

CHAMPLAIN VALLEY CROP, SOIL & PASTURE TEAM

SPRING 2017

In This Issue

- Streamlining Programs Means Less Effort for Farmers, pg 2
- Manure Training for Applicators and Farmers, pg 3
- Grazing Charts: An Adaptable Record Keeping Tool, pg 4
- Cover Crops: From Research to Reality, pg 5
- Crop Yield and N Management in a Cover Crop/No-Till System, pg 6
- Vertical Tillage: How Does It Fit in the Tillage Continuum?, pg 7



FOCUS ON AGRICULTURE IN THE CHAMPLAIN VALLEY AND BEYOND

By Jeff Carter, Agronomy Specialist, Champlain Valley Crop, Soil & Pasture Team

Agronomy and Conservation Assistance Program

Nutrient Management Plan (NMP) classes have been a major emphasis of activity for the past months and 31 farmers completed their NMP through the UVM Extension goCrop™ classes that were held in Richmond, Middlebury and Pawlet. Statewide, over 70 farmers completed the classes offered by the St. Albans and Middlebury Extension Crop teams so farmers can develop their own crop management plans.

There are plenty of field meetings, corn planter clinics, farmer manure trainings, stream floodplain restriction discussions, and buffer workshops going on now and more to come this spring, all geared toward how farmers will adopt practices to meet the Required Agricultural Practices (RAP) rules. Stay updated about current events via e-mail: join our email list at www.uvm.edu/extension/cvcrops.

Field Research/Demonstration

We will be starting some new projects this year with financial support from the NRCS Vermont Conservation Innovation Grant Program; the Agency of Agriculture, Food and Markets; and the Northeast SARE program to continue our work with local farmers. One study will start a benchmark program for the economics of growing cover crops and

using no-till for crop planting. What is the true cost and benefit of moving to no-till with cover, and then how profitable are you? We need better data about the Vermont farms who have changed to these new crop systems to be sure of the right investments for your particular farm. Starting with a handful of farms who have agreed to provide the details about their operations, the data from this project will reflect current finances of these conservation practices as they are used here on our soils.

Whole-farm phosphorus (P) mass balance has been around for some time, but few farms complete the accounting of where the extra P comes from. We have a project to work with several farmers and their feed consultants to collect data on the extent of P imported to local dairy farms. This is good information to have, but really the issue is what to do then? Not all P is leaving the farms, and that is why farmers use the P-Index to better understand the risk of P loss and “plug” any leaks in the farm system. We will be field testing the new 2017 Vermont P-Index and a new Northeast P-Index on several farms and relate that data to whole-farm P-Mass balances and farm conservation. We will collect data to help farmers with crop management decisions under the revised Vermont P-Index. This will then be used to address

the NMP 590 standard, which is the basis for all farm nutrient plans. What to do then if you have a high phosphorus soil test? Another study we have is to evaluate the use of field applications of amendments to reduce soil test P in the field. We will be looking at three types of gypsum, including one with humates, also contrasted with short-paper fiber (SPF). When spring does get here, we will also see how good the cover crops perform that we planted last fall.

VERMONT RAP RULES

The Vermont Required Agricultural Practices Rule affects all farmers this year, and so it affects our Extension work. Focus on Agriculture means a focus on helping you to learn (like Poop Skool) and then figure out the best next steps to take (whatever that is). Give us a call, or just come to the meetings that we host with the Champlain Valley Farmer Coalition. This is a great way to keep up with new ideas so you can deal with changing times in Vermont agriculture.

Have a question for Jeff?

Jeff Carter (802) 388-4969 ext. 332
jeff.carter@uvm.edu

RMA UPDATE: STREAMLINING PROGRAMS MEANS LESS EFFORT FOR FARMERS



Acreage Crop Reporting Streamlining Initiative (ACRSI)

Farmers are time-strapped folks. Having to report the same thing to multiple agencies can seem like a waste of time. Welcome, ACRSI.

ACRSI is a joint effort among producers, Farm Service Agency (FSA), Risk Management Agency (RMA), and the crop insurance industry. The Acreage Crop Reporting Streamlining Initiative (ACRSI) replaces duplicative crop reporting of common acreage information by producers to both the Farm Service Agency (FSA) and Risk Management Agency

(RMA). Producers now have multiple ways in which to report their common acreage data and will not have to report the same information twice to both FSA and their crop insurance agents, saving time and potentially reducing inadvertent errors. ACRSI is available nationwide for the 2017 acreage reporting season.

