



3 Days Training Workshop on Biofertilizer development for pulses production in Pothwar

18-20 May 2022

PMAS-Arid Agriculture University
Rawalpindi-46300

Soil Microbiology Laboratory of Institute of Soil & Environmental Sciences, PMAS-AAUR is presently conducting research aimed at developing biofertilizer products containing indigenous species of Rhizobium

Registration fee:

Faculty.....	2000 (PKR)
Students.....	500 (PKR)
Professionals.....	2000 (PKR)
Company Representative.....	2000 (PKR)
International participants.....	50 (\$)

OBJECTIVES

The objective of this training workshop is

- ▶ To characterize nodule bacteria using molecular tagging for development of quality biofertilizer, its commercialization and registration in Pakistan.

The other objectives include

- ▶ To highlight the importance and efficiency of pulses biofertilizer for enhancing grain productivity by minimizing the input cost in Pothwar.
- ▶ To find out novel ways and means for production, commercialization and registration of pulses biofertilizer keeping in view international quality standards.

WHO SHOULD ATTEND

Soil Scientist, Agronomist, Microbiologist, Agriculture Extension Officers/Agents, Farmers, Fertilizer Manufacturer, Policy Maker, Planners and other Agricultural Professional striving for cost effective and environment friendly sustainable crop production system should attend this workshop.

ORGANIZERS

Patron in-Chief: Prof. Dr. Qamar-uz-Zaman
(Vice Chancellor, PMAS-AAUR)

Organizing Committee

Prof Dr. Khalid Saifullah Khan (Director, IS&ES)
Dr. Rifat Hayat (Focal Person, Associate Professor, Soil Science)
Dr. Mukhtar Ahmed (Assistant Professor, Agronomy)

Students Management Committee

Mr Ghulam Mujtaba
Mr Aashir Sameen
Mr Muhammad Nadeem

Funded by

Research Endowment Fund (REF) Program
Contact:
Dr. Rifat Hayat (Chief Organizer/Associate Professor, Soil Science)
Cell; 0300-9798710, Email; hayat@uaar.edu.pk
Office of Research, Innovation and Commercialization (ORIC),
PMAS-Arid Agriculture University Rawalpindi

Contact:

Dr. Rifat Hayat (Chief Organizer/Associate Professor, Soil Science), Cell; 0300-9798710, Email; hayat@uaar.edu.pk



Soil Microbiology Laboratory of Institute of Soil & Environmental Sciences, PMAS-AAUR is presently conducting research aimed at developing biofertilizer products containing indigenous species of Rhizobium.

3 Days Training Workshop on Biofertilizer development for pulses production in Pothwar

18-20 May 2022

PMAS-Arid Agriculture
University Rawalpindi-46300

Registration fee:

Faculty: 2000 (PKR)

Students: 500 (PKR)

Professionals: 2000 (PKR)

Company Representative: 2000 (PKR)

International participants: 50 (\$)



WHO SHOULD ATTEND

Soil Scientist, Agronomist, Microbiologist, Agriculture Extension Officers/Agents, Farmers, Fertilizer Manufacturer, Policy Maker, Planners and other Agricultural Professional striving for cost effective and environment friendly sustainable crop production system should attend this workshop.

OBJECTIVES

The objective of this training workshop is

- To characterize nodule bacteria using molecular tagging for development of quality biofertilizer, its commercialization and registration in Pakistan.

The other objectives include

- To highlight the importance and efficiency of pulses biofertilizer for enhancing grain productivity by minimizing the input cost in Pothwar.
- To find out novel ways and means for production, commercialization, and registration of pulses biofertilizer keeping in view international quality standards.

ORGANIZERS

Patron in-Chief: Prof. Dr. Qamar-uz-Zaman
(Vice Chancellor, PMAS-AAUR)

Organizing Committee

Prof Dr. Khalid Saifullah Khan (Director, IS&ES)

Dr. Rifat Hayat (Focal Person, Associate Professor, Soil Science)

Dr. Mukhtar Ahmed (Assistant Professor, Agronomy)

Funded by

Research Endowment Fund (REF) Program

Office of Research, Innovation and Commercialization (ORIC), PMAS-Arid Agriculture University Rawalpindi

Contact: Dr. Rifat Hayat (Chief Organizer/Associate Professor, Soil Science), Cell; 0300-9998710, Email; hayat@uaar.edu.pk

