

# STUDY ON GROWTH PARAMETERS OF POTATO BY USING BIOCONTROL AGENT NEEM PRODUCT (BIONEMA) WITH FYM

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**ABSTRACT:** : An attempt was made to study the bio-control efficacy of Neem Product (Bionema) on growth parameter of potato crop. Three type of treatment soil treatment, seed treatment and foliar treatment in combination with farm yard manure were given. The result was recorded at sixty days after sowing and ninety days after sowing and at the time of harvest. The best result was recorded in soil treatment followed by seed treatment and foliar treatment in comparison with control. Therefore from present investigation it is concluded that an eco-friendly biopesticide Neem product (Bionema) 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 Neem product (Bionema) 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.

**Key Words:** Neem product (Bionema), soil treatment, foliar treatment, seed treatment, pathogenic, bio-control, effect on growth parameter.

## INTRODUCTION

India is fortunate enough to have vast diversity of land soil and agro climatic condition to grow various vegetable. Potato is the one of the most starchy food crops of the world. Today farmer 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 Neem product (Bionema), 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 of 2001-2002 and 2002-2003. 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 treatment 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 plot and mixed well with the soil and was broadcasted uniformly in the soil.

## TYPES OF APPLICATION

### 1. SEED TREATMENT

The seeds of potato were treated and then the seeds were spread on an airy and hygiene 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 in to 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:-**

- 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

**OBSERVATION ON PLANT GROWTH PARAMETERS**

1. Shoot Length (cm) :- Shoot length was measured from the soil to the upper part of the plant at 60 and 90 DAS with the help of measuring scale.
2. Root Length (cm) :- Root length was measured at 60 and 90 DAS with the help of measuring scale.
3. Fresh and dry shoot weight (gm): Plants were randomly dug with underground plant portion and detached from root and weighed at 60 and 90 DAS. Then the same were dried at 60°C for 48 hours and weighted to record the shoot dry weight.
4. Fresh and dry root weight (gm) :- Plants were randomly dug with underground plant portion and detached from shoot and root were weighted at 60 and 90 DAS. The same were dried at 60°C for 48 hours and weighted to record the root dry weight.
5. Number and Weight of potato tuber (gm) :- Three plants were randomly dug out and number & weight of potato tubers were recorded.
6. Potato Yield (q/ha) :- The tuber yield was recorded from each plot separately

**RESULT :-** Effect of Neem product(Bionema) with FYM on growth parameters of potato

**FYM –Farm yard manure ; DAS – Days after sowing; Bio-Neem product (Bionema)**

Treatment	Shoot Length (cm)		Root length (cm)		Fresh Shoot Weight (g)		Dry Shoot Weight (g)		Fresh Root Weight (g)		Dry Root Weight (g)		Number of potato tuber formation At harvest	Weight (g) of potato tuber At harvest	Yield (q/ha) of potato At harvest
	60 DAS	90 DAS	60 DAS	90 DAS	60 DAS	90 DAS	60 DAS	90 DAS	60 DAS	90 DAS	60 DAS	90 DAS			
T <sub>0</sub> Control	46.78	51.87	5.04	5.24	33.03	43.77	3.92	5.58	1.51	2.30	0.34	0.53	4.27	25.36	98.01
T <sub>1</sub> Soil Bio+FYM	64.06	71.04	7.11	8.69	75.18	78.87	6.21	10.36	4.33	7.26	0.89	1.92	9.00	27.38	214.89
T <sub>2</sub> Seed Bio+FYM	52.92	57.97	6.70	8.36	50.13	52.99	5.96	6.58	3.01	3.42	0.74	0.78	5.83	38.70	140.98
T <sub>3</sub> Foliar Bio+FYM	48.81	53.63	6.91	9.74	39.70	49.01	4.56	6.56	2.22	3.54	0.64	0.82	8.17	27.88	191.72

**DISCUSSION:-****Effect of Neem Product (Bionema)with FYM on growth parameter of potato.**

The data recorded on growth parameters of Neem Product (Bionema) . Treated plot indicated that shoot length, fresh shoot weight, dry shoot weight , fresh root weight , dry root weight, no. of potato tuber at harvest and yield of potato were increased in treatment T<sub>1</sub> (soil Bio+FYM.). whereas treatment T<sub>2</sub> (seed Bio+FYM.) increased weight of potato tuber at harvest and Significant increase in root length in T<sub>3</sub> (foliar Bio+FYM.). Rathore(2000) reported that FYM and neem leaf would increase plant emergence and growth parameters of moth bean.

Result has been observed by Mirza et al (2000) tested four Neem products namely crude Neem seed oil, nimbokil, crude neem seed oil terpenoid extract and neem leaf decoction against *phytophthora. infestans* causing late blight disease of potato the result show that neem products have potential for the management of potato late blight.

Babu et al (2000) tested several plant extracts from various plants species were tested for their fungitoxic effects on the mycelial growth and spore germination of *Alternariasolani* the causal agent of tomato leaf blight disease. Result showed that neem was also effective against *Alternariasolani*.

**CONCLUSION:-** From all the above we can conclude that biocontrol agent when applied in combination with FYM had beneficial effect on potato growth.

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