

The Value of Peas as a Cover Crop (Interim Report)

Purpose:

Investigations into the opportunities for various cover crops after winter wheat harvest have been ongoing since 2004. From these trials, peas have shown great promise to either replace red clover as a cover crop, or be used to fill in gaps in a clover stand. Of note, trials in 2006 at one location near Lucan showed peas far outperforming either oat or oilseed radish when biomass production was significant, and fall tillage (fall 2005) was difficult due to the volume of cover crop production. Corn yields following peas were significantly higher in this situation than following any other treatment.

However, it is not well established if corn yields significantly improve following peas planted as a cover crop, as initial results have been extremely variable. To further investigate this potential, the Thames Valley Regional Soil and Crop Improvement Association (TVRSCIA) initiated a three year project in the summer of 2006. Strips of peas were planted in fields following winter wheat harvest throughout the region. Corn will be planted in these fields in 2007, along with two replicate tests of nitrogen rates on both the pea strips and the check strips (no peas planted). These plots will be repeated in 2007/2008.

Methods:

23 plots were established across south western Ontario, with wide geographic distribution (from the Niagara peninsula to Lake Huron to Kent County). Pea seed was sourced from either western Canada (dry pea seed), or from by-pass fields that canners in Ontario had been unable to utilize (processing peas). Pea planting dates varied widely, from late July to early September. While most co-operators drilled the pea seed in, several growers broadcast the pea seed and disced it in, to attempt to reduce seeding costs. In one location disced pea seed was compared to drilled seed to determine relative establishment.

Results:

1. Establishment: Pea stand establishment was much less than expected. Seeding rates were targeted at 75 pounds/acre, but stands were thin at most locations. Even growers that bumped seeding rates to 100 pounds/acre had disappointing stands. It is unknown as to the reason for poor establishment. Seed source did not appear to have an impact, nor did baling straw vs. spreading straw. There is some suggestion that slugs may have been feeding on and killing pea seed seedlings, but there is no proof of this hypothesis.

2. Seeding Date: Seeding date had a huge impact on the amount of growth achieved by the pea crop. Peas seeded in late July showed excellent growth, with plants flowering and setting seed before freeze-up. In the best fields, peas could have been harvested as fresh table peas just prior to killing frost. However, peas seeded in early September had minimal growth, and in many cases were only 4 inches (10 cm) high

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when killing frost occurred. This wide differential in growth is partly due to the extremely cool, wet fall conditions experienced, but also indicates that early planting will be essential if peas are to be successful.

3. Seeding method: Broadcast peas followed by discing showed significantly poorer establishment than drilled peas. In fields that were packed following the disc, establishment did improve but still did not equal that of drilled peas. Alternate, cheaper methods of pea establishment still need to be developed, in an effort to make this a more economical endeavor.

4. Grower feedback: Despite disappointing stand establishment, most growers were encouraged by what they saw. In many cases, green pea strips stood in stark contrast to unplanted strips, and the potential for increased corn yields and decreased nitrogen requirements have co-operators intrigued as to the outcome next corn harvest.

Summary:

Next Steps:

Two replications of nitrogen rates will be imposed on the corn planted into these fields in 2007. Nitrogen rates will include both a zero N treatment, along with a "full rate" nitrogen treatment, and most economical rate of nitrogen (MER-N) will be calculated using the delta yield concept, for both the corn following peas as well as the corn following no cover crop. In fields that allow, 4 nitrogen rates will be replicated (0, 50, 100, 150), and MER-N will be calculated using the quadratic plateau method.

Sites will again be planted to peas following wheat in the summer of 2007. Good co-operators are always welcomed. Anyone interested in this project should contact their local Soil and Crop director, or Peter Johnson.

Acknowledgements:

The project organizers would like to thank OSCIA and OMAFRA for the OSCIA Regional Partner Grant approved for this project.

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Location of Project Final Report: