

CHAMPLAIN VALLEY CROP, SOIL & PASTURE TEAM

THE UNIVERSITY OF VERMONT
EXTENSION
SUMMER 2019

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FOCUS ON AGRICULTURE: SUMMER SEEDING OPTIONS & OTHER MANAGEMENT ADJUSTMENTS

By Jeff Carter, UVM Extension Agronomist

The recent winter and spring were not very kind to local farms. This past winter's weather caused widespread winter-kill of alfalfa and much of the less hardy Orchard grass in many hay fields. The cold and wet spring weather in May added insult with slow grass growth and foliar leaf diseases, which reduced yields and lowered forage quality. The lack of fertility was evident in most fields due to excess spring rain. This demonstrates again that reliance on fall-applied manure on grassland can leave the crop short of essential nutrients right when the grass growth is most demanding. And trying to fix the problem with no-till planting into very wet fields doesn't work well when the soil is not at a decent field moisture content.

For some farms, emergency plantings of BMR Sorghum/Sudan-grass should be nearly ready for first harvest now. If it is cut, and then manured or fertilized with nitrogen, it should provide a good second crop by mid-September. Very few new-seedlings of mixed forage grasses and alfalfa went in this spring. A delayed harvest for those newly seeded fields is probably a good management plan to reduce compaction and support the crop establishment this year for stronger first cut yields next year.

Summer seeding in August can yield good crops for next year, and planting without the oat nurse crop is okay, as long as most annual weeds have germinated and been killed with seed bed preparation. Better to do this now rather than waiting until next spring and risking another wet May. A second tillage pass before planting will take care of seedling weeds and help make a finer seedbed for planting tiny grass and legume seeds. Rolling fields before AND after planting always yields the best result for germination in the drier weather conditions of late summer.

If you got your corn in a bit late, use caution and don't over-do the nitrogen (N) fertilizer to try to compensate for already lost yield potential. A delay in corn crop maturity from excess N only delays harvest and creates a situation with wet stalks and dry kernels which can lower feed quality after fermentation. The optimum date for corn silage harvest around here is still mid- to late September, if you want dry harvest conditions and a good catch on your cover crops.

We see that wet springs can test the patience of farmers switching over to a no-till planting system as cover crops can get large, more mature, and "out of control." You need to be ready with options for flexibility in order to be successful as you transition. A wet spring, such as this year's, demonstrates this where many cover crops were sprayed out or rolled down at planting in June.

I hope you have a good season in 2019 and BE SAFE as you get caught up in the rush of life. Come by the Addison County Fair and Field Days, August 6-10, and see the Crops Exhibit in the 4-H Youth Hall. And be sure to drop off your crop samples on Monday that week to display.

Vermont Farmer Watershed Groups: "A Voice for Farmers"

Champlain Valley Farmer Coalition (CVFC)
www.champlainvalleyfarmercoalition.com
info@champlainvalleyfarmercoalition.com

Franklin-Grand Isle Farmer's Watershed Alliance (FWA)
farmerswatershedalliance.org
FarmersWatershedAllianceNW@gmail.com

Connecticut River Watershed Farmers Alliance (CRWFA)
www.crwfa.org
pdoton@gmail.com



Have a question for Jeff Carter?
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NEWS, EVENTS & INFO YOU SHOULD KNOW

The **Crops Signals** workshop schedule has changed because of this year's delayed plantings. Make sure you are signed up to receive our email updates and notifications!

Check out the **Summer Organic Dairy Series**, hosted by the Northwest Crops and Soils Team, NOFA-VT, and Organic Valley. These events, along with others hosted by NOFA-VT, UVM Extension and the Natural Resources Conservation District (NRCD) can be found at go.uvm.edu/summerdairy.

USDA-RMA Deadline: July 31 is the final date to apply for fall-seeded forage crops.

The State of Vermont Agency of Agriculture, Farm and Markets (VAAF) is accepting applications for their **Farm Agronomic Practices (FAP) 2020 program**, due August 1. Info at agriculture.vermont.gov/fap.

