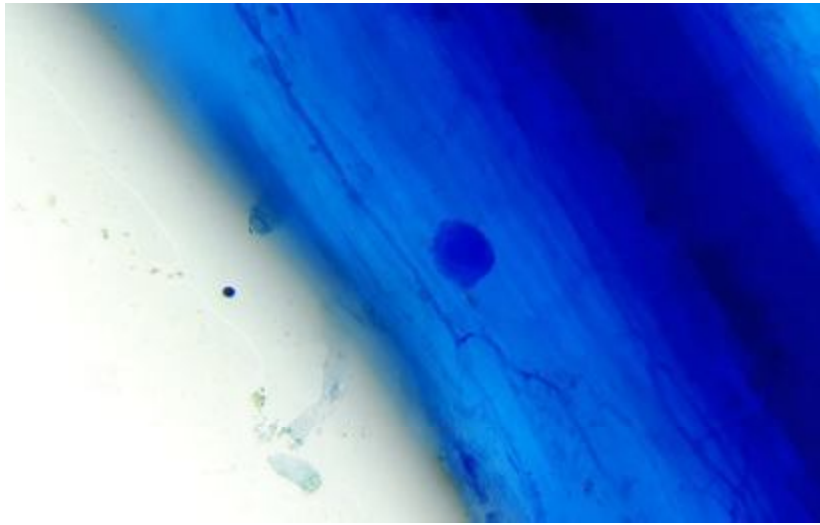
Uprooting of Namely Maize, Bajara and Tomato Roots



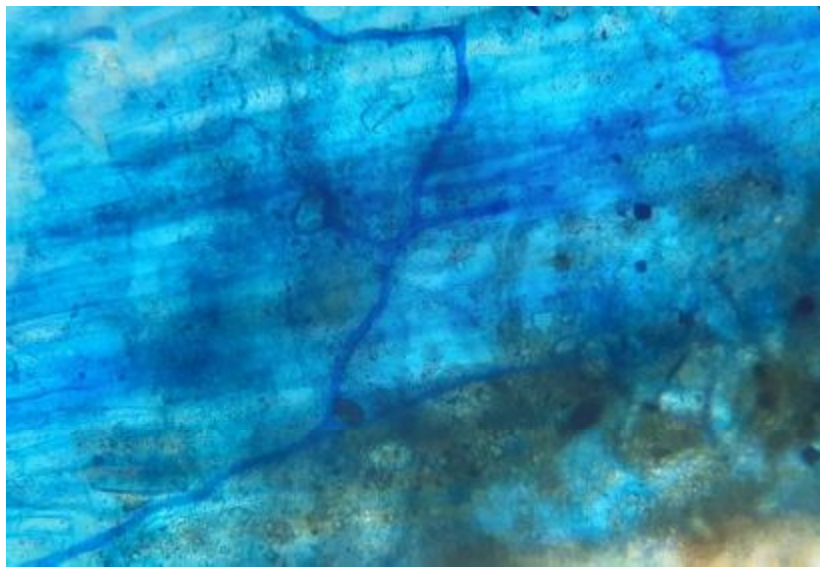
Root Cuttings of Maize, Tomato and Bajara Roots



