

# 2017 Winter Crop Meeting

## Topics & Speakers

- **Genetically Engineered Crops: Top-Notch Designer Genes or the Gene(ie) that got out of the Bottle**  
*Margaret Smith, Plant Breeding, Cornell*
- **An Agronomy Buffet.** Lessons from the Drought, Low Lignin Alfalfa, Nitrogen Trials in Corn, Herbicide Resistant Maize, and Dicamba tolerant soybeans  
*Donald Specker, Agronomist, Pioneer*
- **Cornell University Corn Silage Trial Results & Decoding the Alphabet Soup of Corn Silage Traits**  
*Joe Lawrence, Forage Specialist, PRODAIRY*
- **Cover Crops: How? When? Why?**  
*Adam Robertson, Seedway*
- **Recommendations & Pending Regulations for Winter Manure Spreading**  
*Karl Czymmek, Nutrient Management Specialist, PRODAIRY*

**Cost: \$30/Includes Lunch**

**Registration Information:**

**Call Jen Atkinson at 607.391.2662  
or email [jma358@cornell.edu](mailto:jma358@cornell.edu)**

**Or online at <http://scnydfc.cce.cornell.edu>**

**Friday, January 20**

**Ramada Inn  
2310 N. Triphammer Road  
Ithaca**

**9:00 am  
Registration & Trade Show  
10:15 am - 3 pm  
Program**

**CCA & DEC  
Pesticide Recertification Credits  
In Application**

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We are pleased to provide you with this information as part of the Cooperative Extension Dairy and Field Crops Program serving Broome, Cortland, Chemung, Onondaga, Tioga and Tompkins Counties. **Anytime we may be of assistance to you, please do not hesitate to call or visit our office.** Visit our website: <http://scnydfc.cce.cornell.edu> and like us on Facebook: <https://www.facebook.com/SCNYDairyandFieldCropsTeam>.

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*"Diversity and Inclusion are a part of Cornell University's heritage.*

*We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities."*

## Maintaining Soil Nitrogen

There is an ongoing debate about N fertilizer rate needed to maintain total soil N (and soil C), and longterm sustainability of crop production for cropping systems that do not include forage legumes or mixtures of grasses and forage legumes. For corn and soybean, several principles are clear.

- Maintaining total soil N means maintaining soil organic matter.
- Without N fertilization soil N will deplete, and small changes in total soil N can influence plant-available N supply.
- Without N fertilization soil organic matter will decline and supply of plant-available N will decrease— stabilizing at a low net plant-available N level with resultant low corn yield.
- High (and acceptable) corn yields require N application to supplement the soil N supply.
- Applied N furnishes required plant N and aids in maintenance of soil N.
- A goal for N applications is to approximately balance the input and output of N from soil (maintain soil N) in corn production systems. In continuous corn this is possible, but in rotation with soybean, N application in the corn phase cannot overcome the soil N depleting effect of the soybean crop.

- Nitrogen mineralization from soil organic matter and crop residues supplies inorganic plant-available N; however, nitrate formed from soil organic matter mineralization can also leach from soils as evidenced by tile flow nitrate-N when no N is applied.

- Nitrogen fertilization supplies needed plant-available N, but increases nitrate that can leach from soils.

- Nitrate-N concentration loss in tile flow is greater with continuous corn compared to the corn-soybean rotation due to the higher required N application rate, not solely the annual application with continuous corn.

- Reducing N fertilization to below economic optimum rates reduces nitrate loss, but will not eliminate it.

- Growing forage legumes in rotation with grain crops reduces—but does not stop—nitrate loss, because of N mineralization during and after the forage crop.

- Because the soil is an open system (top and bottom), N losses will occur. This makes maintenance of soil N (and organic matter) and optimal crop yields with fertilization difficult while attempting to eliminate negative environmental impacts. ☼

Source: <https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=Nitrogen+Use+in+Iowa+Corn+Production>

# Nitrogen Uptake in Corn

*Crop Insights* by Jason DeBruin, Research Scientist, DuPont Pioneer, Macomb, Illinois, and Steve Butzen, Agronomy Information Manager, DuPont Pioneer, Johnston, Iowa.

## Summary

- DuPont Pioneer scientists are conducting extensive research designed to increase corn yields by improving the nitrogen use efficiency (NUE) of hybrids.
- Understanding nitrogen (N) uptake patterns is integral to improvement of corn NUE by scientists and optimal management of corn N supply by growers.
- Recent DuPont Pioneer and university research gives new insights into the timing of N uptake and sources of N utilization by corn, including:
  - N for grain development originates from both remobilized N from vegetative tissues **and continued N uptake from the soil**. Therefore, ensuring a season-long N supply is critical for maximizing yield.
  - By flowering (R1), corn has taken up approximately 63% of its N requirement for the season. The rest is taken up during the grain-fill period (R1 to R6).
  - With high yields, ~140 to 210 lbs N/acre is needed to support grain development. Approximately 38% of this demand is remobilized from vegetative tissue; the rest is supplied from continued uptake after flowering.
  - In high-yield environments, postflowering N uptake can range from 85 to 130 lbs N/acre.
- N applied closer to maximum crop use is less likely to be lost and more likely to be taken up by the crop and potentially available to support kernel set at flowering and late-season grain development.
- In-season soil N monitoring could be a helpful tool to 1) alert growers about potential N shortfalls so action plans could be considered, and 2) guide N management plan modifications for future production years.



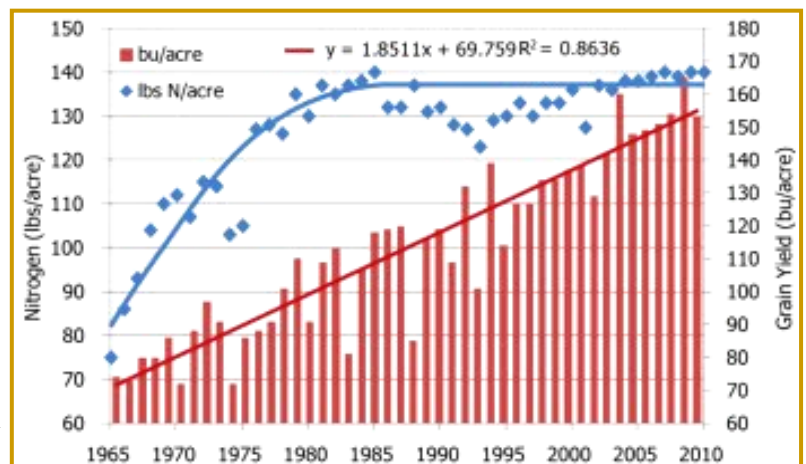
Cornfield at the beginning of the rapid N uptake phase.