Addison County Fair and Field Days – August 6-10. Meet us at the Fair! This year we will have live no-till demos as well as our normal booth and crop display. Drop off your samples on Monday, August 5. Call our office (802-388-4969) for crop registration information. More info at www.addisoncountyfielddays.com.

September 1 – Prevented Planting must be harvested after September 1. For 2019 the USDA has changed the date cover crops can be harvested in prevented planting fields to qualifying for risk management insurance. The original date was November 1. "Plant a cover crop during the late planting period and receive a full prevented planting payment, but for the 2019 crop year do not hay, graze or cut for silage (haylage or baleage) this cover crop before September 1, or otherwise harvest it at any time. If you hay, graze or cut for silage (haylage or baleage) it before September 1, you will not receive a prevented planting payment for your first crop." This is in cases where you have already reported your prevented planting within the correct time window. There are also other planting alternatives. To view the national factsheet see: go.uvm.edu/prevented2019. Also visit www.farmers.gov/manage/prevented-planting.

September 1 – If you are planting multi-species cover crops through an EQIP contract, your planting date will depend on the particular species. However, many species fall in the September 1 planting date deadline. To view the NRCS specification guide sheet (dates on page 11-13), visit go.uvm.edu/cover-specs, or contact your local NRCS office.

UPDATES ON EVENTS & MORE

SIGN UP FOR OUR E-NEWSLETTER: UVM.EDU/EXTENSION/CVCROPS

2020 NO-TILL AND COVER CROP SYMPOSIUM

WEDNESDAY, FEBRUARY 26, 2020

DOUBLETREE BY HILTON, BURLINGTON, VT

SAVE THE DATE!

INFO: GO.UVM.EDU/NTCCS



DAVID BRANDT

OUR FEATURED SPEAKERS

Soil health pioneer based in Carroll, Ohio, **David Brandt** has more than 40 years of experience with no-tilling and cover cropping. **Scott Mangan**'s Vermont business puts precision ag to work in New England.



SCOTT MANGAN

THE PULSE OF THE LAND: USDA RELEASES 2017 CENSUS OF AGRICULTURE RESULTS

By Kristin Williams, Agronomy Outreach Professional

Every five years the *Census of Agriculture* is conducted throughout the United States to assess the current state of agriculture in the country. This count includes all agriculture, urban and rural, with \$1,000 or more of products raised and sold, or equivalent amount that normally would have been sold. Agriculture is a vast enterprise, with all types of food production models. The results of the census help us get a pulse on the status and diversity of systems across the United States.

The previous agricultural census was conducted in 2012 and this article compares the latest results to those from the previous census. Some of the trends from the last census to this census continue:

- Number of farms: Nationwide, there are some 2.04 million individual farms. This is down 3.2% from 2012.
- Farm size: The average farm size is slightly larger at 441 acres (up 1.6%). The total number of acres in production is slightly smaller at 900 million acres (down 1.6%).
- Farm ownership: The vast majority (96%) of all farms are still family owned, but the scale and income of operations varies greatly.
- Farm sales and farm income: Just over 5% of all farms accounted for 75% of farm sales. Less than half (43.6%) of farms had positive net cash farm income in 2017.
- Age of farmers: The average age of farmers is still increasing, and was 57.5 years old in 2017. However, one in four producers is a beginning farmer with 10 or fewer years of experience, with average age of 46.3 years.

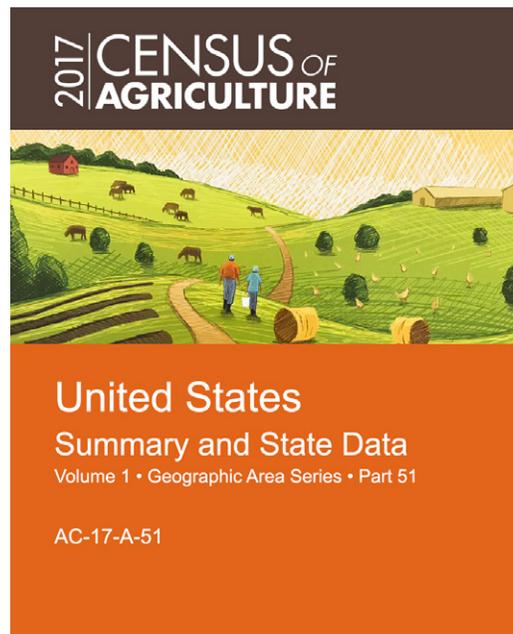
Along with the positive influx of new farmers, the new census improved its model for how it accounts for women in agriculture. More female farmers were counted in this census, due in part to the way the census questions were asked so that more farms reported multiple producers. Of all producers, 36% are female, and 56% of farms reported at least one female producer. Female producers are heavily engaged in day-to-day decisions including record keeping and financial management.

