Covering Ground: Interseeded Cover Crops in Late Season Vegetables

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Background

- Maine survey showed that 77.8% of farmer respondents (n=21) are limited in their ability to plant cover crops due to “late season cash crops coming out too late”.

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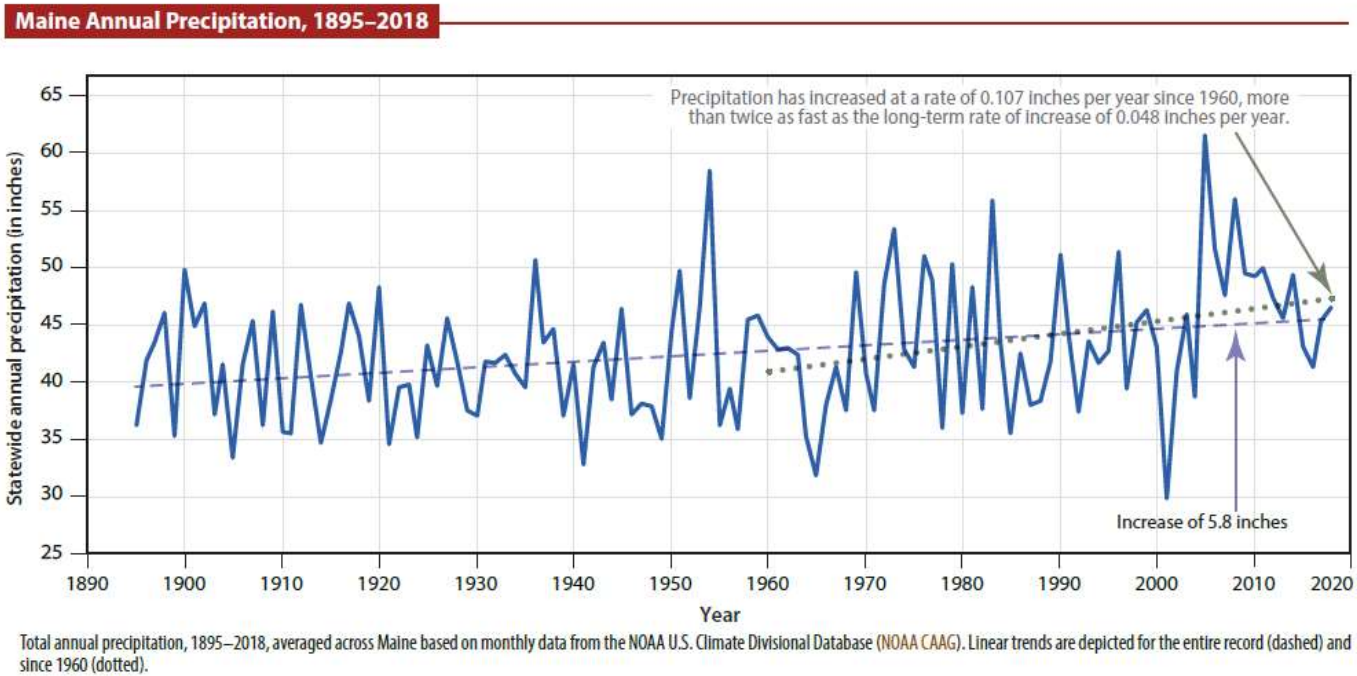
Lilley and Schattman, 2020

Background



Total annual precipitation, 1895–2018, averaged across Maine based on monthly data from the NOAA U.S. Climate Divisional Database (NOAA CAAG). Linear trends are depicted for the entire record (dashed) and since 1960 (dotted).

The northeast is forecasted to experience longer spring wet periods in coming decades, making bare spring soils increasingly vulnerable.

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Fernandez, I., S. Birkel, C. Schmitt, J. Simonson, B. Lyon, A. Pershing, E. Stancioff, G. Jacobson, and P. Mayewski. 2020. Maine's Climate Future 2020 Update. Orono, ME: University of Maine. climatechange.umaine.edu/climate-matters/maines-climate-future/

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Research Questions

1. How does interseeding cover crops in late season cabbage and, separately, sweet corn **affect crop productivity**?
2. What **planting methods** work best to establish interseeded cover crops?
3. What **planting dates** (based on crop growth stage) will optimize both cover crop biomass development and cash crop productivity in the Northeast?
4. What **cover crop species** are best suited for late-season establishment in our region?
5. What are the equipment, timing, labor and other **logistical barriers** to interseeding cover crops in Northern New England?

Hypothesis

1. Interseeding at V5 growth stage of sweet corn and 21 DAT in fall cabbage will result in high cover crop biomass with no negative effects on the crops.

2. Incorporation of cover crop seed into the soil will result in the best cover crop germination, biomass, and weed control.

