

# DELAWARE DAIRY NEWSLETTER



Mailing List Update	1
Plant population for Leafy and Floury Leafy Hybrids By Dr. Francis Glenn	1
Tail Docking By Dan Severson	4
Top Ten Tips: Feeding Forages to Pre-weaned Calves By Amber Adams Progar	6
Thank You	7

## Important Mailing List Update - Please Read

We are updating our mailing list and starting in 2016, we will reduce the distribution of printed copies of the *Delaware Dairy Newsletters*. Some current recipients of the newsletter will need to respond (see below) if you wish to continue receiving the newsletter.

**Producers** who are currently milking cows or in a related venture will automatically continue to receive a printed copy by mail. **No response is required.**

**Vendors** who have supported the dairy program in the past may elect to receive a hardcopy or email containing a pdf version of the newsletter. **Please let us know your preferred method of delivery.**

**For all others, we ask that you contact us and choose between receiving a printed or electronic version. If you do not contact us with a choice, we will assume that you no longer wish to receive the *Delaware Dairy Newsletter*.**

Contact Dan Severson at 302-831-8860 or [severson@udel.edu](mailto:severson@udel.edu). Thank you for your understanding.

All issues of the newsletters and proceedings from The Delmarva Dairy Days can be found at the following website: <http://canr.udel.edu/anfs/dairy-science-research-teaching-and-extension/dairy-extension-resources/>

## Plant Population for Leafy and Floury Leafy Hybrids

**Dr. Francis Glenn**  
**Glenn Seed Ltd.**  
[francis@glennseed.com](mailto:francis@glennseed.com)

*For over 25 years Leafy Corn Silage Hybrids have been bred and tested for the complex agronomic and nutritional requirements of the dairy industry. These hybrids have become a different type of corn plant. They offer a superior balance of effective and digestible fiber, more rumen-available starch, and boast dairy-specific agronomics such*

*as high total plant yields and long harvest windows. They need less time in the silo before they can be fed and they produce milk economically. But the key to realizing all of these silage-specific benefits is a lower plant population.*

### How does leaf area translate to yield?

A corn plant's leaves are the factories that convert sunlight to yield. The chloroplasts within leaf cells produce glucose sugars during photosynthesis. This sugar energy is used for plant growth and development while the plant is young. After the plant reaches flowering, these sugars are transported to the developing kernels on the ear to become starch. Starch accumulation is fueled primarily by the above ear leaves, which receive the most sunlight once the plant is grown to full height, while the early growth of the plant was achieved by the below ear leaves, which become shaded as the plant grows.

The yield potential of a corn crop is related to its leaf area index, which is the one-sided green leaf area per unit of ground surface area. The leaf area index of a corn crop can be maximized by increasing plant population or by increasing leaf area on a per plant basis. Grain corn hybrids produce a maximum of 5-7 leaves above the ear, so these hybrids are planted at a high population of 33-36,000 plants per acre (ppa) to maximize their leaf area index. Leafy Corn Silage Hybrid plants have 8-13 leaves above the top ear, so they have an increased leaf area on a per plant basis. Because Leafies are larger plants, they need more room to produce their intended crop. To achieve this, they must be planted at a lower population of 28,000-30,000 ppa. Leafy Corn Silage Hybrids have an increased potential over non-Leafy hybrids to produce high starch yields on a per plant basis because of their high leaf area combined with their flex ear type.

Figure 1 shows the typical stature of a grain hybrid and a Leafy Corn Silage Hybrid. Note the number of leaves above the ear (LAE), the size of these leaves and the position of the ear. The Leafy Corn Silage Hybrid has 10 LAE compared to 6 LAE on the grain plant.