Additionally, Internet access to farms has increased, from 69.6% to 75.4% of all farms. Also, farmers using renewable energy producing systems more than doubled from the last census, with over 130,000 producers.

Locally, results suggest agriculture continues to be important in Vermont and risk management insurance helps keep farmers in business. In 2017, Vermont producers took out 344 insurance policies, which covered 70,883 acres and provided \$25.5 million in protection. Vermont producers paid in \$1 million in insurance and insurers paid out \$3.5 million to cover losses. There were a total of 6,808 producers reported in Vermont, which is down from 2012 number of 7,338, but still above 2002. They occupied 1,193,437 acres, which does continue a small decreasing trend in acreage over the past 20 years. The average acres per operation was 175, which is on par with previous years (171 in 2012, 189 in 2002). Similar to the national average, the number of farms with positive net cash farm income from 2017 was less than half (42%) of all producers, and only 19% had net positive earnings at or above \$25,000.

The Ag Census tells us broad information about production in Vermont and the U.S., which is why it is important for producers to participate. In order to address concerns and serve farmers well, we need good data from which local, state and federal governments can make funding and resource decisions and set priorities. The census allows us to see these data trends over time, and ask questions about how we can improve our programs.

The USDA website also provides an interactive table where anyone can search the data by a large number of parameters to view anything from market value and value-added products sold, to a breakdown of farm expenses, viewable from the national to county level. You can view the census data query tool at go.uvm.edu/agcensus or their recent news release at go.uvm.edu/censusnews. All information is available at www.nass.usda.gov/AgCensus.



USDA and the University of Vermont are equal opportunity providers and employers. This material is funded in partnership by USDA, Risk Management Agency, under award number RM18RMETS524C022.



FOCUSING ON EFFECTIVENESS WITH GRASS-FED BEEF

By Cheryl Cesario, Grazing Outreach Professional

Dylan Barrows runs 75 head of beef cattle on the Ferrisburgh farm he operates with his grandfather Lawrence Gebo. Dylan is the fourth generation on his family's farm, which has been in operation for approximately 100 years. Dylan manages 400 acres in Ferrisburgh and Waltham. Primarily cropped for hay, cattle were brought onto the farm about eight years ago to help with soil fertility. In 2016, Dylan enrolled in UVM Extension's six-week class to write his own nutrient management plan. He says the class made clear, "We were taking credits by harvesting hay, but only returning maybe a quarter of those." Soil testing also showed which nutrients were needed and where, so he knew how to make economical fertility investments.



Lawrence Gebo (left) and Dylan Barrows (right) on their century-old family farm in Ferrisburgh.

With that knowledge, Dylan attended UVM Extension's four-part grazing class where farmers learn in-depth grazing principles, and have a hand in developing their own plans. This program is part of a two year Sustainable Agriculture and Research Education (SARE) grant that combines classroom education with on-site consulting visits. By the last day of class, Dylan had a completed grazing plan he was able to deliver to NRCS. The resulting contract included practices such as high tensile perimeter fence, temporary polywire fencing, water pipeline and water tubs so that he could expand his pasture acreage.

