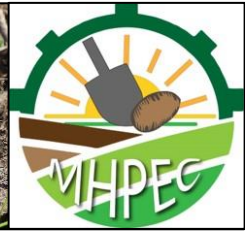


MHPEC Living Root Research Summary 2022

Principal investigator: Zack Frederick

Technician: Andrea Hamilton

Summer student: Maddison Bowley



Many thanks to our industry, grower cooperators and Northstar Seed and Union Forage!

Introduction: There has been significant interest in soil health and input efficiency within the agricultural sector over the last few years. This has included the idea of trying to keep a living root and soil armor for as much of Manitoba's frost-free period as possible. This is to help with the four ecosystem processes: nutrient and water cycling, energy flow, and rotation diversity. Soil doesn't usually have any living plants during pre-seeding and post-harvest periods of the year, otherwise known as the shoulder seasons. Cover crops, nurse crops and companion crops are all great options to increase the number of days with a living root during these shoulder seasons. **The overall goal is to help producers find different options that could help with keeping a living root in the soil for as long as possible while creating soil armor. All while increasing soil health and decreasing different social and economical issues within the potato industry.** This created two projects with a different focus: the spring shoulder season with nurse and companion crops and fall shoulder season with cover crops.

Objectives

1. Plant combinations of species together to see how they complement each other throughout the growing season whether it's within the cash crop or outside of the cash crop growth period with nurse, companion or cover crops.
2. Promote living roots growing through most of the frost-free season to help create soil armor all season long.
3. Trying to promote Nitrogen fixing legumes to try and fixate more atmospheric nitrogen to help increase nitrogen credits within the soil to potentially decrease the total nitrogen costs within potato production.
4. Observe two different seeding dates for a fall shoulder season cover crop mimicking the range of digging dates (first week of September and third week of September)
5. Observe how the integration of nurse/companion and cover crops affect plant growth, plant health, soil fertility and soil health.

2022 Conclusions

1. The nurse and companion crop treatments had similar yield, but the yield profile was more desirable with the companion crop which had half the nitrogen applied.
2. At row closure the nurse crop treatment had twice the nitrate as the companion crop treatment. While both were at sufficient levels for both soil and petioles at this time.
3. The self-seeded peas from the companion crop out competed the cover crop planted one week later.
4. Diversity of the cover crop planted can be a helpful risk management tool to get the most out of a cover crop as possible.