Crops shared under ACRSI include alfalfa, barley, canola, corn, grass, oats, rye, sorghum, soybeans and wheat, as well as acres under the Conservation Reserve

Program (CRP) and fallow fields. Other crops in this program: cotton, peanuts, rice and sunflowers.

These cover approximately 94% of the cropland acres reported to FSA and RMA, and have similar reporting requirements with both agencies. FSA and RMA will gain experience collecting and sharing data for these crops, and will use the lessons learned to make informed decisions whether to include additional commodities in the future.

UPCOMING EVENTS & INFORMATION FOR SUCCESS

Buffers and Grassed Waterways, Oh My!

We know, buffers and grassed waterways are not always the favorite topics of farmers, but when it comes to water quality, they can make a big difference. With our grant focus in the McKenzie Brook we will be hosting spring and summer field events. Look for event details soon, and please let us know if you would like to host one on your farm. We will discuss:

New RAP rule on buffers in effect April 15, 2017. All farmers covered under the RAPs will be required to have a 25-foot buffer on streams and a 10-foot buffer on ditches. Let's face it, this will mean adjusting plowing and planting practices this spring.

Grassed waterways. Although not mandated, these can be very effective, particularly where other practices aren't enough to prevent gully erosion.

Planter Clinics: Getting Ready to No-Till

For the third year, our team is hosting no-till corn planter clinics in coordination with Champlain Valley Farmer Coalition. Are you on our e-mail list to find out dates and details? Like conventional till, successful no-till comes down to healthy soil, a properly set-up planter, and the right timing: they're even more critical since you can't correct mistakes with an extra harrow pass!

No-Till Resources at

www.uvm.edu/extension/cvcrops

Including Factsheets, No-Till Corn Planter Tune Up Checklist, and Closing Wheel Guide

**UPDATES ON EVENTS & MORE
SIGN UP FOR OUR E-NEWSLETTER AT
WWW.UVM.EDU/EXTENSION/CVCROPS**

Welcome, Claire!

Claire Bove is the newest addition to the Middlebury UVM Extension office, hired in February as the Vermont Coordinator for the High School Equivalency Program (HEP). HEP helps migrant and seasonal farm workers or their children obtain the equivalent of a high school diploma, and subsequently gain employment or pursue postsecondary education.

About Claire & HEP: blog.uvm.edu/cvcrops

About Farm Worker Programs:
uvm.edu/extension/agriculture/farmworker

Contact Claire:

802-388-4969 x 338, claire.bove@uvm.edu





UNIVERSITY OF VERMONT EXTENSION
CULTIVATING HEALTHY COMMUNITIES

Nutrient Application Recordkeeping Book

For Custom Manure Applicators and Farmers

UVM Extension helps individuals and communities put research-based knowledge to work. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture, University of Vermont Extension, Burlington, Vermont, University of Vermont Extension, and U.S. Department of Agriculture, cooperating, offer education and employment to everyone without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status.

MANURE TRAINING FOR APPLICATORS & FARMERS: PREPARING FOR THE UPCOMING SEASON

By Nate Severy, Agronomy Outreach Professional

This winter we have been very busy putting together workshops and meetings focused on new manure spreading rules and how farmers and custom applicators can make them work on their farms. Manure or other “agricultural wastes” cannot be spread within 25 feet of a stream and 10 feet of a ditch. There are also new restrictions when spreading in floodplains, training requirements, and recordkeeping requirements. Everyone under the certified small, medium or large farm definition must spread manure according to a Nutrient Management Plan (NMP), and all farms must apply manure based on agronomic rates.

We received a grant last fall from the Vt. Agency of Agriculture, Food and Markets (VAAFAM) to develop an educational and certification program for custom manure applicators in coordination with the Northwest Crop and Soil Team. This program will be very similar to the Pesticide Applicator Program: applicators will have to take and pass an exam, re-certify yearly, and accumulate 8 hours of professional development over 5 years to maintain the certification. The first exam will take place next winter, most likely before Christmas.

For this upcoming cropping season, even though custom applicators will not have their applicator certification, these busi-

nesses will be expected to follow all of the RAPs pertaining to spreading manure, including keeping application records. To help everyone learn about the RAPs and what records need to be kept, we helped organize 3 custom manure applicator workshops and 5 farmer and custom applicator employee workshops throughout Vermont. At these events, attendees learned about the new rules and what is expected from them. These workshops also provided a forum where people were able to ask questions and engage in open dialogue with VAAFAM staff. At each meeting there were good conversations that generated important questions and it is great to hear respectful conversations. Even when people do not agree they can still have a good discussion. We are here to help applicators sort out their questions about the RAPs and will continue to keep the dialogue going.