## Importance of N in Corn Production

Nitrogen (N) is the most commonly applied nutrient and one of the costliest inputs in corn production. In fact, N application averages 18% and 13% of the variable costs in a corn-corn and corn-soybean rotation, respectively (Duffy 2014). Even so, its cost-to-benefit ratio usually exceeds that of other fertilizer inputs, but growers must use N efficiently to maximize its value. This means minimizing N losses by applying the appropriate rate, and timing applications to coincide with peak uptake by the crop. At the same time, growers must ensure that crop yield is not limited by insufficient N throughout the entire period of crop uptake. A previous *Crop Insights* (Butzen, 2011) reported on the importance of N supply during the rapid N uptake period (V8 to VT). This article highlights the importance of having a "season-long N perspective" to ensure that crop N demands are met not only during rapid uptake, but also through the end of grain fill.

## Increase in Nitrogen Use Efficiency

Average U.S. corn grain yields have more than doubled over the last half century, and N application rates have increased as well ([Figure 1](#)).



**Figure 1.** Historical grain yields and nitrogen application rates on corn acres in the U.S. Source: USDA

Beginning in the 1980s, however, average N application rates have plateaued at about 140 lbs N/acre, but corn yields have continued to increase ([Figure 1](#)). This increase in corn yields (by over 2 bu/acre per year since 1980), while N rates remained constant, indicates that nitrogen use efficiency (NUE, bu/lb N) has increased significantly. NUE increases are the result of improvements in both hybrid genetics and agronomic practices.

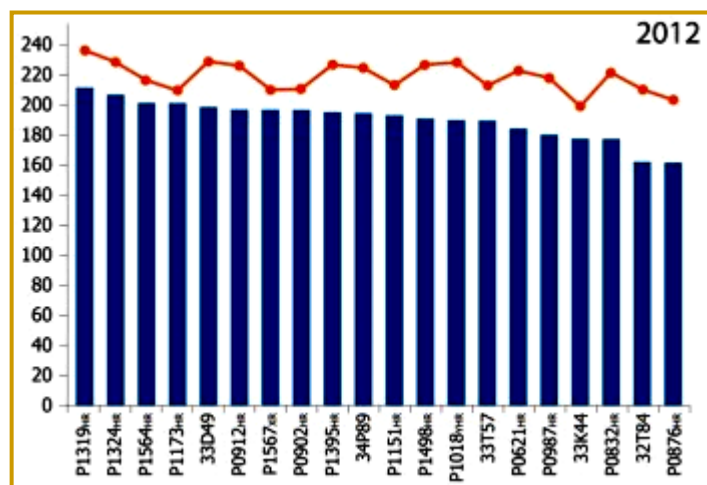
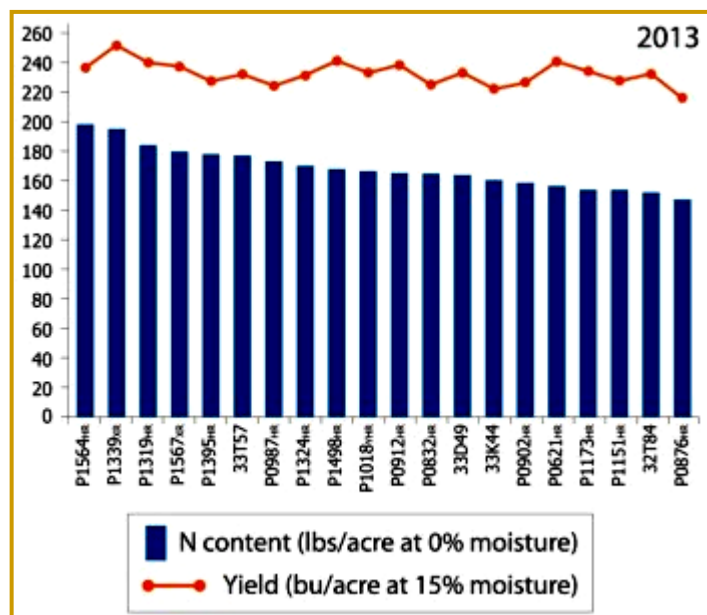
## Grain Nitrogen Content

DuPont Pioneer scientists are conducting extensive research to increase corn yields by improving the NUE of hybrids.

Developing a clear understanding of corn N

*Continued on Page 4*

requirements at high- and low-yield levels and under various N supply conditions is integral to NUE improvements. As part of this research effort, a set of 20 Pioneer® brand hybrids were evaluated under high-yield conditions near Sciota, Ill, during 2012 and 2013. The objective of the study was to determine the grain N content of individual hybrids comprising a diverse sample of modern, elite corn genetics (Figure 2).

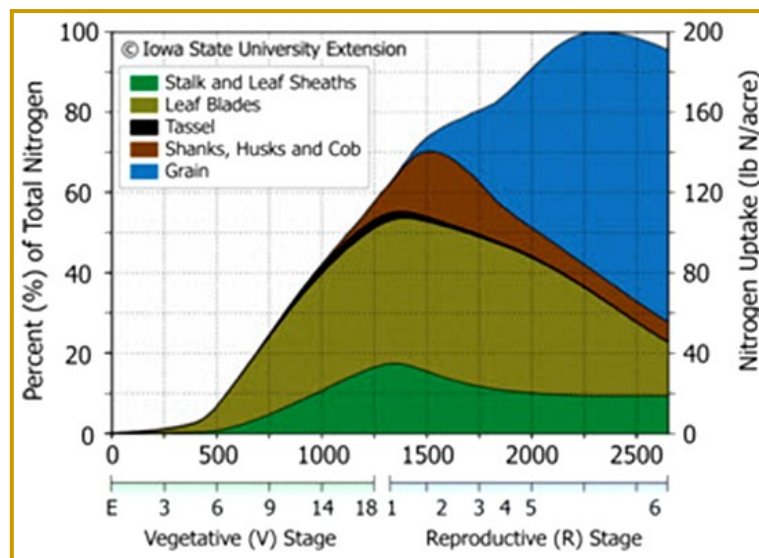


**Figure 2.** Grain N content and grain yield of 20 hybrids grown near Sciota, Ill., during 2013 and 2012. **Hybrid/Brand suffix indicates technology segment** : HR = (HX1, LL, RR2); YHR = (YGCB, HX1, LL, RR2); XR = (HXX, LL, RR2)

Yields ranged from 200 to 250 bu/acre in the study. The average protein content in this set of commercial hybrids was 9% to 10%. N is a basic building block for all proteins in the plant and the grain, each unit of N supporting 6.25 units of protein production. In this high-yield example, 1,060 to 1,260 lbs/acre of protein were produced. Converting this to a nitrogen basis, the grain removed approximately 140 to 210 lbs of N/acre (Figure 2).

