LIVING LAB - ATLANTIC

Fall cover crops protect the soil during fall and winter to reduce soil erosion and nitrate leaching. In some cases, harvestable winter cover crops could become a source of revenue to growers

Which cover crop species consistently overwinter in Atlantic conditions?

- Due to the long cool growing-season there is limited opportunity to establish a fall cover crop following harvest
- Harvestable fall cover crops can provide economic return to producers
- We sought to identify suitable fall seeded cover crops by comparing spring and winter species and if the inclusion of winter pea would improve agronomic characteristics

What we did

- Cover crops were drilled post Sept 15th from 2018 to 2021 (**Table 1**)
- Paired plots were established that were either soil-incorporated and planted to potato or left to determine crop yield
- We collected soil cover, crop biomass post snow-melt and prior to soil-incorporation, and final yield

Table 1: List of species seeded as fall cover crops. Pea was seeded at 14 seeds/ft^2. Seeding rates of cover crops were the same with and without winter pea

Cover crop	Seeding rate (seeds/ ft^2)
Winter wheat	36
Fall rye	36
Winter canola	45
Winter barley	36
Spring wheat	36
Oat	36
Brown mustard	45
Spring barley	36

Fig 1: Cover crops were sown in fall and left to mature or soil incorporated and planted to potato

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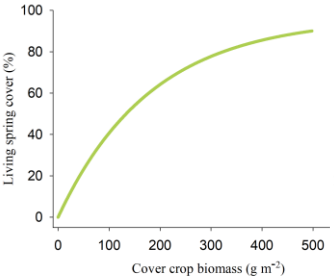

Fig 2: Relationship between cover crop biomass (g m^{-2}) and spring soil cover (%)

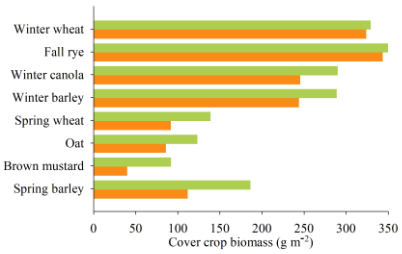

Fig 3: Cover crop biomass production with (green) and without (orange) winter pea

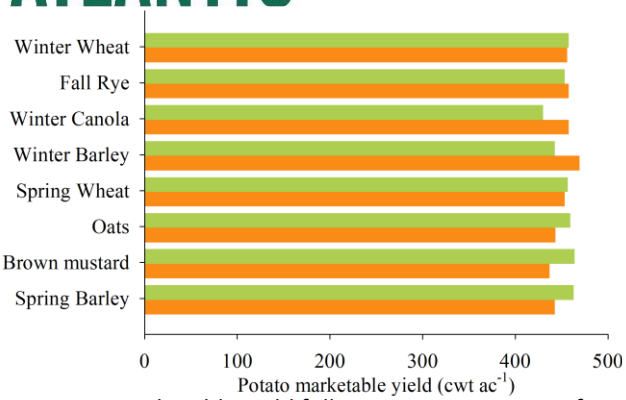

Fig 4: Potato marketable yield following incorporation of cover crops with (green) and without (orange) winter pea

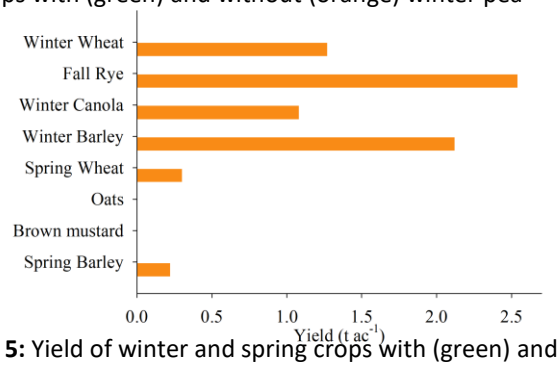

Fig 5: Yield of winter and spring crops with (green) and without (orange) winter pea

What we found

- No cover crop survived the winters of 2018 or 2019
- Spring soil cover (%) increased as cover crop biomass increased (**Fig 2**)
- Needed 275 g m^{-2} of biomass to achieve 75% soil cover (**Fig 2**)
- All winter species produced > 275 g m^{-2} when sown alone
- Winter pea did not increase survival or biomass of cover crops (**Fig 3**)
- Adding winter pea to spring species increased likelihood of adequate biomass required for soil cover
- Potato marketable yield was highest following winter species alone or spring species mixed with winter pea (**Fig 4**)
- Winter pea rotted in field preventing harvest of crops (**Fig 5**)

Conclusions

- Fall cover cropping is risky in Atlantic Canadian conditions
- All winter species tested are candidate fall cover crops
- Winter pea may prevent harvest of winter crops
- Winter species can provide economic return for producers
- If the plan is to plant potatoes, plant winter pea

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