UMass Extension

# Crops, Dairy, Livestock & Equine Newsletter

Spring 2018

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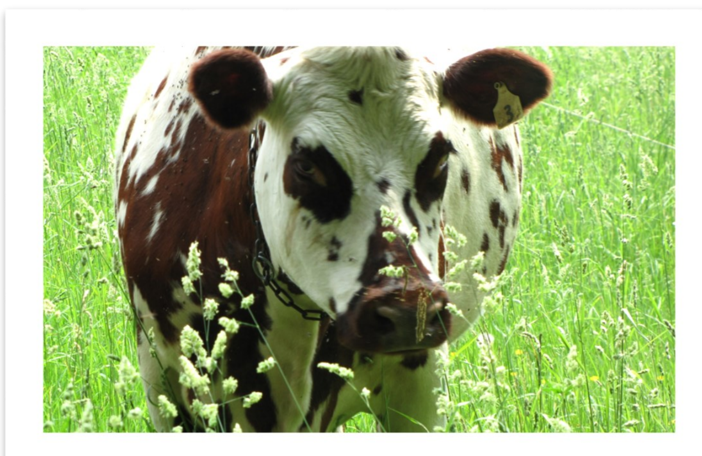
Editor,

Masoud Hashemi

Masoud Hashemi


# Upcoming Events:

## Strategies to Optimize Yield and Quality of Forage on Your Farm



**March 6, 2018**

**9:30 AM – 3:30 PM**

**Free Registration—Lunch Provided**

**UMass Crop and Animal Research Education Center**

**South Deerfield, MA**

*Please join us for a multi-state collaborative event that focuses on innovations in sustainable forage production, featuring presentations from several distinguished professors and professionals in the Northeast.*

## Strategies to Optimize Yield and Quality of Forage on Your Farm

### Agenda:

| | |
|---|---|
| **9:30 – 10:00** | **Registration + Coffee** |
| **10:00 - 10:30** | **Estimates of Massachusetts Dairy Costs and Returns**<br>*Dr. Dan Lass, UMass* |
| **10:30 – 11:00** | **Managing Weeds in Pastures**<br>*Dr. Sid Bosworth, UVM* |
| **11:00 – 11:30** | **Forage Sorghum: The Other Corn Crop**<br>*Tom Kilcer, Advanced Ag Systems, NY* |
| **11:30 – 12:00** | **Understanding the Importance of Fiber Digestibility**<br>*Rick Kersbergen, UMaine* |
| **12:15 – 1:00** | **Lunch** |
| **1:00 – 1:30** | **Double Cropping: Making Money on Both Ends**<br>*Tom Kilcer, Advanced Ag Systems, NY* |
| **1:30 – 2:00** | **Troubleshooting Corn After Cover Crops**<br>*Sam Corcoran and Masoud Hashemi, UMass* |
| **2:00 – 2:30** | **Perennial Forage Variety Selection**<br>*Dr. Heather Darby, UVM* |
| **2:30 – 3:00** | **Get Your Planter Ready for No-Till**<br>*Jeff Sanders, UVM* |
| **3:00 - 3:15** | **Closing Remarks** |



## Thank You to our 2018 Event Sponsors for Making this Event Possible!

Gold Sponsors:

Silver Sponsors:

Refreshments donated by:

# 2018 SOUTHERN NEW ENGLAND SHEPHERDS FORUM

**SATURDAY MARCH 3, 2018**

***Sponsored by the:***
**Rhode Island Sheep Cooperative**

**OFFERING ADULT AND YOUTH CLASSES**

**ALL ARE WELCOME!**

*LOCATION:*

**Norfolk Ag School**
**400 Main Street**
**Walpole, MA 02081**

**REGISTRATION STARTS**
at 8:00

**FORUM**
9:00 a.m. to 4:15 p.m.

## ADULT CLASSES:

9:00 to 10:30 – Parasite Control & Resistance, How to Read Fecal Samples – Dr. Catherine Peterson