3. Utilizing lower biomass cover crops such as annual ryegrass and crimson clover will minimize nutrient and water competition with cash crops.

Materials and Methods

4 Trials at University of Maine Roger's Farm over 2 seasons (2022 and 2023 growing seasons).

4 Demos with Collaborating Farms. .

Trial A

- Timing x seeding method in **Sweet Corn** (Annual Ryegrass+Crimson Clover).
- Timing x seeding method in **Cabbage** (Annual Ryegrass+Crimson Clover).
  - 25 lb/A 60% ryegrass:40% clover

Trial B

- Cover crop species trial in Sweet corn
  - Annual Ryegrass+Crimson Clover
  - Oat+Pea
  - Winter Rye+Hairy Vetch
  - Control

Materials and Methods

Trial A: Cabbage Timing Trial

Timing treatments

- Cabbage- 17 Days After Transplanting (DAT), 23DAT, 31DAT, Post Harvest

Seeding method treatments

- Broadcast cover crop seed, Broadcast and Incorporate, Drill (Earthway Seeder)

Variety

- Storage #4

Spacing

- Beds 5.5ft center to center.
- 18" between-rows in bed, 18" in-row spacing.

Materials and Methods

Trial A: Corn Timing Trial

Timing treatments

- Corn- v3, v5, v7, and Post Harvest

Seeding method treatments

- Broadcast cover crop seed, Broadcast and Incorporate, Drill (Earthway Seeder)

Variety

- Montauk

Spacing

- 30" between rows. seeded with corn seeder.

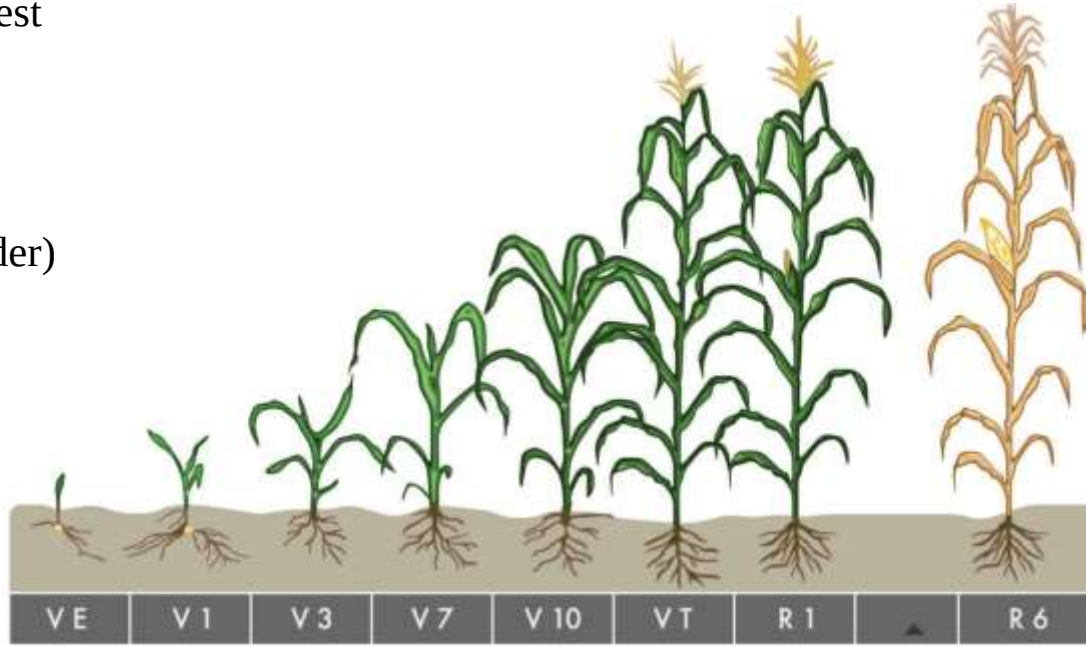
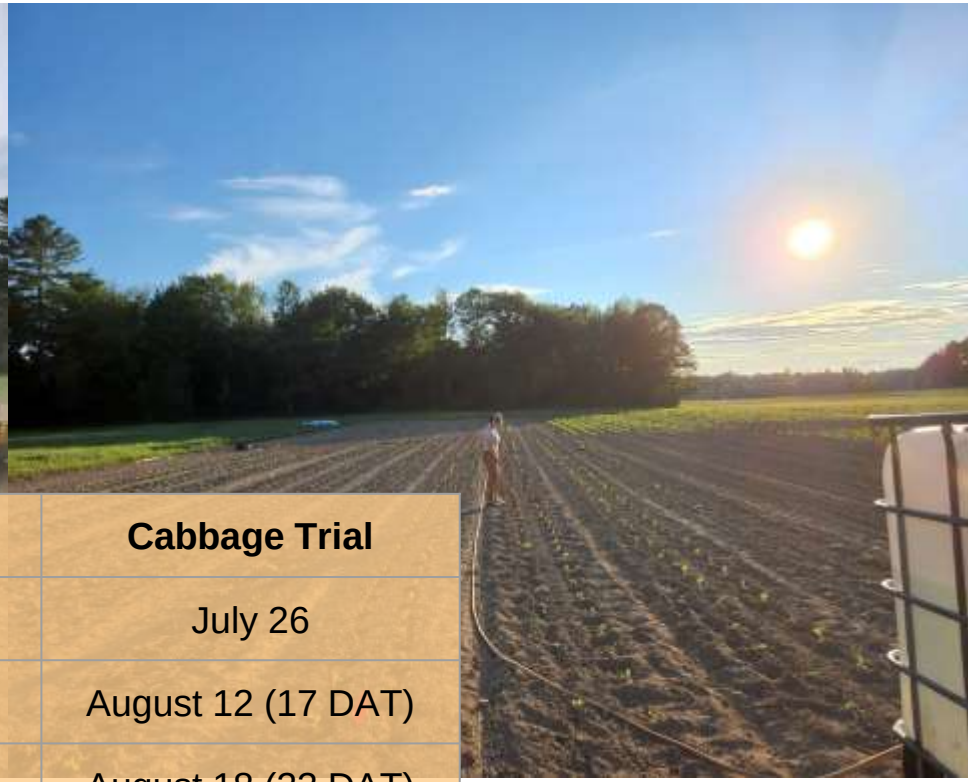