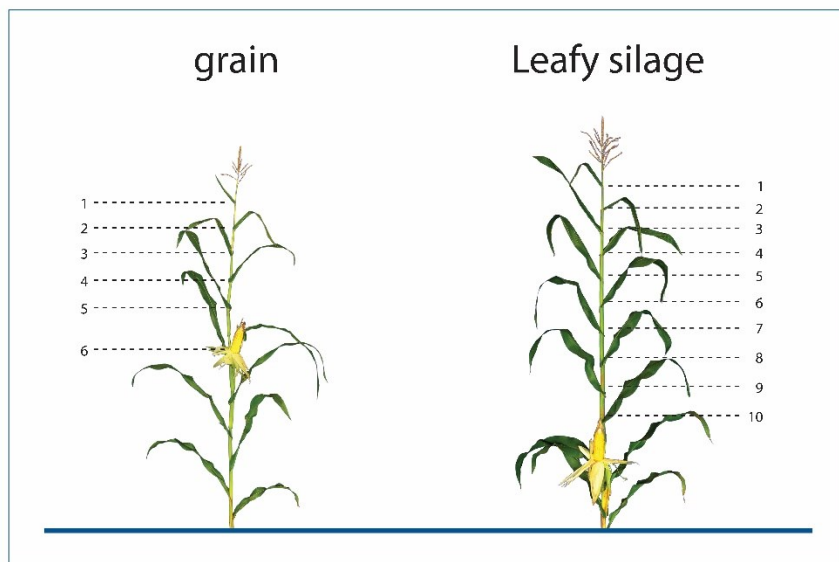


Figure 1

Figure 2 shows the difference in leaf area between the two plants. The four extra leaves highlighted in red just above the ear are the extra leaves on the Leafy Corn Silage Hybrid. This Leafy plant has 70% more leaf area above the ear than the grain hybrid. The ear position on the Leafy is lower than the grain hybrid, so the Leafy has about 40% more total leaf area than the grain hybrid.

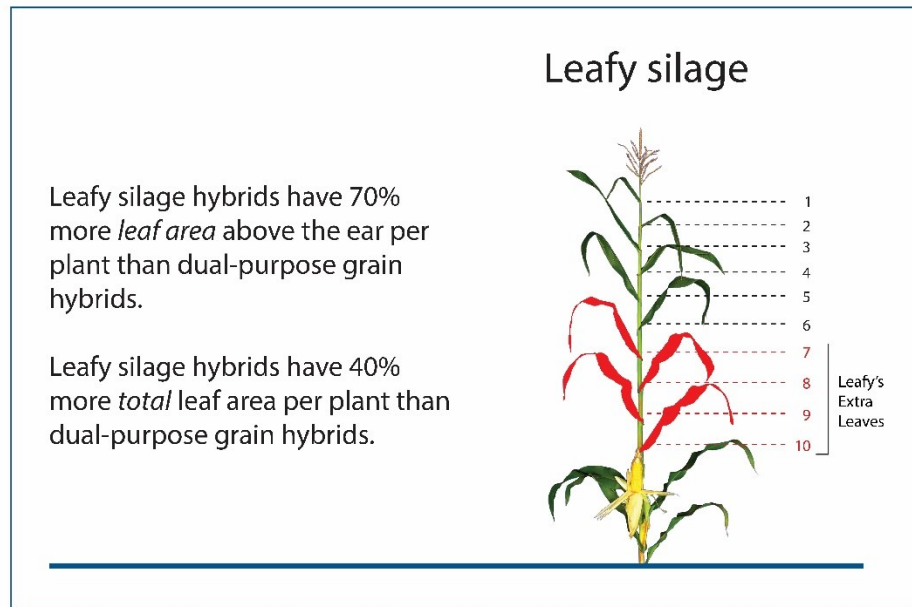


Figure 2

### Let's compare apples to apples

The dominant industry message is to plant all corn hybrids at high populations in order to maximize silage yield. While this advice is well-taken for grain hybrids, it is detrimental to a Leafy Corn Silage crop to plant it at the high populations recommended for grain. Table 1 below takes into account the higher leaf area of a Leafy Corn Silage Hybrid and compares that to the population density of a grain hybrid.

<i>Leafy planted at</i>	<i>is comparable to</i>	<i>Grain planted at</i>
25,000 ppa	x 40% more leaf area	35,000 ppa
28,000 ppa	x 40% more leaf area	39,000 ppa
35,000 ppa	x 40% more leaf area	49,000 ppa

Table 1

When leaf area is accounted for, you can see that planting a Leafy Corn Silage Hybrid at 35,000 ppa gives a comparable canopy to the grain hybrid at 49,000 ppa. Planting the Leafy at 28,000 ppa gives the same leaf canopy as the grain hybrid at 39,000. To achieve the equal leaf area canopy as a grain hybrid that is planted at its recommended population of 35,000 ppa, the Leafy would be planted at 25,000 ppa.

### What difference in yield does population make?

Glenn Seed is the developer of Leafy Corn Silage Hybrids. We have been breeding and testing these products for the market since 1989. In that time, we have conducted numerous population studies on our best hybrids. We have seen

them suffer hot dry seasons, and experience major weather events with high winds and heavy rains. What we have found is that plants with 8-9 LAE achieve maximum yields at 30,000 ppa. For plants with 10-11 LAE, maximum yields result when they are planted at 28,000 ppa. At 28,000 to 30,000 ppa, Leafy Corn Silage Hybrids have strong roots and good drought response. They also produce a crop with excellent feed qualities – high starch and a good proportion of digestible fiber. At these populations our Leafies are higher-yielding than grain hybrids that are planted at 35,000 ppa – by about 10%.