Going into the 2017 cropping season, I believe that recordkeeping is going to be a big obstacle for many people. Good recordkeeping takes extra time, patience, and dedication, even on a small farm. If someone is not prepared, recordkeeping could be challenging for a custom applicator that spreads manure on thousands or even tens of thousands of acres on many different farms. At our meetings, we stressed that the key to good record-

keeping is to seamlessly integrate it into your business. Some are already doing this through technologies like UVM’s goCrop™ or flow meters where field-by-field data is automatically recorded and downloaded into a computer. Other people have put recordkeeping logs on the back of employee timesheets and require that the employee fill out the log in order to be paid. For custom applicators who need help with recordkeeping, UVM Extension has developed a recordkeeping book (copies available at our office). Each page has a carbon copy so at the end of the day the applicator can fill out the page, tear off the top and give it to the farmer for his/her records, and then tear off the carbon copy and put it in a file at home. All of these systems are acceptable, but it is important to use the system that will work best for you, and will strengthen your business going into the future. Even though there is an initial inertia required to make recordkeeping successful, the hope is that it can also pay off for the farmer by documenting and improving on agronomic practices.

If you have questions about manure application or would like more information or materials on recordkeeping, contact our office. If you do not have an NMP and need to obtain one, contact your local conservation district or NRCS office for funding possibilities.

Copies of UVM Extension’s nutrient application recordkeeping book are available by contacting our office, (802) 388-4969.

COVER CROPS: FROM RESEARCH TO REALITY

By Kirsten Workman, Agronomy Outreach Professional

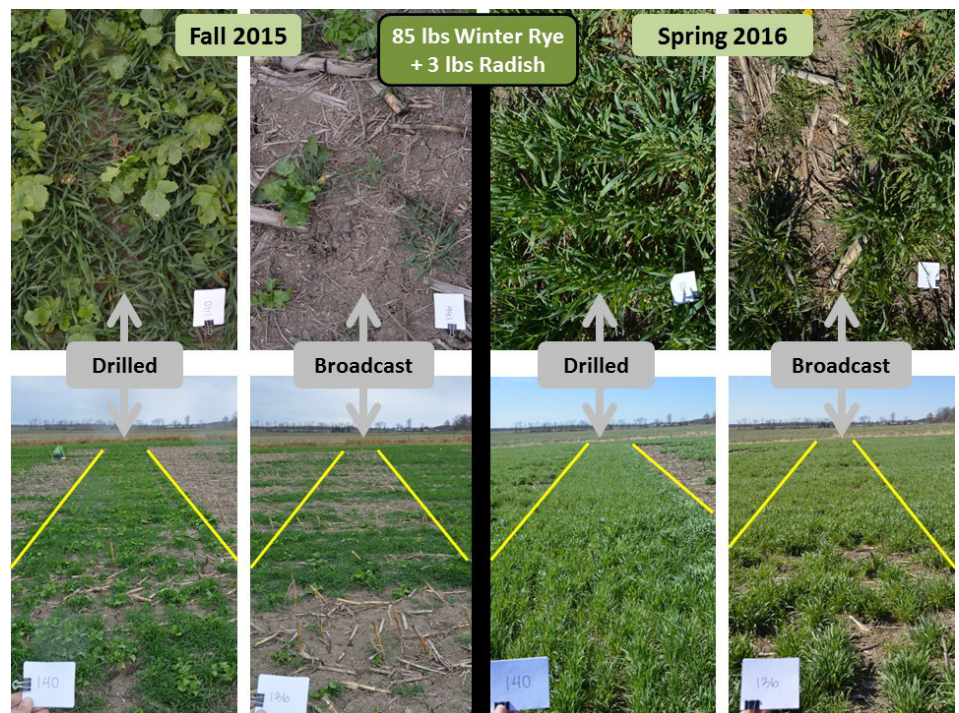
For the last 5 years, our team has had grant funding from the USDA to do research and demonstration projects investigating novel ways of cover cropping in corn silage and soybean systems in Vermont. We started with a small project in 2013 in Ferrisburgh at Deer Valley Farm comparing 2 different cover crop mixtures planted into the standing corn and drilled after harvest. That project was successful and provided us with enough preliminary data to start investigating additional cover crop mixtures and planting timing on a larger basis.