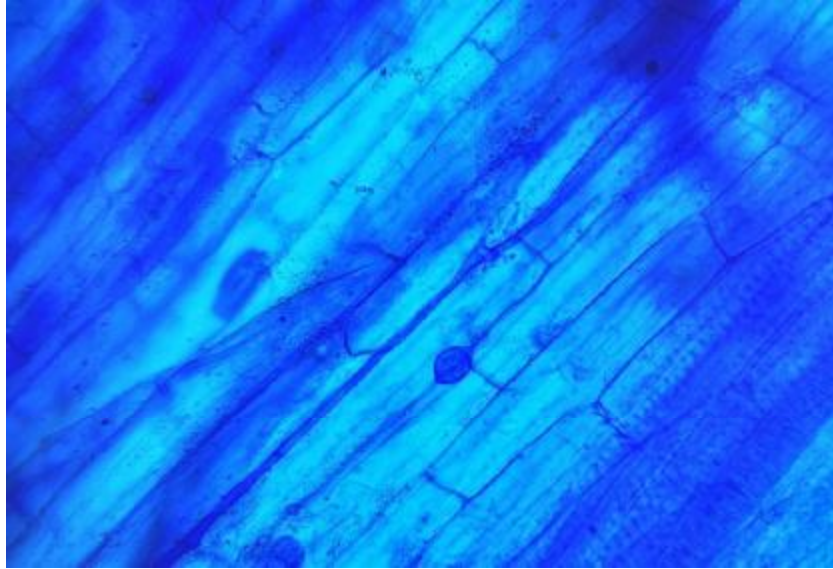
Observed vesicles in Tomato Root



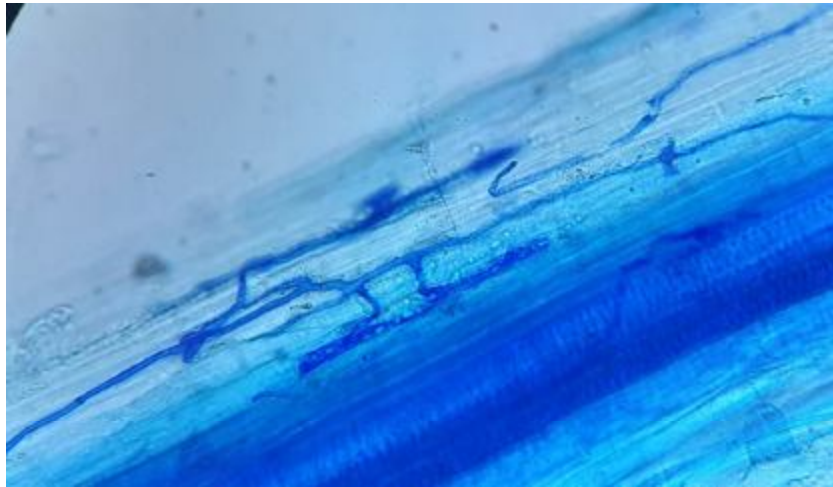
Vesicle and Mycelium in Tomato Root



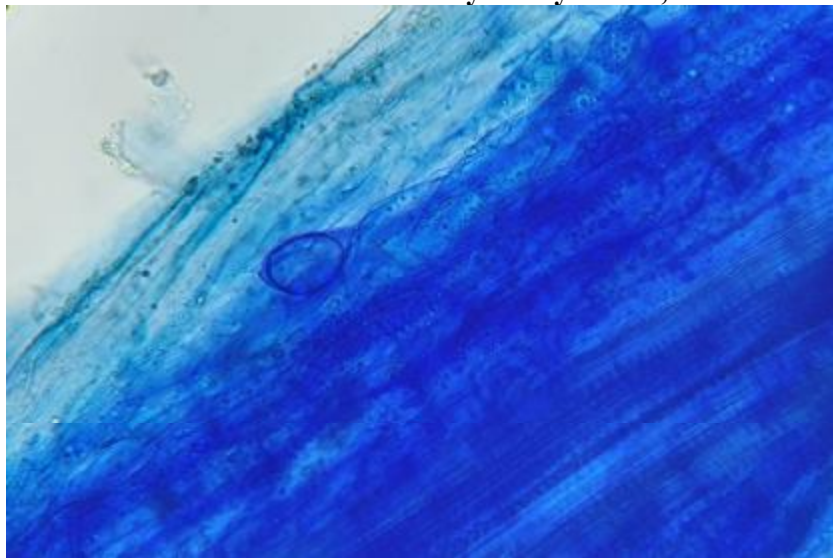
Mycelial Growth on Tomato roots



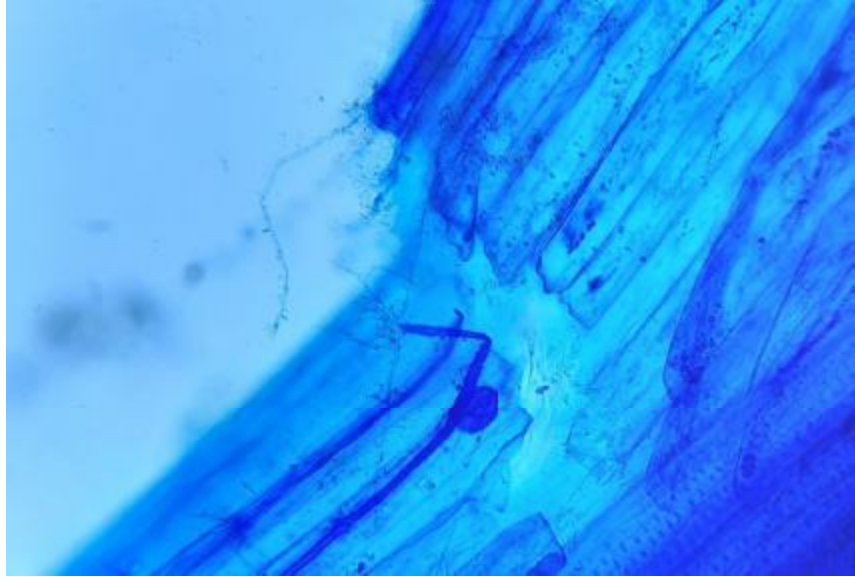
Vesicles in Maize Roots



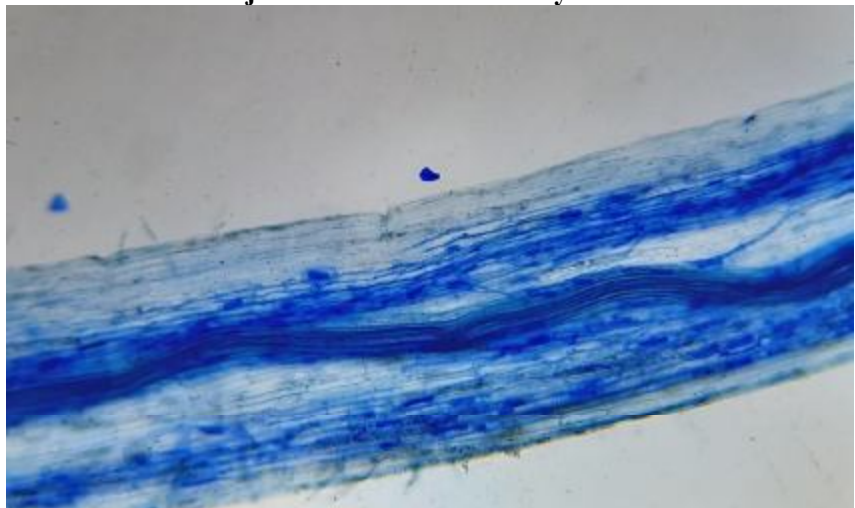
Maize Root Colonization: Coenocytic Mycelium, Arbuscule.



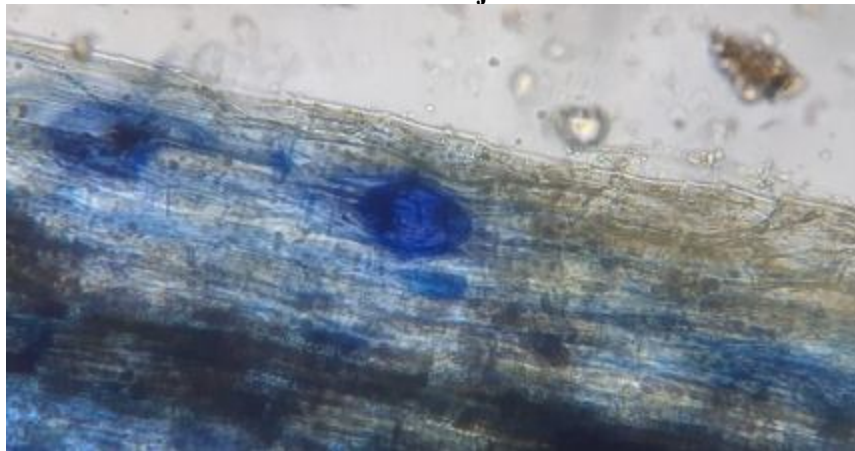
Vesicle in Maize Root



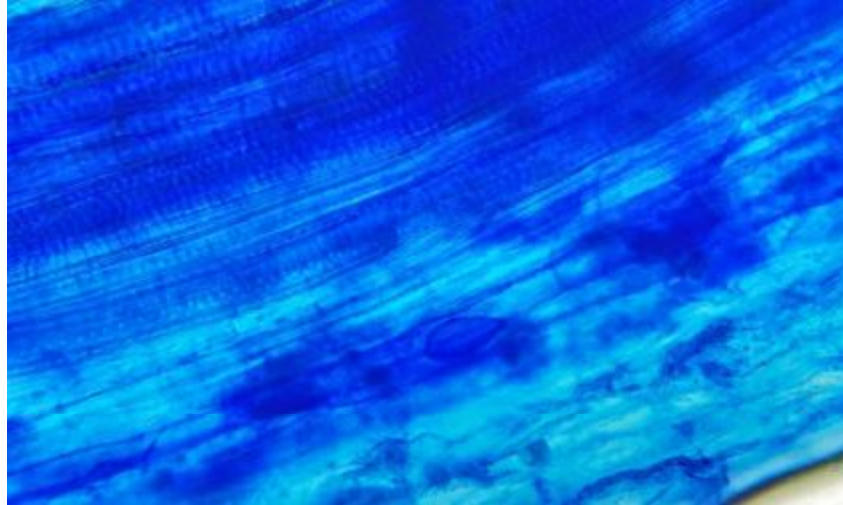
Bajara roots Vesicle and Mycelium



Arbuscules in Bajara Root



Vesicle in Bajara root



Vesicle in Bajara root

Experimental Set up toward mass Multiplication of Mycorrhizal Culture:

Once it is clear from earlier experimental set up that the host plants like Maize, Bajara and Tomato plants are showing positive root colonization for *Glomus mosseae*, then further we have designed experimental set up for successive root trap cultures for mass multiplication of mycorrhizae James Dsouza (2019) and Stutz, J. C., & Morton, J. B. (1996). Rhizosporic soil and roots segments of Maize, Bajara and Tomato from earlier rounds of respective experiments are collected. Roots are chopped / cut into pieces (1 cm), and placed at a depth of 5 to 8 cm in 16 no potter containing sterilized soil. Surface sterilized seed of Maize, Bajara and Tomato were densely added in the pots. The pots were kept in green house and watered regularly. After two months of growth in pots suddenly watering were stopped and the potters are subjected for starvation. Adverse condition will develop sporulation in the potter.



Root Trap Culture Experiments on Maize, Bajara and Tomato.



Root Trap Culture Experiments on Maize, Bajara and Tomato.

Mycorrhizal spore content obtained from the root trap culture experiments were used to study its effect on wheat seeds. Wheat is one of the commonly growing crop specially in winter season by the farmers of this region. Therefore, we have selected this crop to study effect of prepared root trap culture contents on the growth and yield of wheat.

