Champlain Valley CROP, SOIL & PASTURE Team

University of Vermont | Extension
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Spring 2025 Newsletter

Management of Fall-Planted Cover Crops in Spring

Shawn Lucas, Assistant Professor, Extension Agronomy

A sure sign of spring in Vermont is that fall planted cover crops are growing fast. These cover crops are important in modern crop systems because they have many beneficial functions including erosion control, nutrient inputs (particularly with leguminous cover crops), scavenging excess soil nutrients in fall, building soil organic matter, promoting soil structure, reducing compaction, suppressing weeds, and enhancing biological activity. A farm's reasons for growing cover crops depend on the goals of the operation. For some the cover crop is simply a tool that keeps the soil covered between summer crops. Others try to maximize growth to build soil health and get the most benefit from cover crops. Some producers use cover crops as a "double crop" in which a portion of the cover crop is harvested as forage for livestock. The Vermont Required Agricultural Practices mandate planting of cover crops in croplands that are subject to frequent flooding.

Commonly grown fall planted cover crops in Vermont are wheat, rye, and triticale. These cereal grains grow slowly through fall and winter and then develop significant biomass in spring. Other options include oats, radish, red clover, or hairy vetch. Oats and radish generally winter-kill in Vermont, while red clover and hairy vetch are legumes that will provide nitrogen. Producers will sometimes mix cover crops to get multiple benefits (rye-vetch is a common mixture). Successful use of fall planted cover crops requires understanding your system, understanding the lifecycle and needs of the cover crop(s), planting as early as possible after summer crop harvest, and understanding when and how you will terminate the cover crop.

Successful termination is critical as producers prepare for the summer growing season. The goal is to completely kill the cover crop and termination strategies will vary with the needs of the farm. As mentioned above, oats and radish will winter-kill in Vermont. Many farms terminate in spring using herbicides; typically glyphosate at a rate of 0.75 to 1.5 lb ae / acre for cereal grains and 2,4-D may be added (0.5 lb ae / acre) if hairy vetch or red clover is being terminated. Other farms till cover crops under or roll them with a crimper-roller. Timing is important. Some producers prefer to terminate before cereal grains have developed large amounts of biomass and seed heads, leaving less residue and making no-till planting easier. Other producers allow more biomass production in order to maximize residue inputs for building soil organic matter. Greater biomass can pose challenges for planting and row-cleaners, gauge wheels, closing wheels, and planting depth may need to be adjusted. Farmers opting for crimper-roller termination of cereal grains must wait for anthesis (crop is shedding pollen) for optimal termination. Some operations terminate with herbicide and crimper roller where the crimper roller is used to directionally orient the cover crop stalks for easier planting. Other farmers double crop by cutting and baling cover crops such as rye or triticale for use as forage and then till residue under or otherwise terminate prior to summer crop planting. All of these strategies require fine tuning as producers learn what works in their system. If you have cover cropping needs, The Champlain Valley Crop, Soil and Pasture Extension Team, would be glad to learn more about your operation and help you develop strategies for success!

A rye cover crop near Ferrisburgh, Vermont developing biomass in late April, prior to termination.

Estimating Spring Nitrogen Availability from Cover Crops

Becky Maden, Vegetable Nutrient Management Specialist, UVM Extension

Farmers appreciate the value of cover crops for the wide range of benefits they provide to the soil and the environment, but when it comes to relying on nitrogen contributions from cover crops, there is a lot of uncertainty. We know that legume cover crops have a fantastic ability to "fix" atmospheric nitrogen (N) and we know that cereal cover crops "mop up" N after cash crops. But when is cover crop N available, and how much can you count on? In other words, can you reliably reduce N fertilizer rates following cover crop termination?

To answer these questions, we need to dive into a little science and a little guess work. For starters, it's important to consider the species of cover crops grown. There is good guidance on cover crop selection in the Northeast: through UVM Extension, the Northeast Cover Crop Council, Cornell, and many other publications. It's important to note that if you plant a nitrogen-fixing legume cover crop, best to grow it in fields that do NOT have residual N from previous fertilizer or manure applications (legumes are a little lazy, so if there is available N in the soil, they will use that instead of doing the hard work to fix atmospheric N). It's also important to note that legume seed should be inoculated with the appropriate rhizobia symbiont to ensure that N fixation occurs.

Cover crops store the majority of nitrogen in above ground biomass, so the process of releasing this into the soil begins at termination. This "organic N" must be converted into plant available N by soil microorganisms though a two-step process: first into ammonium (NH_4^+), and then into nitrate (NO_3^-). These important soil microorganisms need warmth (temperatures above 65°F), oxygen, and moisture to be active. In other words, when the soil is cold, saturated, or too dry, this process does not occur.