The plant's N demand for grain development is roughly proportional to the grain yield. A review of the most recent

literature for modern corn hybrids indicates that at yields between 80 and 150 bu/acre, the demand is less than 65 lbs N/acre (Table 2). When yields exceed 200 bu/acre, grain N removal averages 139 lbs N/acre. The Iowa State University reference guide, *Corn Growth and Development*, reports an almost identical amount of N in the grain - 137 lb N/acre at yield levels of 225 bu/acre (Figure 3).



**Figure 3.** Seasonal N uptake (lbs N/acre) separated into leaf, stalk, tassel, husk+cob, & grain material for a typical corn crop. Abendroth et al., Iowa State University Extension, 2011.

### Timing and Source of N Uptake

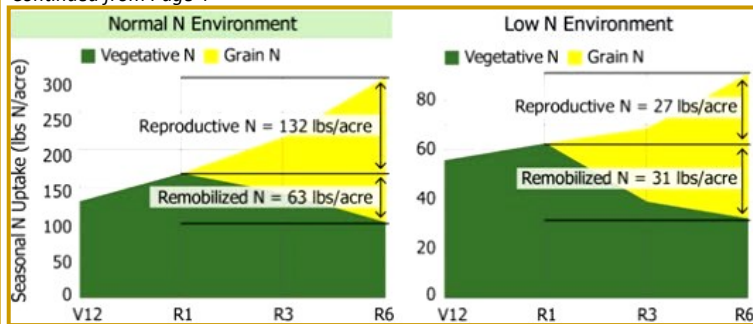
The importance of N uptake prior to flowering cannot be overstated, as this N supports critical ear shoot development, kernel number and potential kernel size. For this reason, corn growers have traditionally targeted N availability to this period, and considered postflowering applications to be of little value. Historical research with older, lower-yielding hybrids also pointed to early application. In fact, many studies concluded that grain fill depended almost entirely on remobilized N from the leaves and stalk, and that postflowering N uptake contributed little to yield accumulation.

However, extensive research conducted over the last 5 years has shown that nitrogen needed for grain development originates from both remobilized N (from leaves, stalks, cobs and husks) and continued N uptake from the soil. Research studies include those conducted by DuPont Pioneer and university scientists.

A DuPont Pioneer study was conducted at Macomb, Ill., in 2012, comparing a "normal" rate of 200 lb N/acre with a "low" rate of 50 lb N/acre. Resulting yields averaged 250 bu/acre for the normal rate, and 100 bu/acre for the low N rate. In the normal N environment, 130, 170, and 301 lbs N/acre were taken up by V12, R1 and R6, respectively (Figure 4). Of the 195 lb N/acre contained in the grain at maturity, 63 lbs were sourced from remobilized N (from leaves, stalks, etc.) and 132 lbs were from N taken up postflowering (Figure 4).

In the low N environment (100 bu/acre yield level), N uptake

Continued on Page 5



**Figure 4.** Seasonal N uptake (lbs N/acre) for hybrids grown under normal (left) and low (right) N supply near Sciota, Ill., 2011.

was limited to 60 lbs/acre by R1, and only 27 lbs/acre were taken up postflowering (**Figure 4**). These reduced N levels simulate conditions when the pool of available N is low due to leaching, denitrification or under-application of N.

In cases of low N availability when postflowering N uptake cannot fully support grain development, the remaining nitrogen comes from N remobilized from the vegetative tissues (stalk, leaves, husks and cob). The leaves are the most substantial source of remobilized N. Based on recent publications from experiments conducted in Illinois and Indiana, the amount of N remobilized from vegetative tissue averages 38% across all yield levels with a maximum of 54% under high yield, high N conditions (**Table 2**). In a recent publication by DeBruin et al., (2012) 2 independent studies documented that a maximum of 63% of the leaf N could be remobilized to the grain. Further work by Pioneer documented that the stalk generally contributes less than 20% of the remobilized N to the grain and that contributions from the cob and husks are insignificant.

**Several university studies** evaluated timing of N uptake. In Iowa State studies, approximately 60% (120 lbs N/acre) of total N (**Figure 3**) was taken up and stored in the leaves, stalk and ear shoot by R1 (silking) for a high-yielding corn crop of 225 bu/acre corn (Abendroth et al., 2011). By R6 (black layer), total N uptake (stover + grain) reached 190 lbs N/acre. Further calculations with these data indicate that 70 lbs of N/acre must still be taken up postflowering to support grain development.

Other recent publications document the amount of N taken up by flowering and after flowering (**Figure 5** and **Table 2**) These data suggest that the total N taken up by flowering is almost identical under low or normal N conditions (averaging 63% and 62%, respectively). While this is a large proportion of total seasonal N, the demand for postflowering N uptake still ranges from 39 to 132 lbs N/acre.

### N Uptake Patterns – Old vs. New Hybrids

One reason for misconceptions about postflowering N uptake and its contribution to grain fill is that modern, higher-yielding hybrids have different N use patterns. Research in the past few years has documented that newer hybrids take up additional nitrogen **postflowering** compared to older hybrids. Recent work by Ciampitti and Vyn (2012) summarized 100 scientific reports covering old (1940 to 1990) and new (1991 to 2011) hybrids (**Table 1**). The summary shows that, on average, new

hybrids took up an additional 7 pounds of N over the season. The timing of N uptake is even more significant - new hybrids took up **29% more N postflowering** than old hybrids (**Table 1**).

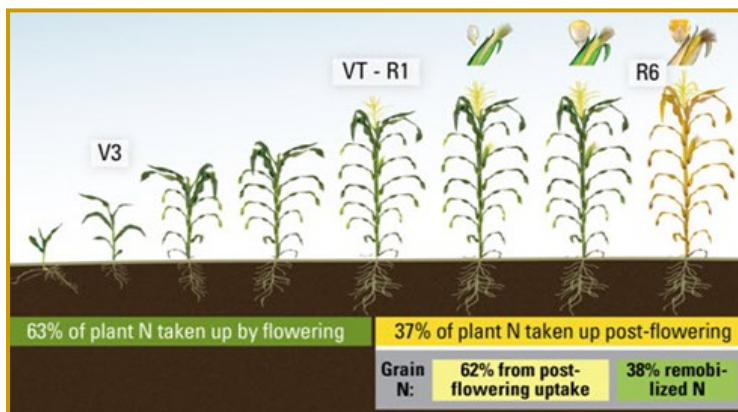
Nitrogen uptake trends were further documented by Haegele (2013), who compared 1970-era hybrids to hybrids released after 2000 (**Table 1**). This study showed that new hybrids took up an additional 8 pounds over the season and accumulated **40% more N postflowering** than older hybrids (**Table 1**). Evaluation of Pioneer® brand hybrids marketed from 1934 to 2013 supports these findings that additional N is taken up by new hybrids and that a larger fraction of total N is taken up **postflowering**. As a result, researchers, agronomists and growers may need to re-evaluate recommendations for timing of N applications and maintaining adequate N supply throughout corn's reproductive period.