10:45 to 12:15 - Breeding Ram Care & Semen Fertility Checking – Dr. Rachael Gately

12:15 to 1:00 - LUNCH

1:00 to 2:30 – Power Point presentation on Maximizing Profit from Wool, followed by demonstration on skirting fleeces – Matt Best

2:15 to 4:15 – Modern Marketing Techniques for Your Sheep & Wool Products – Rosalyn Price English

GUEST SPEAKERS:

Matt Best of New Hampshire, is owner of Best Shearing Services. Matt is a professional shearer of sheep & llamas, who specializes in shearing alpacas. Matt and his wife, Jozi, raise and show Tunis sheep.

Rosalyn Price English is the owner of Price English Marketing Group, a multifaceted entrepreneur focusing on social media and graphic design.

Rachael Gately, DVM, of Connecticut, a former 4-H member who earned her undergraduate degree from the University of Rhode Island and her Doctor of Veterinary Medicine from Texas A&M University and is employed at Tufts University Veterinary Field Service in Woodstock CT. Dr Gately is Chair of the NES&WG Scholarship Committee, and Vice President of the Texel Sheep Breeders Society. Dr. Gately raises, shows and sells top quality Polled Dorsets & Texels nationally.

Debra Hopkins of Rhode Island, is a well known sheep breeder, professional showman and judge. Deb chairs the All American Jr. Show, volunteers on the North East Youth Sheep Show Committee, is Superintendant of the Eastern States Exposition Sheep Show, and is the Executive Secretary/Treasurer of the Continental Dorset Club.

Bonnie Kegler of Connecticut, has been a High School Animal Science Teacher for 27 years. She has a background in FFA, 4-H & College Livestock Judging Teams, as both a Member & Coach. She has been breeding & showing Hampshires for 17 years.

Bryan Mason of Massachusetts – Raises and shows Dorper, Hampshire, Lincoln, & Southdown sheep nationally. He is a well respected judge who enjoys working with youth and their sheep projects.

Dr Catherine Petersson, is an Associate Professor at the University of Rhode Island, Dept of Fisheries Animal & Veterinary Science, and Advisor to the URI NESA Livestock Judging Team. She obtained her Ph.D. from Cornell University. Dr. Petersson is a project leader for FAMACHA parasite control in small ruminant trainings.

Brittany Sederback of Rhode Island, a former 4-H and FFA member, graduated from the University of Rhode Island. She was the 4-H After School Program Coordinator, creating "A Farm in Your Backyard" workshop. Previously employed at Brown University, now works as Research Associate, InVivo Studies at Semma Therapeutics in Providence.

Mike Wright, has been around sheep his whole life, currently resides in New Hampshire with his family who raise, show and sell top quality Oxfords and Southdown sheep, locally as well as nationally. Mike is Vice President and New England Director of the Continential Dorset Club.

MADF MASSACHUSETTS ASSOCIATION of DAIRY FARMERS Preserving A Massachusetts Way of Life

## 8th Annual Joint Meeting
## Massachusetts Association of Dairy Farmers

**Monday, March 12, 2018**
**10:00 am – 1:00 pm**

Bluebonnet Restaurant, 324 King Street, Northampton, MA

Please join us on Monday, March 12, 2018 for the 8th Annual joint meeting of the Massachusetts Association of Dairy Farmers and the Massachusetts Dairy Promotion Board.

We invite you to attend the annual meeting where a variety of guest speakers will provide industry and program updates valuable to you. Our meeting will include several special guests that will share with us the ever changing local, regional and national, political and regulatory issues affecting the dairy industry.

We hope that you will be able to join us as well for this important day.

Sponsorship Opportunities are Available - Register online at www.madairyfarmers.org or For more information, please call 413-369-4656. Thank you!

