

# CHAMPLAIN VALLEY CROP, SOIL & PASTURE TEAM



THE UNIVERSITY OF VERMONT

EXTENSION

SUMMER 2021

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## FOCUS ON AGRICULTURE

By Kirsten Workman, Agronomy Outreach Professional Sr.

It seems that a collective sigh of relief has been released all across Vermont as the impacts of COVID-19 have either become more manageable or are becoming a thing of the past. As more Vermonters receive vaccinations and rates of infection plummet, we have started resuming in-person life and taken our masks off. At the same time, spring gave us pretty nice weather for early field work, allowing time for manure application, field prep, planting, first-cut hay, and an early grazing season.

While we take that sigh of relief, we can turn our attention to what's in the air. Look at how farmers are impacting climate change and how their practices can influence greenhouse gas emissions, carbon sequestration, and enhanced water infiltration. There are SO MANY projects going on simultaneously which you will read about in this newsletter. Jeff Carter explains the complexity surrounding carbon in your farm soils, and describes state and local climate initiatives, while Kristin Williams shares a new soil health testing effort underway in Vermont.

A brand-new project on one Addison County dairy farm brings together many of these ongoing initiatives. Audet's Blue Spruce Farm in Bridport is no stranger to innovations in sustainability, they are host to the edge-of-field water quality

research site for our Conservation Effects Assessment Program (CEAP) and are also a key partner in a national project which is part of the Innovation Center for U.S. Dairy's Net Zero Initiative (<https://www.usdairy.com/about-us/innovation-center>). This is a nationwide effort to quantify the impact of farm conservation practices and evaluate the potential for the U.S. dairy industry to reach net zero environmental goals by 2050. In Vermont, Joshua Faulkner (UVM Extension's farming and climate change program coordinator) is leading an interdisciplinary team of researchers, including myself, to measure the impact of an optimal soil health management program.

This work is part of a six-year, multi-institutional project funded with money from the Foundation for Food and Agriculture Research (FFAR) (<https://foundationfar.org/>), corporate partners and in-kind support to evaluate changes in greenhouse gas emissions, soil carbon storage, soil health and water quality at dozens of farms across the major dairy producing regions of the country. Learn more by visiting <https://www.uvm.edu/cals/news/soil-health-climate-change>.

We hope your 2021 season is a breath of fresh air and look forward to seeing more of you out in the field.



*A rainbow over a winter rye cover crop field which is going to seed, taken after a welcome rainstorm.*

# NEWS, EVENTS & INFO YOU SHOULD KNOW

## April Webinar on Manure Injection Now Available On-demand (and with credits!)

Kirsten Workman joined Jeff Sanders of the Northwest Crops and Soils Team and custom manure applicator Eric Severy to present a webinar on grassland manure injection. They discussed the basics of injection, inline nutrient sensing, and the impacts of injection on nutrient management. If you missed the webinar, you can still watch it on-demand and get a water quality educational credit (for custom applicators). Visit the “Water Quality Educational Credits” page on the Vermont Agency of Agriculture, Food and Market’s (VAAFM) website (<https://agriculture.vermont.gov/water-quality-educational-credits>) for the link to the “Manure Injection Webinar” and the quiz (worth one credit).

## Farm Agronomic Practices (FAP) Grant - Vermont Agency of Agriculture, Food and Markets

Cover Crop Application Deadline: August 1

The Farm Agronomic Practices (FAP) Program provides up to \$8,000 to farms to implement soil-based agronomic practices that improve soil quality, increase crop production, and reduce erosion and agricultural waste discharges. Eligible practices for FAP payments include rotational grazing, cover cropping, conservation crop rotation, conservation tillage, no-till pasture and hayland renovation, manure injections, and educational/instructional activities. Contact VAAFM with questions or for more details at 802-622-4098 or visit <https://agriculture.vermont.gov/fap>.

## New Grant Provides IPM Weed Management in Pasture and Hayland Outreach to Landowners

UVM and UNH received a two-year grant to promote Integrated Pest Management (IPM) weed management practices. This project will include case studies, webinars, short videos and a weed identification website. The team will produce outreach materials on perennial forage management for farmers and non-farmer landowners (who rent land to farmers). Watch for more information in future newsletters, and to stay updated with the program contact Kristin Williams at [kristin.williams@uvm.edu](mailto:kristin.williams@uvm.edu).