Surface sterilized wheat seeds were taken in 16 no potter containing sun dried soil. In this experiments we are using simple sterilized soil. The soil sterilization was done by exposing/drying soil to sun light for successive five to six days only. We are keeping this technology very simple so that other farmers can use it in their own field. About 100 gm

of root trap culture containing mycorrhizal spore were added in the potter containing twenty to twenty-five wheat seeds. The potters were kept in green house and watered regularly. The growth characteristics like height, length of head, number of grain per head were monitored in between control and mycorrhizal spore added potter.





Growth of Wheat seedlings in control and mycorrhizal spore applied potter.

In the photograph we can easily observe difference in growth vigor. (Left side Potter is of Control and Right side is of Bio fertilizer applied). As mentioned earlier the growth parameters like height, Length of head and number of seeds per head were compared with control and fertilizer applied wheat plant.

Table 1: Effect of Mycorrhizal treatment on growth of Wheat Plant

Total Plants Studied (20 Plants)	Height of Plant (in cm)	Length of Head (in cm)	Number of Seeds per Head
1	105	15	70
2	103	16	72
3	95	12	65
4	98	13	70
5	101	13	70
6	97	14	69
7	98	12	67
8	94	13	62
9	102	15	74
10	97	12	71
11	96	13	67
12	99	14	66
13	93	12	62
14	99	13	65
15	96	14	71
16	102	14	70
17	101	13	69
18	97	12	68
19	102	13	69
20	95	13	71
Mean	98.5	13.3	68.4



Fig: Photographs showing mycorrhiza bio fertilizer treated wheat plant, head and Wheat grains

Table 2: Effect of Non-Mycorrhizal treatment on growth of Wheat Plant (Control)

Total Plants Studied (20 Plants)	Height of Plant (in cm)	Length of Head (in cm)	Number of Seeds per Head.
1	55	10	45
2	45	10	42
3	42	09	35
4	56	10	42
5	50	12	43
6	51	11	44
7	52	10	43
8	54	13	41
9	55	12	42
10	58	12	45
11	60	13	45
12	64	12	43
13	60	13	43
14	61	11	41
15	67	13	42
16	64	13	50
17	59	12	49
18	58	11	48
19	61	12	49
20	70	13	42
Mean	57.1	11.6	43.7



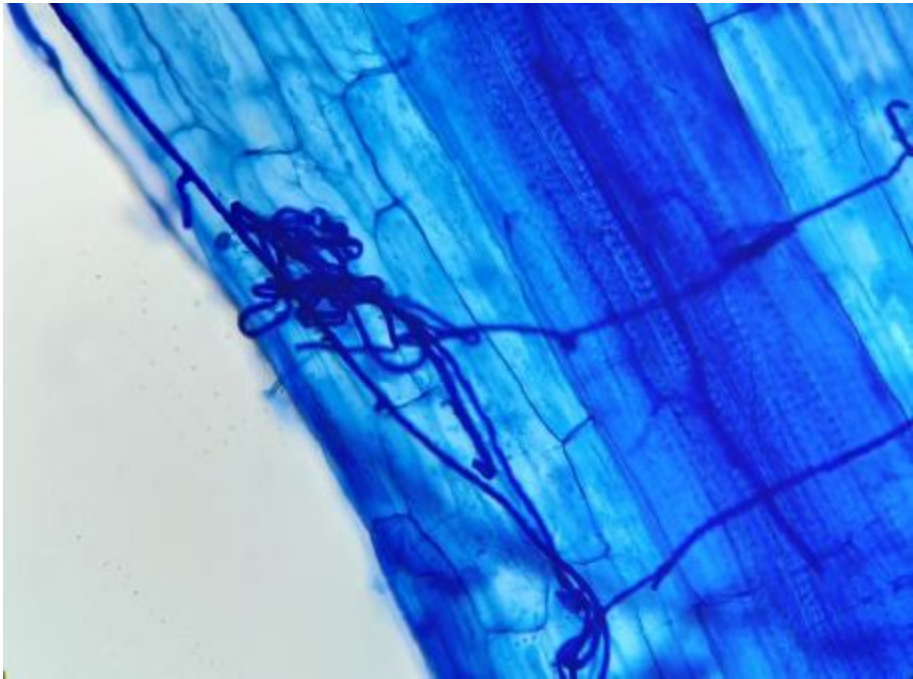
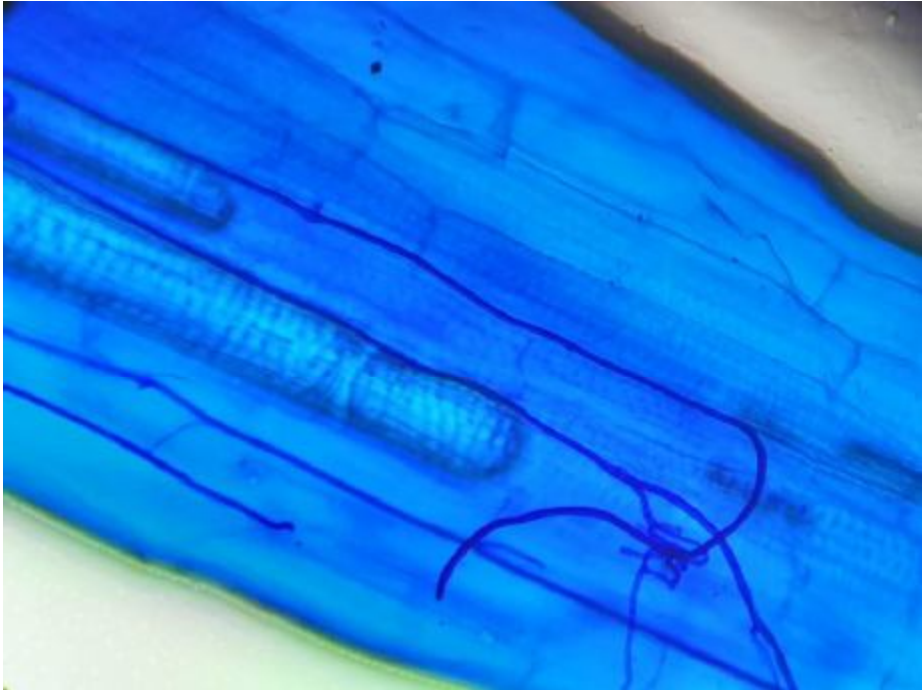
Fig: Photographs showing non-mycorrhizal treated wheat plant, head and Wheat grains (Control)