# Announcements:

## Get SMART: New Solar Incentive Program Coming to Massachusetts

The Massachusetts Department of Energy Resources (DOER) is in the process of finalizing a new solar PV incentive program, the Solar Massachusetts Renewable Target (SMART) Program. The regulations for SMART include an option for dual-use solar arrays on continually farmed agricultural land, namely an Agricultural Solar Tariff Generation Unit. UMass Extension is named in the regulation as a resource to farmers and developers in the development of dual-use agricultural plans. Specifically, these plans will be developed "in conjunction with UMass Amherst agricultural extension services, including compatibility with the design of the agricultural solar system for such factors as crop selection, sunlight percentage, etc." Guidelines for the SMART program have not yet been finalized.

UMass Clean Energy Extension (CEE) is actively working with UMass Agricultural Extension, DOER, and Massachusetts Department of Agricultural Resource (MDAR) to develop tools and guidance for those considering dual-use PV systems. If you are being contacted by solar development companies about building arrays on your land, or just have interest or questions about this new regulation, please feel free to contact River Strong at CEE: gcstrong@umass.edu, (413) 545-8510 ext. 2.

For further reading, here is a link to the regulation:

https://www.mass.gov/files/documents/2017/10/16/225cmr20.pdf

University of Massachusetts Risk Management

## Corn (Silage, Grain) Crop Insurance Deadline – March 15th, 2018

Farmers that grow corn for either silage or grain should start evaluating the type and level of coverage that meets their needs in 2018. There are many options in the type of coverage;

Grain or silage: These policies offer similar coverage. The insurance coverage at taches at the planting. Coverage ends when the crop is harvested or the final harvest date which is Oct. 20th for silage or Dec. 10th for grain.

Yield or revenue: The **yield option** uses the growers average yield to establish their 2018 yield.

The **revenue option** uses both the average yield plus the established price. The grower's revenue per acre is the average yield x price = revenue. Growers will receive both yield and market loss protection under this option.

Growers can purchase 50% coverage up to 85% coverage under either option.

Crop insurance has many other options such as separate unit coverage, price selections, etc. Now is a good time to discuss all the options with your agent.

Crop insurance is sold and delivered through private crop insurance agents. A list of crop insurance agents is available at all USDA Service Centers or on the RMA website at: https://www.rma.usda.gov/tools/agent.html

*UMass Extension works in partnership with the USDA Risk Management Agency (RMA) to educate Massachusetts producers about Federal Crop Insurance and Risk Management Programs. For more information, please visit www.rma.usda.gov or contact UMass Risk Management Specialists Paul Russell at pmrussell@umext.umass.edu or Tom Smiarowski at tsmiarowski@umext.umass.edu*

**"This Institution is an Equal Opportunity Provider"**

*Now Accepting Nominations for the*

## *Massachusetts Outstanding Dairy Farmer Award*


*The 2017 winners of the Massachusetts Outstanding Dairy Farmer Award, Louis and Holly Aragi of Pine Island Farm in Sheffield, MA.*

***The selection committee is accepting nominees for 2018. Please nominate a dairy farmer that you think is qualified for such an award by May 1, 2018. Self Nomination is welcome. The selection committee will base their decision on the following criteria:***

1) Farm is operated by a full –time farmer with an efficient dairy operation
2) Quality of dairy herd (milk production/cow, breeding program and herd health)
3) Farm Efficiency (milk production/worker, other productivity considerations)
4) The forage program (quality of forage as a well-balanced feeding program)
5) Is the farm operation economically sound?
6) Leadership ability (contributions at the local, regional, state, or national level)
7) Contribution to environmental improvement (management, visibility, appearance, scenic aspects)

***For more information, questions, or comments, please contact:***

***Masoud Hashemi***

***(413) 545—1843***

***masoud@umass.edu***

## Now's the Time to Assess the Risks on your Farming Operation

Tom Smiarowski

It's the start of a new year, it's been cold, daylight is in short supply, you're inside getting records together for your accountant, so what better time to assess the risks on your farming operation and make-plans on how to address your critical risks in 2018!

