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

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Three Year Experiment Summary - Effect of Cover Crops on Rhizoctonia Root and Hypocotyl Rot in Radishes and Thrips Overwintering

Rhizoctonia solani is a soilborne fungus that causes disease in a wide range of crops, including vegetables. Rhizoctonia diseases have increased in incidence and severity over the past decade on vegetables grown on muck soils in northern Ohio, and no current methods adequately control these diseases. In particular, Rhizoctonia root and hypocotyl rot has become a limiting factor in radish production on these soils. In some areas farmers no longer produce radishes due to the risk of total crop loss due to this disease.

We hypothesized that the use of oat and rye winter cover crops, a practice adopted to reduce the overwintering populations of Thrips tabaci, may be a factor in this increase. Oats and rye may be more susceptible to R. solani than wheat, a previously used cover crop, and thus contribute to the buildup of the pathogen, or they may be less supportive of soil microbial communities that suppress the pathogen. We established a trial in which we compared the development of Rhizoctonia root and hypocotyl rot on radishes grown in plots planted to different cover crops or combination of cover crops. We intended to determine if cover crops influenced the incidence or severity of Rhizoctonia disease in the following radish crop. We also re-assessed the attractiveness of the different cover crops or combinations of cover crops to thrips.

Seven cover crop treatments were established on the Muck Crops Research Experiment Station in autumn 2001, 2002 and 2003. Plots were long strips on the north side of the station, arranged in a randomized complete block design with four replications. For each of the three years, the arrangement of plots remained the same. The treatments were 1) wheat 'Hopewell', 2) rye, 3) oats 'Ogle', 4) barley 'Penco', 5) oats/wheat 50:50, 6) oats/rye 50:50, and 7) oats/barley 50:50. Each spring, all but 10 ft of each cover crop treatment were removed and the area was prepared for radishes. The remaining cover crops were sampled for thrips. There were no significant differences in the seasonal total of thrips from different cover crops. Radishes were sampled 10 days after emergence, rated and cultured for Rhizoctonia and prepared for evaluation of bacterial colonists. In 2002, Rhizoctonia incidence was extremely low, probably due to very dry conditions. Radishes were planted again with the same result- lack of disease. In 2003 flooding destroyed the plots. In 2004, two radish varieties were evaluated: 'Mister Red' and 'RS95167'. The amount of Rhizoctonia root and hypocotyl rot that developed in the experiment was again relatively 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 'RS95167' (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 in plots in which the preceding crop was oats/rye. There were strong block effects, probably the result of heavy rain that occurred during the trial and uneven drainage across the field. Thrips data indicated a slight trend toward higher populations in wheat cover crop, but there were no significant differences.

In summary, we were unable to demonstrate a consistent effect of cover crops on the succeeding radish crop in incidence of Rhizoctonia root and hypocotyl rot. The experiment was hampered by very dry weather in 2002 and heavy rainfall in 2003 and 2004 that flooded the plots. There was also no effect of cover crop on thrips populations. Farmers may consider planting the cover crop or combination of cover crops that best suits their needs, without consideration of potential effects on Rhizoctonia disease incidence.