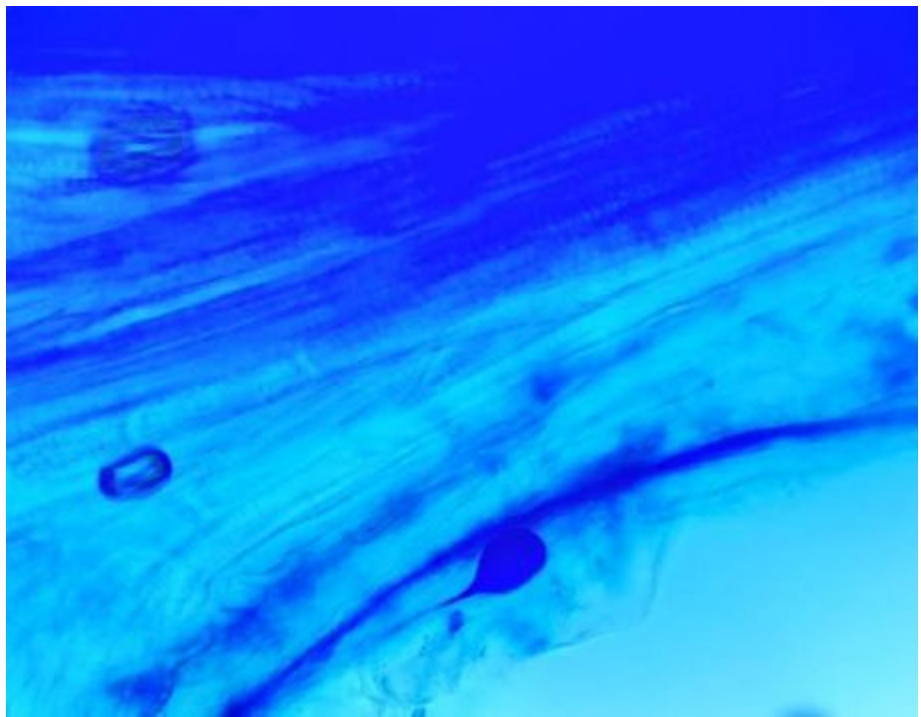
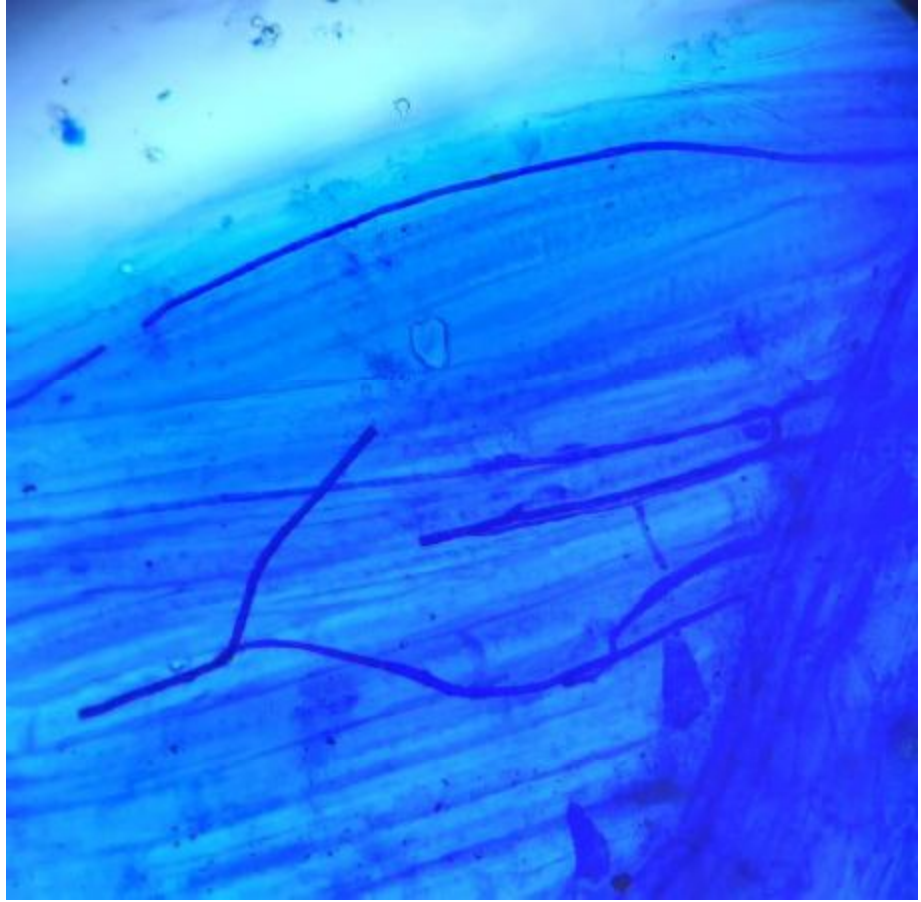
The results of effect of mycorrhizal bio fertilizer on growth of wheat plant are shown in above table no. 1 and 2. The growth parameters like height, Length of head and number of seeds per head were compared. The results obtained shows significant difference in height, length of head and number of seeds. The average height of wheat plant in fertilizer applied pots were more i.e. 98.5 cm as compared to non-applied pots i.e. 57.1 cm. The average length of head were found to be 13.3 cm as compared to 11.6 cm in control. Similarly, average number of seeds in fertilizer treated plants were found to be higher i.e. 68.4 seeds per head as compared to average in control plants i.e. 43.7 seeds per head. Overall these obtained results shows that mycorrhizal spore application to crop plants increases its productivity. In case of our in-vitro study, height, length of head and number of seeds per plants were found to be greater as compared to control plants. From this study we conclude that the mycorrhizal bio fertilizer prepared in the current research project is more effective in increasing productivity of wheat plant. In this regards we needs to perform some more field studies to obtain more and more data in support to the bio fertilizer prepared.

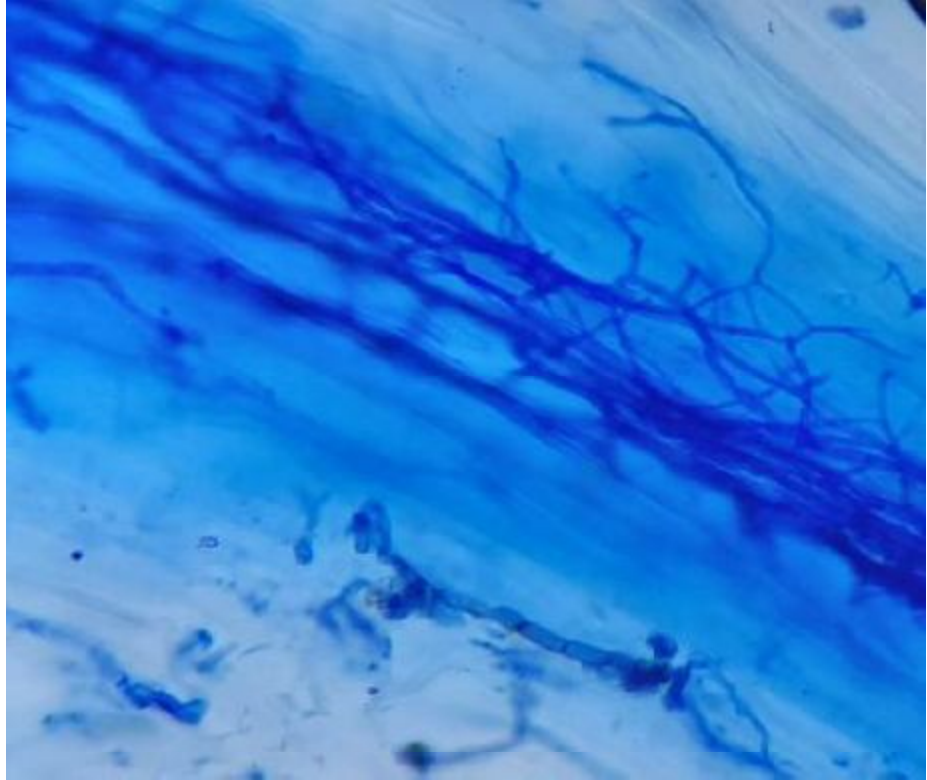
Root Colonization Studies on Wheat Roots:

In order to increase growth and productivity of crop, the applied mycorrhizal spores needs to colonize wheat roots. Therefore, root colonization studies were performed to see colonization of AM fungus on wheat roots. Wheat roots from the potter were cutted in to small pieces of about 1.00 cm length. Fine roots were fixed in the formalin acetic acid alcohol solution (90:5:5) after washing thoroughly, roots were autoclaved in KOH solution for 45 minutes (10 per cent), cleaned in distilled water and neutralized with HCl (2 per cent) and stained in lacto phenol trypan blue (0.05 per cent). The stained root segments were placed on clean glass slide and observed under stereo zoom and binocular microscope (Labomed make). The observed root segments have shown positive mycorrhizal colonization for AM fungus. The root segments

showed presence of vesicle, arbuscule and many filaments of coenocytic mycelium. The positive colonization of AM fungus on wheat root segments might be responsible for increased in absorption and productivity of crop.







