

Management of stem necrosis disease of potato

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SUMMARY

An experiment was conducted during *Rabi* seasons of 2002-2003 at Potato Research Station, S.D.A.U., Deesa (North Gujarat) as well as spraying schedules with six different treatment enveloping seed treatment, soil application with four replications under Randomized Block Design. Results revealed that three sprays of methyl - o- dematon @ 0.05 % (metasystox) at 15 days interval starting from the appearance of the disease found significantly superior to all other treatments and recorded higher tuber yield (234.64 q/ha.) with 37.29 per cent increase in yield over check.

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Key words :

PSND,
Tospovirus,
Insecticides,
Incidence, Index

Potato is an important cash crop in the western plains of India where in Gujarat state is accredited with high productivity of potato. Potato stem necrosis disease (PSND) caused by a tospovirus transmitted by thrips vector (Paul Khurana *et al.*, 1998) is a limiting factor for potato cultivation in Northern Gujarat region due to its severe regular appearance on the crop since last few years. It is also a serious problem in early planted crop in Central India (Somani *et al.*, 1999). In Gujarat high temperature (>30°C) and dry weather conditions prevailing during onset of the *Rabi* reason are favouring the disease develop. The predisposing factors for the disease are congenial for build up of vector thrips population.

MATERIALS AND METHODS

Considering the economic importance of the disease, an experiment was conducted during *Rabi* 2002-2003 at Potato Research Station, S.D.A.U., Deesa (North Gujarat) in Randomized Block Design with four replications and six treatments:

T₁ : Imidacloprid @ 0.1 seed tuber d i p for 10 minutes,

T₂ : Soil application of Phorate 10 G @

15 kg/ha. at earthing up.

T₃ : Soil application of Carbofuran 3 G @ 10 kg/ha. at earthing up.

T₄ : Three sprays of neem based Vanguard @ 5 ml/litre at 15 days interval starting from appearance of the disease/thrips.

T₅ : Three sprays of Methyl-o-demeton @ 0.05% at 15 days interval after appearance of the disease/thrips.

T₆ : Control (No treatment)

Variety	Kufri Badshah
Gross plot size	3.0 x 3.0 m ²
Net plot size	2.0 x 2.6 m ²
Row to row distance	50.0 cm
Plant to plant distance	20.0 cm
Date of planting	20 th October, 2003

The plots under experiment were visited daily to record the first appearance of the disease/thrips on potato in the experimental field.

Recommended agronomical package and practices of the region were followed for all the treatments under the experiment.

The final disease incidence and disease index were recorded at 20 days before

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harvesting on the basis of number of disease infected plants and severity of disease by counting 20 randomly selected plants of each treatment. The tuber yield was recorded from each treatment in kilograms and converted into quintals per hectare.

Per cent disease incidence and index worked out by following the formula given by Paul Khurana *et al.*(1997):

$$\text{Per cent disease incidence} = \frac{\text{No. of infected plants}}{\text{Total No. of plants examined}} \times 100$$

$$\text{Per cent disease index} = \frac{\sum \text{No. of plants infected} \times \text{Grade of infection}}{\text{Total No. of plants examined}} \times 100$$

Per cent increase in yield in each treatment over check was worked out by using the following formula (Nene, 1972):

$$\text{Per cent disease in yield} = \frac{\text{Yield in treatment} - \text{Yield in control}}{\text{Yield in control}} \times 100$$

RESULTS AND DISCUSSION

Results revealed from the data presented in Table 1 and Fig.1 that all the insecticidal treatments tried were

found significantly superior over control in reducing the stem necrosis disease incidence and index. Though, among the insecticides spraying of methyl-o-demeton (0.05%) was found significantly superior to all others, which has shown the minimum disease incidence (8.7 %) and index (0.39). This was followed by imidacloprid (0.1%) with 12.55 per cent incidence and 0.64 disease index.

In respect to, yield maximum yield 234.64 q/ha. was obtained with three spraying of methyl-o-demeton (0.05%) which was 37.29 per cent higher yield over control. This treatment was followed by imidacloprid (0.1) as seed tuber treatment (Table 1 and Fig. 2).