Nitrogen availability from a terminated cover crop depends largely on crop species and crop growth stage. Terminating legumes at flowering is when there is the highest concentration of N in the plant tissues. If the material is finely chopped, it will be more quickly broken down into available N for the next crop. Incorporating the material into the soil instead of leaving it on the surface also accelerates decomposition because it provides access to the soil microbes.

Research done in Vermont and other states suggests that the majority of cover crop nitrogen is mineralized 4–6 weeks after termination. This means that it is very hard to have early season N from cover crops, but once the soils warm up, farmers can rely on significant cover crop N contributions. The presidedress nitrate test (PSNT)

https://www.uvm.edu/vtvegandberry/factsheets/PSNT.html

is a good tool to monitor soil nitrate levels and help reduce some of the uncertainty. For more information, see this excellent guide from Oregon State on estimating cover crop N:

https://extension.oregonstate.edu/catalog/pub/pnw-636-estimating-plant-available-nitrogen-release-cover-crops

Optimizing cover crops for on-farm N production is a great way to reduce costs and fertilizer inputs while harnessing many other wonderful benefits of cover crops.

Spring seeded oats and peas. Photo: Becky Maden

Flowering spring peas and oats. Photo: Becky Maden

Is My Grass Ready to be Grazed Again?

Carly Bass, Grazing Specialist, UVM Extension

The grazing season has begun! Soon it will be time for the next rotation. But how do you know if the grass is ready for the animals to return? In the last newsletter I mentioned the importance of recovery times before returning to a pasture and how those vary throughout the season. Keeping track of the number of days the forage has been regrowing since last being grazed or clipped is a great starting point, but it is important to know how grass grows and what to look for before returning to a pasture because the time it needs to reach the desired maturing level will vary based on weather and management.

When determining if the grass is ready for the next rotation, head out to the field and measure the grass height. The rule of thumb is to graze when the grass is 8–12 inches tall and keep a 4-inch stubble. While residual height should always be at least 4 inches, the appropriate height for grazing can depend on several factors including plant species and past land management. The best way to ensure you are returning to a pasture at the appropriate time is to assess the plants individually. The first thing to look for is how many blades the plants have on the main shoot and whether there are tillers growing from it. The right time to graze is when most of the plants in a paddock have 3 NEW blades on the main shoot, as shown by the far-right plant in Figure 1.

It is also important to keep in mind that each species and class of animals has different nutritional needs, so it is important to know what your specific livestock needs are and what stage of plant growth would be best for them to graze. Figure 2 illustrates the stages of grass growth. Fiber levels increase as the plant matures, and the protein and sugar levels decrease. Most high-performance livestock should graze in Phase 2, but others that want a diet with more fiber might look for Phase 3. It is important to keep in mind that pastures might go past the desired maturity level before the rotation returns to it again. This is a common obstacle if you have a low stocking density or have long recovery periods to prevent parasites (small ruminants, mostly). If that is the case, clipping or haying might be beneficial, but only if the grass has time to grow to Phase 2 again before it is grazed.

Paying attention to the plants in your fields and grazing them at the appropriate stage of growth will help ensure your animals are getting the maximum quantity and quality out of their forage. This form of management will also keep the plants healthy and promote regrowth for many grazing seasons to come.

Figure 1: Assessing plant maturity based on number of blades

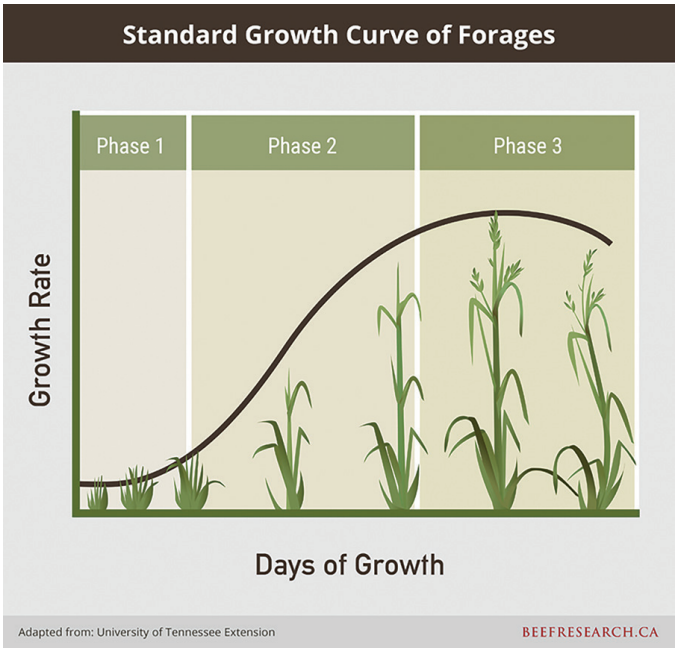

Figure 2: Growth pattern of grasses

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