### Balancing yield with quality

When we plant a Leafy Corn Silage Hybrid, we are growing FEED that must be digested to produce MILK, so we aim to grow this crop at the population that will produce the highest quantity of dry matter with the highest grain yield and best fiber digestibility, while achieving the best crop security. In our population studies, we have seen that in average conditions, the YIELD of a 10-11 LAE Leafy will not be different between 28,000 and 32,000 ppa, and will often be less at 36,000. But when we look at the difference in the QUALITY of the feed that is produced at different populations, we see that maximum grain yield and digestible fiber is achieved at the lower 28,000 ppa. For 8-9 LAE Leafy hybrids, this number is 30,000 ppa. This difference in feed quality affects milk production potential.

Figure 3 illustrates the differences between the same Leafy Corn Silage Hybrid planted at 28,000 ppa and 35,000 ppa at the same location. At 28,000 ppa, the hybrid produced large ears and thick stalks. At 35,000 ppa the ear and stalk size declined. As the stalk size declines, so too does its digestibility.

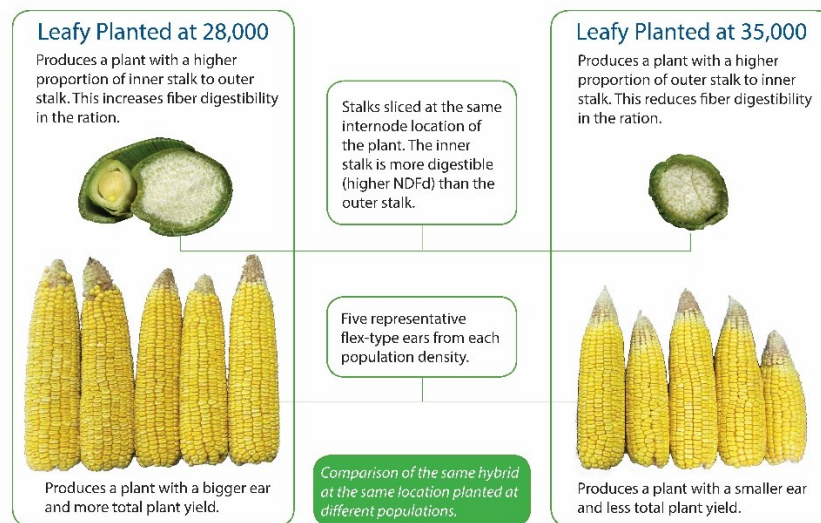


Figure 3

It is essential to grow Leafies at their intended populations. Increasing density can alter flowering dates and maturity, drought response, standability and overall plant composition, all of which affect the feeding value of the silage product.

### Select the best corn silage hybrid for your dairy

Selecting a corn silage hybrid based on its performance in state trials should be a no-brainer. Unfortunately, these trials are planted at a population that is much too high for Leafy Corn Silage Hybrids. All states publish their comparative yield data based on trials that were planted at 33-35,000 ppa. As we know, when the Leafy is planted at this population, it is comparable to planting a grain hybrid at 49,000 ppa. How would a grain hybrid do at 49,000 ppa?

You have seen higher populations when the rows on headlands come closer together. Plants are thinner, ears are smaller, they mature more rapidly and if you look at the amount of grain in the whole plant community, it is much lower than where the rows are regularly spaced. The high population community has a low grain to stover ratio and the plants are very susceptible to drought stress, fertility stress, and root lodging. You would NEVER grow that grain hybrid at 49,000 ppa. In state trials, the data that is produced on Leafy Corn Silage Hybrids grown at 33,000-35,000 ppa does not reflect performance at their intended population.

In state trials where the Milk 2006 formula is used to calculate milk per ton, the Leafy Corn Silage Hybrids show less starch and milk per ton, though they generally still have competitive yield per acre. In our trials we grow dual-purpose hybrids at their recommended population of 35,000 ppa and Leafy Corn Silage Hybrids at their population of 28,000 ppa, in three row plots. We harvest only the centre row to get the best comparable data. In these population-sensitive trials, the Leafies show their undeniable advantage in milk per ton and milk per acre.

