

## EFFECT OF SEED TREATMENT WITH FUNGICIDES AND INSECTICIDES ON THE CONTROL OF ROOT ROT AND STEM FLY ON COWPEA

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### ABSTRACT

Efficacy of seed treatment with fungicides and insecticides on the control of root rot and stem fly was assessed both under pot culture and field conditions. Carbendazim, quintozene, TMTD and carbendazim + carbosulfan seed treatments were highly effective in the control of root rot disease. Carbosulfan, monocrotophos, phosalone and chlorphyrifos seed treatments were effective in reducing the incidence of stem fly, *Ophiomyia phaseoli*.

The possibility of successful cultivation of any crop is frequently lowered by the onslaught of many pests and diseases. In cowpea, considerable losses in the production occur as a result of root rot caused by *Macrophomina phaseolina* (Tassi) Goid and stemfly, *Ophiomyia phaseoli* Tryon. The present study reports the efficacy of seed treatment with fungicides and insecticides on the control of root rot and stemfly.

### MATERIALS AND METHODS

Experiments both under pot culture and field conditions were conducted during January-March, 1985 at the Tamil Nadu Agricultural University, Coimbatore to study the efficacy of seed dressing chemicals on root rot and stem fly.

Freshly harvested cowpea seeds of cultivar C152 were well dried at 8.0 per cent moisture content and treated with three fungicides viz., carbendazim, quintozene and TMTD and four insecticides viz., carbosulfan, chlorphyrifos, phosalone and monocrotophos and also combinations. The seeds were treated with the different fungicides at the rate of 2g per kg of seed as dry seed dressing. The seeds were shaken with the fungicides in a plastic container for 15 minutes. Another lot of seeds was treated with different insecticides at the rate of 4

ml per kg of seed in a flask in which 0.125 g of gum and 5ml of water were added to form a pellet. The treated seeds were shade dried for one day. In the combination of seed treatment with fungicides and insecticides, the seeds were treated first with fungicides at 2g per kg of seeds and 24 hours later with insecticides at 4 ml per kg of seeds. One lot of seed was left untreated to serve as control.

Pots were filled up with a soil mixture of uniform composition of nutrients and infested with *M. Phaseloina* multiplied in sand maize medium. The inoculum was added at the rate of 10 per cent. The treated seeds were raised by direct sowing. Suitable controls were maintained by sowing seeds without any chemical treatment. Each treatment was replicated three times. Each pot containing five plants was considered as a replication.

The experiment under field conditions with 20 treatments including control was replicated thrice in a randomised design. An uniform manurial schedule of 25:50:0 kg NPK per ha was adopted. Those nutrients were applied as urea and super phosphate respectively as basal dose. The plot size was 5 x 4 m. Seeds were sown in rows at a spacing of 45 x 15 cm and the plants

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**Table 1: Effect of seed treatment with fungicides and insecticides on the incidence of root rot and stem fly in pot culture under natural conditions of infection\*\***

| Sl. No. | Treatment*                   | Incidence of root rot (%) |          |       |
|---------|------------------------------|---------------------------|----------|-------|
|         |                              | 30th day                  | 60th day | Mean  |
| 1.      | Carbendazim                  | 0.00                      | 0.00     | 0.00  |
| 2.      | Carbendazim + Chlorphyriphos | 0.00                      | 0.00     | 0.00  |
| 3.      | Carbendazim + Phosalone      | 0.00                      | 6.67     | 3.34  |
| 4.      | Carbendazim + Monocrotophos  | 0.00                      | 0.00     | 0.00  |
| 5.      | Carbendazim + Carbosulfan    | 0.00                      | 0.00     | 0.00  |
| 6.      | Quintozene                   | 0.00                      | 0.00     | 0.00  |
| 7.      | Quintozene + Chlorphyriphos  | 0.00                      | 6.67     | 3.34  |
| 8.      | Quintozene + Phosalone       | 6.67                      | 20.00    | 13.34 |
| 9.      | Quintozene + Monocrotophos   | 13.33                     | 26.67    | 20.00 |
| 10.     | Quintozene + Carbosulfan     | 0.00                      | 20.00    | 10.00 |
| 11.     | TMTD                         | 0.00                      | 6.67     | 3.34  |
| 12.     | TMTD + Chlorphyriphos        | 26.67                     | 40.00    | 33.34 |
| 13.     | TMTD + Phosalone             | 26.67                     | 33.33    | 30.00 |
| 14.     | TMTD + Monocrotophos         | 33.33                     | 46.67    | 40.00 |
| 15.     | TMTD + Carbosulfan           | 6.67                      | 33.33    | 20.00 |
| 16.     | Chlorphyriphos               | 26.67                     | 26.67    | 26.67 |
| 17.     | Phosalone                    | 46.67                     | 53.33    | 50.00 |
| 18.     | Monocrotophos                | 40.00                     | 46.67    | 43.34 |
| 19.     | Carbosulfan                  | 33.33                     | 46.67    | 40.00 |
| 20.     | Control                      | 46.67                     | 46.67    | 46.67 |

- Mean of three replication \*\* No stemfly infestation \* Fungicides at 2g and insecticides at 4ml per kg of seed

were thinned to two per hill after seven days. In the experiments observations were taken on the entire population in each plot and the percentage of stemfly infested plants and root incidence were worked out. To assess the influence of seed treatment on yield, the grains were harvested from each plot and the weight was recorded.

## RESULTS AND DISCUSSION

No root rot incidence was prevalent when the seeds were sown after pretreatment with carbendazim, quintozene, carbendazim + chlorohyriphos, carbendazim + monocrotophos and carbendazim + carbosulfan. The next best treatment was TMTD which recorded 3.34 per cent incidence under

natural conditions of infection (Table 1). In the trial laid out under field conditions incidence of both root rot and stem fly was negligible. However, significantly lowest incidence of root rot was noticed in carbendazim + phosalone, TMTD + phosalone and carbendazim + chlorpyrifos and all the five were on par. In general, stem fly infestation was low in the control.

Among the fungicides and insecticides tested as seed treatment against *M. phaseolina* in general, carbendazim, quintozene, TMTD, carbendazim + carbosulfan were highly effective. Treatment of seeds with fungicides appears to offer a certain amount of protection against root rot pathogens. This is in evidence from the earlier reports that carbendazim when used as seed dressing gave good control of *M. phaseolina* in cowpea (Sinha and Khare, 1977) and jute (Barman and Prasad, 1981). Masih et al., (1970)

reported that *M. phaseolina* was more sensitive to quintozene.

Saxena et al., (1975) obtained significant protection by carbofuran 2 per cent to green gram and black gram. Manohar (1978) reported good protection by 4 per cent carbofuran seed treatment to blackgram. He also reported the protection provided by seed soaking in monocrotophos 0.5 per cent in controlling stem fly. This result is in conformity with the present finding.

Carbendazim + carbosulfan, TMTD + carbosulfan and TMTD + phosalone treatments recorded increased yields of 1610, 1636.67 and 1515g respectively as against 898.33g per plot in the untreated control (Table 2) Seed treatment with carbendazim or thiabendazole has reportedly increased the yield of wheat by 2.5 to 4.5 quintals per ha (Frisullo and Pigionica, 1978).

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