Figure 1: Corn growth stages

Corn seeder planting corn

Cabbage being watered after transplanting



PROJECT TIMELINE	Corn Trial	Cabbage Trial
Crop Planted/Transplanted	July 5	July 26
1st Cover Crop Seeding	August 3 (V3)	August 12 (17 DAT)
2nd Cover Crop Seeding	August 18 (V5)	August 18 (23 DAT)
3rd Cover Crop Seeding	August 30 (V7)	August 26 (31 DAT)
Harvest	September 27	October 20

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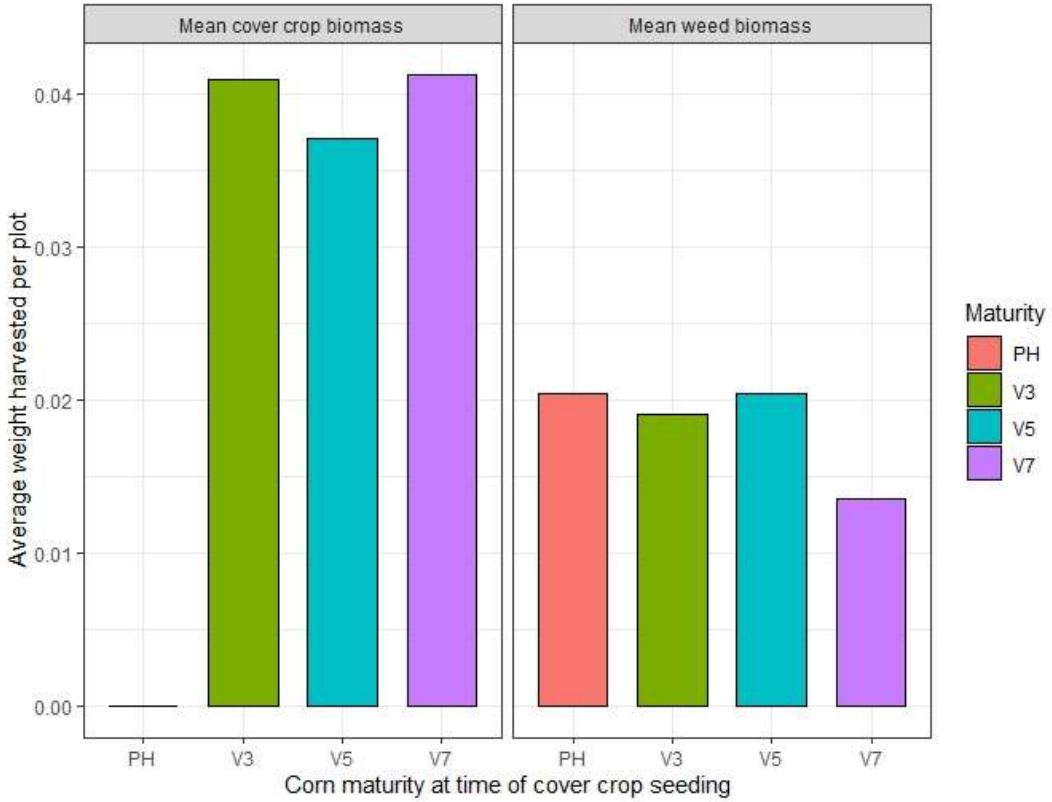
Materials and Methods