Take my well-researched advice: plant your Leafy Corn Silage Hybrid at the population that will produce the largest quantity of high quality feed for milk production – 30,000 ppa for 8 to 9 LAE hybrids and 28,000 ppa for 10 to 11 LAE hybrid – and get the added benefit of saving money on seed. All you need to do is change that planter population setting. When you plant a Leafy Corn Silage Hybrid, less is certainly more.

### **Tail Docking**

Dan Severson  
University of Delaware  
[severson@udel.edu](mailto:severson@udel.edu)

Tail docking is a management practice used in the dairy industry with the intention of enhancing udder cleanliness, reducing incidence of mastitis, and to improve milk quality and milk hygiene. In addition, it is used to increase the comfort of the people performing the milking as well as reducing the incidence of leptospirosis. Research on the benefits of tail docking to achieve such goals has shown no statistical difference between cows that have had their tails docked versus cows that have not been docked. Additionally, the reduced risk of the spread of leptospirosis to humans that perform the milking has shown no relationship of docked versus non docked tails.

Delaware House Bill 189 – Dairy Cattle Tail Docking is a bill that seeks to make dairy cattle tail docking a Class A misdemeanor. The punishment for such an act, if passed, would be up to one year in prison and a \$2300 fine. The bill states that the only way a cow can have a tail docked is if it is done for a therapeutic purpose, the procedure is performed by a licensed veterinarian using suitable instruments and under hygienic conditions, the dairy cattle has been adequately anesthetized to minimize the animal's pain and suffering during the operation, and the procedure is conducted in such a way that minimizes any long-term pain and suffering of the animal. The bill has been tabled, but can be brought off the table if any House of Public Safety Committee member sees fit.

The national Milk Producers Federation has announced that as of January 1, 2017, tail docking will no longer be permitted under Farmers Assuring Responsible Management or (FARM). FARM is a program that is open to all dairy producers, milk processors and milk co-ops that sets the standards of animal care guidelines in the dairy industry. The American Association of Bovine Practitioners (AABP) and the American Veterinary Medical Association (AVMA) currently oppose routine tail docking of cattle. The AABP states that "*current scientific literature indicates that routine tail docking provides no benefit to the animal.*" Furthermore, California has passed legislation banning routine tail docking and other states are proposing similar actions.

However, the consumers of our products want to know more about the way we raise our animals. This is becoming a public perception as well as an animal welfare issue. Hoard's Dairyman recently published an article dealing with the tail docking debate and suggested alternatives to tail docking:

- Use cattle clippers to remove hair from the tail.
- Use sheep shears to remove hair from the tail.

Use an attachment to a drill, called a Tail Well, to remove the hair from the tail.

If you milk in a tie stall barn, you have the option of tying the tails up with a bungee type apparatus.

The intent of this article is to bring your attention to the current issue of tail docking. I am not for or against tail docking. My purpose is to make every producer aware of tail docking legislation that may have an impact on your operation. Getting hit in the face with a wet soiled tail during milking is not a pleasant experience. Therefore, you may want to start discussing alternatives to tail docking with your veterinarian.

If you would like more information feel free to contact Dan Severson at [severson@ude.edu](mailto:severson@ude.edu) or call 302-831-8860.

**References are available upon request.**

## **Top Ten Tips: Feeding Forages to Pre-weaned Calves**

**Amber Adams Progar, Dairy Management Specialist**

**Wahsington State University**

[amber.adams-progar@wsu.edu](mailto:amber.adams-progar@wsu.edu)

Did you know that about 50% of dairy producers surveyed in 1992 offered hay to calves within the first 14 days of life? In 2014, only 20-30% of producers reported offering hay to pre-weaned calves and the first offering typically didn't occur until calves were 30-58 days old. What happened? What caused the dairy industry to reconsider feeding forages to pre-weaned calves? I recently presented a talk in Lynden, WA, on these very topics.

One producer applied the information he/she learned during my talk and began offering hay to calves at seven days of age. Previously, the producer waited to offer hay until calves reached 40 days of age (calves are weaned at 80 days of age on this particular dairy). The results this producer noticed were encouraging and he/she contacted me to share the news. Not only were the calves eating more starter grain than usual, but they were also starting to eat grain at an earlier age. On top of that, calves were consuming more water than usual. We are all curious to see how these calves look a couple of months from now. Will they wean at a heavier weight? Are there long-lasting effects of feeding hay at a younger age? For now, we will just have to wait and see.