Root Colonization on wheat roots showing coenocytic mycelium, Vesicle and Arbuscule

Mass Multiplication of Mycorrhizal Culture for production of cost effective Bio fertilizer:

For mass production of mycorrhizal bio fertilizer three host plants namely Maize, Bajara and Tomato are used in green house experiments. Root trap culture experiments were conducted using these plants as per the experiments designed by James Dsouza (2019) and Stutz, J. C., & Morton, J. B. (1996). The inoculum of mycorrhizal spores were obtained from rhizosporic soil and roots segments of Maize, Bajara and Tomato from earlier rounds of experiments are used for root trap culture multiplications. Roots are chopped / cut into pieces (1 cm), and placed at a depth of 5 to 8 cm in 16 no potter containing sterilized soil. Surface sterilized seed of Maize, Bajara and Tomato were densely added in the pots. The pots were kept in green house and watered regularly. After two months of growth in pots suddenly watering were stopped and the potters are subjected for starvation. Adverse condition given at the end will develop maximum number of spores in the potter.





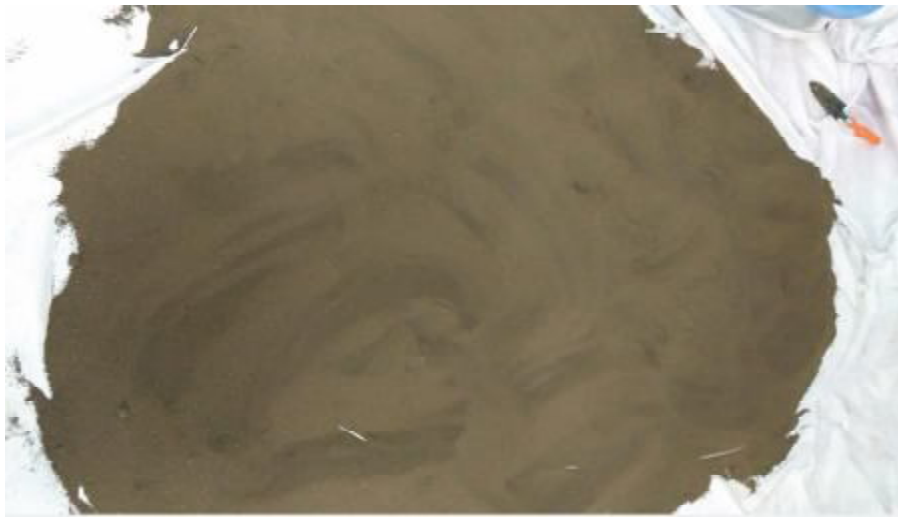
Experimental set up of root trap culture for Mass production of Mycorrhiza Biofertilizer in Green House

Harvesting of Root Trap Content, Processing and Packing for distribution to farmers.

After two months of growth in green house, the content of potter having mass of soil, root biomass were taken out. The soil content and root segments were chopped in to small pieces. The content thus obtained was then sieved using stainless steel sieve to obtain uniform soil particles. Obtained sieved soil content were later mixed with

vermicompost material in the ratio of (3:1). It is said that vermicompost maintains good status and longevity of mycorrhizal spores in storage condition. Thus prepared mass of bio fertilizer containing mycorrhizal spores (Approximately 400 to 500 per 100gm) were weighed 750 gm, using electronic balance; packed and sealed using a sealing machine, in polythene bags. These bags containing mycorrhizal bio fertilizer were distributed to farmers by organizing a special workshop sponsored by SRTMUN and RGSTC Mumbai.







Mycorrhizal Bio fertilizer Preparation from mass of root trap culture and its packing in to Polythene bags (Each bag Contains 750-gram Bio-fertilizer)

MYCORRHIZAL BIOFERTILIZER FOR FARMERS

Workshop on

Sponsored by :-
SRIMUN & RGSTC, Mumbai

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Principal

Prof. D. U. Gawal

Vice Principal

Prof. D. D. Pawar
Prof. L. P. Shinde

Program Schedule

30 June 2022	Inaugural Function
10:30 to 11:30	
11:30 to 11:45	Tea Break
11:45 to 12:30	Inaugural Speech on "Importance of Mycorrhiza in Agriculture" Prof. R. M. Muliani Director Distance Education SRIMUN Nanded Former Director School of Life Sciences SRIMUN Nanded Ex-Rigveda SRIMUN Nanded
12:30 to 01:15	Demonstration of Mycorrhizal Mass Production
01:15 to 01:45	Distribution of Mycofert to Farmers
01:45 to 02:15	Feedback & Vote of Thanks
02:15	Refreshment



Nanded Education Society's

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Affiliated to Swami Ramnarayn Teerth Marathwada University, Nanded (MS)

Recognized with 'A' Grade in 3rd Cycle by MAAC (CPA 3.18, DST 85T, UGC CPE Status, Best College Award)



Workshop on

MYCORRHIZAL BIOFERTILIZER FOR FARMERS

Sponsored by :-

SRIMUN & RGSTC, Mumbai

Date : 30 June 2022

Organized by :-

DEPARTMENT OF BOTANY,

MICROBIOLOGY AND BIOTECHNOLOGY

M. E. S. SCIENCE COLLEGE, NANDED

431 605, Maharashtra State

Website : www.kitencollege.nanded.org | E-mail : sciencecollege1990@gmail.com
Phone Nos:-Prinicipal : 02467 -250465, Office : 251548, Fax : 02467 -250465

About Department:

The department has adequate infrastructure with spacious laboratories, research laboratory cum plant disease clinic. Department has well established Botanical garden, Medicinal Plant Garden and a Green House for maintenance of some endangered plants, museum enriched with many rare specimens.

Sixty four students of the department awarded Ph. D., more than 350 research papers published so far. Presently seven research guides supervising fifteen students for their Ph.D. degree. Tradition of Gold medals and merits from university is maintained every year. Significant number of major and minor research projects completed by the faculties of the department. Department runs a Post Graduate innovative program "M.Sc. Herbal Medicine" funded by UGC, New Delhi.

About Mycorrhiza:

A mycorrhiza is a mutual symbiotic association between a fungus and a plant. Mycorrhiza live in beneficial relationship i.e. symbiotic association between the plant root and fungus. These specialized fungi colonize plant roots and extend far into the soil in a mycorrhizal association, the fungus colonizes the host plant's root tissues. Mycorrhizal fungi improve nutrient uptake for plants, in part, by exploring the soil more efficiently than plant roots. Mycorrhizal fungal hyphae occupy large volumes of soil, extending far beyond the nutrient depletion zone that develops around roots. Mycorrhizae fungi occur naturally in soil but, because of modern agricultural practices, these are getting declined from the soil therefore to sustain soil fertility it must be introduced to the soil.

Mycorrhizae inoculants, available for sale in liquid and powder forms, are easy to use and effective. Mycorrhizal biofertilizer is powder form of inoculum containing mycorrhizal spores prepared in our laboratory of department of Botany, Science College, Nanded in collaboration SRTMUN- RGSFC, Mumbai. The product developed in our lab will be useful for overall sustainable growth of plants.

About College:

Pooja Swami RamnandTeerth established "Nanded Education Society" in 1950 for catalyzing educational revolution in backward region of Marathwada. N.E.S. Science College is one of the premier institute of this region. It is single faculty college imparting quality education to the students of this region since last 67 years. The college is always ready to offer emerging contemporary education to the learners to fulfill the need of society as well as to meet global challenges. This institution has been on the forefront in pursuit of academic excellence. Reaccredited with 'A' grade by NAAC with (GPA) 3.38 and received college with potential for excellence (CPE) status from UGC. The college received DST-FIST programme and recently awarded as Best College Award by Swami RamnandTeerth Marathwada University, Nanded.