## Addison County Fair and Field Days is Back – AND We Hope to See You There!

The Fair is scheduled for Tuesday, August 10 through Saturday, August 14. For schedule, exhibits and forms visit <https://www.addisoncountyfielddays.com>. *We need your crop submissions to make our display spectacular!* Submit your crops at the north end of the 4-H Exhibit Building on Monday, August 9, between 8:00 a.m. and noon. Judging begins at 1 p.m. Entry rules and categories are on page 7.

## Intra-Family Mediation and Counseling for Vermont Dairy Farm Families

With support from the Working Lands Enterprise Fund, the Environmental Mediation Center’s Vermont Agricultural Mediation Program (VTAMP) has initiated a project designed to help dairy farms reach consensus among family members and/or business partners about future operations of their dairy farm. While VTAMP currently provides free mediation services to farmers in Vermont on financial or credit concerns and other issues, this project provides for additional critical services and will combine counseling, mediation, and financial and technical advice. The project will partner with Vermont Housing and Conservation Board’s (VHCB, <https://www.vhcb.org/>) Vermont Farm and Forest Viability Program (which provides business and financial planning support) and use intra-family mediation to reach consensus on the best path forward. For more information or to enroll, please contact Matt Strassberg at the Vermont Agricultural Mediation Program at (802) 583-1100 ext. 101 or at [matts@emcenter.org](mailto:matts@emcenter.org), or visit [www.vtamp.org](http://www.vtamp.org).

## Hot off the press! The “State of the Lake 2021 Report”

The Lake Champlain Basin Program “2021 State of the Lake and Ecosystem Indicators” report was just released. If you want to understand how ecosystem managers are making decisions about Lake Champlain, it is worth reading, <https://www.lcbp.org/2021/06/17048/>.

## Our Survey Needs More Respondents and We Still Need YOUR Input!!

All of our work, including the publication of this newsletter, is grant funded. We need to demonstrate impact to keep our grants going, which means establishing that our work matters to YOU! Please help us by filling out a VERY SHORT anonymous 3-question survey at [go.uvm.edu/cvcropssurvey](http://go.uvm.edu/cvcropssurvey).





# OPPORTUNITY FOR FARMERS TO DEVELOP GRAZING PLANS

By Cheryl Cesario, Grazing Outreach Professional



When farmers are considering grazing as a new management practice, or want to change or improve their existing system, many questions arise - from both the animal and land perspectives. Is this going to work? Will my animals respond well? What will this look like on my farm? How will I do it?

These are all reasonable questions that are not easily answered in a one- or two-hour farm visit. I find the most successful grazing systems develop from farmer involvement in the planning process as well as having relationships with service providers and with other farmers who can answer questions and share ideas.

This fall, through Northeast SARE funding, we will again offer a grazing management course for farmers to learn about the benefits and challenges of grazing from both economic and environmental perspectives. Participating farmers will develop a plan specific to their own operation that considers their personalized farm goals.

The class will meet once per week over the course of a month and each farmer will receive a copy of Sarah Flack's book "The Art and Science of Grazing" as both the course textbook and helpful future reference. Outside of class, one-on-one farm visits will provide additional support as new practices and strategies are implemented on the ground.

Here is a sampling of what the class will cover:

- Pasture plant identification of common species, looking at favorable growth conditions, and how plants respond to grazing impact.

- Pasture nutrition and how it can affect grazing behavior, and overall intake and animal performance.
- Grazing management concepts such as measuring dry matter availability, determining paddock sizes, stocking rate versus stocking density, and overall acreage requirements.
- Soil health in pasture systems and the benefits of soil, forage and manure testing to understand nutrient cycling and management within pasture systems.
- Pasture system design to determine infrastructure needs and management techniques to avoid overgrazing damage, decreased carrying capacity, and other negative impacts.
- Grazing record keeping systems and the benefits of monitoring and documenting activities.

Eligible farmers will be able to use the grazing plan developed during the class to apply for USDA Natural Resources Conservation Service (NRCS) or state funding opportunities to help cost-share a variety of grazing practices. However, new infrastructure alone will not create improvements. Achieving healthy pasture ecosystems requires an understanding of the relationship between the soil, plants and livestock grazing behavior. A clear goal and a plan based on plant and animal needs is essential for success.