The class also showed him how he could intensify his grazing management. Dylan says, "I used to do four to five days in bigger paddocks. It was working, but I saw

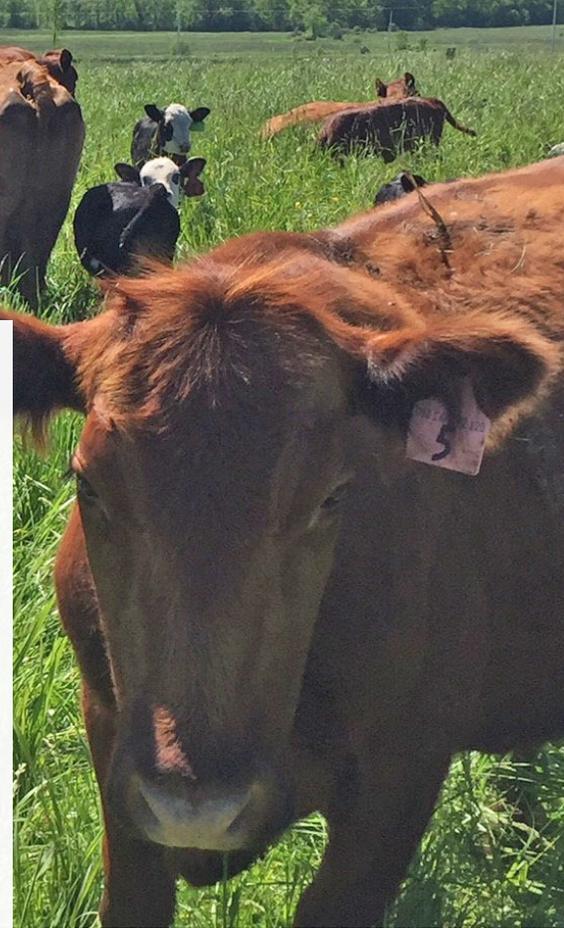
what I could gain with daily animal moves." Currently Dylan is moving animals one to two times per day. What is his response to people who say this type of management involves too much labor? "If you have time to feed them hay, you have time to move them. It takes me 20 minutes and I would be checking them anyway." He adds, "The cows look better and the calves grow better."

Dylan is using a grazing chart to plan. He says the chart not only documents what he has done, but allows him to stay ahead of the animals and reduces his stress. "I don't have to plan my life around the animals." Now he plans around his grass availability.

One of the biggest turning points for Dylan was completing the nationally renowned Ranching for Profit School in February 2019. This is a seven-day intensive program focused on economic and financial principles with strategies to identify profit and increase effectiveness. He says of the school, "It was a brick to the forehead." What were the biggest takeaways?

1. If you are in the cow/calf business, you are in the cull cow business. Develop those markets and find ways to reduce cow depreciation.
2. Calve in sync with nature. Shift the calving season so that cows are on an uphill plane of nutrition before calving.
3. Make less hay to graze more animals. The increased carrying capacity will outweigh the benefit of making your own hay.

AND one more message that is just as important, "Don't worry about what your neighbor is doing." As Dylan makes some large shifts in his management, he has found that calving on pasture provides many benefits, including fewer health issues for animals and less stress for people. He wants the brood cows to be on grass for at least two weeks



IF YOU HAVE TIME TO FEED THEM HAY, YOU HAVE TIME TO MOVE THEM.

before calving begins. The idea is to mimic the cycle of wild herbivores, working with nature rather than against it.

Last year, even with the drought, Dylan achieved 157 days on pasture without hay supplementation. His goal is to get to 200 days. A recent visit to grazer Greg Judy's farm in Missouri inspired him to get there. Seeing Greg's system, "Gave me the confidence," Dylan says. Last winter Dylan began experimenting with grazing cows on stockpiled pasture forage and gained an additional 10 days without supplementation. "What we grazed down in winter was the first grass to turn green in the spring." Dylan can see if he plans his pasture forage inventory right, he can meet his 200-day goal this year. After all, Dylan says, "The longer you graze them, the more money in your pocket."

Grazing questions?
Contact Cheryl Cesario:
802-388-4969 x346
cheryl.cesario@uvm.edu



VERMONT FARMERS ARE CONSERVATION LEADERS

By Nate Severy, Agronomy Outreach Professional

How do you show other people the good work you have done towards on-farm conservation practices? And how do you quantify that progress? This winter the Champlain Valley Farmer Coalition (CVFC) Board of Directors explored these questions by completing a survey about conservation practice implementation on their own farms in 2018.

