

ORIGINAL ARTICLE

Effect Of Different Chemicals Used For Seed Treatment On Seed Germination And Seedling Growth of *Gossypium SPS*.

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ABSTRACT

Cotton is the backbone of Indian agriculture. Cotton has great economic importance in hosiery industries. Up to 70% farmers are doing this cash crop in Rabi season. Cotton the “white gold” of the country being native of India, is an important commercial fiber crop of the world. To preserve the cotton seed for long life, it is treated with different chemicals. Commercially seed industries use Imidachloprid, Thiamethoxam, Thiram, Gaucho for seed treatment. This study was undertaken for analyzing effect of these chemicals at various concentrations on seed germination and seedling growth. Frequent treatments were done during the year 2015-16 for collection and documentation of Insecticides and Fungicides. Cotton seeds were treated with commercially used 02 insecticides (Imidachloprid, Thiamethoxam) and 01 fungicide (Thiram) Thiamethoxam-70 WS (5g/kg) showed the highest germination percentage (98 %) as compared to control (90%), while Thiamethoxam-70 WS (28.3 cm) and Thiamethoxam (5g/kg) + Thiram (2g/kg) showed the highest seedling growth (28.7 cm) as compared to other treatments and control.

Key words – Cotton, Insecticide, Pesticide, treatment, germination.

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INTRODUCTION

Cotton is the backbone of Indian agriculture. Cotton having so many economic importance in hosiery industries. Upto 70% farmers are doing this cash crop in Rabi season. To preserve the cotton seed for long life, it should be treated with different chemicals.

Cotton the “white gold” of the country being native of India, is an important commercial fibre crop of the world. Cotton is cultivated in more than 70 countries of the world with total coverage of 101.71 million hectare. In India, area under cotton is 95.8 lakh hectares with the production of 310 lakh bales and productivity of 599 kg per hectare. In Karnataka, the area under cotton cultivation is 4.27 lakh hectares with a production of 9.00 lakh bales and an average productivity of 392 kg lint per hectare.

The importance of Bt cotton is just gaining with the development of few varieties and hybrids in our country. The area of Bt cotton in India is estimated to be 7.6 million hectare [1, 2]. The seeds of Bt and non Bt cotton varieties are produced and supplied to farmers for commercial cultivation by both public and private seed producers. The storage of seeds of Bt and non Bt cotton varieties bears pivotal role in the chain of seed production as “seed produced is seed saved” an adage holds even good today.

In storage, number of biotic and abiotic factors influence storage potential of seeds and results in gradual seed deterioration and ultimately death of the seeds. However, the rate of seed deterioration could be slowed down by certain seed treatments with fungicides, insecticides, halogen compounds, low cost and non hazardous botanicals and storing them in suitable moisture impervious containers [3].

MATERIALS AND METHOD

Seed procurement with variety- The delinted, healthy Cotton seeds were collected from Green gold seeds pvt. Ltd., Aurangabad (MS), India.

The concentrations of pesticides, insecticides chosen were –

- 1) Thiamethoxam-70 WS = 05g/kg
- 2) Imidachloprid-70 WS = 05g/kg
- 3) Thiram - 75% WDP = 04g/kg
- 4) Thiamethoxam (5g/kg) + Thiram (2g/kg)
- 5) Thiamethoxam (10g/kg) + Thiram (4g/kg)
- 6) Imidachloprid (5g/kg) + Thiram (2g/kg)
- 7) Imidachloprid (10g/kg) + Thiram (4g/kg)
- 8) Thiamethoxam (5g/kg) + Imidachloprid (5g/kg) + Thiram (2g/kg)
- 9) Thiamethoxam (10g/kg) + Imidachloprid (10g/kg) + Thiram (4g/kg)

A standard between paper germination methods was used. Cotton seeds (400 seeds per concentration) were putted on moist germination paper. After the putting of seeds, the samples were incubated in the dark at 25±2 °C for 12 days as per the ISTA rules (Rattan lal Agrawal, 2nd edition). After 12 days, the evaluation of seedlings i.e. normal, abnormal, hard, fresh & dead was done as per the standard procedure. Length of seedlings root (cm) and shoot (cm) were measured with the help of thread and scale and observations are recorded.

The Germination percentage were calculated by using the following formula-

$$\text{Germination \%} = \frac{\text{No. of normal seedlings}}{\text{Total No. of seeds tested}} \times 100$$

$$\text{Total height of seedling (cm)} = \text{Shoot length(cm)} + \text{Root length (cm)}$$

RESULTS AND DISCUSSION -

The observations made in relation to germination percentage and seedling height (cm). The effect of different chemical concentrations on cotton seed germination (%) recorded after 12 days under laboratory conditions were given. It was found that, Thiamethoxam-70 WS (5g/kg) showed the highest germination percentage (98.00%) as compared to the control sample (90.00%), while Thiamethoxam-70 WS (28.3 cm) and Thiamethoxam-70 WS (5g/kg) + Thiram (2g/kg) showed the expandable seedling growth (28.7 cm) as compared to other chemical treatments and control.

Evaluation of seedlings in different concentration

T₀ T₁ T₁ T₂ T₂ T₃ T₃ T₄ T₄ T₅ T₅ T₆ T₆ T₇ T₇ T₈ T₈



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Treatments	Dosage/kg	Germination Percentage	Root length (cm)	Shoot length (cm)	Seedling height (cm)
Control		90.25	14.50	10.50	25.10
Thiamethoxam-70 WS	5g/kg	98.25	16.30	12.00	28.30
Thiamethoxam-70 WS	10g/kg	98.75	15.40	12.30	27.70
Imidacloprid-70 WS	5g/kg	94.50	15.20	12.30	27.50
Imidacloprid-70 WS	10g/kg	91.50	14.50	10.20	24.70
Thiram-75% WDP	2g/kg	97.50	13.00	10.00	23.00
Thiram-75% WDP	4g/kg	95.75	15.80	10.80	26.60
Thiamethoxam + Thiram	5g/kg+2g/kg	92.25	16.40	12.30	28.70
Thiamethoxam + Thiram	10g/kg+4 g/kg	90.00	16.00	12.40	28.40
Imidacloprid + Thiram	5g/kg+2g/kg	93.50	14.40	10.30	24.70
Imidacloprid + Thiram	10g/kg+4 g/kg	93.50	15.10	11.20	26.30
Thiamethoxam + Imidacloprid + Thiram	5g+5g+2g/kg	91.50	14.10	13.10	27.20
Thiamethoxam + Imidacloprid + Thiram	10g+10g+4g/kg	92.75	16.40	10.00	26.40

Prasanna *et al.*[4] was also recorded enhanced seed germination in cotton by treating the seeds with imidacloprid. It was also found that even, the highest seed germination in cotton by treating the seeds with Thiram by Hemashree *et. al.* [3].

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