This is a two-year funded SARE project. Classes will begin in fall 2021. Each class provides up to 12 hours of classroom and planning time. For more information, please contact Cheryl at [cheryl.cesario@uvm.edu](mailto:cheryl.cesario@uvm.edu) or 802-388-4969 ext. 346.



*A grazing stick is a great tool to estimate available forage in a field and plan your grazing paddocks. We will learn how to calculate pasture forage availability in our class.*



*Grazers have many new tools to optimize forage intake and grass health. We will discuss tools, what fits best for your farm, and funding opportunities.*



# MANAGING NITROGEN IN HAY AND PASTURE CROPS

By Kirsten Workman, Agronomy Outreach Professional Sr.



Perennial crops can be hard to target for nitrogen (N) applications, as the decision often depends on stage of establishment and species composition. Both factors change over time and adjustments should be made from season to season, or even within the same season. Below are factors to consider when trying to target the most efficient use of manure-based and purchased nitrogen in your perennial crops.

## Species

Grass and legumes (alfalfa, clovers, trefoil) each have very different nitrogen needs. Grass crops will respond readily to both manure-based and fertilizer-based nitrogen. Grass species not only reward adequate N supply with increased yield, but also increased quality. Applying up to (and sometimes over) 200 pounds of nitrogen per acre on grasses almost always yields an economically viable response.

Legumes, on the other hand, do not need additional nitrogen from manure or fertilizer. Legumes have a fascinating symbiotic relationship with a soil-borne bacteria known as rhizobia. Rhizobia fixes atmospheric nitrogen in nodules on the roots that it colonizes,

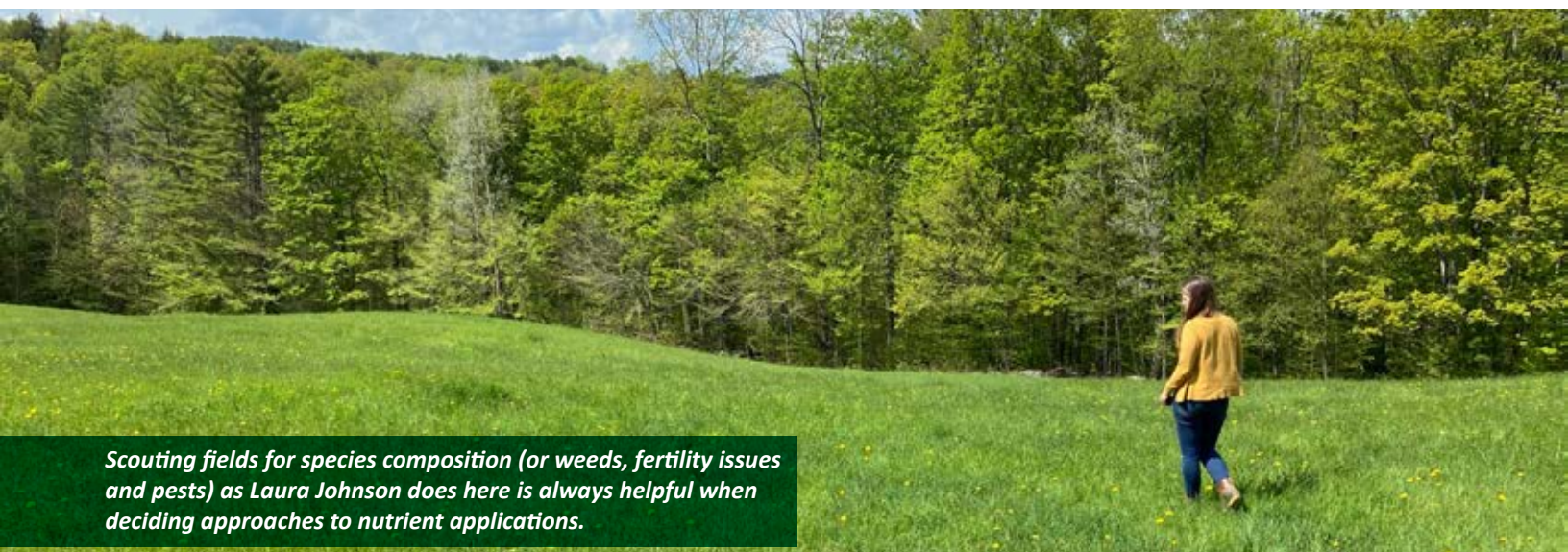
and then transforms it into plant-available nitrogen.

