



LIVING LAB - ATLANTIC

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Establishing Fall Cover Crops

Potato is the most economically important crop in Atlantic Canada and traditionally grown in a 2- or 3-year rotation with small grains and forages

Cover crops are increasingly being incorporated in to Atlantic Canadian rotations to combat declines in soil organic matter and soil disturbance associated with potato production

Due to the long cool growing season there is limited opportunity to establish a cover crop following harvest resulting in the soil left bare throughout the winter

Successful establishment of a fall seeded winter cover crop can provide producers a mechanism to cover the soil and reduce nitrate leaching and soil erosion prior to a potato crop

Harvestable fall cover crops can provide economic return to producers

We sought to identify suitable fall cover crops by comparing spring and vernal species, if the inclusion of winter pea would improve agronomic characteristics, and their impact on potato yield

Materials & Methods

Crops were drilled post September 15th from 2018 – 2022

Paired plots were established that were either soil-incorporated and planted to potato or left to determine crop yield

Data was collected at two time points: (1) post snow-ablation, and (2) prior to soil-incorporation

Data collection included: cover (%), crop biomass, pea biomass, weed biomass, soil temperature, soil moisture, crop height and leaf area index

Data was analyzed as a linear mixed effects model in the R environment. Crop, pea and their interaction were treated as fixed effects and year and replication were treated as random effects. Means were separated with a Tukey's HSD ($\alpha = 0.05$).

Table 1: List of cover crop species, vernalization requirement and seeding rate used in this study. All cover crops were also sown with Austrian winter pea at 150 seeds m⁻². Seeding rates were the same with and without pea

Cover Crop	Spring/Vernal	Seeding Rate (seeds m ⁻²)
Oat	Spring	400
Brown mustard	Spring	500
Wheat	Spring	400
Barley	Spring	400
Fall rye	Vernal	400
Winter canola	Vernal	500
Wheat	Vernal	400
Barley	Vernal	400



Results

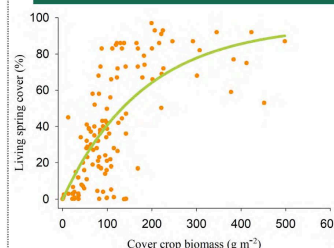


Figure 1. Relationship between cover crop biomass and ground cover

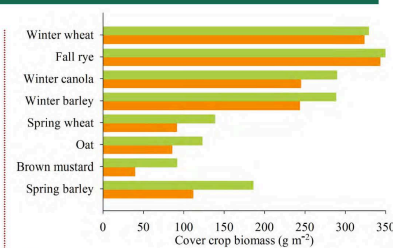


Figure 2. Cover crop biomass production

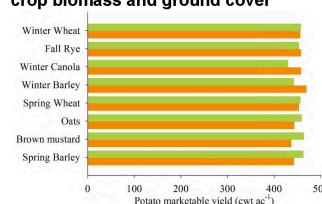


Figure 3. Marketable potato yield

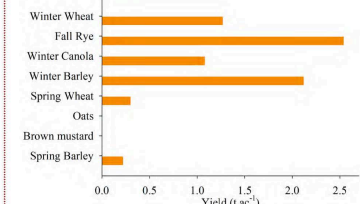


Figure 4. Yield of cover crops

Results

Cover crops did not survive the winter in 2018 or 2019

Ground cover increased with cover crop biomass (Figure 1)

Adding pea did not improve winter survival or biomass production of any crop (Figure 2)

Adding pea increased likelihood of ensuring living ground cover in spring when sown with spring crops

Adding pea did not impact subsequent potato yield (Figure 3)

There was a slight reduction in potato yield following incorporation of vernal crop species alone (Figure 3)

By crop maturity peas had rotted in field preventing crop harvest (Figure 4)



Conclusions

Fall cover cropping is risky in Atlantic Canada

Winter pea is a good fall cover crop for Atlantic Canada

Vernal crop species can provide economic return

If the plan is to plant potatoes, plant winter pea