### Nitrogen Management Plan for the Long Haul

Era of hybrid release	N at R1	N at R6	Post-flowering N uptake	Increase in post-flowering N uptake
----- lbs N / acre -----			%	
Old (1940 to 1990)†	102	145	43	28%
New (1991 - 2011)	97	152	55	
Old (1970)‡	125	162	37	40%
New (2000)	125	177	52	
† Ciampitti and Vyn , 2012		‡ Haegele et al., 2013		

**Table 1.** Nitrogen uptake timing and quantities for old and new hybrids.

In most production systems, grain development (starting at pollination) begins about 75 to 95 days after planting, depending on hybrid maturity (CRM). However, the majority of N is typically applied just prior to planting or even 4 to 5 months ahead of planting (in the fall). N management programs are largely driven by workload management and N price, and partially by crop demand (e.g., split applications during the season), but rarely by accounting for late-season crop N uptake.



**Figure 5.** Percent of N taken up by the plant before and after flowering, and percent of N in the grain from postflowering (after VT-R1) uptake and remobilized sources.

Continued on Page 6

**Ensuring there is a pool of soil N available during the late stages of grain development is the most difficult aspect of an N management plan. This is because late N availability is dependent on many complex and interacting factors, including:**

- initial N application rates and timing.
- mineralization of soil organic matter, which provides N
- in plant-usable forms.
- environmental factors that affect volatilization, leaching, denitrification and mineralization.
- crop uptake during the vegetative period.
- crop yield potential.

Losses due to volatilization and leaching may range from 0 to 50 lbs/acre/year depending on the growing environment. Denitrification losses may be as high as 2% to 5% of the total soil N per day if soils are saturated. Crop uptake during the vegetative period generally ranges from 1 to 2.8 lbs/acre per day. Because N is easily lost from the soil and may be taken up quickly by a fast-growing corn crop, planning for postflowering soil N availability is challenging. In fact, the confidence level in predicting the supply of soil N for grain filling declines as the interval between N application and grain development increases.

Current N application strategies target application in the spring prior to crop planting. Having a supply of N during vegetative development is clearly important, because greater than 60% of the N is taken up and stored prior to flowering (Figure 5). However, only a third of that N is generally remobilized to support grain development. In high-yield environments where the grain N demand exceeds 200 lbs N/acre, the importance of available late-season N is magnified.

Based on recent research findings regarding pre- and post-

flowering N uptake as well as N remobilization, a logical strategy is to build a nitrogen application plan that mirrors crop demand to limit losses and maximize N uptake:

Application of 70% of the total seasonal N requirement prior to planting should provide sufficient N for vegetative growth.

Applying the remaining 30% as late during the growing season as equipment allows would likely be advantageous most years.

This planned late application also provides the option of replacing N lost due to high rainfall conditions typical in May and June in many locations.

Another option is adding a nitrification inhibitor to the late application to help delay N release until closer to flowering or after flowering. This option depends on soil N availability at the time of application, as well as the time of application relative to the crop development stage.

### Conclusions

Evaluation of your N plan is essential to maximizing yield and minimizing N cost. The largest unknown in the system is documentation of the soil N pool that is available for crop uptake. Environmental and cultural parameters that directly impact the soil N pool are rainfall, temperature, soil type, and N application dates and amounts. By including these parameters in environmental models, an estimate of available N can be calculated. Comparing crop growth and development to projected yield potential can further identify whether available soil N will meet crop demand for aggressive yield targets. ◇

Source: <https://www.pioneer.com/home/site/us/agronomy/library/n-uptake-corn/>

## Considerations for winter manure application

### Karl Czymmek, Nutrient Management Specialist, PRODAIRY

Winter manure application can present a high risk for runoff losses. Runoff risk is much lower when manure is placed below the soil surface or when surface applied manure can seep into and be in contact with soil. Research suggests that after three days of contact between manure and soil after application and before rain or snowmelt, runoff losses from surface manure applications can be similar to non-manured sites.

Conditions that prevent manure from soaking into or reaching the soil are challenging. There are three winter conditions considered high risk for runoff loss when manure is surface applied:

- 1) wet soils followed by a hard freeze (“concrete frost”)
- 2) ice layer on the soil surface or in the snowpack
- 3) deep snow, perhaps 8”-12” or more.

When possible, manure should be stored in these conditions or low risk fields should be selected for application. Every farm should have one or two low risk fields identified and managers should keep them in reserve for these high risk conditions if spreading is necessary. \*



**PRO-DAIRY**

## REGISTRATION FEE

**\$50 Per Person, Per Site**

*Register by January 15 and receive a \$100 coupon from King's AgriSeeds!*

*Registration Deadline: January 25, 2017*

Discounts available extension staff and university faculty.

## HOW TO REGISTER

*Register online now at  
[prodairy.cals.cornell.edu/conferences](http://prodairy.cals.cornell.edu/conferences)*

Each person registering must use their own separate e-mail address. Members of the same company or farm may not register online using the same e-mail address. Registration fees includes refreshment breaks and lunch at the site selected and event proceedings.

Alternatively, you may download and complete a registration form online and return with check payable to Cornell University to 272 Morrison Hall, Ithaca, NY 14853.

If you are unable to complete the online registration or form above, you may contact Ashley Umble at (717) 687-6224 to register. Registration is not confirmed until payment is received by Cornell University.

## QUESTIONS?

Contact Heather Darrow, Conference Coordinator at [hh96@cornell.edu](mailto:hh96@cornell.edu) or (607) 255-4478

## REFUND POLICY

A full refund of the registration fee paid will be given if notification is provided 1 week or more prior to the first day of the conference. Cancellations less than 1 week before the conference starts will receive a refund at conference staff discretion. Refunds will not be given to participants who register for the conference but do not attend. Refunds will be returned according to original payment method and process. Substitutions of attendees are permitted but must be approved by the conference coordinator.