UVM Extension staff assisted this project by gathering maps of each farm with their associated fields. We sat down with each farm owner and had them identify which fields were planted to annual crops or hay; cover cropped in the fall; no-till/reduced till; and which fields had manure injected below the soil surface. We then entered all of that data into an attribute table on the ArcGIS computer program and tallied the results (see graphics below).

Hay was the major crop type (58%), and both conservation tillage and cover cropping were adopted at relatively high rates (66% each of cropland). While 38% of corn ground was manure injected, all told 47% of farmland, which includes grassland, was manure injected.

From all of this conservation work, we were able to estimate that these 13 farms have reduced phosphorus from entering waterways by 13,218 lb/year! (P conservation estimates using Natural Resource Conservation Service (NRCS) BMP Scenario Tool for TMDL reduction planning). This is a powerful story as it shows (1) that farmers are working hard to improve the practices on their farms and (2) that those practices have REAL benefits.

UVM Extension has also done a separate survey in the East Creek and McKenzie Brook watersheds, which we've discussed in past issues of this newsletter. We see that farmers in these watersheds have gone beyond what the NRCS and Agency of Agriculture have funded, and are adopting these practices because it benefits their

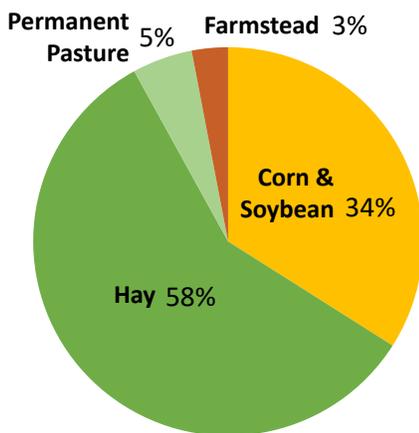
farms. Taking the state as a whole, 25% of Vermont is cover cropped which is the highest of any state on a percentage basis. In watersheds where there is a high amount of technical support for conservation practices, approximately 30 to 40% of annual cropland is cover cropped.

Even more impressive is the small group of farmers in the CVFC who are passionate about figuring out how to make conservation work on their farms and who have almost 75% of their annual cropland cover cropped! What this tells us is that focused technical support and financial assistance along with farmer buy-in and farmer-to-farmer engagement are making a real difference in increasing the number of acres engaging in conservation practices like cover cropping.

As the State of Vermont works to show the U.S. Environmental Protection Agency (EPA) that we are making real efforts to clean up our waterways, understanding the full picture of what farmers are doing will be paramount. The Agency of Agriculture, Food and Markets (VAAF), UVM Extension and other organizations are working on how we can confidentially highlight farmer progress. Given what we've already found, it's clear that supporting farmers financially, technically and emotionally – while giving them the freedom to figure out what works on their farm – does make a difference. This will be ever more important as we move beyond the initial funding phases and continue conservation efforts to meet state targets.

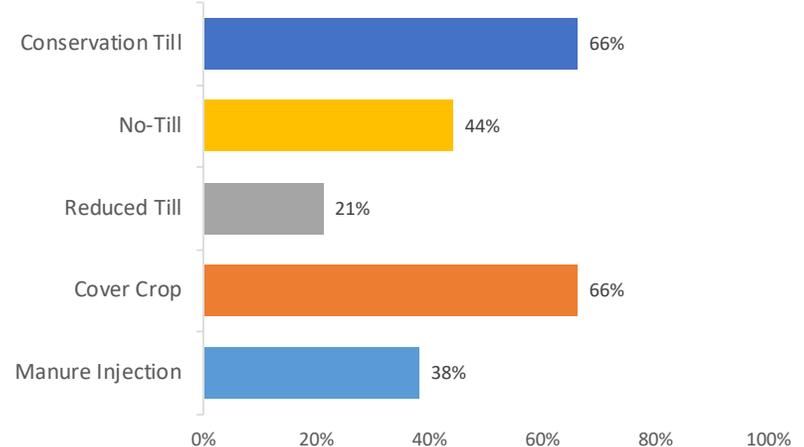
For more information about the Champlain Valley Farmer Coalition visit www.champlainvalleyfarmercoalition.com.