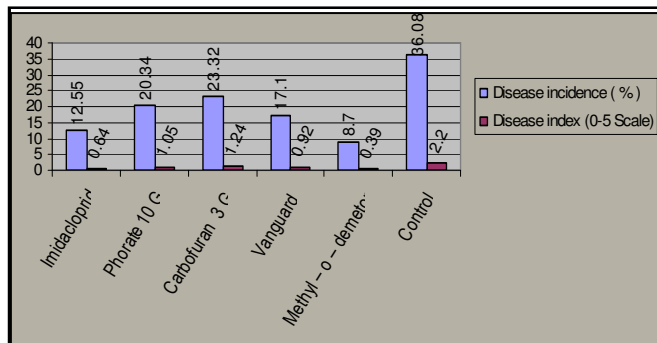


Fig. 1 : Effect of insecticides on diseases incidence and disease index of stem necrosis disease of potato (cv. KUFRI BADSHAH)

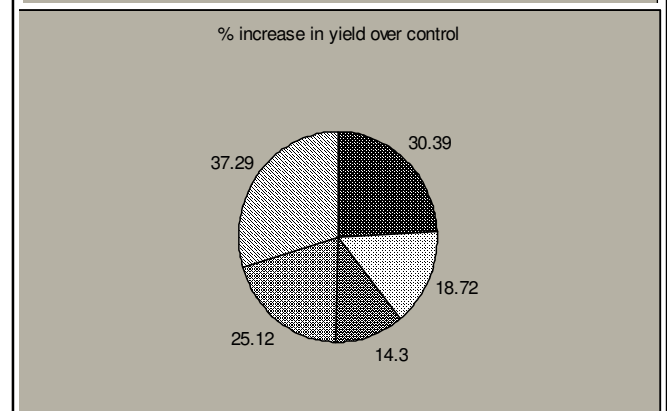
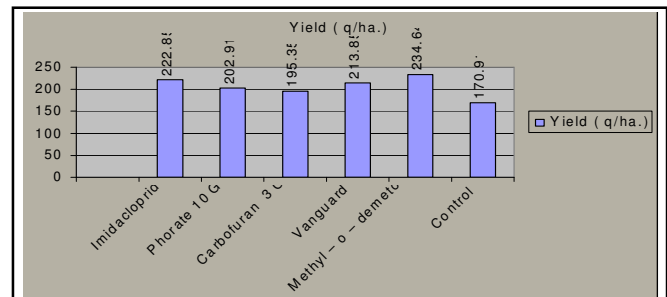


Fig. 2 : Effect of insecticides on potato tuber yield (q/ha) and per cent increase in yield over control (cv. KUFRI BADSHAH)

Table 1 : Effect of insecticides on disease incidence and disease index of stem necrosis and potato tuber yield

Sr. No.	Treatments	Disease incidence (%)	Disease index (0-5 scale)	Yield (q/ha)	% increase in yield over control
1.	Imidacloprid	12.55	0.64	222.85	30.39
2.	Phorate 10 G	20.34	1.05	202.91	18.72
3.	Carbofuran 3 G	23.32	1.24	195.35	14.30
4.	Vanguard	17.10	0.92	213.85	25.12
5.	Methyl – o – demeton	8.70	0.39	234.64	37.29
6.	Control	36.08	2.20	170.91	
	S.E. (±)	0.87	0.08	13.07	
	C.D. (P=0.05)	2.63	0.23	42.70	
	C.V. %	8.86	14.45	10.86	

0 = Free, 5 = Maximum disease

Conclusion :

Stem necrosis disease of potato was effectively checked by three sprayings of 0.05% methyl-o-demeton at 15 days interval and found significantly superior to all others and has shown the minimum disease incidence of 8.70 per cent and disease index of 0.39 and also recorded higher yield of potato tuber (234.64 q/ha.). Maximum per cent increase in yield over control was recorded in the treatment of methyl-o-demeton (37.29 %) followed by imidacloprid (30.39 %).

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