In 2014, we started our NRCS Conservation Innovation Grant, "Better Cover Crop Mixes in Vermont." This project enabled us to evaluate several three-way cover crop mixtures alongside a winter rye monoculture. The cover crops were planted into standing corn (at V5/V6 growth stage and at tassel) as well as drilled after harvest. Similarly, we interseeded into soybeans at R3-5 and R6-8. As a result, we ultimately evaluated 15 different three-way cover crop mixtures during 29 different planting events for a total of 319 research plots. This work could not have happened without our farm partners. For this project alone, we collaborated with 10 farms on 13 fields in 7 Vermont towns.

So what? you may wonder. These plots provided us with valuable data to share with producers, NRCS staff, technical service providers and agency folks, and that information is helping us make sound recommendations for successful cover cropping in Vermont. However, the true value of this project (and our other cover crop projects) is the ability to enable hundreds of Vermont farmers to witness, learn about and adopt this practice. In this single grant project described above, we were able to do some amazing outreach to farmers. This included 12 field days, 6 presentations, 7 newsletter articles and 5 *Across the Fence* television episodes. Our field days involved over 200 farmers, 61 agricultural business employees, and 112 agency staff. Our workshops and conferences reached 153 farmers, 81 ag. business employees and 221 agency staff. And while that in itself is a tremendous feat, the real *so what* is that we have seen exponential increases in the adoption of cover crops in Vermont over the last 3 to 5 years.

According to the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) data, "Vermont farmers planted a record-setting 25,727 acres of

cover crops on more than 2,000 fields in 2016 on approximately 25% of all annual cropland in Vermont. That's a 58% increase in the acres of protective winter cover crops planted in 2015." By my count, it is a 250% increase from 2014. While these research and demonstration projects are by no means the sole reason for this impressive rate of adoption, I do believe they are an important piece of the puzzle. Enabling farmers in the Champlain Valley to approach these conservation practices with solid, local information that allows them to be successful. They are able to investigate species, planting methods, potential pitfalls and see for themselves when and if these cover crops make the most sense on their farms, in their soil and weather conditions and with their equipment. And most importantly they are getting the most out of their cover crops by establishing them in a truly *effective* way, meaning the cover crops are functioning as intended and providing erosion control, taking up manure nutrients, and protecting water quality. In addition, the farmers are figuring out how to do it more profitably, utilizing these cover crops for forage or as a key component in their no-till systems, using less seed and planting it better, and even growing their own seed. Essentially, Vermont farmers are making them an integral part of their farming operations. This is the true meaning of adoption. Not just throwing seed out there because there is cost-share money, but REALLY MAKING IT WORK.



An example of cover crop research plots comparing broadcasting seed on the soil surface versus planting with a no-till grain drill. Both were planted on the same day, after corn silage harvest, on Vergennes clay soil, and received approximately 4,000 gallons of liquid dairy manure/acre. Pictures were taken about two months after planting and in the following spring.

CROP YIELD AND NITROGEN MANAGEMENT IN A COVER CROP/NO-TILL SYSTEM

By Kristin Williams, Agronomy Outreach Professional

We just finished a two-year, multi-farm study on the health of clay soils, funded through a VT Conservation Innovation Grant through the NRCS. Measures of soil health (using Cornell's soil health test) were not consistent, and we found that comparing practices over time was more informative than comparing field to field. One interesting, and maybe obvious, lesson was the correlation between soil health practices and crop yields.

So, how do soil health practices influence yield? Research suggests soil health can improve yields. It is important to note our project focused on demonstration, not replicated research. We compared no-till and conventional/reduced till corn silage on 5 farms with clay fields in our region. A simple t-test revealed no significant difference in yield between no-till (19.1 tons/acre) and conventional (19.2 tons/acre). More importantly, we were able to demonstrate that a farmer can grow no-till without yield losses, and be successful with good management practices. A yield gain might take time as the soil builds up its condition.

We also wondered how cover crop species or mixes might affect corn silage yield. We had an opportunity to use a field where the corn was accidentally killed. We planted 15 different combinations, including 4 single species, 6 two-way mixes, and 5 three-way mixes. This project was a slight anomaly in that the cover crops were planted with a drill in late August, which allowed for a more vigorous production of all cover crops. Radish was a star in the fall, maximizing both phosphorus and nitrogen uptake. We did not measure phosphorus content in the spring, so we do not know how much was retained in the soil. It seems to have allowed for more available nitrogen in the soil at the time of a pre-sidedress nitrogen test (PSNT), therefore requiring less nitrogen. Surprisingly, legume mix covers had good fall biomass, but that did not translate into more N mineralization.