A useful and simple to use tool that helps you get started is the Risk Management Checklist: https://www.rma.usda.gov/pubs/2011/risk_management_checklist.pdf. The Risk Management Checklist is broken down into six categories: Production; Marketing; Financial; Legal; Human; and, General. Each category has a series of questions that require a simple "Yes" or "No" checkmark. As you read down the checklist you will note many things that undoubtedly you have already dealt with. The beauty of the Risk Management Checklist and what makes it an effective tool to begin analyzing your farming risks is that it captures all these categories in one document. After completing the checklist you should quickly see the areas you need to address.

Review the checklist with your family and/or your business associates including lenders and service providers to address the most critical risks identified on the checklist. Don't be surprised to find that you are already protected against risk in some of those categories to the point that you have the resources to address other risk categories on your farming operation.

Paul Russell and Tom Smiarowski work with (Massachusetts/Rhode Island) farmers under the USDA - Risk Management Agency (RMA) Targeted States Program to address risks on farming operations with a primary emphasis on Federal Crop Insurance. Federal Crop Insurance can provide an important and effective tool in managing production risks while providing a safeguard against damaging weather. Crop insurance is sold and delivered through private crop insurance agents. A list of crop insurance agents is available at all USDA Service Centers or on the RMA website at https://www.rma.usda.gov/tools/agent.html .

The Federal government, as well as State governments and private organizations, have programs that can provide financial and technical assistance to address potential problems, risks and threats identified on the Risk Management Checklist. For more information, please visit

www.rma.usda.gov or contact Paul Russell at pmrussell@umass.edu or Tom Smiarowski at

tsmiarowski@umass.edu. Now is the time! You won't have that time in the Spring!

**"This Institution is an Equal Opportunity Provider"**

## Nitrogen Contribution of Grass-Legume Mix Cover Crops in Sustainable Sweet Corn Production

Parisa Akbari, Stephen J. Herbert

It is well documented that cover crops enhance soil health, natural soil fertility, and reduce off-farm fertilizer purchases. There is an increased interest in integrating cover crop systems into sweet corn production. Sweet corn has an important economic and ecological relevance in the Northeast region, where tillage and herbicide application are still common practices. In New England where considerable rainfall occurs in the period between soil preparation/ planting and rapid phase of plant growth, a large portion of nitrogen will be lost by leaching to the soil below the root zone. Many farmers traditionally over-fertilize corn fields to compensate for such nitrogen losses. This approach affects farm profitability and increases the risk of environmental nonpoint source pollution. Therefore, cover crop planting is necessary for conserving nitrogen over the winter and early spring while assuring an adequate crop yield. In cropping systems, cover crop nutrient availability depends on a more or less rapid mineralization of the cover crop residues, which makes nutrients progressively available to the following crop.

In a two-year experiment, we are studying an overwintered grass (rye), legume (hairy vetch) and winter kill grass (oat) cover crops in pure stands and grass-legume mixtures to quantify nutrients contribution of cover crops to the successor crop (sweet corn). The mixtures have two different hairy vetch seed rates to explore the possibility of reducing the seed cost when using legume cover crops in the Northeast region. The nutrient accumulation in cover crops in early spring and the decomposition and nutrient release patterns of cover crop residues will be determined when planted with sweet corn. Data from this research will enable the development of an innovative production system for early sweet corn taking full advantage of the benefits of cover crops.

# Can Faba Bean be Transplanted?

**Fatemeh Etemadi, Masoud Hashemi, Omid Reza Zandvakili**

## *Why Transplant?*

At first glance it seems kind of odd to transplant a grain legume! However, in a 2-year study we found several advantages for transplanting faba bean. Unlike many grain legumes such as peas, lentils, and soybeans, faba bean is a cool season crop. It can be seeded as early as mid-March if the soil is workable. However, many years the soil in March is often wet or still covered with snow, which delays the direct seeding of faba bean. Early planting of faba bean comes with some potential benefits:

- It provides the opportunity of double cropping in a relatively short growing season region such as New England.
- Flowering of faba bean will not be coincided with high temperatures in summer which increases the incident of chocolate spot disease (Figure 2).