Planning a new fall conservation practice like cover cropping? Give our office a call this summer if you'd like some help, 802-388-4969.



Thirteen Champlain Valley Farmer Coalition farms were surveyed, representing 19,527 acres of farmland from Rutland to Richmond. The composition of their cropland is shown above. Not surprisingly, the majority of acres are in hay, corn and soybeans.

Farmers used a variety of on-farm conservation practices in 2018, sometimes simultaneously.



Farmers were asked which conservation practices (selecting all that apply) they used on their corn crops which totaled 4,349 acres.

NUTRIENT MASS BALANCE: OPERATING IN THE GREEN ZONE?

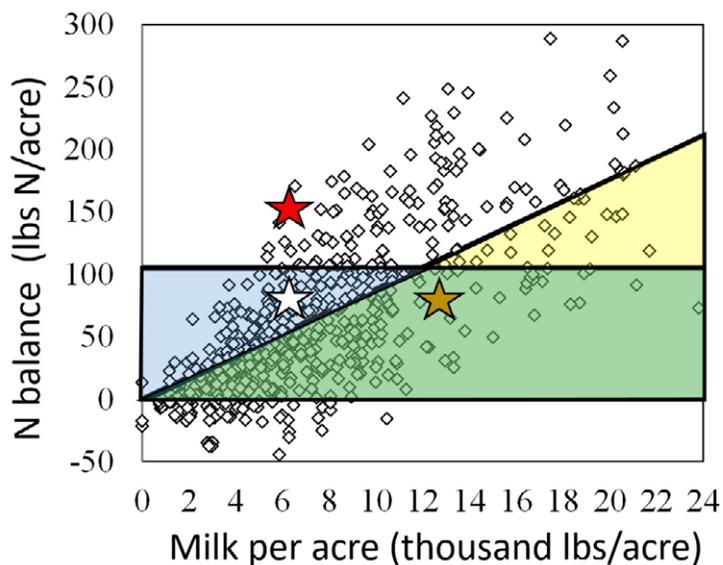
By Rachel Orr, Agronomy Field Technician

Evaluating how nutrients flow through the farm is a very important part of running an economically viable business. When excess nutrients are brought onto the farm and are not utilized by animals or plants there becomes a buildup in nutrients (focused currently on N-P-K) that can be lost through multiple means. This includes in-field, or bound with soil unused by the crop, which effectively leaves dollars in the field.

It is important to realize, though, that we are not advocating for nutrients to be drawn down to zero because we know that having soil reserves is a healthy part of the system, and that no process in nature is 100% efficient. Mass balance is about identifying a healthy middle ground between not enough and too much, to insure both healthy crops and environmental sustainability.

We have started to identify what average farms are running in yearly nutrient flow and graphing them using Cornell's guidelines. This program allows us to follow farms for multiple years to be able to look at averages. After identifying farm P averages, we have applied Cornell's economic restraints to get an idea of where potential savings could be. This is neither a cut-and-dried process nor one-size-fits-all model. However, it allows farms to identify potential economic areas of savings or opportunities to fully utilize their resources.

Phosphorus inputs come from multiple sources on a farm, not just fertilizer purchased. Outputs in product usually extract a portion of those inputs, though a farm can end up being on either end of the scale – having more inputs than outputs or vice versa.



(above) Creating nutrient sustainability indicators for dairies nationwide. Image courtesy Mart Ros, Karl Czymmek and Quirine Ketterings.