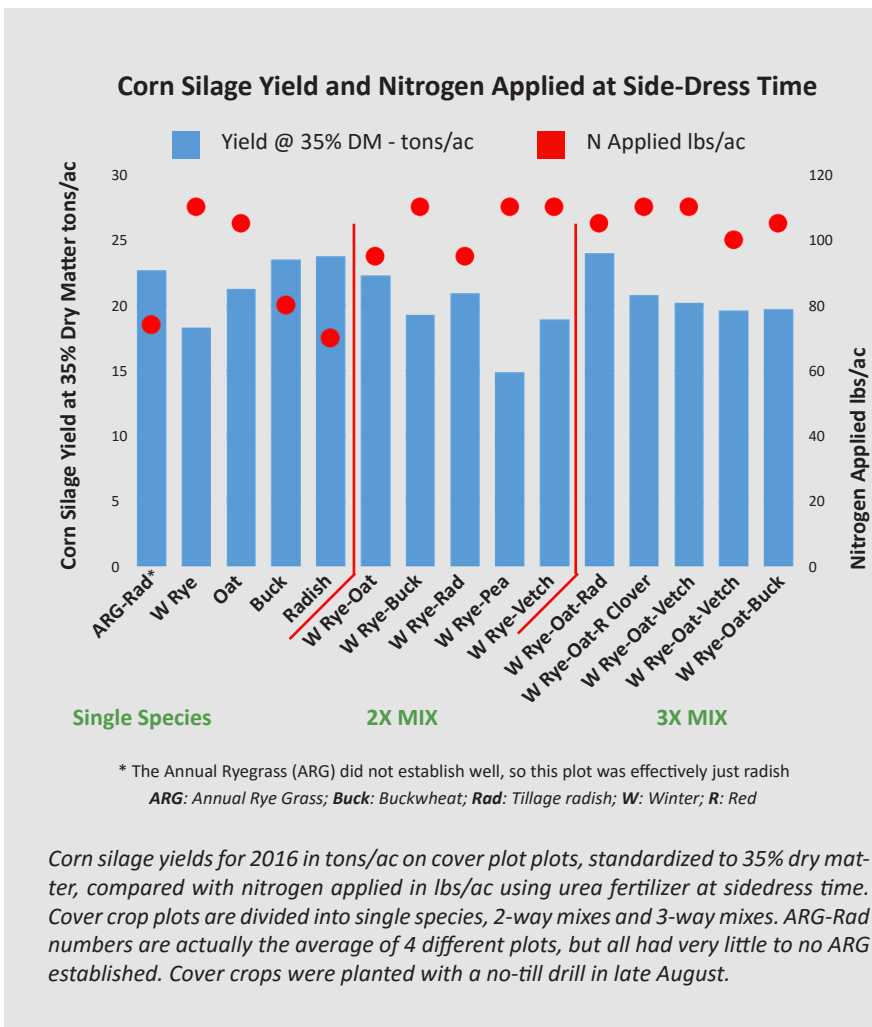
We applied nitrogen to each plot as per the PSNT recommendation for 20 tons/acre corn silage. At the end of the season, we measured corn silage yield and compared that to nitrogen applied (see graph). The winter rye plot had a lower corn silage yield and required more nitrogen. Other than the nutrient effect of less uptake and slower decomposition, there may have been a physical barrier created by the standing rye crop, which was particularly vigorous in the spring. However, our three-way mix (winter rye – oats – radish) actually had the highest average corn silage yield, even though it required more N at PSNT time than the pure radish stand.

So, do not go abandoning your winter rye just yet. In fact, we think this three-way mix has promise and we are looking for a mix that gives both fall and spring soil conservation. Radish alone will winter kill, which may be good for mineralization, but not as good for spring soil conservation. Oats also winter kill but provide faster fall soil cover than rye by itself.

When using an over-wintering cover crop, it is clear that timing and success of termination is critical for subsequent crop yields. Nitrogen mineralization may happen later in the season with a plant such as winter rye that has a heavier carbon content. In a no-till system particularly, you may need to adjust your nitrogen rates/timing and put more on upfront. If you are using cover crops, a PSNT seems like a wise investment.

It is also important to remember that soil health is a long game, and it may take time to see the results of your labors with cover crops. We have replicated this project by replanting these cover crops in the fall of 2016, this time planted in September, and will look at this again this coming season.