***Figure 1.*** *Faba bean should be transplanted to the main field when it is 4-5 inches tall.*

Even in years that soil conditions allow direct seeding, faba bean seed germination and establishment of young seedlings may take 4-6 weeks due to low soil temperature. In New England, transplanting faba bean in early April provides the opportunity for:

•early planting without being limited by soil conditions.

•use of drip irrigation and/or fertigation to minimize the negative impact from prolonged drought incidents.

•higher biomass and pod yield.

•earlier harvesting for more successful double cropping.

•minimizing the weed pressure when plastic or other mulch (eg. wood chips) are used as beds (Figure 3).

•avoiding planter issues related to planting mixed seeds with significant variation in size.

## *Direct Seeding vs. Transplanting*

In order to work around the potential downsides of direct seeding the feasibility of transplanting faba bean was studied from 2014 and 2015. Some results obtained in this study indicated:

- Seedlings should be transplanted after being grown in greenhouse for 10-12 days.
- Seedlings should be only 4-5 inches prior to transplanting. Use of bigger size seedlings results in slender main stems that is prone to lodging (Figure 1).
- The best time for transplanting into the main field is early April..
- In the main field, seedlings should be spaced 6-9 inches apart. Wider spaces results in lower final population thus reduces total harvestable yield.
- Wider spaces also allow the appearance of several lateral branches which generally are less productive than the main stems.

In our 2 year study we found that on average, transplanting resulted in 11% higher fresh pod and 21% more fresh seeds yield compared with direct seeding (Table 1) in addition to the abovementioned benefits.

***Figure 2.*** *Faba bean transplanted in early April avoids chocolate bacteria.*

Table 1. Faba bean yield average over two years (2014 and 2015)

| Planting method | Pod fresh yield (lb $ac^{-1}$) | Seed fresh yield (lb $ac^{-1}$) |
|---|---|---|
| Direct | 6094 | 1969 |
| Transplanting | 6792 | 2484 |

# Sunn Hemp Shines in Massachusetts

Sam Corcoran & Masoud Hashemi

Foreground: Testing out sunn hemp as mulch and fertilizer for garlic, fall 2017; Background: a field of flowering sunn hemp before winterkill, early November.

Sunn hemp is a new, summer crop for us in the Northeast. Despite its name, Sunn hemp (*Crotalaria juncea)* is not related to the industrial hemp you may be familiar with (*Cannabis sativa*). The Sunn Hemp plant bears only a mild resemblance to *Cannabis,* and is actually a legume in the same family as peas and beans. As a legume, Sunn Hemp has a relationship with bacteria that convert atmospheric nitrogen into plant-available nitrogen. It is believed that this tropical crop has been grown for hundreds of years, and it remains popular in India, Bangladesh, and Brazil. Sunn Hemp can be used for forage, fiber, or as a green manure to provide nitrogen to subsequently planted crops.

Modern interest in Sunn Hemp in the U.S. surged in Hawaii in the 80's. Research spread across the southern U.S. in the 90's through present, with Mid-Atlantic States also taking a recent research interest. Within just the past 2-3 years, a few seed companies have started readily supplying Sunn Hemp throughout the U.S.

Four years ago, we tried planting this crop at the UMass Research Farm and discovered we can grow Sunn Hemp, too. Despite our cooler climate, the hot summers in Massachusetts are sufficient for this tropical crop; in the 2016 drought, Sunn Hemp remained high performing while other crops suffered.

*Spouts appear on 7-15-16, just three days after planting on 7-12-16.*

We have launched several experiments to identify how this crop might suit our local growers. Our primary goals at this time are identifying

1. When and how to plant the crop;
2. Management for optimum forage yield and quality;
3. The amount of nitrogen and biomass that this crop can produce;
4. Basic life-cycle characteristics specific to the Northeast region;
5. Disease and pest susceptibility.