Convener

Dr. D. U. Gawal
Principal, NES Science College,
Nanded

Co-Convener

Dr. B. D. Gachande
Professor and Head
Department of Botany,
Microbiology & Biotechnology

Organizing Secretary

Dr. D. M. Jadhav
Dr. V. R. Marathe
Associate Professor
Department of Botany,
Microbiology & Biotechnology

Organizing Committee

Dr. P. S. Borkar	Shri. M. R. Durke	Mr. S. S. Shirde
Dr. V. B. Chavan	Mr. Faizan Khan	Mr. S. R. Darne
Dr. P. G. Paul	Mr. C. K. Gorathakar	Mr. Sandeep Kanshette
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Shri. S. F. Gore	Ms. V. S. Magthane	Ms. A. S. Pundge



Report of Workshop on Mycorrhizal Bio fertilizer for Farmers

One-day workshop sponsored by Swami Ramanand Teerth Marathwada University Nanded and Rajiv Gandhi Science and Technology Commission Mumbai for farmers was organized by Department of Botany, Microbiology and Biotechnology at N.E.S. Science College Nanded. The main purpose of workshop was to distribute the prepared mycorrhizal bio fertilizer to farmers and to give orientation about production of technique of similar type of bio fertilizer at their own farm without any cost or at low cost. Around 65 to 70 farmers have participated for the workshop. The programme was inaugurated by well-known mycorrhizal scientist and key note speaker Prof R. M. Mulani former Director School of Life Sciences, and Ex-Registrar Swami Ramanand Teerth Marathwada University, Nanded.

While giving key note address Prof R. M. Mulani told about the importance of mycorrhiza in sustainable agriculture. He has also given a brief orientation about production and large scale culturing of mycorrhizal bio fertilizer in the farm itself. The organizing secretary Dr. D. M. Jadhav has given information to farmers about the use of prepared mycorrhizal bio fertilizer under the SRTMUN-RGSTC sanctioned project. During workshop Principal and President of programme Prof. D. U. Gawai assured farmers about availability of college research laboratories and facilities to solve problems of farmers of this region. Head of Department Prof. B. D. Gachande also guided and appealed farmers to participate such programmes organized by the department in future. Dr. V. R. Marathe conducted the entire programme very nicely and Dr. P.G. Paul expressed vote of thanks. Other faculty members Dr. A. T. Shinde, Dr. Mrs. P.S. Borkar, Dr. V. B. Chavan, Mr. Sunil Darne, Mr. Sachin Shinde, Mr. Rukamaji More, Mr. Pankaj Hingmere, Project assistant Mr. Sandeep Kanshette, other departmental staff including Mr. B. K. Satare, Mr. Bhagwan Deshmukh have helped for successful conduction of workshop.

Feedback from farmers were taken, farmers have expressed their happiness about the organization of programme by the department, finally the workshop was concluded by serving lunch to all farmer participants.



Registration of Farmers for Workshop on Mycorrhizal Bio fertilizer



Inauguration of Farmers Workshop on Mycorrhiza Bio fertilizer By the hands of Chief Guest and Key note Speaker Prof. R. M. Mulani and Principal Dr. D. U. Gawai along with Vice Principal Dr. D. D. Pawar, Head of Department Prof B. D. Gachande, Governing Council Member Dr. A. T. Shinde, Organizing Secretary Dr. D. M. Jadhav and one representative Farmer Mr. Govind Marotirao Hulsure



Felicitation of Chief Guest Prof. R. M. Mulani, President of Programme Principal Prof. D. U. Gawai and Farmer Mr. Govind Marotirao Hulsure



Inauguration and Release of Mycorrhiza Bio fertilizer By the hands of Chief Guest Prof. R. M. Mulani and Principal Dr. D. U. Gawai along with Vice Principal Dr. D. D. Pawar, Head of Department Prof B. D. Gachande, G.C. Member Dr. A. T. Shinde, Organizing Secretary Dr. D. M. Jadhav and Farmer Mr. Govind Hulsure



Key Note Address by Prof. R. M. Mulani, Presidential Address by Principal Prof. D. U. Gawai and Guidance to farmers by Head of Department Prof. B. D. Gachande.



Instruction regarding use of Mycorrhiza Bio fertilizer was given by Organizing Secretary Dr. D. M. Jadhav; The programme was nicely coordinated and conducted by Dr. V. R. Marathe and finally vote of thanks were expressed by Dr. P.G. Paul.



Distribution of Prepared Mycorrhiza Bio fertilizer to Farmers



Expression of Positive Feedback by two representative farmers



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DEPARTMENT OF BOTANY, MICROBIOLOGY AND BIOTECHNOLOGY



Active participation of farmers in workshop and A group photo of all farmers

Registration

Workshop on Mycorrhizal Biofertilizer for
Farmers [List of Participants]

class
Date _____
Page _____

S.No	Name and Address of Farmer	Mobile No
1	प्रमोद बालाजी कुलसुरे काजनागाव वाडी	9767703325 8380980662
2	शंकर लुकाराम जागरेराव	+
3	शंकर चोंव शंकर	9527457542
4	शंकर सुधाकर क.	9834924831
5	शंकर विठ्ठल	8149661414
6	कुमकुल क्षामाजी	9527791183
7	शंकर अकाशलेख	992813953
8	हिगामिरे शंकर	8411854127
9	शंकर गजानन	9145367072
10	कुमकुल चांदोजी	9545027701
11	हिगामिरे माधव	9309189149
12	शंकर गंगाधर	7620744874
13	शंकर चंडिन	9623409177
14	शंकर क्षामाजी	967844372
15	शंकर देविदास	8390721391
16	हिगामिरे संभाजी	9657579620
17	गोविंदपुत्र कक्षत	7620718807
18	कुमकुल क्षामाजी	96321761
19	कुमकुल क्षामाजी	9920399410
20	शंकर शंकर	9834855710
21	कुमकुल शंकर	9604079523
22	विठ्ठल शंकर	9370349866
23	हिगामिरे मायाजी अक्षयराव	9689457340
24	कुमकुल गोविंद मायाजी	9527791379
	वीरल सर्व जगतरी मु.घा. काकनागाव वाडी ता. पुर्णा जि. परभणी अशोक उदरेवासी भादरा.	

Sl. No.	Name & Address of Farmer	No. No.
25.	एकनाथ भडसुके	9828788222
26.	लुकराम भोजन	9112052331
27.	मोगेश भोजन	9763451310
28.	ज्ञानेश्वर कदम	9373787328
29.	साहेबराव भडसुके	8605098926
30.	नवनाथ भडसुके	9922794132
31.	संजय भडसुके	97875493457
32.	राजू भडसुके	7798558001
33.	भाऊराव भोजन	9325510130
34.	साहेब भडसुके	9881967188
35.	इशामराव भडसुके	— —
36.	नागोराव भडसुके	7553576010
37.	विठ्ठल भोजन	9579343926
38.	राजाराम भोजन	901151812
39.	श्रीमती दिगोले लहरा	— —
40.	पांडुरंग भोजन	9850652198
41.	शंकर शंकाजी डोके	924538775
42.	दधीनाथ पुराजि भडसुके	— —
43.	माधवराव भडसुके	9689637971
44.	साधुपत डोके	9657508454
45.	श्रीपती डोके कळंगापुर्वाडी	9527952962
46.	सामयंत डोके	— —
47.	पिरजी भडसुके	9604966238
48.	विठ्ठल भोजन	9765639649
49.	राजेश भडसुके	9922032389
50.	विकास भडसुके	9552293384
51.	गोपाळ भडसुके	916892001181
52.	संजय कदम	9359007477
53.	सुनील लहरा	9921828608
54.	दिगमिरे पंकाज	98609960774977
		9767949452