More info about UVM's PSNT test can be found at: go.uvm.edu/getpsnt



VERTICAL TILLAGE: HOW DOES IT FIT IN THE TILLAGE CONTINUUM?

By Rico Balzano, UVM Extension Agronomy Outreach Professional

Here in Vermont, when farmers are considering a no-till system, several questions often arise: What about incorporating manure? What about cold soils? What about ruts leftover from harvest? Vertical tillage offers a solution with minimal soil disturbance and virtually no soil inversion, thereby maintaining a natural soil structure essential for success when otherwise no-tilling.

Vertical tillage can be a vague and confusing term for both equipment dealers and farmers, mostly because there are so many implements that claim to accomplish vertical tillage. A very general definition of vertical tillage equipment is any implement with disks, shanks, or teeth that enter AND leave the soil vertically, only moving soil up and down. Implements that move soil horizontally, such as moldboard plows and disk harrows (with concave disks), create restriction layers that impede water movement and root growth. These implements shear or smear the soil, which can lead to compaction in or below the tillage depth.

By definition in-line rippers and chisel plows (with straight points) are vertical tillage tools, and can be used to “reset” the soil profile when restriction layer(s)

are present. Ideally, this “reset” should happen only when necessary and not on an annual basis, which would just amount to a conventional tillage system. Most often, vertical tillage refers to shallow or surface tillage that sizes and incorporates residue and manure without creating a stratification layer. Usually the depth is limited to 2” to avoid creating a compacted layer under the seed. This allows vertical tillage to fit into a reduced tillage system, with the goal of seeding at or below tillage depth. Other advantages of vertical tillage in a reduced tillage system include warming the seed bed in the spring, incorporating cover crop seed in the fall, incorporating manure, and leveling out ruts from harvest or other field activities.

Most vertical tillage tools consist of vertical cutting blades set straight or at a very shallow angle to size and incorporate residue while minimizing horizontal soil movement. Also, most implements have some combination of rolling baskets and cultivator wheels to break up clods and level the seed bed. Aerator machines can be effective vertical tillage tools, especially when equipped with some combination of coulters, rolling cultivators, or rolling baskets. Some manufac-

turers’ vertical tillage implements have concave disks or straight disks set on an aggressive angle. These set-ups can help incorporate residue and manure, but increase the chances of smearing soil and creating compaction in the tillage zone. Care must be taken not to use ANY tillage implement when soil moisture is too high, as more harm than good will be done.

When done at the right time and right depth vertical tillage can be an effective management tool for reduced tillage practices here in Vermont.



Where’s Rico?

Rico Balzano has moved to the Rutland Extension office, but he is still an active part of our team and continues to be involved in programming content and outreach.

Contact him at:

(802) 773-3340 ext. 281, rico.balzano@uvm.edu



(above) Vertical tillage implement (Great Plains) with straight cutting disks, rotary harrow and rolling baskets.

(right) Aerator machine (Gen-Til) equipped with coulters for vertical tillage.



23 Pond Lane, Suite 300
Middlebury, VT 05753

CHAMPLAIN VALLEY CROP, SOIL & PASTURE TEAM

Middlebury, VT
(802) 388-4969 • (800) 956-1125
cvcrops@uvm.edu
www.uvm.edu/extension/cvcrops

Project Leader
Jeff Carter, Agronomy Specialist

Agronomy Outreach

Rico Balzano
Cheryl Cesario
Nate Severy
Kristin Williams
Kirsten Workman

Administration

Karen Gallott

SUPPORT THIS PUBLICATION & OUR RESEARCH:
go.uvm.edu/donate-extension



UPDATES ON EVENTS & MORE INFO
SIGN UP FOR OUR E-NEWSLETTER AT
WWW.UVM.EDU/EXTENSION/CVCROPS

UVM Extension is grateful to our supporters and funders:



**United States
Department of
Agriculture**

Northeast SARE, Project #: ONE 13-177; GNE 14-091
NIFA Agriculture Food Research Initiative Grant, Project #2014-68006-21864
Vermont NRCS Conservation Innovation Grants, Project #: 69-1644-13-5;
69-16944-13-4

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. University of Vermont Extension, Burlington, Vermont. University of Vermont Extension, and U.S. Department of Agriculture, cooperating, offer education and employment to everyone without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or familial status. Any reference to commercial products, trade names, or brand names is for information only, and no endorsement or approval is intended.

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2014-68006-21864. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.