As a result, a clear stand of clover or alfalfa would not need additional nitrogen fertilizer or manure to reach maximum yield or quality. However, very few hay or pasture stands in Vermont are 100% grass or legume, and most farmers want a combination to maximize the benefits of species diversity and production. In these cases, we adjust the recommended nitrogen application rate to maximize production but still encourage the legumes in the stand to fix nitrogen.

Fixing nitrogen is a trade-off for the plant, which shares carbohydrates with the rhizobia. This means that if extra nitrogen is available, plants can become “lazy” and not invest energy in that association. Additionally, a mixed stand with legumes that is treated with N up to the grass rates will encourage a shift of dominant species towards grasses as the grasses begin to outcompete the legumes.

The table below shows how the nitrogen recommendations change depending on the legume content of the stand. In this case, grass is defined as any stand with less than 30% legume.

Crop-Species Composition		Nitrogen to Apply Annually (lbs./acre)
Grass	(< 30% legume)	80-240 (varies with yield)
Grass/Legume mixture (30-60% legume)		40-80
Legume	(> 60% legume)	0
Pasture	(< 30% legume)	50-100
Pasture	(30-60% legume)	0



Scouting fields for species composition (or weeds, fertility issues and pests) as Laura Johnson does here is always helpful when deciding approaches to nutrient applications.





*Balancing the nitrogen needs of grasses and clovers in a mixed stand can be tricky, lower application rates based on recommendations can help keep clovers and other legumes in your stand.*

## Split Applications

Because N is mobile (both in the soil and the plant), it is important to split applications to maximize uptake by the plant and reduce losses. With hay and pasture, fortunately, we take multiple harvests and have the opportunity to split applications into reasonable amounts to be utilized by the crop over the course of the season:

- Grass: split applications into 50 to 75 pounds per acre increments, ideally following each harvest.
- Mixed stands (30-60% legume): one single 40-pound application; if applied in early spring, a second 40-pound application may be beneficial.

## N During Establishment (New Seedings)

Nitrogen fertility is not recommended for establishing legumes and mixtures. The exception is when a small grain is seeded with the legume or mixture. In this case, a 30 pound per acre application is recommended to get the companion crop up and growing ahead of the weeds.

For a new grass seeding, the following recommendations apply:

- 50 pounds per acre for a spring seeded crop.
- If more than one harvest occurs in the seeding year, a second application of 40 to 50 pounds should be applied.
- Late summer seedings only need 30 pounds per acre.

## Reducing Needed N With Maintenance of Legumes

If nutrients are limited and you are trying to reserve manure-based nitrogen for crops like corn or pure grass, take steps to maintain legumes in your stand. This will reduce or eliminate the need for manure or purchased nitrogen. Strategies to help maintain legumes include:

- Maintain higher soil pH (6.8).
- Leave adequate crop residual between cuttings, but especially after your last cutting.
- Consider a less intensive cutting schedule to ensure adequate regrowth between harvests. Time your last harvest to allow for adequate regrowth before frost.
- Monitor and maintain adequate potassium and boron levels in the soil.

At the end of the day, managing nitrogen resources on hay and pasture crops will pay off. A well-fertilized grass crop will pay you back in most years. However, manure is especially tricky, as it is easy to overapply N on mixed stands and this can contribute to legumes becoming less competitive, leaving the stand open to weeds. If you want to maintain legumes, back off on N and manage for legumes. Split applications for the best effect and, if possible, utilize low disturbance injection to really make the most of N in manure applications.

Making nutrient management decisions systematically on your farm and keeping good records is all part of having a nutrient management plan. Even without a formal plan, you can make informed decisions based on these basic principles. We are here to help farmers optimize yields and manage their inputs wisely.

\*All recommendations are from “Nutrient Recommendations for Field Crops in Vermont” (September 2020, <https://go.uvm.edu/br1390>). For specific recommendations, consult your crop adviser or call Kirsten for more information.

If you would like help managing nutrient application rates, or have other related nitrogen questions, contact Kirsten at [kirsten.workman@uvm.edu](mailto:kirsten.workman@uvm.edu) or 802-338-4969 ext. 347.