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Email: principal@sciencecollegennd.org, sciencecollege1950@gmail.com Web: www.sciencecollegennd.org

Workshop on
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Organized by
Department of Botany, Microbiology & Biotechnology

१.	शेतकऱ्यांचे नांव:	एकनाथ भुंजाजी हारसुळे.
२.	पत्ता	ता. जिला. नांदेड. पोस्ट. मरळकु
३.	मोबाईल नं.	9823788222
४.	कार्यशाळेबद्दल आपले मत	कार्यक्रम. चांगला पडेलो. पाड पाडो किलोशम लागो. वाटको
५.	सूचना	
६.	कॉलेजकडून शेत विषयक मार्गदर्शनासाठी अपेक्षा	कार्यक्रमा पडेलो, मदीती मिळो
७.	स्वाक्षरी	



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१.	शेतकऱ्यांचे नांव:	Bhojane . Hanmant Govind Row
२.	पत्ता	AT. Ekdolga Po :- malga Tal. B. Dist. Nanded
३.	मोबाईल नं.	9922032382
४.	कार्यशाळेबद्दल आपले मत	अत्यंत उपयुक्त अशा प्रयोग अहे.
५.	सूचना	
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	
७.	स्वाक्षरी	Bhojane



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१.	शेतकऱ्यांचे नांव:	राजेश आरसुळे
२.	पत्ता	मु. एकदरा ता. जि. नानेद
३.	मोबाईल नं.	9552293384
४.	कार्यशाळेबद्दल आपले मत	२१२ जे आपण शेतकऱ्यांसाठी कृषिशाळा कार्यशाळा जेवढे खर्च जेर आपण शेतकऱ्यांचे जे बातरेचे उद्देशाने होऊ तेथे हे कार्यकाळ अरबका त्या आपणे आभार मानता
५.	सूचना	
६.	कॉलेजकडून शेतती विषयक मार्गदर्शनासाठी अपेक्षा	आपल्या कॉलेजकडून शेतकऱ्यांसाठी मार्गदर्शन आपलेच साधक सतत शेतकऱ्यांसाठी साठी साठी शेतकऱ्यांसाठी शेतकऱ्यांसाठी
७.	स्वाक्षरी	



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१.	शेतकऱ्यांचे नांव:	गुणराम बिंदे
२.	पत्ता	श. उजळेरगाव पो मरळु ता. जि नांदे
३.	मोबाईल नं.	९०९६११३५९०
४.	कार्यशाळेबद्दल आपले मत	सायव्य कॉलेज या प्रयोग शाळा योजकता माहीती योग्यदिका
५.	सूचना	
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	
७.	स्वाक्षरी	उकाराक



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१.	शेतकऱ्यांचे नांव:	इलसुरे जयानोबा चांदु
२.	पत्ता	रा. कावळगांव वाडी त. पुढारी जि. परभणी जं. कावळगांव
३.	मोबाईल नं.	3921039910
४.	कार्यशाळेबद्दल आपले मत	बरे शेतकऱ्यांनी उपयुक्त मार्गदर्शनाचा फायदा मिळतो.
५.	सूचना	all people important
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	शेतकार्याची भावना वाढते मार्गदर्शन फायदेशीर होते
७.	स्वाक्षरी	



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१.	शेतकऱ्यांचे नांव:	खमरोडे-चंद्रकांत देवराव
२.	पत्ता	रा. कावळगाव वडि ता. पूरान जि. फरणगी पो. कावळगाव
३.	मोबाईल नं.	9011939663
४.	कार्यशाळेबद्दल आपले मत	खरीना उपयुक्त मार्गदर्शन मिळाले.
५.	सूचना	अर्ब श्रेकभानी सहभाग नोंदवावा
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	"all peoples come college"
७.	स्वाक्षरी	Jansode.



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१.	शेतकऱ्यांचे नांव:	भोगेबा विधराम भोगे
२.	पत्ता	श. एकवरा ता. जि. नांदेड पो. मरफळ.
३.	मोबाईल नं.	9763451310
४.	कार्यशाळेबद्दल आपले मत	चांगले आहे. सरांकी जे मागवले केले. खुपच कर्पणाका-जि + मरफळी यापेक्षा आहे.
५.	सूचना	
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	शेती प्रकृती यापेक्षा - नेणे वकी मागवले करे.
७.	स्वाक्षरी	पडोबा



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१.	शेतकऱ्यांचे नांव:	शंकर रामजी हिंगामीरे -
२.	पत्ता	रा कावळगाव वाडी ता.पुर्णा जि. परभणी
३.	मोबाईल नं.	8411854187
४.	कार्यशाळेबद्दल आपले मत	कार्यशाळेची जी माहिती मिळाले ते खूप तुष्ट करणारे आहेत. ती क्षेत्रासाठी अधिक उत्पादन व जमीनपती कोन चांगली राहिले. त्यामुळे कार्यशाळे बद्दल माझी मनापासून त्यांचे आभार मानते.
५.	सूचना	माती पारिक्षण करणे ही
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	शेतकऱ्यांचे उत्पादन वाढवण्याची आपेक्षा आहे.
७.	स्वाक्षरी	शंकर रामजी



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१.	शेतकऱ्यांचे नांव:	शेठके गंगाधर भागिकुराव
२.	पत्ता	मु.पो. कावलगाव वाडी ता. पूर्णा जि. परभणी.
३.	मोबाईल नं.	7820144874.
४.	कार्यशाळेचेव्हाल आपले मत	शेतकरी मार्गदर्शन कुरव्यासाठी आपल्यालाख्या नामवंल मोठ्या कुराव्यांशेभांनी वारंवार कार्यशाळी कायें जि.
५.	सूचना	भाती परिष्कण कुरवण व्हावी
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	दर महिन्याक आयोजिल कुरावी.
७.	स्वाक्षरी	



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१.	शेतकऱ्यांचे नांव:	द्विगमिरे महादेव केशवराव
२.	पत्ता	मु. पो. कावळगाव वाडी ता. पुर्णा जि. परभणी
३.	मोबाईल नं.	9309189149, 9011837293
४.	कार्यशाळेबद्दल आपले मत	कार्यशाळेबद्दल माझे मत असे आहे की, हेमा कार्याशाळेतून मजबूत रूप चांगले मिळाले आहे. मुझे भागची जमीन मजबूतसाठी विशेष रक्षण आहे.
५.	सूचना	
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	
७.	स्वाक्षरी	



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१.	शेतकऱ्यांचे नांव:	शेकडे सुधाकर केशवराव
२.	पत्ता	मु. पो. कुवलगांव वडी ता. पूर्णा जि. परभणी
३.	मोबाईल नं.	९८३५१२५८३१
४.	कार्यशाळेबद्दल आपले मत	आमच्या जमिनीची सुपिकला वाढेल आणि आता येणाऱ्या पुढच्या पिढीला एक जिवंत जमिनी देणार. खान्भवराव
५.	सूचना	
६.	कॉलेजकडून शेती विषयक मार्गदर्शनासाठी अपेक्षा	
७.	स्वाक्षरी	

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'सायन्स'मध्ये 'मायकोरायझा' जैविक खतनिर्मितीवर शेतकऱ्यांची कार्यशाळा