# WINTER FORAGE MEETINGS

## Dairy Forage Profit 3.0

*Take Your Forage and Feeding Program to the Next Level!*

- 9:30 a.m. Introduction  
*Tim Fritz, King's AgriSeeds*
- 9:35 a.m. Fiber Digestibility: New Ways to Measure and Why It Is Important  
*Dr. Tom Overton, Cornell University PRO-DAIRY*
- 10:20 a.m. Break
- 10:35 a.m. Forage Grass Breeding for Modern Dairy Needs  
*Devesh Signh, Barenbrug*
- 11:15 a.m. Linking Crop Rotations and Feeding Programs  
*Joe Lawrence, Cornell University PRO-DAIRY*
- 12:00 p.m. Lunch
- 1:00 p.m. Changing Farm Profitability Through an Improved Forage Program: A Case Study  
*Shawn Lasher, Progressive Dairy Solutions*
- 2:30 p.m. The Financial Impact of High Forage Rations and Modern Crop Rotations  
*Dr. Tom Overton, Cornell University PRO-DAIRY*  
*Joe Lawrence, Cornell University PRO-DAIRY*

## Dates and Locations

JANUARY 31	FEBRUARY 1	FEBRUARY 2
Ramada Conference and Golf Hotel	Holiday Inn	Daniele's Banquet Specialists
1450 South Atherton St. State College, PA 16801	2468 NYS Route 414 N Waterloo, NY 13165	8360 Seneca Turnpike New Hartford, NY 13413

## Speakers

<b>Dr. Tom Overton</b>	Cornell University, Professor of Dairy Management Director, PRO-DAIRY Associate Director, Cornell Cooperative Extension
<b>Joe Lawrence</b>	Cornell University PRO-DAIRY Dairy Forage Systems Specialist
<b>Devesh Signh</b>	Barenbrug USA Vice President, Research and Development
<b>Shawn Lasher</b>	Progressive Dairy Solutions Dairy Nutritionist

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## Important Updates to Keep In Mind For 2017

Betsy Hicks, Area Dairy Specialist

There are several large efforts going into effect in the coming months that affect most all dairy producers as well as some other livestock farms.

1. **Veterinary Feed Directive (VFD) Final Rule** – this outlines the process for authorizing use of VFD drugs (animal drugs intended to use in or on animal feed that require the supervision of a licensed veterinarian). This requires veterinarians to issue all VFDs within a Veterinarian-Client-Patient-Relationship (VCPR). The VFD goes into effect January 1, 2017. For more information, contact your veterinarian or see the FDA's VFD Final Rule and Next Steps information online at: <http://www.fda.gov/AnimalVeterinary/DevelopmentApprovalProcess/ucm449019.htm>
2. **Farmers Assuring Responsible Management Version 3.0** – This next version of National Milk Producers Federation's FARM Program also goes into effect January 1, 2017. Within some cooperatives, this program is mandatory and all farms that ship milk within that cooperative must be in compliance. New requirements include having a VCPR as discussed above, as well as eliminating tail docking. In addition, any non-family employees of the dairy farm should sign a cow care agreement and all employees should receive documented yearly training on general stockmanship as well as specific job responsibilities. For more information, contact your



cooperative's field representative or see <http://www.nationaldairyfarm.com/> where there are numerous resources to help you gain compliance. Your local Cooperative Extension Specialists, Betsy Hicks and Betsey Howland, can also aid in helping you through the process. See their information on the inside cover.

3. **Blu-Kote** – this topical agent should no longer be used in food-producing animals. It is labeled for use in Non-food producing animals, and even though it had been allowed by the FDA previously because they felt it was at low risk for milk and tissue residues, new residues in imported seafood from the main ingredient in Blu-Kote (gentian violet) have caused them to take a more solid stance on banning the use in food-producing animals. This product should be removed from your milking facilities and discontinued from use in cows effective immediately.
4. **Milk Testing for Tetracycline** – After January 1, 2017, the FDA will require processors to test milk loads for not only Beta-lactams but also tetracycline. The extra-label use of tetracycline powder in hoof wraps will also come under scrutiny. Follow proper withhold times and test cows that have been treated with tetracyclines before returning their milk to the tank. Common medicines containing drugs in the tetracycline family are: Agrimycin, Bio-Mycin, Oxytetracycline, Pennox and Liquamycin LA-200. Contact your veterinarian for questions on withhold times and use of tetracyclines in your herd. (DMS November 2016 Check Letter) →



## Webinars

Join us on the last Wednesday of each month from January through April

- These webinars will be entirely in Spanish.
- The first webinar will discuss the basic physiology of how milk is produced.
- The second webinar will focus on the calving process, and what's happening with the cow and the calf.
- The last three webinars will be a series on reproductive management, including heat detection, pregnancy checking, synch protocols and 1st and subsequent breeding strategies.

### Program Dates and Topics:

- Jan 25, 2017: *Calving management*
- Feb 22, 2017: *Reproduction Management*
- March 29, 2017: *Reproduction Management*
- April 26, 2017: *Reproduction Management*

### For more Information, contact:

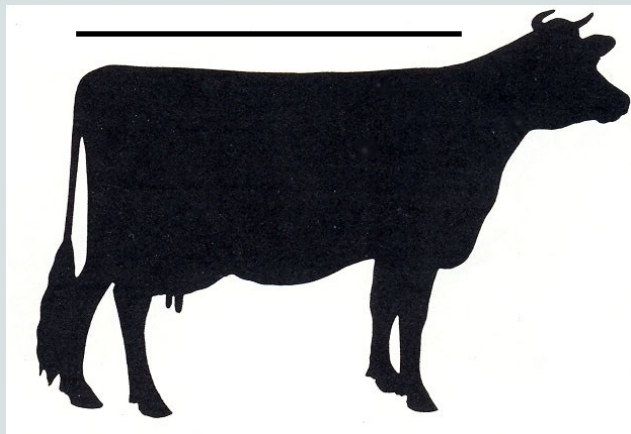
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607.229.4357

For more information about [PRO-DAIRY](http://prodairy.cals.cornell.edu/), go to: <http://prodairy.cals.cornell.edu/>

Webinars are held from  
12:30 to 1:00 PM  
Registration is not required. Access the  
webinar link on the [Dairy Webinars](#)  
section on PRO-DAIRY's website to join.

