

RADISH (*Raphanus sativus* ‘Mister Red’ and ‘RS95617’)  
 Rhizoctonia hypocotyl rot; *Rhizoctonia solani*  
 Clubroot; *Plasmodiophora brassicae*

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**Evaluation of cover crops for the management of Rhizoctonia hypocotyl rot and clubroot in radishes, 2004.**

The experiment was conducted at the Ohio Agricultural Research and Development Center Muck Crops Research Station in Celeryville, OH. Seven cover crop treatments were established, for the third consecutive year, at a rate of 1 bu/A on 2 Oct 03. Treatments were planted in 25 ft by 12 ft strips and arranged in a randomized complete block design with five replications. Cover crops were mowed and disked under on 21 Jun. Fertilizer (17-17-17, 500 lb/A) was incorporated into the field on 27 Apr. Plots were disked, leveled, and compacted on 17 May. Radishes (cv. RS95617 and cv. Mister Red) were direct seeded at a rate of 12 seeds/ft on 17 May using a Stan-Hay vacuum seeder. Each plot consisted of three 25 ft rows (per cultivar) with 18 in. between rows. Plots were separated by 6 ft. Dual II MAGNUM (1.5 pt/A) was applied on 17 May for weed control. Radishes were harvested from a 5 ft section of the center row of each plot on 11 Jun, and the number of radishes per row, percent Rhizoctonia hypocotyl rot, and the number of radishes per row with clubroot were determined. Thrips were sampled by cutting all foliage in a one square foot area at the soil line, and extracting the thrips in Berlese funnels, which use the heat from an incandescent light bulb to drive the thrips down and out of the foliage and into a collecting jar filled with preservative. Thrips populations begin to increase early in the spring, and the series of samples provide an estimate of how quickly the populations increase. The initial sample tested for differences in late fall establishment and overwintering survival. Data were analyzed by ANOVA using SAS statistical software. Means were separated using Fisher’s protected least significant difference test. Average maximum temperatures for 17-31 May and 1-11 Jun were 78.2 and 76.9 °F; minimum averages were 53.9 and 58.7 °F and total rainfall was 3.2 and 3.2 in., respectively.

The amount of Rhizoctonia root and hypocotyl rot that developed in the experiment was low, and there were no statistically significant differences among cover crop treatments in the amount of Rhizoctonia disease that developed. However, the stand count in ‘RS95617’ (number of radishes per row) was significantly higher ( $p \leq 0.10$ ) for radishes grown in soil previously cropped to barley, oats, or oats/barley than for those in which the preceding crop was oats/rye. Clubroot was in plots cropped to oats/barley. There were strong block effects, probably the result of heavy rain that occurred during the trial and uneven drainage across the field. The oats were winter-killed in all treatments, and no foliage remained for thrips sampling during April. Thrips do not survive well on oats alone, or to increase on dead foliage during spring. Wheat, rye and barley did not differ in the number of thrips per square foot, regardless of whether they were grown together with oats. Previous studies had shown lower rates of thrips increase in rye compared with wheat, and a similar trend was observed in our study although the numbers were not significantly different even for the final sample date.

Treatment	Cultivar	Stand count (number radishes/100 ft)		% Rhizoctonia		Clubroot (number radishes/100 ft)	
		cv. Mister Red	cv. RS95617	cv. Mister Red	cv. RS95617	cv. Mister Red	cv. RS95617
Wheat	Hopewell	780 a	936 ab	20.8 a	17.8 a	764 a	1084 a
Rye	Mixed cultivars	908 a	944 ab	27.0 a	25.8 a	904 a	1076 a
Oats	Ogle	868 a	1080 a	24.4 a	14.0 a	868 a	1048 a
Barley	Penco	888 a	1084 a	13.4 a	12.0 a	888 a	1004 ab
Oats:Wheat (1:1)	Ogle:Hopewell	792 a	1004 ab	19.8 a	16.2 a	792 a	936 ab
Oats:Rye (1:1)	Ogle:mixed	844 a	868 b	14.0 a	10.2 a	836 a	932 ab
Oats:Barley (1:1)	Ogle:Penco	944 a	1048 a	26.2 a	21.6 a	928 a	856 b
<i>p</i> value		0.23	0.10	0.81	0.65	0.23	0.07

<sup>x</sup>Values are the means of five replicate plots; means followed by the same letter within a column are not significantly different at  $p \leq 0.10$ .

April 7

Cover crop	Avg no. thrips/ft <sup>2</sup>	Fresh weight	Dry weight
Wheat “Hopewell” .....	0.9	24.6	5.6
Rye .....	1.2	36.3	8.6
Barley “Penco” .....	1.1	23.8	6.7
Oats:Wheat .....	1.7	21.2	5.8
Oats:Rye .....	1.1	28.3	6.7
Oats:Barley .....	<u>0.9</u>	<u>17.9</u>	<u>4.8</u>
Tukey’s HSD ( $\alpha=0.05$ )	1.8	14.4	1.8

April 21

Cover crop	Avg no. thrips/ ft <sup>2</sup>	Fresh weight	Dry weight
Wheat "Hopewell" .....	0.9	88.6	13.5
Rye .....	0.6	95.0	14.7
Barley "Penco" .....	1.3	70.6	10.3
Oats:Wheat .....	0.7	82.7	13.4
Oats:Rye .....	0.6	113.2	16.9
Oats:Barley .....	0.2	81.2	12.2
Tukey's HSD ( $\alpha=0.05$ )	1.3	63.9	8.4

May 5

Cover crop	Avg no. thrips/ ft <sup>2</sup>	Fresh weight	Dry weight
Wheat "Hopewell" .....	2.1	118.3	23.3
Rye .....	0.4	196.6	33.1
Barley "Penco" .....	2.4	141.7	23.5
Oats:Wheat .....	1.0	143.2	28.4
Oats:Rye .....	0.9	156.2	28.1
Oats/Barley .....	3.2	101.3	17.6
Tukey's HSD ( $\alpha=0.05$ )	2.9	102.1	15.7