Program

Venue; Agricultural Seminar Room and Institute of Soil & Environmental Sciences

Date and Time	Activity
Day 1 (18-05-2022)	
Inaugural Ceremony	
9:00-10:00 am	Registration
10:00 – 10:10	Recitation from Holy Quran & Natt Shareef
10:10 – 10:20	Welcome note by Prof Dr. Khalid Saifullah Khan, Director IS&ES
10:20 – 10:35	Presentation by Dr. Rifat Hayat; Associate Professor Soil Science
10:35 – 11:00	Presentation by Dr. Iftikhar Ahmed Development of next generation biofertilizer PSO / Program Leader, National Culture Collection of Pakistan (NCCP), Bioresource Conservation Institute (BCI), NARC, Islamabad
11:00 – 11:10	Address by Prof. Dr. Qamar-uz-Zaman Vice Chancellor, PMAS-AAUR
11:10 – 11:30	TEA BREAK
11:30 – 01:00	Lab Training/Practical on isolation of bacteria from pulses nodules Resource Persons: Dr. Ummay Amara & Dr. Rifat Hayat
01:00-02:00 pm	Lunch/Refreshment and Prayer Break
2:00-4:00 pm	Lab Training/Practical on agronomic trait characterization of nodule bacteria Resource Persons: Dr. Ummay Amara & Dr. Rifat Hayat
Day 2 (19-05-2022)	
Session-1	
09:00-09:30 am	Presentation by Dr. Mukhtar Ahmed Assistant Professor, Agronomy, PMAS-AAUR
09:30-10:00	Lab Training/Practical on molecular techniques like identification of bacteria using 16SrRNA molecular tagging, DNA amplification, Gel electrophoresis, etc. Resource Persons: Dr. Iftikhar Ahmed
10:00-01:00	Visit to Biofertilizer Manufacturing Unit at NARC, Islamabad. Resource Persons: Dr. Rifat Hayat, Dr. Tauseef Tabassum
01:00-02:00 pm	Lunch/Refreshment and Prayer Break
02:00-04:00 pm	Formulation of Biofertilizer, Carrier selection, Quality control & marketing of biofertilizer Resource Persons: Dr. Tauseef Tabassum, Senior Scientific officer, NARC
Day 3 (20-05-2022)	
09:00-10:00 am	Biofertilizer application, seed coating and sowing of beans crops in pots Resource Persons: Dr. Rifat Hayat, Research Students
10.00-11:30 am	Concluding Ceremony/Certificate Distribution
11:30-12:00 pm	Refreshment

Focal Person

Dr. Rifat Hayat (Associate Professor, Soil Science)
Cell; 0300-9998710, Email; hayat@uaar.edu.pk

Biofertilizer development for pulses production in Pothwar

Background

Biofertilizers are products containing efficient species of beneficial soil microorganisms which are known to improve plant growth. Biofertilizers are environmentally friendly and can replace a percentage of the crop nutrient requirement normally supplied by chemical fertilizers thereby reducing the economic limitations imposed by the high cost of these fertilizers. Once developed, biofertilizers are relatively inexpensive to produce and its agronomic applications are well within scope of subsistence farmers.

The demand for pulses (vegetable protein) is increasing rapidly in Pakistan but the area under pulses production and yield declined drastically. The wide gap between the attainable yield, potentials and farmers' yield are due to various biotic (insects/pests, diseases, weeds), abiotic (nutrients deficiency, salts, temperature, moisture variation), and socio-economic factors. The unavailability of suitable inocula [biofertilizer: varieties (host) specific *Rhizobium* (symbiont)] is major reason of this low yield and quality. There is an urgent need to increase pulses production in the country to cope with the requirements either area expansion or realizing yield potential while the scope of former is limited. Inoculation of pulses seeds with *Rhizobium* bacteria helps in better nitrogen fixation and improves pulses yield.

There is a need to develop Bio-formulation for enhancing productivity and profitability of pulses. Research regarding pulses nodulating rhizobia on the basis of sequence homology of 16S rRNA and housekeeping genes is rare. Thus identification of isolated strains at molecular level i.e. using 16S rRNA, housekeeping genes (*atpD*, *recA*, *rpoB*, *glnII* and *gyrB*), *nifH* and *nodA,C* gene sequencing and bioinformatics is requisite to use these strains as potential inoculants for pulses (legumes; chickpea, groundnut, beans and lentils). Soil Microbiology Laboratory of Institute of Soil & Environmental Sciences is presently conducting research aimed at developing biofertilizer products containing indigenous species of *Rhizobium*.

OBJECTIVES

The objective of this training workshop is

- To characterize nodule bacteria using molecular tagging for development of quality biofertilizer, its commercialization and registration in Pakistan.

The other objectives includes

- To highlight the importance and efficiency of pulses biofertilizer for enhancing grain productivity by minimizing the input cost in Pothwar.
- To find out novel ways and means for production, commercialization and registration of pulses biofertilizer keeping in view international quality standards.

WHO SHOULD ATTEND

Soil Scientist, Agronomist, Microbiologist, Agriculture Extension Officers/Agents, Farmers, Fertilizer Manufacturer, Policy Maker, Planners and other Agricultural Professional striving for cost effective and environment friendly sustainable crop production system should attend this workshop.

NOTE; Participants should bring their laptop with windows operating system for bioinformatics analytical works. No TA/DA will be paid to participants.

Patron in-Chief

Prof. Dr. Qamar-uz-Zaman (Vice Chancellor, PMAS-AAUR)

Organizing Committee

Prof Dr. Khalid Saifullah Khan (Director, IS&ES); Dr. Rifat Hayat (Focal Person, Associate Professor, Soil Science); Dr. Mukhtar Ahmed (Assistant Professor, Agronomy)