

ONION (*Allium cepa*)
Smut; *Urocystis colchici*

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Evaluation of seed treatments for onion smut control - Palmyra, 2007

A trial was established 20 Apr in a commercial field at Dean Kincaid, Inc, Palmyra, WI, with a history of high incidence of onion smut, to evaluate efficacy of seed treatments. Three-ft-wide raised beds were prepared by the grower with 30 gal/A of 7-18-6 starter fertilizer applied. Seeds of onion cultivar Arsenal pretreated with Pro-Gro, Raxil (three different suppliers) or untreated, were planted at approximately 9 seeds per ft. All seeds, including those with no fungicide treatment, were prepared with a clothianidin seed treatment for insect control. Soil type was Houghton muck and a randomized complete block design with five replications was used. Each replicate plot consisted of one 30-ft long row and rows were spaced 1.5 ft apart. All fertilizer, herbicide, insecticide and foliar fungicide applications were done according to standard grower practice. All plants in each plot were counted and examined for symptoms of onion smut on 15 Jun, 29 Jun and 20 Jul. On each date, plants with symptoms were recorded and removed from the plots. Two 5-ft-long sections of row were harvested from each treatment plot on 29 Aug and onions were separated into four size classes by diameter (> 3 in., 2-3 in., 1-2 in., and < 1 in.) and weighed. The field received 4 in. irrigation in three applications, late June – July.

Overwintering smut inoculum from previous crops combined with cool and moist growing conditions during the emergence period provided moderate smut pressure in this trial. The number of emerged plants was lowest in plots planted with seed treated with Pro-Gro. Compared to the untreated check plots, treating seed with Raxil (Eastern Seed Service) appeared to improve plant stand. The lowest number of plants exhibiting smut symptoms appeared to be in plots treated with either Pro-Gro or Raxil (Eastern Seed Service), although differences were not significant at the 5% level. Low stands in the Pro-Gro treated plots were reflected in low yields at harvest. Yields were variable and significance was not observed between treatments in any of the yield parameters.

Table 1. *Seed treatment and source.*

| Trt No. | Product | Seed source | Active ingredient |
|----------------|----------------|----------------------|--------------------------|
| 1 | no fungicide | Eastern Seed Service | |
| 2 | Pro-Gro | Eastern Seed Service | thiram + carboxin |
| 3 | Raxil | Eastern Seed Service | tebuconazole |
| 4 | Raxil | Incotec | tebuconazole |
| 5 | Raxil | Seed Dynamics | tebuconazole |

Table 2. Plant counts and incidence of smut symptoms.

| Trt No. | Product | 15 Jun evaluation | | | 29 Jun evaluation | | | 20 Jul evaluation | | | Plants with smut symp-toms 29 Aug | Cumulative # of plants with smut symptoms | Cumulative % of plants with smut symptoms (as % of seeds planted) |
|------------------|--------------|---------------------------|-------------|------|---------------------------|-------------|------|---------------------------|-------------|------|-----------------------------------|---|---|
| | | Avg. # total plants /plot | Avg. #/plot | % | Avg. # total plants /plot | Avg. #/plot | % | Avg. # total plants /plot | Avg. #/plot | % | | | |
| 1 | no fungicide | 132.8 | 7.2 | 5.4 | 131.4 | 2.6 | 2.0 | 127.8 | 1.0 | 0.8 | 0 | 10.8 | 4.0 |
| 2 | Pro-Gro | 114.8 | 1.8 | 1.6 | 115.8 | 0.2 | 0.2 | 119.0 | 0.4 | 0.3 | 0 | 2.4 | 0.9 |
| 3 | Raxil | 141.8 | 2.8 | 2.0 | 138.6 | 1.2 | 0.8 | 144.8 | 0.8 | 0.6 | 0 | 4.8 | 1.8 |
| 4 | Raxil | 136.6 | 4.0 | 3.0 | 134.8 | 2.4 | 1.8 | 132.4 | 1.2 | 0.9 | 0 | 7.6 | 2.8 |
| 5 | Raxil | 125.8 | 6.6 | 5.5 | 120.6 | 1.2 | 1.1 | 123.4 | 0.4 | 0.3 | 0 | 8.2 | 3.0 |
| P>F ¹ | | 0.02 | 0.05 | 0.11 | 0.10 | 0.12 | 0.15 | 0.06 | 0.77 | 0.79 | --- | 0.07 | 0.07 |
| LSD | | 15.5 | 4.1 | NS | NS | NS | NS | NS | NS | NS | --- | NS | NS |

1 Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated (alpha=0.05). NS = not significant at P = 0.05.

Table 3. Yield.

| Trt No. | Product | Total yield cwt/A | Onions in size category | | | | | | | | | | |
|------------------|--------------|-------------------|-------------------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| | | | > 3 in. | | | 2-3 in. | | | 1-2 in. | | | < 1 in. | |
| | | | % of yield | Avg. # of onions | % of yield | Avg. # of onions | % of yield | Avg. # of onions | % of yield | Avg. # of onions | % of yield | Avg. # of onions | % of yield |
| 1 | no fungicide | 559.3 | 2.5 | 1.0 | 86.2 | 55.2 | 11.2 | 17.2 | 0.0 | 0.0 | 0.4 | 0.4 | |
| 2 | Pro-Gro | 511.4 | 0.6 | 0.2 | 87.8 | 50.6 | 11.5 | 15.2 | 0.1 | 0.1 | 0.4 | 0.4 | |
| 3 | Raxil | 604.0 | 0.0 | 0.0 | 82.6 | 60.8 | 17.2 | 29.4 | 0.2 | 0.2 | 1.6 | 1.6 | |
| 4 | Raxil | 543.0 | 1.7 | 0.6 | 83.8 | 53.6 | 14.4 | 21.6 | 0.1 | 0.1 | 0.4 | 0.4 | |
| 5 | Raxil | 562.2 | 1.1 | 0.4 | 86.9 | 56.6 | 11.3 | 16.8 | 0.7 | 0.7 | 1.0 | 1.0 | |
| P>F ¹ | | 0.33 | 0.20 | 0.20 | 0.37 | 0.30 | 0.30 | 0.04 | 0.32 | 0.32 | 0.35 | 0.35 | |
| LSD | | NS | NS | NS | NS | NS | NS | 9.7 | NS | NS | NS | NS | |

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