Grass Farming Research:
Cocktail Cover Crop Grazing Trials on a Champlain Valley Research Farm

About the research

The Center's research team is investigating methods to sustainably recover soil health and pasture forage ecosystems as they relate to the production of high quality grass-fed, grass-finished beef. Because cover crop mixes (so-called "cocktails") can provide so many benefits within the ecosystem of the farm, they are a key part of this research project.

Research shows that grazing fresh pastures is the most economical way to convert solar energy into protein and fiber. At the same time, hay and supplementation are often a producer's largest expense. By deepening our understanding of the costs and benefits of the specific practices and relationships that are at the heart of successful pasture-based farming, we can support farmers, communities, animal health and welfare, and the natural environment we share.

Background and Methodology

The research location is a 400-acre Champlain Valley diversified beef farm with long previous use as a dairy operation. Past practices that include heavy tillage and synthetic inputs, as well as increased frequency of extreme weather events, have contributed to soil erosion and disaggregation and resulted in degraded fields. In 2016 and 2017, right after the first cut of hay, we no-till-drilled subplots with four different cover crop mixes - two warm-season mixes were planted in May (C and D, detailed on the other side of this page), and two cool-season mixes followed into those plots (A and B), at the end of August, seeded in after sheep and cows grazed the remainders of the warm-season growth.

Questions?
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Goals

Goals for the cover crops varied across the farm, depending on the conditions and needs of specific fields:

1. Increasing soil health, in particular by building soil organic matter, increasing micro-and macro-nutrients and cation exchange capacity
2. Providing a natural control of a persistent stand of reed canary grass
3. Supporting pasture productivity by increasing biodiversity, particularly by attracting pollinators
4. Dodging the "summer slump"
5. Extending the grazing season
6. Providing additional support to animals with high nutritional requirements: lactating cows, stockers, etc.

Preliminary Observations:

- Once drainage issues were addressed in a field in which they had been a problem, cool-season cover crop mixes (A and B at right) were able to be established normally, particularly winter rye and brassicas, and grew well until late November.
- It was more effective to plant into broken or semi-disturbed sod than to seed into existing growth. This challenged some of our soil health objectives because plowing and tilling break up the soil's structure.
- Plant species within each mix germinated adequately and started growing when no-till-seeded into the sod.
- These mixes successfully maintained growth and productivity through the summer period; even when warm season mixes slowed down, the cool-season plants in the mix were also growing.

Details, Cost & Yield

Mix A (cool season)

Triticale (42%);
Italian Rye Grass (22%);
Winter Peas (14%);
Phacelia (8%);
Red clover (8%);
Kale (4%)

cost: $142/acre **yield: 2751.7 lbs./acre**

Mix B (cool season)

Oats (38%);
Festulolium (21%);
Sweet Clover (16%);
Hairy Vetch (13%);
Turnip (6%);
Rapeseed (5%)

cost: $144/acre **yield: 2833.3 lbs./acre**

Mix C (warm season)

Dwarf BMR Pearl Millet (33%);
Foxtail Pearl Millet (22%);
Maxum Field Peas (16%);
Sun Hemp (13%);
Buckwheat (8.6%);
Rapeseed (7%)

cost: $128/acre **yield: 3519.3 lbs./acre**

Mix D (warm season)

Pearl Millet (30%);
Annual Rye Grass (26%);
Windham Winter Peas (18%);
Alfalfa (12%);
Forage Radish (8%);
T-Raptor turnips (6%)

cost: $168/acre **yield: 2898.7 lbs./acre**

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