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Management of Root Rot in Bengal Gram with Soil Application of *Trichoderma viridae* in Nellore District of Andhra Pradesh

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ABSTRACT

Pulses are rich source of vegetative protein and play an important role in nutritional security of a substantially vegetarian population of India. The pulse crops are invariably grown under risk-prone rainfed environments. Root rot is one of the major problem being faced by farmers of Nellore district in cultivating Bengal gram. The present study was carried out to evaluate the perfiormance of soil application of Trichoderma viridae (2Kg/acre) + FYM (180Kg/acre) and Neem cake (20Kg/acre) in controllingthe root rot in Bengal gram in Nellore district of Andhra Pradesh. The results revealed that The percentage increase in recommended practice over farmers practice on an average is of 36.36%. Thus it is clearly reveals intervention from the table that soli application of Trichoderma viridae (2Kg/acre) + FYM (180Kg/acre) and Neem cake (20Kg/acre) enhances the productivity and yield by controlling of root rot disease in Bengal gram.

Keywords: *On- farm demonstration, Pulses, Rainfed, Root rot and Fusarium wilt, Trichoderma viridae.*

INTRODUCTION

Pulses are rich source of vegetative protein and play an important role in nutritional security of a substantially vegetarian population of India. The pulse crops are invariably grown under risk-prone rainfed environments. The comprehensive assessment demonstrated that current yield under rainfed farming is 2-5 folds lower than the achievable potential yield due to low rain-water use efficiency (35 45%) in most rainfed areas (Dar et al., 2009). To increase the production and productivity of pulses, the Cluster Frontline Demonstrations on Pulses Programme (CFLD) was initiated by Ministry of Agriculture and Farmers Welfare, Govt. of India during Rabi 2015-16 under National Food Security Mission (NFSM). During the year 2016-17 the programme was continued and the Cluster Frontline Demonstrations on Pulses were conducted by KVK's during Kharif, Rabi and Summer seasons in Andhra Pradesh, Telangana, Maharashtra States, ZONE-X.

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A total of 4030ha area was allotted to Zone-X in which 3893.7ha programme was implemented by organizing 9047 No of demonstrations on Pigeonpea, chickpea, blackgram and Greengram crops in the above three states with an achievement of 96.61% (www.icar.org.in).

Root rot is one of the major problem being faced by farmers of Nellore district in cultivating Bengal gram Desi variety JG 11 is being cultivated in large extent in this area. Bengal gram diseases may lead to yield losses of upto 100 per cent depending on time and stage of infection. The major management practice for the soil borne diseases is use of resistant varieties. Even though a number of improved disease resistant varieties have been developed and distributed to farmers but their prevalence is confined to certain pockets and among few farmers. Root rot diseases are the major fungal pathogens affecting chickpea crop and among them wilt is the major disease in the crop growing areas of India where as in recent years due climate change, recently dry root rot and collar rot are also emerging as threats to production. Under the above said prevailing situations DAATTC Nellore has conducted demonstrations on utilization of *Trichoderma viridae* (2Kg/acre) +FYM (180Kg/acre) and Neem cake (20Kg/acre) in controlling root rot. Hence the paper discloses hoe the demonstrated practice influences the production, productivity and profitability of Bengal gram farmers in Nellore district of Andhra pradesh.

MATERIALS AND METHODS

The present study was conducted in adapted mandals and villages namely Vijamuru, Kaligiri and Kondapuram of Nellore district of Andhra pradesh. Cluster frontline demonstrations were conducted by the DAATTC Nellore and Krishi Vigyan Kendra, Nellore of Andhrapradesh in kharif and Rabi seasons in the farmer's fields during 2016-17 and 2017-18 with evaluation the performance of *trichoderma viridae* on production and productivity of pulses demonstrated for Bengal gram were identified based on Participatory Rural Appraisal (PRA) technique. A group of 150 cooperative farmers were identified based on their participation and feedback received during the preliminary survey and interactive meeting. Crop yield was recorded from the demonstration and control plots for the crops at the time of harvest. The most feasible way by which this could be achieved is by demonstrating the recommended improved technology of *Trichoderma viridae* (2Kg/acre) + FYM (180Kg/acre) and Neem cake (20Kg/acre) in farmer's fields through front line demonstrations with the objectives to work out the input cost and monetary returns between front line demonstration and farmers methods, to identify the yield gaps between farmer's practices and front line demonstrations. The basic information were recorded from the farmer's field and analyzed to comparative performance of cluster frontline demonstrations (CFLD's) and farmer's practice. The yield data were collected from both the demonstration and farmers practice by random crop cutting method and analyzed by using simple statistical tools. The technology gap and technological index (Yadav et al., 2004) were calculated by using following formula as given below.

Extension gap = Demonstrated yield- farmer's practice yield
Technology index=Potential yield-Demonstration yield *100/ Potential yield
Percent increase yield= Demonstration yield - farmers yield X 100/ Farmers yield

RESULTS AND DISCUSSIONS

The *Trichoderma viridae* inoculation is more important with technological intervention for productivity and profitability of pulses by reducing the root rot disesase.

Table 1: Gap analysis of demonstrations of *trichoderma viridae* application in Bengal gram

Year	No. Of Demonstrations	Average yield Q ha^{-1}		% Increase in Recommended Practice (RP)	Extension gap (Q ha^{-1})
		Recommended practice	Farmers practice		
2016-17	25	14-18	10	40.00	4
2017-18	35	15-19	12.5	24.00	3
Average	30	15-20	11.25	36.36	3.5

A cursory look into the table 1 reveals us that the practice of *trichoderma viridae* application in Bengal gram reduces the root rot and in turn increases the yield than in case of traditional practice. The yield in general farmers practice in an average is of 14-55 Quintals per hectare as compared to 10 quintals per hectare in farmers practice. The percentage increase in recommended practice over farmers practice on an average is of 36.36%. Thus it is clearly visible from the table the intervention of *Trichoderma viridae* (2Kg/acre) + FYM (180Kg/acre) and Neem cake (20Kg/acre) enhances the productivity and yield by reduction of root rot disease in Bengal gram.

CONCLUSION

The *Trichoderma viridae* inoculation is more important with technological intervention for productivity and profitability of pulses by reducing the root rot disesase. The percentage increase in recommended practice over farmers practice on an average is of 36.36%. Hence the technology of *Trichoderma viridae* (2Kg/acre) + FYM (180Kg/acre) and Neem cake (20Kg/acre) can be poularized in Nellore district in order to decrease the incidence of root rot and in turn increase the productivity.

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