# HOW MUCH CARBON SHOULD YOU ADD TO YOUR SOIL?

By Jeff Carter, Agronomy Specialist

Adding carbon to agricultural soils is being tossed about as the preferred currency for extra payments to support farms, improve soil health for better crops, hold precious rainwater, and reduce those pesky CO<sub>2</sub> greenhouse gases (GHG) in the atmosphere which are hurting our planet. This leaves farmers and service providers asking, “how much carbon should we be trying to add to our soils?” The short answer is, “as much as you can.”

Right now, the Vermont Climate Council, the Payment for Ecosystem Services (PES) workgroup, and the Addison County Climate and Economy Action Committee (CEAC) are all discussing the values of increasing carbon in farm fields, for short-term income, long-term soil base preservation, and GHG mitigation. Easy to talk about, but much harder to accomplish if you are a farmer.

Adding carbon to your soil is done by increasing the organic matter (OM) content. Does that mean “just” utilize practices that add OM and you automatically increase carbon in the soil, then test soils for OM and we have the number?

Not so fast, since the organic matter amount seen on a test result is only about 58% stable organic carbon which soil micro-organisms can use for their own growth, which can then be mineralized and utilized by crops. A major increase of permanent carbon storage in soil—known as sequestration—is not an easy task.

But it can be done, and many farmers are doing it. No-till corn with cover crops, rotational grazing pastures, permanent grass fields, and fields growing up to brush all gain in organic matter over time. The question is, “can we do this fast enough for a true carbon credit?” I think we can, and so do many other people. Right now, across the state and the nation there are agencies, organizations and farmer groups all trying to identify the best way to account for, model, and measure potential and actual carbon sequestration. The potential to sequester thousands of tons of carbon in Vermont soils will make a huge difference for our agriculture of the future.

Check out these sites for the status of these projects in Vermont:

- <https://aoa.vermont.gov/content/vermont-climate-council>
- <https://agriculture.vermont.gov/pes>
- <https://ceacac.org/climate-action-planning/>

# SOIL HEALTH TESTING COMING TO A FIELD NEAR YOU

By Kristin Williams, Agronomy Outreach Specialist

UVM Extension is engaged in a long-term watershed research project as part of a national monitoring and research network established by the USDA. This project is known as the Conservation Effects Assessment Project (CEAP) and is led by Joshua Faulkner. The current water quality data is in what we call baseline or calibration years. The two focus areas in Addison County are the east and west branches of the Dead Creek, and the Headwaters of Little Otter Creek. Blue Spruce Farm, a key partner on the CEAP project, is also a partner in a new FFAR-funded project Kirsten Workman referenced on page 1.

I am assisting Joshua in CEAP data collection and analysis of farmer conservation practices. This will be a long-term effort involving many partners (with farmer permission) including the Farm Service Agency (FSA), Natural Resource Conservation Service (NRCS), and farmer service providers. As the CEAP progresses, more farmers in the area may hear from Joshua, Kirsten, Laura Johnson or me as we collect data on farmer conservation practices which we hope to link back to the water quality data. We are currently wrapping up Cornell soil health testing on a subset of 70 fields within these two study areas, with assistance from Jeff Farber at Vermont Association of Conservation Districts (VACD). Michelle Smith is coordinating field visits from multiple district employees to accomplish the actual sampling. It takes a team to accomplish these big goals!

Alissa White, a UVM Gund Institute for the Environment postdoctoral fellow, is conducting statewide soil health testing and soil carbon testing analysis. She has already collected 160 soil samples across various soil types and management conditions in Vermont to assess the “State of Soil Health.” In addition to the Cornell soil health test, she is taking additional samples to assess soil biological diversity (through DNA analysis), and a special deep core (30 cm. depth) soil carbon measure. The latter is designed to align with a test that may be conducted for a future carbon credit system. We partnered with her on tests conducted in Addison County for use in her research and for CEAP. She also visited my family’s farm in the Connecticut River Valley where I caught up with her and Jennifer Byrne of the White River Conservation District.

Our work is at the confluence of water quality, soil health, farm profitability, and climate change mitigation and adaptation. We hope to demonstrate how practices have a stacking effect, benefiting multiple farm and community values.

