

## Study on carbohydrate contents of potato by using biocontrol agent *Pseudomonas fluorescens* with farm yard manure

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### ABSTRACT

An attempt was made to study the bio-control efficacy of *Pseudomonas fluorescens* on carbohydrate contents of potato crop. Three types of treatments; soil treatment, seed treatment and foliar treatment in combination with farm yard manure were given. The result was recorded at the time of harvest. The best result was recorded in soil treatment followed by foliar treatment and seed treatment in comparison with control. Therefore from present investigation, it is concluded that an eco-friendly biocontrol agent *Pseudomonas fluorescens* is very easy to use and having no adverse effect on crops, people or animals and they can be applied to prevent and control several pathogenic fungi and grow healthy crop. The *Pseudomonas fluorescens* can be used as a bio-control agent as it is low cost and profitable dependent system and it also helps in conserving the natural resource.

Figure : 00

References : 05

Table : 01

KEY WORDS : Bio-control, Effect on carbohydrate contents, Foliar treatment, *Pseudomonas fluorescens*, Seed treatment, Soil treatment

### Introduction

India is fortunate enough to have vast diversity of land soil and agro climatic conditions to grow various vegetables. Potato is the one of the most starchy food crops of the world. Today farmers are searching for resource efficient low cost and profitable dependent system. Chemical pesticides when especially used indiscriminately have contaminated the environment. A number of plant diseases especially the soil and seed born could not be significantly controlled by chemical means and gain the resistance from the chemicals. So the substitute is only to apply cultural and biological practices. Biological control methods are alternative means of disease control and grow healthy crop, which are the otherwise unprotected because of the involved expenses. An ecofriendly biopesticides viz *Pseudomonas fluorescens*, is very easy to use and having no adverse effects on environment (crop, people or animals). They can be applied to prevent and control several pathogenic fungi such as *Fuarium*, *Rhizoctania*, *Phythium*, *Phytophthora*, *Alternaria* etc. and grow healthy crop.

### Materials and Methods

#### Experimental site

The experiment was conducted in the farm of Allahabad Agriculture Institute-deemed university Allahabad during the Rabi season. Immediately after harvest of the kharif crop, the experimental field was

ploughed 20-25 cm deep with soil turning plough. Cross ploughing and one planking was also done to obtain the good tilth. Fifteen centimeters deep furrows were opened with the help of bullock drawn furrows maker at the appropriate distance. Seed beds were prepared for respective treatments as per the lay out planned plot for each treatment 2 x 2 square meters. The seed variety selected for the study was Kufri Bahar. Farm yard manure was given @ 30t/ha in selected plots and mixed well with the soil and was broadcasted uniformly in the soil.

### Types of Applications

#### 1. Seed treatment

The seeds of potato were treated and then the seeds were spread on an airy and hygienic place. The uniform sized and well sprouted healthy tubers were collected for sowing.

#### 2. Soil treatment

Little amount of soil was taken and treated. 15 cm deep furrows were made with the help of hoe. Treated soil was broadcasted informally into the furrows. Seeds were placed in the furrows and were later covered with soil.

#### 3. Foliar spray

Foliar spray was given by hand sprayer till the leaves became thoroughly wet. This treatment was given 30 days after sowing. This spray was repeated after 15 days

of interval till February.

Detail of Treatments:- *Pseudomonas fluorescens* (biocontrol agent) with FYM

- 1- T<sub>1</sub>- soil application @ 3 Kg/ha+FYM
- 2- T<sub>2</sub>- Seed application @ 200 g/500 tubers+FYM
- 3- T<sub>3</sub>- Foliar application @ 2.5kg/ha+FYM
- 4- T<sub>0</sub>- control

**TABLE-1 : Effect of Bio-control Agent *Pseudomonas fluorescens* with FYM on Carbohydrate Contents of potato.**

Treatment	Carbohydrate Contents
T <sub>0</sub> Control	14.27
T <sub>1</sub> Soil P.f. + FYM	15.90
T <sub>2</sub> Seed P.f. + FYM	14.90
T <sub>3</sub> Foliar P.f. + FYM	15.27

FYM—Farm Yard manure ,P.f- *Pseudomonas fluorescens*

### Observation of carbohydrate contents at the time of harvest

**Carbohydrate estimation** : carbohydrate was estimated with the help of Anthrone methods.

### Result and Discussion

#### Effect of *Pseudomonas fluorescens* with FYM on carbohydrate contents of potato

The data recorded on carbohydrate contents of *Pseudomonas fluorescens* (biocontrol agent) . Treated plot indicated that carbohydrate contents of potato tuber at harvest were increased in treatment T<sub>1</sub> (soil P.f.+FYM.) followed by treatment T3 (foliar P.F.+FYM) and treatment T2(seed P.f.+FYM). Earlier workers<sup>3</sup> reported that an abundant supply of Nitrogen increase reflected change in starch content of potato. It was reported that the starch content was highest in treatments without fertilizers and it decreased with increase in nitrogen<sup>1</sup>.

It was also reported that FYM and neem leaf would increase plant emergence and growth parameters of moth bean<sup>2</sup>.

### Conclusion

From all the above, we can conclude that biocontrol agent when applied in combination with FYM had beneficial effect on carbohydrate content of potato.

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