Parameters

- Soil Nitrate
- Soil Moisture
- Weed Biomass
- Crop Yield
- Cover Crop Biomass

Results

Corn Trial- Cover Crop and Weed Densities (Nov. 17)



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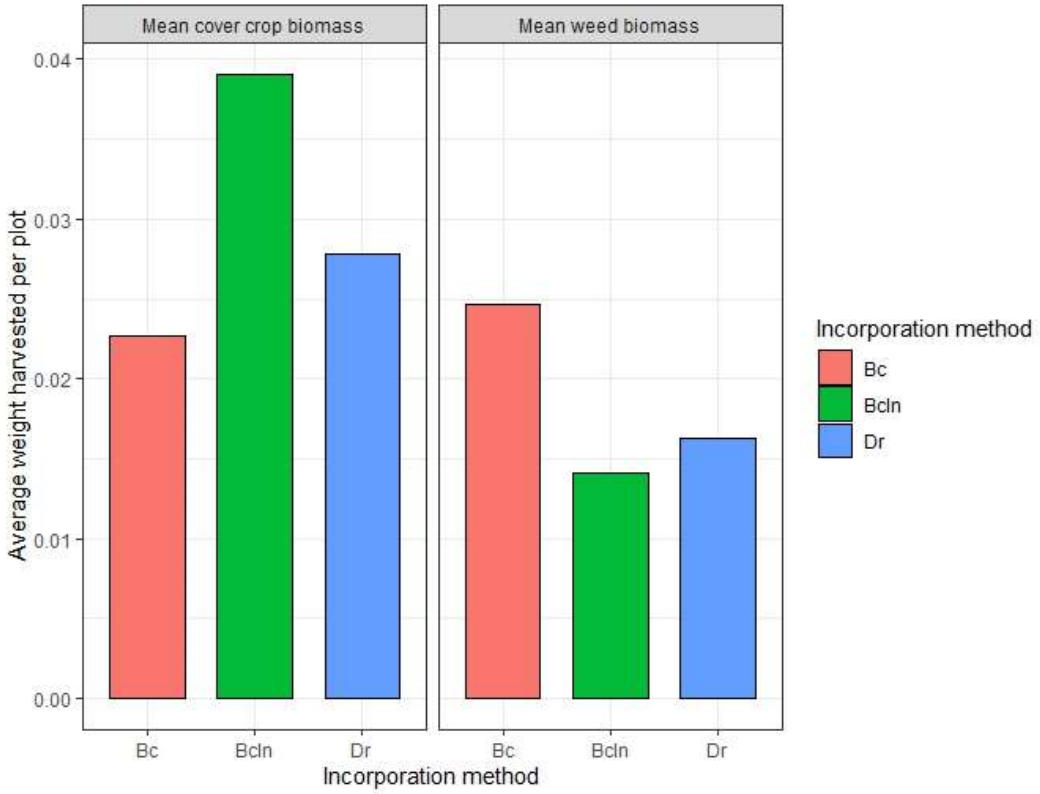
Corn Trial Seeding Method Effects on Cover Crop and Weed Biomass (Nov. 17)



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Corn species cover crop biomass assessment

Annual Ryegrass+
Crimson Clover

Control

Winter Rye+Hairy
Vetch

Oats+Field Peas

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Potential Drawbacks

- Row Spacing
- Herbicide Interactions
- Labor Demands at Seeding Time
- Pest Concerns

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Equipment Options

- Seed mixed with Fertilizer in spin spreader at sidedressing and last cultivation
- G-Cultivator with front mounted drop spreader, and belly seeding units.
- Strawberry Rotovator can be adjusted to work in seed over plastic or between rows
- Orbit Air Seeder for sidedressing or interseeding in corn.
    - Drop tube has deflectors to spread seed
    - Lilliston cultivators for incorporation.

Next Steps

- Analysing results of 1st year trials.
- Second year of trials Fall 2023.
- Publications, guides and outreaches through field days.

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Wrap Up

- Observationally, there were no differences in yields by seeding timing.
- Final cultivation lines up well with previous research findings of optimal timing for interseeding.
- Incorporation of seeds lead to a better cover crop biomass, and reduced weed density.
- Growers are using a diversity of available equipment to streamline this practice.
- Get creative and trial on a small scale. Feel free to reach out and keep us posted with your experiences.

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THANK YOU!

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The Agroecology Lab

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Project # LNE22-451R

Research Layout