Our early results have been promising: Sunn hemp planted for use as a summer cover crop on July 12, 2016, grew over 8 feet tall and produced more than 5 tons of dry matter per acre in just 90 days. Sunn hemp planted on July 12 for forage provided two cuttings within 80 days totaling 2.5 tons of dry matter per acre suitable for animal feed when harvested at a height of 24-30 inches.

*The long root of a young Sunn Hemp seedling.*

*Sunn hemp regrowth for a second cutting for forage.*

This research was presented at the Northeast Organic Farming Association Summer Annual Conference on August 11, 2017, where we shared more details on what we have learned so far. If you are interested in this crop, please contact Sam Corcoran at sglazecorcor@umass.edu. Additional results from 2016 and 2017 field trials, as well as greenhouse assessments, will be made available in future newsletters.

# 2017 Massachusetts Corn Hybrid Evaluation

Sarah Weis, Alexa Smychkovich, Masoud Hashemi

Many hybrids are available for farmers wanting to plant corn for silage and/or grain. Some will perform better than others, and some are well suited to the local climate. This report includes silage yield data for 13 hybrids which were submitted for trial by Albert Lea, Doebler's and DeKalb. These hybrids should be available for the 2018 growing season. The hybrids were evaluated for silage and grain yields at the University of Massachusetts Amherst Crops Research and Education Center, in South Deerfield, Massachusetts in 2017. The soil was a Unadilla silt loam. Each hybrid was assigned to one of four groups based on relative maturity (RM) provided by the seed companies; Group 1; early maturity (RM <95 days), group 2; mid- maturity (RM 95-100 days), group 3; full-season (RM 101-107 days), and group 4; long season (RM>107 days). All hybrids were planted on May 18, 2017. A cone type distributor mounted on a double disc opening corn planter was used in a conventionally prepared seed bed. Plots were planted at the rate of 35,000 seeds per acre in 30 inch rows. Weeds were controlled using Acuron herbicide at 2.5 qt per acre. Herbicide application was on May 19, 2017.

Plots consisted of 3 rows, 25 feet long and 2.5 feet wide, and replicated 5 times. The site received around 150 lbs/acre of nitrogen (300 lb urea) prior to planting, as recommended by an April soil test and sidedressed on June 28th with another 300 lb urea. Side-dressing was based on a pre side-dress soil nitrate test (PSNT) taken in late June.

Ten foot sections of the central rows were harvested by hand for evaluation of silage yield. Hybrids were harvested by replication on September 22 (group 1), September 25 (group 2), and October 4 (groups 3 and 4). Harvested hybrids were evaluated for silage and ear yield, percentage ears, and moisture content. Silage yield was adjusted to 70% moisture (harvest moisture had averaged 64%) and earcorn yield to 25% moisture. Note that harvests were later than usual.

Climate data for the evaluation site is presented in Table 1. Overall, in 2017 the corn crop experienced a cool growing season until September when it became unseasonably warm. The cool weather in July and August, as well as the low rainfall in July are likely responsible for the poorer than normal yields. Nutrient levels and weed control were not judged to be sub-optimal, but plants were judged to be smaller than expected.

**Table 1:** Climate data in 2017 for South Deerfield, MA and area norms.

| | GDD[1] | | | Rainfall (inches) | | |
|---|---|---|---|---|---|---|
| | 2017 | Norm[2] | Deviation | 2017 | Norm[2] | Deviation |
| May | 198 | 224 | -26 | 6.54 | 3.30 | 3.24 |
| June | 488 | 481 | 7 | 4.65 | 4.42 | 0.23 |
| July | 628 | 637 | -9 | 2.5 | 3.54 | -1.04 |
| August | 559 | 595 | -36 | 4.3 | 3.56 | 0.74 |
| September | 489 | 350 | 139 | 2.42 | 4.18 | -1.76 |
| October | 274 | 88 | 186 | 8.86 | 4.20 | 4.66 |
| **May - August** | **1873** | **1937** | **-64** | **17.99** | **14.82** | **3.17** |
| **May - October** | **2636** | **2375** | **261** | **29.27** | **23.20** | **6.07** |