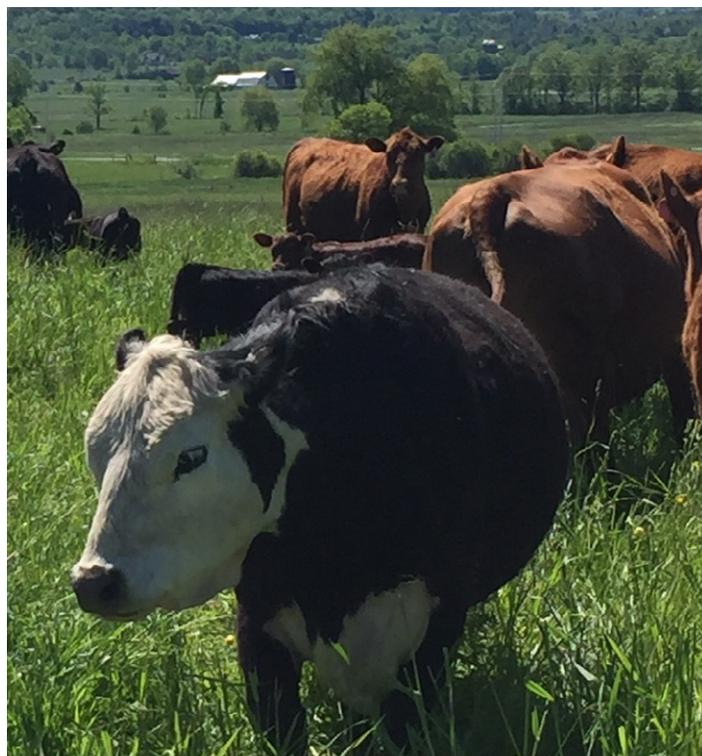


Agronomists at Cornell have graphed actual mass balances and identified “zones” of operation. When we run a Nutrient Mass Balance we can compare a farmer’s actual situation to the following Feasible Nutrient Mass Balance zone classifications:

- Green zone: the “optimal operation zone” for dairy farms, where neither too many nutrients are entering the farm for the acreage and production, nor are too many nutrients leaving the farm.
- Blue zone: indicates there are not enough nutrients entering the farm for the number of acres and milk production, and the land is being depleted of reserves, which is not sustainable in the long term.
- Yellow zone: indicates there are too many nutrients entering the farm for the number of acres and milk production, which will lead to nutrient accumulation or environmental loss in the long term.

In either blue or yellow, there are multiple options for moving the farm operation into the green, not simply by adding or removing fertilizer. This is a way of looking at nutrient management at the farm scale, which is different than field-by-field planning of an NMP. But the two approaches should complement each other in managing nutrients.

To learn more about Cornell’s Whole Farm Mass Balance, visit: blogs.cornell.edu/whatscroppingup/2016/04/20/what-is-the-nutrient-balance-of-your-dairy-farm.



RESEARCH UPDATE: GYPSUM TRIALS LEAD TO INCREASED SULFUR UPTAKE BUT NOT YIELD

By Kristin Williams, Agronomy Outreach Professional

We are in the midst of the final year of research and demonstration for our gypsum grant funded through a state Conservation Innovation Grant (CIG) from the Natural Resource Conservation Service (NRCS). Our main focus has been looking at how gypsum can be used as a soil amendment both for soil health and to measure potential changes to soil test phosphorus (P) levels.

To explore this concept we've used mined gypsum, flue gas gypsum and black gypsum (which also contains humates). Gypsum is essentially calcium sulfate, and it is the calcium that interacts in clay soils by displacing magnesium and encouraging "flocculation" where clay particles are coagulated into micro-aggregates. Theoretically, this can improve soil structure and decrease soil crusting, thereby increasing water infiltration and decreasing runoff. The sulfur can bind with aluminum (toxic in large quantities as our clay soils tend to be higher in aluminum), thereby making the aluminum less reactive in the soil profile. Humates, complex organic molecules, also provide potential soil health properties.

Our final soil health tests will be conducted this fall, so we plan on providing a final update this coming winter on this project. Meanwhile, we have had multiple field seasons to look at soil and crop responses. Unfortunately the vast majority of our results did not suggest any significant differences ($\alpha=0.1$) between any of our treatments. We did not see any changes in soil test P (either positive or negative) based on

treatment, nor did we see any yield changes in corn silage or alfalfa/hay trials. We have seen some stratification of nutrients and slightly lower pH at the surface of the soil, irrespective of treatment (see our Summer 2018 Newsletter).