# 2017 Winter Dairy Management

Don't Be Lame! Factors and Impacts upon Lameness



**Wednesday, March 8, 2017**

Registration 9:30am,

Program 10am-3pm

*CCE Broome County,*

840 Front Street, Binghamton, NY

Cost \$25 if pre-registered by March 1, \$30 at

## Topics & Speakers

**Identifying lameness especially at its earliest stages.** Strategies and protocols for consistently identifying lameness ASAP. *Chip Hendrickson*

**Economic Impact of lameness.** Cull cows, decreased repro performance, decreased milk production, increased vet costs, increased labor requirements, etc. *Neil Andrew*

**Facilities Impact on lameness.** Stall design, alley design, flooring surfaces, bedding materials and management. *Lindsay Ferlito, NNY dairy extension specialist*

**Management factors that impact lameness.** Stocking density, nutrition-ration, feeding strategy, ventilation, heat abatement, trimming schedules, body condition, pasture access and adjusting to concrete, integrating heifers, general group management to limit injury. *Curt Gooch, ProDairy*

**\* 2 On-Farm Workshops will be held as a follow up - Dates, Locations TBD**

## Registration Information:

Call Jen Atkinson at 607.391.2662 or email [jma358@cornell.edu](mailto:jma358@cornell.edu)

Pay online at <http://scnydfc.cce.cornell.edu/event.php?id=483>



Cornell University  
Cooperative Extension  
South Central New York Dairy & Field Crops Team



# Are you staying current on Agriculture Employment Rules and Best Practices?

Betsey Howland, Area Farm Business Management

The agricultural employment environment is ever changing- from minimum wage to housing rules, youth employment, and payroll deductions and allowances. As farmers and employers, it can sometimes be hard to keep up with the latest employment rules and best practices. Recently I attended a workshop put on by the Agricultural Workforce Development Council which was held to help agriculture employers stay current on employment rules and best practices. The workshop focused on 3 topic areas: basic rules of employment, housing and health and safety. Here are my take-aways.

## Basic Rules of Employment

New York State requires employers to have a pay notice work agreement signed and on file for all employees. In general, this document gives specifics about the employee's job and pay. Agricultural employees must be paid weekly and terms of this pay should be included in the work agreement. You can find the worker agreement forms, form LS309, on the Department of Labor Website at [https://www.labor.ny.gov/formsdocs/wp/ellsformsandpublications.shtm#Farm\\_Labor](https://www.labor.ny.gov/formsdocs/wp/ellsformsandpublications.shtm#Farm_Labor).

The work agreement is a contract that should be completed at hire and at any time there is a change to the employee's position- whether it be a pay change or a job description change. If changes are necessary, employees are required to receive notification in writing at least seven calendar days before the change takes place. Work agreements must be provided to the employee in their primary language.

There is a very specific list of things that can be deducted from an employee's paycheck or that you can give them an allowance for. In addition, there are certain allowable amounts for things like housing. Deductions must be in writing, for the benefit of the employee and the employer needs to keep an authorization on file. Some things that you *cannot* deduct for are uniforms, boots, cable/internet or cell phone. A true transaction of money must take place for these items. Either the employee pays for their own, or they can reimburse their employer for the purchase if appropriate. In addition, all agricultural workers must be paid weekly.

## Housing

Many farm employers provide housing for their workers and it is becoming increasingly important to know the regulations surrounding employee housing. There are two main areas regarding housing that farm employers should be concerned with: compliance with government regulations and housing management.

When an employee lives in farm owned housing farms should have a housing agreement with that employee. If there is no housing agreement with the employee, the tenant is considered to be a month to month tenant. This agreement should include things such as the location and type of housing

provided and house rules including but not limited to inspections, utilities, cleanliness and maintenance and guest policy. Farm employers should encourage employees to let them know of issues within the housing that needed to be addressed.

Housing deductions are allowed if employees can voluntarily accept the housing provided. Allowable amounts for deductions are very specific and include utilities. For more information on allowable amounts go to <https://labor.ny.gov/formsdocs/wp/cr190.pdf>. If a farm provides housing, but does not charge the employee for it through a deduction or allowance, then the farm is considered compliant with government regulations for housing agreements. However, the farm should consider still having an agreement with employee to establish house rules.

## Health and Safety

We all know farming can be a dangerous occupation and that providing a safe working environment is very important. However, identifying risk areas on our farms and risk mitigation strategies can be an overwhelming task. It is important to first start with a risk analysis of your farm and then work toward removing or engineering away the risks that you can and managing the risks you can't. It's a little bit of the eating an elephant paradox- do it one bite at a time.

When most people think of safety regulations, they think of OSHA. Farms that have had more than 10 non-family full time PLUS part time employees at any one time in the past year are required to comply with OSHA regulations. There are 12 target hazards for dairy farms. More information on these hazard areas and how NYCAMH can help your farm identify them, visit <http://www.nycamh.org/osha-ny-dairy-lep/>. NYCAMH has funding to do safety walk through with farms across the state.

Staying up to date with labor rules and regulations is increasingly important for all New York farm employers. If you have questions related to your individual farm situation, please contact Betsey Howland, Farm Management Specialist at [BLH37@cornell.edu](mailto:BLH37@cornell.edu) or 607-592-0651. ✖



Department  
of Labor

## Keep Kids on the Farm Safe

**James Carrabba, Agricultural Safety Specialist, The New York Center for Agricultural Medicine & Health (NYCAMH)**

In farming, there is a strong tradition of having children help out with farm chores. These experiences are great for instilling strong work ethics and responsibilities in children. However, farm work poses many hazards for youth. In the US, it is estimated that approximately 100 youth under the age of 20 die each year from agricultural injuries. Every three days, a child dies in an agriculture-related incident. The leading sources of fatalities for youth involved machinery 25%, Motor vehicles (includes ATV's) 17%, and drowning 16%. For working youth, tractors were the leading source of fatalities, followed by ATV's.

The US Department of Labor's Fair Labor Standards Act has declared certain agricultural tasks to be hazardous to youth under the age of 16. These tasks are listed in the Hazardous Occupations Order in Agriculture (HOOA). Employment of youth under the age of 16 for these hazardous tasks is illegal except for certain exemptions. The HOOA does not apply to children under 16 years of age employed "by their parents, or by persons standing in the place of their parents on farms owned or operated by such parents or persons." The HOOA restricts hired youth under 16 years of age from the following eleven tasks:

- ✦ Operating a tractor over 20 horsepower\*
- ✦ Operating a variety of farm machinery\* -- corn picker, cotton picker, grain combine, hay mower, forage harvester, hay baler, potato digger, mobile pea viner, feed grinder, crop dryer, forage blower, auger conveyor, or the unloading mechanism of a nongravity-type self-unloading wagon or trailer; power post-hole digger, power post driver, nonwalking-type rotary tiller.
- ✦ Operating the following machines: trencher or earthmoving equipment; fork lift; potato combine; power-driven circular, band, or chain saw.
- ✦ Working in a yard with certain animals or working on a farm in a yard pen or stall occupied by a -- bull, boar, or stud horse maintained for breeding purposes; or sow with suckling pigs or a cow with a newborn calf.
- ✦ Harvesting timber
- ✦ Working on a ladder over 20 feet
- ✦ Driving a vehicle with passengers or riding on a tractor
- ✦ Working in confinement buildings under certain circumstances
- ✦ Handling or applying agricultural chemicals
- ✦ Handling or using a blasting agent
- ✦ Using anhydrous ammonia

\* Listed items with an asterisk indicate that minors age 14 and 15, who hold certificates of completion of their tractor and/or

machinery operation program, may work in the occupations for which they have been trained. Farmers employing minors who have completed this program must keep a copy of the certificates of completion on file with the minor's records. The Tractor and Machinery Certification course will allow exemption from this law for 14 and 15 year-olds. Youth who will only be working for their parents are encouraged to attend Tractor and Machinery Certification courses even though they are not mandated to do so. Farm safety education is a major part of the certification courses.