For more information, contact [kristin.williams@uvm.edu](mailto:kristin.williams@uvm.edu), [joshua.faulkner@uvm.edu](mailto:joshua.faulkner@uvm.edu), or [alissa.white@uvm.edu](mailto:alissa.white@uvm.edu).

# ON THE WILD SIDE

## By Jeff Carter, Agronomy Specialist

I have had great success utilizing summer seedings in early August to grow high quality food plots for fall. The same system used in farm fields for seeding pastures and hay fields works for clover, chicory, peas, radishes and Brassicas for wildlife food plots. Remember that warm soil and fewer weeds means the new crop can grow very fast compared to an early spring seeding. However, water is needed for good germination, so wait until the hot dry days of July have passed. The seeding rates (below) are in pounds per acre (43,560 sq. ft.) so adjust according to your food plot size. Make sure to take a soil test before any crop planting, and remember to feed your crops lime and fertilizer if you want to feed the wildlife. Find wildlife food plot recommendations at <https://go.uvm.edu/ag-testing>.

I like to plant these mixes in separate plots, or side-by-side, right at the end of July or the first week in August:

- Cool season perennial: 8 pounds clover mix plus 4 pounds chicory per acre. Add 30 pounds of oats as a nurse crop (and to keep the bears busy) while the clover gets good roots established.
- Cool season annual: 6 pounds Brassica mix, plus 2 pounds radish per acre. Overseed 100 pounds of oat/wheat/rye mix 30 days later for a tasty treat in late fall that provides for winter feed and spring green-up.

Toward the end of August, try this mix:

- Cool season Annual: 50 pounds oats plus 50 pounds winter



*Use a trail camera to track use of food plots by wildlife. You never know what might show up.*

peas. Add 100 pounds of wheat or rye in early September for that extra boost of feed.

Reach out to Jeff if you have questions on food plots at [jeff.carter@uvm.edu](mailto:jeff.carter@uvm.edu) or 802-388-4969 ext. 332.

## ADDISON COUNTY FAIR & FIELD DAYS CROP ENTRY INFORMATION

Submit one entry per farm in each class. ALL entries must be produced on the exhibitor's farm. Crops will be awarded ribbons as follows:

- Blue - Excellent (\$15)
- Red - Good (\$10)
- White - Fair (\$5)
- Best of Class (\$25)
- Best of Show (\$50)

### Whole Plants

Corn Plants: 3 whole plants with roots

Soybeans: 10 plants with roots

Cereal Grains: 20 stems (wheat, barley, oat, rye)

### Silage Crops

Corn Silage: 1 quart jar

Corn Snaplage of Ground Ear Corn: 1 quart jar

Grass Haylage: 1 quart jar

Legume Haylage (alfalfa, clover): 1 quart jar

Baled/Wrapped Silage Hay

Samples will be judged on:

- Freedom from plant defects or contamination.
- Yield and crop quality potential.
- Proper maturity at harvest for storage.
- Proper moisture content for storage.
- Conformation of size and uniformity.

### Dry Hay

1st Cut Legume Hay (alfalfa, clover): 1 slice of bale

1st Cut Grass Hay: 1 slice of bale

2nd Cut Legume Hay (alfalfa, clover): 1 slice of bale

2nd Cut Grass Hay: 1 slice of bale

\* Note there is no mixed legume hay category.

### Grain Crops

Corn Grain Whole Kernel: 1 quart jar

Corn Grain Ground: 1 quart jar

Soybean Grain: 1 quart jar

Cereal Grain (wheat, barley, oat, rye): 1 quart jar

Other Dry Grain (oilseed, buckwheat, other): 1 quart





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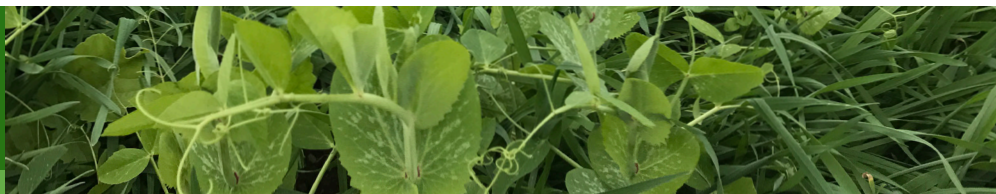
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