

SOIL MANAGEMENT

Mitigating Limitations to On-Farm Yield

Three year funding commitment through AgrilInnovation Program, Potatoes New Brunswick, McCain Foods, Prince Edward Island Potato Board, and additional partners.

Research Purpose: To identify limitations for yield, and to explore ways to counteract these limitations through addressing soil erosion, soil health, and other beneficial production practices.

Key Findings of PEI trials:

Nurse Crops

- A nurse crop screening trial was started in 2015 at the AAFC research farm in Harrington, PEI to identify species which might prove beneficial as a nurse crop to be planted at the same time as potatoes in the spring. This nurse crop would provide protection to the soil before potatoes emerge and/or achieve row closure.
- Four crops were tested: winter rye, brown mustard, buckwheat, and oats. Of the four crops tested, only winter rye produced yields comparable with no nurse crop, as the other three persisted through the growing season and acted like weeds to reduce yields.
- For 2016, there are plans to alter how the nurse crops are planted as well as experimenting with how to best incorporate or kill the nurse crop as the potatoes emerge. This will be done on a commercial field scale this year. There will also be a replicated trial done at Harrington.

Late-Season Cover Crops

- There is a desire to identify plant species which can serve as an effective late-season cover crop after potato harvest. A number of growers already broadcast cover crops like winter rye or ryegrass, but this is most prevalent in potatoes harvested in September (seed, early table, chip, etc).
- In the fall of 2015, a screening trial was performed at Harrington looking at two seeding dates: late September and mid-October.
- Winter rye established at both seeding dates, though it established better in September. Root max ryegrass and a mix of radish/rape/oats/peas established well in



Winter rye seeded on October 15th

September but less so in October. Winter rape, Italian ryegrass, and peas alone did not establish well at either planting date.

- For 2016, spring barley, winter wheat, and winter rye will be evaluated at two planting dates, one in late September and the other on approx. October 8th. This will be done at Harrington and in a conventional grower field.

Residue Tillage Systems

- A trial was started in the fall of 2015. This trial has two components:
 - Measuring water infiltration rates and organic matter on tillage done on forage land, comparing moldboard plowing, Lemken in the fall, and Lemken in the spring.
 - Measuring water infiltration rates and organic matter on tillage performed on potato fields after harvest, with the intent to reduce compaction and incorporate potato vines. Comparing Lemken with rolling baskets, Lemken with packing wheels, and a modified chisel plow with a dammer diker.
- These trials will be monitored through the growing season, and yield samples will be taken in the fall of 2016.