There are two great resources available online to assist farms who employ youth workers. One is Safety Guidelines for Hired Adolescent Farm Workers (SAGHAF). The purpose of this resource is to help employers reduce the risk of injuries among hired adolescent



**Safety Guidelines**  
Hired Adolescent Farm Workers

workers. It includes resources addressing specific work tasks to be used by crew leaders and other supervisors in the field. It also includes ready-to-use training tips, basic principles for training adolescent workers, and employer/supervisor responsibilities. This can be accessed at: <http://www.marshfieldresearch.org/nccrahs/safety-guidelines-for-hired-adolescent-farm-workers-saghaf>

The other resource is the North American Guidelines for Children's Agricultural Tasks (NAGCAT). NAGCAT is a collection of guidelines designed to assist parents and others in assigning age-appropriate tasks for children ages 7–16 that live or work on farms and ranches across North America. The guidelines are based on an understanding of childhood growth and development, agricultural practices, principles of childhood injury, and agricultural and occupational safety. Voluntary use of the guidelines can help parents and others make informed decisions about appropriate tasks for youth that work on their families' farms. The NAGCAT guidelines can be accessed at: <http://www.marshfieldresearch.org/nccrahs/north-american-guidelines-for-children-s-agricultural-tasks-nagcat>



For more information on youth safety in agriculture please contact me at 800-343-7527, ext 2216 or e-mail me at [jcarrabba@nycamh.com](mailto:jcarrabba@nycamh.com). A program of Bassett Healthcare, NYCAMH is enhancing agricultural and rural health by preventing and treating occupational injury and illness. Visit us on our website at [www.nycamh.com](http://www.nycamh.com). ☼

# 2017 NYCO Winter Meetings

Tuesday, January 10th  
10:00AM-2:00PM

Please join us for the following speakers:

## Bob Quinn

Bob Quinn of Big Sandy, Montana will be the opening speaker for our 23<sup>rd</sup> season of NYCO. He leads the Quinn Organic Research Center which includes a 2,800 acre farm. They transitioned their 4<sup>th</sup> generation farm to organic production in 1986. His work on organic grain varieties led to the redevelopment of Kamut, an ancient grain grown by the Egyptians. In addition they grow soft white wheat, durum wheat, buckwheat, lentils, peas, sweet clover, and flax. Bob is a sought after speaker on marketing and development of organic grains. He will present his vision of where organic markets are going and how New York's producers can prepare for the future.

## Sandra Wayman

Sandra Wayman is a research technician with the Cornell Sustainable Cropping System Lab. She will review their work with the newly developed perennial grain, Kernza.

## Tim Christensen

Tim Christensen farms with his father, Guy in Penn Yan, NY. He has been experimenting with different cover crops in his corn and small grain rotation. His decisions are based on multi-layered objectives of; protecting soil health, adding green manures and qualifying for annual Conservation Stewardship Program (CSP) payments. Tim will share some of the success and failures he has had on his farm.

## Mark Sorels, PhD.

Mark Sorels, PhD. is the chair for the Atkinson Center for a Sustainable Future at Cornell University. He was part of a team of researchers at Cornell who worked on the "Accelerating Production of Organic Grains in Western NY" sponsored by the Genesee Valley Regional Market Authority and Wegmans. Mark will review the results of this study done at the Cornell University's Musgrave Research Farm. ☺

The popularity of the NYCO winter meetings has grown from a gathering of six organic grain producers in the Martens Farms' farmhouse kitchen in 1994 to Jordan Hall in Geneva. Last year we had more than 300 farmers attending the 3 meetings.

To continue the tradition, the Winter NYCO meetings will be held in Jordan Hall, Geneva Experimental Station. They will be held January 10th, February 14th and March 13th. This years topics will include the use of Alternative Forages, Expanding to Poultry and Nutrient Balancing.



There is no cost or need to register to attend the meetings, which start promptly at 10:00am. Participants are asked to bring a dish to pass at the potluck lunch. The New York Crop Insurance Education Team and Cornell Cooperative Extension provide support for these meetings. There will be a brief description of how Crop Insurance can benefit organic farmers at each of the meetings. ☺

For more information contact **Fay Benson at 607-391-2669 or at [afb3@cornell.edu](mailto:afb3@cornell.edu)**

**New Opportunity for Beef and Cull Animals  
For Organic Producers  
Abbie Teeter, Organic Dairy Assistant, CCE Cortland**



New York's Organic dairy farms have had limited opportunity capture the value of their certified organic cull cows. When the decision to cull the dairy animal was made it was sent to one of the many sale barns around the state and sold along with the other conventional animals. Two years ago Tom Hoskins, working with NOFA NY, the main organic certifier in the state, certified his sale barn in New Berlin, NY to sell organic. This fall Empire Livestock worked also with NOFA to certify four of their sale barns, and is continuing to certify barns that are not already. This is good news for organic farmers, because like other markets, organic livestock will get a higher premium than conventional livestock. There are some things to keep in mind, though, this process is fairly new, and there are kinks that will need to be worked out.

NOFA-NY has drafted a brief guide to buying and selling at auction that they certify, which they shared at the Organic Dairy Task Force Meeting on December 8, 2016. They plan to include the final guidelines with their renewal/update applications that will be sent out soon to the farms they certify. This guide briefly explains the requirements of buying and selling organic animals at auction. To begin, auction facilities must be certified to sell certified organic livestock. If the auction facility is not certified, then the animals, regardless of organic status, may not be sold as organic.

Documentation is very important in this process, but it is complicated, and can be difficult for some producers. Is it necessary to have an organic certificate listing the type of livestock being sold, meaning dairy cows, dairy replacements or beef cows. It is also necessary to have documentation from the certifier verifying the dairy/slaughter status of the individual animal being sold. Organic farmers have said the process is easier if they are certified through NOFA-NY, simply because they are required to have an animal list, which meets the documentation requirement. Organic producers who are certified through other organizations will need other forms of documentation stating that the animal is certified organic, is able to be sold as organic livestock (meaning that animal was

not transitioned), and the farmer is certified to sell organic livestock.

There are other ways this documentation can be provided, such as an affirmation signed by the certifier that lists the IDs of animals and weather each animal qualifies for dairy/slaughter. If the slaughter status of an animal is not able to be verified through documentation, the animal is not eligible for organic slaughter.