[1] Growing Degree Days was calculated as: GDD = $\Sigma(T_{max} + T_{min})/2 - 50^{o}$ F

[2] Norms are averages of 20 years, 1997-2016, at nearby Orange airport, Orange, MA

Comparisons of silage yields of corn hybrids are given in Table 2. Hybrids are arranged according to reported days to maturity. Silage yield adjusted to 70% moisture content averaged roughly 19 tons/acre and ranged from 14 ton/ac to 24 ton/ac in individual plots. Yield of 25 ton/ acre would be considered normal. A summary of relationships between days to maturity and silage yields is shown in bold at the bottom of Table 2. Longest season hybrids out yielded shortest season by an average of 2 ton/acre. Regardless of maturity group all hybrids tested in 2017 yielded poorly compared to previous years. This is very likely related to drought. As mentioned earlier, rainfall in June and July (during rapid growth of corn) was particularly deficient. Drought tolerant hybrids presumably performed best.

Earcorn yield, or percent ears (weight of ears as a percent of total plant biomass), is used as an indicator of silage quality, with a higher ear percentage connoting higher quality silage (more energy in grain than stover). The longer season hybrids as a group out-yielded the shorter-season hybrids, though they did not have better quality. In the past we often found the different RM groups of corn yielded similarly. The present superior performance of longer-season hybrids could be due to the ability to assimilate carbon over a longer (and hot September) growing season, inherently allowing the plants to produce superior silage, both in terms of yield and quality. However, using shorter-season corn hybrids provides the opportunity to plant cover crops in a timely manner. Early planting of cover crops not only maximizes the benefits to environment and recovering nutrients, but also provides biomass which can be grazed or cut as baleage in the following spring.

When choosing a hybrid, time to harvest is a consideration if a cover crop is to be planted in the fall. The shortest season hybrid tested this year gave only slightly less yield and better than average quality (as defined as percent ears) and could be harvested in mid- September in the Pioneer Valley in Massachusetts. One of these hybrids could be a good choice if an early cover crop is to be planted. The longer season hybrids did have higher yields. Note that differences in harvest moisture are due to harvest date chosen, not to inherent differences in hybrids. The early maturing hybrids could probably have been harvested up to a week earlier and still have had moisture content acceptable for ensiling.

**Table 2. Data related to corn silage hybrid evaluation in MA, 2017.**

| RM Category | Days to Maturity | Percent Ears[z] | Silage Ton/ac[y] | Earcorn Ton/ac[x] | Harvest Moisture Pct[w] | Hybrid | |
|---|---|---|---|---|---|---|---|
| 1 | 92 | 69 | 18 | 5.8 | 64 | Albert Lea | Viking 42-92 |
| 1 | 93 | 68 | 17 | 5.6 | 67 | Albert Lea | Viking 74-93 |
| 1 | 93 | 68 | 19 | 3.9 | 65 | DeKalb | DKC43-48RIB |
| 1 | 93 | 68 | 18 | 6.1 | 62 | Doebler's | RPM® 3316 AM™ |
| 2 | 95 | 71 | 19 | 4.3 | 64 | Albert Lea | Viking 51-95 |
| 2 | 95 | 70 | 18 | 4.8 | 63 | DeKalb | DKC45-65RIB |
| 2 | 99 | 66 | 17 | 5.5 | 64 | Doebler's | 3916GRQ™ |
| 2 | 99 | 66 | 17 | 6.0 | 66 | DeKalb | DKC49-72RIB[v] |
| 3 | 101 | 69 | 18 | 5.8 | 58 | Albert Lea | Viking 53-01 |
| 3 | 105 | 68 | 20 | 6.1 | 64 | Doebler's | RPM® 563HXR™ |
| 3 | 107 | 66 | 21 | 4.8 | 61 | DeKalb | DKC57-92RIB |
| 4 | 111 | 65 | 21 | 6.7 | 64 | DeKalb | DKC61-88RIB |
| 4 | 111 | 62 | 19 | 7.0 | 66 | Doebler's | RPM® 5125 AM™ |
| LSD[v] | | 2 | 2.5 | 0.9 | 2 | | |
| **Average** | | **67** | **19** | **6.9** | **64** | | |
| Harvest 9/22 | | 68 | 18 | 6.5 | 64 | 1 Shorter- Season (<95 days) | |
| Harvest 9/25 | | 68 | 18 | 6.6 | 64 | 2 Mid-maturity (95-100 days) | |
| Harvest 10/4 | | 67 | 20 | 7.4 | 61 | 3 Full-Season (101-107 days) | |
| Harvest 10/4 | | 64 | 20 | 7.3 | 65 | 4 Long-Season (>107 days) | |