I summarized my talk into the ten tips listed below, but you may also access the video of my talk at <https://www.youtube.com/watch?v=n9XK8vyAjIM>. I hope you find this information to be useful as you contemplate whether feeding forages to your pre-weaned calves would be a good fit for your dairy.

What you need to know about the advantages and disadvantages of feeding forages to pre-weaned calves:

1. **Energy and Digestion.** Starches are known to provide more energy per unit and are more quickly digested than forages. This is one reason why starter intake has been preferred over forage intake for pre-weaned calves.
2. **Rumen Development.** Another reason starter grains have been preferred over forages is because volatile fatty acids (VFAs) from forages may negatively impact rumen development. A 1962 study found that pre-weaned calves fed hay developed 63-67% fewer papillae in their rumens. The papillae, as we know, play a key role in the absorption of nutrients in the rumen.
3. **Appetite.** Consuming forages may lead to "gut fill", where the forages suppress a calf's appetite and less starter feed is consumed by the calf.
4. **Dry Matter Intake.** The consumption of hay during the pre-weaning period may actually lead to increases in pre-weaning (up to 15% increase) and post-weaning (up to 38% increase) dry matter intake.
5. **Body Weight.** Forage feeding in pre-weaned calves has been associated with heavier weaning weights (increases up to 9%), but not all studies support this claim. No differences in body weight have also been documented.



6. **Average Daily Gain.** A 36% increase in average daily gain was reported in calves fed alfalfa hay during the pre-weaning period.
7. **Feed Efficiency.** Offering forages to pre-weaned calves does not appear to influence feed efficiency.
8. **Heart Girth.** Calves fed hay during the pre-weaning period had slightly larger heart girths (a 2% increase).
9. **Abdominal Girth.** The addition of hay to pre-weaned calf diets has resulted in larger abdominal girths (a 6% increase).
10. **Future Performance.** Few studies have evaluated the long-term effects of feeding forages to pre-weaned calves. Our understanding, thus far, is that this diet does not impact a calf's future performance (reproductive success or future milk yield).

## Thank You to the 2016 Delmarva Dairy Sponsors and Exhibitors

<b>AgroLab Inc</b>	<b>Innovative Dairy Solutions</b>
<b>AgRAEIS</b>	<b>Kemin Industries</b>
<b>Animart North East</b>	<b>King Crop Insurance, Inc.</b>
<b>Cargill</b>	<b>Lancaster Farming</b>
<b>Central Life Sciences</b>	<b>MD&amp;VA Milk Producers</b>
<b>Chemgro Seeds</b>	<b>Coop</b>
<b>Dairy One Cooperative, Inc.</b>	<b>Mid-Atlantic Dairy Association</b>
<b>David Szelestei Hoof Care</b>	<b>Mid-Atlantic Farm Credit</b>
<b>Delaware Dept. of Agriculture</b>	<b>Myocogen</b>
<b>Delmarva Feed &amp; Farm Service</b>	<b>Renaissance Nutrition</b>
<b>Doebler's Pennsylvania Hybrids</b>	<b>T.A. Seeds</b>
<b>Elanco Animal Health</b>	<b>USDA/NASS</b>
<b>Growmark FS, LLC</b>	<b>USDA Rural Development</b>
	<b>Weller &amp; Associates Inc.</b>

**Department of Animal & Food Sciences  
Cooperative Extension  
University of Delaware  
Newark, DE 19716**



**Contacts:**

**Dan Severson, Agriculture Agent:**  
302 831-8860  
severson@udel.edu

**Limin Kung, Jr., Professor:**  
302 831 –2524  
lksilage@udel.edu

**We're on the Web!**

Dairy Research - <http://ag.udel.edu/dairy/index.html>  
Department of Anim. & Food Sci. - <http://ag.udel.edu/anfs>  
<http://extension.udel.edu/animalscienceblog/>  
UD Creamery - <http://ag.udel.edu/creamery>  
Publications - <http://ag.udel.edu/anfs/faculty/kung/Publications.htm>  
twitter @DanSeversonUD

Cooperative Extension Education in Agriculture and Home Economics, University of Delaware, Delaware State University and the United States Department of Agriculture cooperating. Distributed in furtherance of Acts of Congress of May 8 and June 30, 1914. It is the policy of the Delaware Cooperative Extension System that no person shall be subjected to discrimination on the grounds of race, color, sex, disability, age, or national origin.

College of Agriculture and Natural Resources  
Department of Animal and Food Sciences  
531 S. College Avenue  
044 Townsend Hall  
Newark, DE 19716

