EXTENSION

AGRICULTURE

# Implementing No-Till Organic Forage Systems

## Tips for Success

As Vermont has made great progress in adopting conservation cropping systems that involve no-till practices and cover cropping to protect water quality and build soil health, these systems can be incredibly challenging in organic systems that rely on tillage for weed management. Mountain Meadows Farm in Sudbury, VT explored opportunities to integrate no-till practices into their organic forage rotation from 2021-2023. Learning more about how to implement no-till organic forage crop production successfully will not only provide guidance on how to reduce tillage in organic systems, but also how to potentially reduce the use of herbicides in conventional no-till systems.

- **Growing season:** Vermont's short growing season really limits the amount of growing degree days for crop production and cover crop growth. When developing rotations, think about crops that can create more flexible windows for timely cover crop planting like rotating out of hay/pasture or planting summer annuals.
- **Weather:** Appropriate moisture, growing conditions, and winter weather will all influence if certain field operations can be completed and the outcome of no-till organic systems. If operations like rotating out of hay or timely cover crop planting cannot be completed at appropriate times due to weather constraints, consider adapting rotations and pivoting plans. Weather can also impact yields in roller crimped systems, and weather should be considered when whether or not to no-till. For example, spring drought conditions may contribute to yield drags due to high cover crop growth.
- **Soil type:** Soil types that are unforgiving in periods of drought or excessive precipitation may exacerbate weather related challenges. If you have a variety of soil types on the farm, it may be beneficial to begin experimenting with no-till organic forage systems on more forgiving soil types to develop and fine-tune a system that works best for you and your operation.
- **Flexibility is key:** Always have flexibility and alternative plans if conditions don't align with those necessary to be successful in a no-till organic system. Weather, crop conditions, management operations and other uncontrollable factors need to align perfectly into order for no-till organic systems to be successful. Being prepared to pivot to a plan that includes tilling in a cover crop is part of the system for successful implementation.
- **Summer annuals:** Summer annuals present a great opportunity to produce high biomass forages, stimulate soil biology, and create adequate windows to establish a legume cover crop in late summer. Though summer annuals can be harvested mechanically, if there is the opportunity to graze the land, there are added benefits from integrating livestock on the landscape.

Sorghum sudangrass & peas, August 9, 2021. Cows turned in for first grazing.

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- **Cover crop species and variety selection:** Quality seed with good germination that will overwinter is crucial to success. Consider varieties with important, desirable traits. Potential traits include tolerance to winter conditions, early maturing, high biomass, later fall planting dates, good tillering, and lower risk lodging, and priorities will depend on your system and goals.
- **Timely cover crop planting**: Planting early enough for sufficient fall growth and spring biomass is necessary for adequate weed suppression in the no-till system. In Vermont, planting legume species by mid to late August and rye by early to mid September is recommended.
- **Effective termination with roller crimper**: Roller crimping will only be an effective termination method if timed properly. The cover crop needs to reach anthesis, when it is switching from being vegetative to reproductive. Consider when the cover crop will be reaching this stage and how well it aligns with your desired planting date. Crop species and variety will influence this timing.
- **Roller crimping alfalfa**: If no-till planting into an alfalfa stand, the stand must be a pure stand to effectively terminate with the roller crimper. In VT, challenges with overwintering alfalfa and competition from perennial grasses in the seed bank may make it difficult to achieve pure stands. If stands have perennial grasses that will not terminate from roller crimping, consider alternative management decisions.
- **Nutrient management for high biomass cover crop:** Applying manure can be beneficial for a robust cover crop, but needs to be timed appropriately so not to stunt cover crop growth.

Rolling crimping and no-till planting corn into alfalfa/grass hay stand.

- **Springtime cover crop evaluation:** Evaluate your cover crop stand in March to decide whether the coverage is there for effective weed suppression throughout the season, or if the forage crop should be planted conventionally. For rye, University of Wisconsin's Dr. Silva recommends 80% or more canopy cover to move forward with the roller crimping system. If there is only 50-80% canopy cover, it is only recommended to move forward if there are no weeds in the field.
- **Additional nutrient considerations:** In cover crop systems, nitrogen tie up is common regardless if the cover crop remains on the surface or is tilled in. Especially given the limited affordable organic sources of available nitrogen, more work needs to be done in VT to refine nutrient management guidelines in no-till organic forage systems.

Reach out to the UVM Extension Northwest Crops & Soils Team with questions or for assistance at 802-656-7610 or by email to Jeff Sanders, Jeffrey.sanders@uvm.edu.

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