[z] Percent ears is reported on a dry weight basis.

[y] Silage yield is reported as US tons per acre of 70% moisture plant material at harvest .

[x] Earcorn is reported as tons per acre of ears in the husk at 25% moisture.

[w] Moisture at the time of harvest.

[v] LSD , least significant difference is the smallest difference between any two values in the column above in which a difference is considered to be of statistical significance at odds of 19 in 20.

Grain samples of twenty-five linear feet of row were harvested on November 30, 2017 using a two-row plot combine. Five replicates were harvested for each hybrid. Yields, as well as moisture content and protein are reported in Table 3. On the whole yields were higher for the longer season hybrids. Moisture content was higher as well, but all hybrids would require further drying to achieve the desirable 15.5% moisture, even harvested at the very end of November. Protein as estimated using NIRS was lower than in 2016.

**Table 3. Grain yield and quality, harvest of November 30, 2017.**

| Days to maturity | Maturity Group | bu/ac @ 15.5% moist. | Harvest Moist. %[z] | Protein Pct. | Hybrid |
|---|---|---|---|---|---|
| 92 | 1 | 180 | 18.1 | 6.3 | Albert Lea Viking 42-92 |
| 93 | 1 | 195 | 17.1 | 7.0 | Albert LeaViking 74-93 |
| 93 | 1 | 203 | 17.2 | 6.4 | DeKalb DKC 43-48 RIB |
| 93 | 1 | 178 | 17.7 | 6.6 | Doebler'sRPM® 3316AM™ |
| 95 | 2 | 204 | 17.9 | 6.5 | Albert LeaViking 51-95 |
| 95 | 2 | 207 | 19.1 | 6.4 | DeKalb DKC 45-65 RIB |
| 99 | 2 | 178 | 19.8 | 6.3 | Doebler's3916GRQ™ |
| 99 | 2 | 217 | 19.1 | 6.7 | DeKalb DKC49-72RIB |
| 101 | 3 | 188 | 19.9 | 6.3 | Albert LeaViking 53-01 |
| 105 | 3 | 214 | 22.1 | 6.7 | Doebler'sRPM® 563HXR™ |
| 107 | 3 | 203 | 22.2 | 6.8 | DeKalb DKC57-92RIB |
| 111 | 4 | 252 | 21.4 | 6.7 | DeKalb DKC61-88RIB |
| 111 | 4 | 202 | 22.0 | 6.3 | Doebler'sRPM® 5125AM™ |
| **Average** | | **201** | **19.4** | **6.5** | |
| LSD[y] | | 31 | 1.2 | 0.2 | |
| Short Season (<95 days) | 1 | 189 | 17.5 | 6.5 | |
| Mid-Season (95-100 days) | 2 | 201 | 19.0 | 6.5 | |
| Full Season (101-107 days) | 3 | 202 | 21.1 | 6.6 | |
| Long Season (>107 days) | 4 | 227 | 21.7 | 6.5 | |

[z] Moisture was measured at the time of harvest using a Dickey-john® mini GAC® moisture tester.

[y] LSD , least significant difference is the smallest difference between any two values in the column above it which is considered to be of statistical significance at odds of 19 in 20.