One result worth noting is that in 2018 we did find greater uptake of sulfur in corn silage samples. Specifically, flue gas gypsum was significantly greater than the control and all the other treatments (see below). It should be noted that the treatment types were not the same in terms of rate (lbs/ac) because the rate was based on industry recommendations, and flue gas gypsum had the greatest application rate in our study. The average soil test for sulfur was significantly greater at the surface for flue gas gypsum as compared to the control at both Farm Two, where amendments had been applied for two years, and Farm Three, where amendments had been applied for one year. (Yield and uptake results at Farm Two were not measured since a microburst hail storm ruined the crop).

It is not surprising that the addition of gypsum would lead to increased sulfur in the soil or crop, at least when applied at almost 2 tons/acre (3,750 lb/ac). We know that sulfur is an essential nutrient for chlorophyll growth and protein production, as well as being required by rhizobia bacteria in legume nitrogen fixation. However, in Vermont we are lack-

ing recommended rates based on soil test levels. You will notice your soil test only lists average state values, not a recommendation.

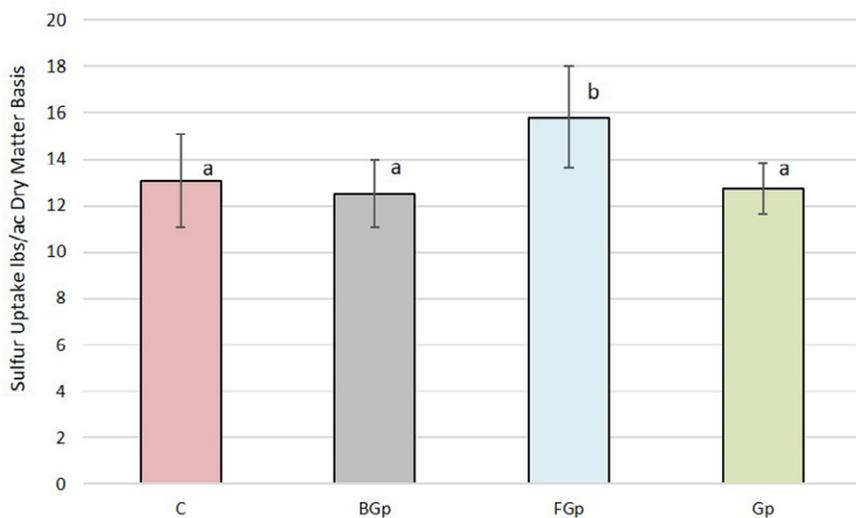
In this case, the greater uptake of sulfur did not relate to any greater yield or nitrogen lb/ac in the corn silage, so that would suggest the sulfur was already sufficient in the field for crop purposes. (Not long ago increased acid rain did lead to increase sulfur precipitation; however, in this form sulfur acts a pollutant that also acidifies the soil.)



EFFECTS ON CORN GROWN IN SOIL AMENDED WITH GYPSUM?

ALTHOUGH PRELIMINARY RESULTS FOUND NO SIGNIFICANT DIFFERENCES IN SOIL PHOSPHOROUS OR CROP YIELD, WE FOUND A GREATER UPTAKE OF SULFUR.

While gypsum is a relatively common amendment in other parts of the country, it is not used as commonly here. We are hoping that our final year results will shed more light on its potential in this area. Look for those updates in the upcoming winter/spring.



Corn Silage Treated with Flue Gas Gypsum Had Higher Sulphur Uptake

Average estimated uptake on dry matter basis of sulfur (S lb/ac) in corn silage samples at Farm Three of our gypsum trials in 2018. N=4 replicates per treatment.

C – Control, BGp- Black Ag Gypsum, FGp – flue gas gypsum, Gp – mined gypsum.

Error bars represent ± 1 standard deviation. Letters that do not overlap indicate significant difference based on Tukey post-hoc test.



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