



## **Management Considerations for Immature and Frosted Corn Silage**

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The 2019 growing season in New York has again not been “normal.” Wet conditions delayed planting in many areas of the state. Later in the growing season, some areas were dry. On many farms, there are large differences in corn maturity between fields. There is a possibility that some corn will not reach “normal” maturity when it is harvested. Growing degree days in August and September will be key in determining maturity at harvest. An early frost will further complicate the situation.

What can we do to manage corn harvest in this situation? The key will be to apply the basic principles of harvest, storage and feeding of the 2019 corn crop. Dairy producers have been through this situation a few times in the last 10 years and have some experience in managing this situation. The key points to concentrate on for the 2019 corn crop are:

### **Nutrient Composition:**

Immature corn will be wet (30% DM), higher in crude protein sugar and NDF and lower in starch than mature corn. NDF digestibility is difficult to predict due to environmental conditions at different phases of plant growth. Energy value of immature corn will be 80 – 95 % of normal maturity corn silage.

### **Harvesting:**

- Do everything possible to harvest corn silage at the **right dry matter content**. The target range for harvest is 32 – 38% dry matter (DM). The goal is for the average DM to be 34 – 36% in bunker silos.
- Use whole plant dry matter to determine when to harvest. With many hybrids, milk line is not a good indicator of harvest time.
- If plant dry matter is determined with a Koster tester, the value obtained is about 2 units higher than the actual plant dry matter. A DM of 33% using a Koster tester is about 31% DM in the plant. This needs to be considered when determining harvest time.
- Whole plant dry down rates are about 0.5% per day in September. If the corn plant is 28% DM today, it will take about 8 days to reach 32% DM. Dry down rates are variable due to weather conditions. Check whole plant DM before starting to harvest.
- If the immature corn is harvest at < 30% DM, kernel processing may not be needed.
- Monitor particle size and kernel breakage during harvest. This is the only way to determine if the settings are right.
- Kernel breakage should be > 90%.
- Particle size distribution using the Penn State particle separator:
  - o 2 screens + pan
    - Top screen = 10-20% of the total weight.

- Middle screen = 40 – 60%.
    - Pan = < 40%
  - 3 screens + pan
    - Top screen = 5 – 15% of total weight.
    - 2<sup>nd</sup> screen = >50%.
    - 3<sup>rd</sup> screen = < 30%
    - Pan = < 5%
- You may need to recheck the settings during harvest since factors such as hybrid, stand density, maturity and DM influence particle size and kernel breakage.
  - Consider the use of research proven bacterial silage inoculant to assist improving fermentation efficiency and dry matter recovery. Follow the directions for handling and use.
  - Take some samples for forage analysis to characterize nutrient composition and planning the feeding program. Analyses should include DM, CP, NDF, starch and NDF digestibility.

### **Storage:**

- Try to store immature and normal corn silage in separate facilities. This provides for better flexibility at feeding time and allocation to specific animal groups.
- Make sure you have enough packing tractor weight. The thumb rule is 800 lbs. of packing tractor weight for each ton of silage delivered per hour. If the filling rate is 100 tons/hour, you would need 80,000 lbs. of packing tractor.
- Pack in thin layers (5-7 inches).
- Consider covering the silo walls with plastic on the inside to minimize air infiltration through cracks and joints.
- Seal the silo with plastic and tires or the newer lower oxygen permeability cover.

### **Frosted Corn:**

In some years, there is a killing frost before corn has reached maturity for harvest. Key points to consider in this situation are:

- The leaves will quickly turn brown and the plant will appear “dry”. This gives a false reading on whole plant DM since the leaves are only 10 – 15% of the total plant weight on a DM basis. Most of the plant moisture is in the ear and stalk.
- Whole plant DM needs to be determined to assess when to harvest. Corn for silage should be > 32% DM before starting harvest.
- Frost may kill some of the normal bacteria on the plant. A research proven inoculant may assist in getting a good fermentation started.
- Harvest as quickly as possible. This lowers the risk of the plant getting too dry and potential mold growth on the ear.
- Follow the guidelines listed above for packing and sealing the silo.

### **Mycotoxins:**

The risk of mycotoxins increases when corn plants are subjected to stress. The 2019 growing season may have a higher potential for mycotoxins. There is some monitoring going on by companies and a better assessment should be available by late September or early October.

**Summary:**

- Harvest at > 32% DM.
- Monitor forage particle size and kernel breakage.
- Take samples for forage analysis during harvest.
- Store immature or frosted silage in separate storage facilities.
- Pack and seal the silo.
- Consider the use of a research proven inoculant.
- Watch for more information in mycotoxin risk.

**For More Information:**

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