नांदेड दि. ४ : नांदेड एज्युकेशन सोसायटी संचालित सायन्स कॉलेज, नांदेड येथील वनस्पतीशास्त्र विभागातील प्राध्यापक डॉ. डी.एम. जाधव यांना स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ व महाराष्ट्र सरकार अंगीकृत राजीव गांधी विज्ञान व संशोधन संशोधन प्रकल्प योजनेअंतर्गत संशोधन प्रकल्प नुकतच मंजूर झाला होता. या संशोधन प्रकल्पात स्वामी घाणकोरायझा या बहुभुज जैविक खताची निर्मिती केली आहे. हे जैविक खत शेतकऱ्यांसाठी बरदान ठरण्याची शक्यता असल्यामुळे याची निर्मिती करण्याची प्रक्रिया शेतकऱ्यांना अवगत व्हावी, यासाठी

शेतकऱ्यांची कार्यशाळा दि. ३० जून २०२२ रोजी संपन्न झाली. या कार्यशाळेसाठी दिंगोली, नांदेड, परभणी या जिल्ह्यातील १०० च्यावर शेतकऱ्यांची सहभाग नोंदविता, या कार्यशाळेत विषयातील तज्ञ व ज्येष्ठ वनस्पतीशास्त्र प्रोफेसर आन.एम.मुलानी यांनी या खत निर्मितीची माहिती व स्थानी उपयुक्तता पाहून शेतकऱ्यांना मार्गदर्शन केले. संशोधन प्रकल्पाचे मुख्य संचालक डॉ. डी.एम.जाधव यांनी हे खत शेतकऱ्यांसाठी बरदान ठरू शकते म्हणून शेतकऱ्यांनी याचा शोधासाठी वास्तवी जाग

वार करण्याचे आवाहन केले. कार्यशाळेत सहभागी शेतकऱ्यांना ७५० ग्रॅम जैविक खताची बॅग प्रमुख पाहुणे व प्राचार्य डॉ. डी. यु. गवई यांच्या हस्ते सोफा वितरीत करण्यात आली. खर करणेशाळेत शेतकऱ्यांना मार्गदर्शन करताना महाविद्यालयाचे प्राचार्य डॉ. डी.यु.गवई यांनी महाविद्यालयातील संशोधक व प्रयोगशाळा सँडर शेतकऱ्यांच्या अडथळ्या शोधविण्यासाठी तत्पर राहतील असे प्रतिपादन केले. विभागाप्रमुख डॉ. बी.डी. गवाडे यांनीही शेतकऱ्यांना मार्गदर्शन करून येत्या ऑक्टोबर- नोव्हेंबर मध्ये

शेतकऱ्यांसाठी आयोजित करण्यात येणाऱ्या कार्यशाळेत भवता वाढवताही होण्याचे आवाहन केले. या कार्यक्रमातही संशोधक विद्यार्थी सदीप कनरोडे यांचा विशेष साकार करण्यात आला. या कार्यशाळेचे सूत्र संचालन डॉ. विशाल मराठे यांनी केले तर आधार डॉ. पीळ यांनी मानले. सदरील कार्यशाळेस डॉ. बबलान, डॉ.सो. बोकर, डॉ.ए.टी.शिंदे हे उपस्थित होते. कार्यक्रम यशस्वी करण्यासाठी रुकाबाई मोरे, कनरोडे, पंकज दिगमिरे, सुनील टरवे सह सर्व शिक्षकेतर कर्मचाऱ्यांनी परिश्रम घेतले.

त्रिक ग्रामसेवक संघटनेच्या अर्धापूर तालुक्याक्षती भास्कर कापसे, सरविटणीसपादी जगान ताकडे यांची सर्वांजुमते निवड करण्यात आली.

सचिव लॉ. अरुण भित्तल, कोन्यापस लॉ. राजेश कामद, सप्तन्ययक लॉ. सुशील पाडे, विभागीय अध्यक्ष लॉ. यशोराज कुम्भार जापसवाल, सचिव लॉ.

यांनी स्थापल मनोपातरात विविधाची पुरविका विपद केव्ही. नांदेड लॉयन्स परिचारातर्फे गुल्बाराच्या पारंपरिक वेशभूषेत

बॅकव्हट भोरे, लॉ. ममता व्यास साव्यासार उदगीर, लातूर, जालना येथील लॉयन्स सदस्यांची उपस्थिती होती.

सायन्स कॉलेज येथे 'मायकोरायझा' जैविक खत निर्मितीवर शेतकऱ्यांची कार्यशाळा

नांदेड = लॉ. ए. सी. सवलित सायन्स कॉलेज, नांदेड येथील वनस्पतीशास्त्र विभागातील प्राध्यापक डॉ. डी. एम. जापस यांना स्वा. रा. ली. म. विद्यापीठ व महाराष्ट्र सरकार अर्थीकृत राजीव गांधी विधान व तंत्रज्ञान संशोधन प्रकल्प योजने अंतर्गत संशोधन प्रकल्प नुकरगाव मंजूर झाला होता. या संशोधन प्रकल्पात त्यांनी मायकोरायझा या बाहुमुल्य जैविक खताची निर्मिती केेली आहे. हे जैविक खत शेतकऱ्यांसाठी बरदान



उत्पत्तीची शक्यता असल्यामुळे याची निर्मिती करण्याची प्रक्रिया शेतकऱ्यांना अवगत करावी यासाठी शेतकऱ्यांची कार्यशाळा ३० जून रोजी संपन्न झाली.

या कार्यशाळेतसाठी हिगोली, नांदेड, परभणी या जिल्ह्यातील १०० व्या वर शेतकऱ्यांनी सहभाग नोंदविला. या कार्यशाळेत विषयातील तज्ज्ञ व जेष्ठ

वनस्पतीशास्त्रज्ञ प्रोफेसर आर. एम. मुलानी यांनी या खत निर्मितीची माहिती व त्याची उपयुक्तता याबाबत शेतकऱ्यांना सखोल माहिती देऊन शेतकऱ्यांचे संशोधन प्रकल्पाचे मुख्य सप्तन्ययक

डॉ. डी. एम. जापस यांनी हे खत शेतकऱ्यांसाठी बरदान ठरू शकते म्हणून शेतकऱ्यांनी याचा श्रेष्ठता जास्तीत जास्त वापर करण्याचे आवाहन केले.

निधनवार्ता

चिन्नापाई गिरोड
भोकर = तानुश्यातील कांडली केथीन रविचारी चिन्नापाई सायबा गिरोड यांचे २ जुलै रोजी निधन झाले. त्यांच्या पार्श्वचंद्रावर ३ जुलै रोजी त्यांच्या मानी कांडली येथे



महाराष्ट्राचा मानविंदू

लोकमत

**‘सायन्स’मध्ये
जैविक खतनिर्मिती;
कार्यशाळा संपन्न**

डोकमत न्यूज नेटवर्क
 नोंदवू : जैविक खत रोतक-यासाठी
 कवचान ठरवणे, खतनिर्मिती करण्याची
 प्रक्रिया रोतक-यांना माहिती पुरवी,
 यासाठी सायन्स कॉलेज येथे
 रोतक-यांची कार्यशाळा घेण्यात आली.
 सायन्स कॉलेजचे प्रा. डॉ. डी. एम.
 जाधव यांनी कलेच्या संशोधनात
 मायकोरयझस या जैविक खताची
 निर्मिती करण्यात आली आहे. हे
 जैविक खत रोतक-यांनाही निर्माण
 करता येते, खट्टी या कार्यशाळेचे
 आयोजन केले होते. कार्यशाळेत प्रा.
 डॉ. एम. सुकुनी यांनी मार्गदर्शन केले.
 प्राचार्य डॉ. डी. व्ही. गवई यांच्या
 हस्ते खत वितरित करण्यात आले. या
 कार्यशाळेला नविदसह डिग्रीसी व
 पर्यटकी निव्वड्यांकर रोतक-ची उपस्थित
 होते.



Dr. D. M. Jadhav.
Principal Investigator

Dr. D. U. Gawai
Head of Institute