It is important to remember that every animal sent to slaughter is different when considering the amount of money received per animal. No two cows are alike, so expect different pay rates, but it is fair to expect a higher pay rate for your organic cows. For example, if you send two cows to market, and one is worth \$.50/lb and the other is worth \$.62/lb at the conventional rate, chances are the organic rates will be higher, but \$.50/lb may only be worth \$.55/lb – nowhere near the price for the second cow. Every cow will yield a different price.

What can be done to make this market bigger, better and more profitable? The most important thing this new market needs is competition. There needs to be more buyers in the game to make this a really profitable venture. However, this is a difficult area to find buyers for. The environmental regulations are high and the organic regulations hold people back. Most slaughter facilities in the state have little to no interest in the market, because there simply aren't enough animals to justify the stopping of processing and cleaning the floor to begin organically processing.

What will need to be done to make this process smoother? Chances are, the National Organic Program will need to step in and set some guidelines. It was suggested that there needs to be standards set for these animals, in order to preserve the integrity of the market. Finally, there needs to be education on this topic. Producers need to know what is going on, and how to make the best of that they have.

If you have any questions, we encourage you to reach out to your certifier. ✕

### **Organic Discussion Meetings**

**Candor Fire Hall - January 11th, January 31st & February 22nd**

**Lafayette Town Hall - January 12th, February 2nd & February 23rd**

Fay Benson & Abbie Teeter will host 3 lunch meetings at each site to bring farmers together to discuss their successes and challenges this past year.

In organic production there hasn't been as much research on farming practices so farmers rely on sharing their experience with each other to improve their businesses.

During the first meeting, the participants will choose from recorded videos to watch over a lunch of soup and sandwiches with a discussion to follow. We hope this discussion will set the topics for subsequent meetings.

All meetings will be 11:30am to 2:00pm. There will be a light lunch at each meeting. Participants are asked to bring \$5 to cover lunch. Please register by calling Abbie Teeter at 607.391.2670 or email [ajt248@cornell.edu](mailto:ajt248@cornell.edu). ♦

# Operations Managers Conference: Precision Management: Merging People, Cows, Crops and Technology

January 24-25, 2017  
Holiday Inn Liverpool/Syracuse

Operations management on dairy farms is integral to the success of the farm business. The Operations Managers Conference for Dairy and Field Crops provides an opportunity for people responsible for day to day activities to increase their management and operations skills while interacting with other managers.

## General Sessions:

- ♦ **The Team You Get is the Team You Build: Create and Maintain a Culture of Engagement, Productivity, and Accountability**
- ♦ **Changing Labor Environment - Implications for Day to Day Management**
- ♦ **Becoming and Being an Employer of Choice**
- ♦ **Precision Dairy Monitoring Opportunities and Challenges**

## Dairy Management Breakout Sessions:

- ♦ **Use of Automated Monitoring Technologies to Identify Cows with Health Disorders**
- ♦ **10 Tips to Maximizing Your Feeding Program**
- ♦ **Application and Management of Dairy Cattle Heat Stress Relief Systems**
- ♦ **On Farm Data Management**
- ♦ **Using Scales to Monitor Calf Programs**

## Labor Management Breakout Sessions

- ♦ **Updating Our Animal Care Training and Documentation for a Changing Industry**
- ♦ **Recruiting, Training, and Retaining Employees**
- ♦ **The Eye in the Sky: Why a Camera System at Your Farm is the Best Management Tool Available**
- ♦ **Running Effective Team Meetings**

## Crops Management Sessions:

- ♦ **Benefits and Costs of Entry Level Precision Agriculture Technologies**
- ♦ **Yield Monitoring: The Basis for Precision Agriculture**
- ♦ **Putting Your Data to Work**
- ♦ **Optimizing Variable Rate Corn Planting in NYS**
- ♦ **Getting Good Data from On-Farm Crop Trials**
- ♦ **The Soil Health Journey of Table Rock Farm**

## FEES: *Early Bird Deadline: January 1, 2017*

	Early Bird	Standard
General Registration	\$250	\$275
NEDPA Producer Member	\$200	\$225
CCE Employee	\$175	\$200
College Faculty	\$175	\$200
Student	\$75	\$100

For Complete Information: <https://prodairy.cals.cornell.edu/conferences/operation-managers-conference>. General questions addressed to : Heather Darrow, Conference Coordinator,(607) 255-4478 or [hh96@cornell.edu](mailto:hh96@cornell.edu).

To Register On-line: <https://www.cvent.com/events/2017-operations-managers-conference/registration-9c60d61dd13840f9878a6c39067eecf9.aspx>

Coordinated by **PRO-DAIRY Program** at Cornell University  
and the **Northeast Dairy Producers Association**

**Bobb Cropp, Professor Emeritus University of Wisconsin-Extension**

The U.S. Department of Agriculture is forecasting 2017 milk

As of now it looks like the Class III price will maybe be in the high \$15s at the start of 2017, in the low \$16s by the end of first quarter, in the mid-\$16s by second quarter, higher \$16s third quarter and with the \$17s as a possibility fourth quarter. The average for the year could be near \$16.50, a good improvement over the expected \$14.75 this year. This is more optimistic than USDA and some other forecasters are forecasting. USDA has the Class III averaging from \$15.30 to \$16.20. But final milk prices will be subject to any rather small changes in milk production, sales or exports.



Cornell University Cooperative Extension  
**SCNY DAIRY & FIELD CROPS TEAM**

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**CALENDAR OF EVENTS**

<b>Jan 10, Feb 14, Mar 13</b>	<b>2017 NYCO Winter Meetings</b> , Jordan Hall, Experiment Station, Geneva, NY See Page 11 for more information and registration instructions	10am-2pm
<b>Jan 11-12</b>	<b>Organic Discussion Meetings</b> See page 12 for locations, times and more information	
<b>Jan 20</b>	<b>Winter Crop Meeting</b> , Ramada Inn, 2310 N. Triphammer Rd., Ithaca See front cover for more information and registration instructions	9am-3pm
<b>Jan 24-25</b>	<b>Operations Managers Conference</b> , Holiday Inn Liverpool/Syracuse <b>Precision Management: Merging People, Cows, Crops &amp; Technology</b> See Page 13 for more information and registration instructions	
<b>Jan 31, Feb 1&amp;2</b>	<b>Winter Forage Meetings</b> See Page 7 for more information, dates, locations and registration instructions.	
<b>Mar 8</b>	<b>"Don't Be Lame" Winter Dairy Management Program</b> , CCE Broome County See Page 9 for more information and registration instructions	9:30am-3pm

**Happy Holidays**