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Cooperative Extension

Management Considerations for Immature and Frosted Corn Silage

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Reports from around the state indicate that corn planted for silage is highly variable around the state this season. In some areas, corn maturity stage and potential yields appear to be very good. In other situations, corn is behind normal maturity. This variation in maturity status is evident within fields and between fields in the same area. Some corn was also flooded in parts of the state. There is a good possibility that least some corn planted for silage will not attain “normal” maturity at harvest unless we get a large number of growing degree days and a late frost. However, an early frost will increase the acres of immature corn harvested as silage.

What do we do in this situation? The key is to remember and apply the basic principles for harvest, storage and feeding this year’s corn crop. We have been through this same scenario a number of times in the last 10 years so many people have some experience in managing this situation. The key points to concentrate on for the 2014 corn crop are:

A. Harvesting

- a. Do everything possible to harvest corn silage at the **right dry matter content**. The target range for harvest is 32 – 38% DM (62 – 68% moisture).
- b. Harvesting at the right DM increases forage yield, dry matter intake, forage digestibility, milk production and profitability.
- c. **Use whole plant dry matter** to determine when to harvest. With many of the newer hybrids, milk line **is not** a good indicator of when to harvest.
- d. It has been shown that the plant DM value obtained with a Koster tester is about 2 units higher than actual plant dry matter. A 33% DM determined with a Koster is really about 31%. Keep this in mind when interpreting the results and deciding when to harvest.
- e. Whole plant dry down rates are about 0.5% per day in September. You can use this as a gauge for harvesting. If your corn silage is 28% DM today, it will be about 10 days until it reaches 32% DM. Since the dry down rate is variable, you should double check whole plant DM before starting harvest.
- f. Forage harvester settings:
 - i. If using a processor, theoretical length of cut (TLC) should be 0.75 inches.
 - ii. Set the processor rolls with an opening of 1-3 mm.
 - iii. If not using a processor TLC should be 0.25 – 0.5 inches.
- g. **Monitor what’s actually coming out of the Harvester!**

- i. There are too many factors (hybrid, stand density, DM, maturity, field speed, etc.) that determine the **actual** particle size of the material leaving the chopper. The only way to know if the settings are right is to monitor particle size and kernel breakage. Guidelines are:
 - 1. Penn State particle separator
 - a. 2 screens + pan
 - i. Top screen = 10-20% of the total weight
 - ii. Middle screen = 40 – 60%
 - iii. Pan = < 40%
 - b. 3 screens + pan
 - i. Top screen = 5-15% of the total weight
 - ii. Second screen = > 50%
 - iii. Third screen = < 30%
 - iv. Pan = < 5%
 - 2. Kernel breakage – The goal is > 90% of kernels broken or damaged.
- j. Adjust chopper settings if particle size or kernel breakage is not meeting the above guidelines.
- k. You should recheck these measurements frequently since things like hybrid, stand density, maturity and DM will change both particle size and kernel breakage with the same settings.

B. Storage

- a. If you have both “normal” and immature corn silage, try to store them in separate silos or Ag-Bags. This provides flexibility at feeding time.
- b. Store any BMR corn silage in a separate silo.
- c. Make sure you have enough packing tractor weight. The thumb rule is 800 lbs. of packing tractor weight for each ton of silage put in the bunk per hour. If you have a fill rate of 100 tons/hour, you would need 80,000 lbs. of tractor weight.
- d. If more than 1 packing tractor is needed, make such the silo is wide enough for both tractors to work safely at the same time.
- e. Pack thin layers (6-8 inches) if possible.
- f. Consider covering the bunker walls with plastic on the inside to minimize air infiltration through cracks and joints.
- g. Seal the silo with plastic and tires or the new lower oxygen permeability covering material.
- h. Consider the use of a research proven bacterial silage inoculant or acid preservative to assist in improving fermentation efficiency and dry matter recovery. Ask for research data that supports the product claims.
- i. Handle and use the product according to directions from the supplier. A number of things can decrease the effectiveness of bacterial products. These

include improper application rates, the water used to mix the material, water temperature in the tanks and how long the product has been mixed up.

C. Feeding considerations

- a. If possible. Let the corn silage ferment for 3 – 4 months before feeding. This will minimize the typical “October to December” ration adjustments and lower milk production associated with feeding “new” corn silage.
- b. The weather conditions during the 2011 growing season make it difficult to predict digestibility and feeding value of the corn silage produced. The following forage sampling and analysis schedule should help:
 - i. Take samples at the time of harvest and analyze then for DM, CP, NDF, starch and NDF digestibility. This will provide a base or starting point for planning your feeding program.
 - ii. At feeding time, feed off the front part of the silo to less sensitive groups (late lactation cows, far off dry cows, bred heifers) until you reach a good silo face.
 - iii. Take samples from a number of places on the face, composite and send in for wet chemistry analysis of DM, CP, soluble CP, NDF, starch, NDF digestibility and fermentation profile. Your feed professional can use this information to adjust rations and take maximum advantage of your silage.
 - iv. Repeat this sampling procedure at least monthly until the results become stable. It may take 3-6 months for this to occur.
 - v. **Observe safety precautions when working around the silo face. Don't approach the face if there are overhangs, etc. Always have a second person at the silo (but not at the face) in case you get buried. Make sure they know how to dig in and get you an airway for breathing. Have a cell phone available to call for help.**
 - vi. An alternative is to use the front end bucket or silo facer to knock down forage. Remove this silage a safe distance from the face and then take your samples.
 - vii. When you start feeding the 2014 corn silage, take 1-2 weeks to transition between the old and new corn silage. This will minimize potential fermentation and nutrient changes in the ration. Cows like consistency of both feed and nutrients!

D. Frosted Corn Silage

In some years, we get a killing frost before the corn has reached maturity for harvest. The following factors should be considered when managing frosted corn silage:

- The leaves will quickly turn brown and the plant will appear “dry”. This gives a false reading on whole plant DM since leaves are only 10-15% of the total plant weight on a DM basis. Most of the plant moisture is in the stalk and ear.
- Whole plant DM needs to be determined to assess when to harvest. Corn for silage should be at 32% DM before you start chopping. The target range for harvest is still 32 – 38% DM.
- The frost may kill some of the normal bacteria found on the plant. The use of a research proven bacterial silage inoculant should be used to assist in getting a good fermentation started when ensiling this crop.
- Once you start harvesting, harvest as quick as possible. This will lower the risk of the plant getting too dry and any molds that could grow on the ear while it is still in the field.
- Follow normal guidelines for packing and sealing the silo.

Summary:

Harvesting corn for silage in 2014 will be challenging in some situations due to the need to handle immature or frosted corn. The harvest and silo management principles used for harvesting “normal” corn silage still apply in these situations. The most single critical step is to use whole plant DM determinations as the base for determining when to start harvesting. Once chopping has started, check corn forage particle size and kernel damage to determine if the chopper settings are correct or need adjusted. Fill the silo fast, pack, and seal the silo. This should provide the best quantity and quality of corn silage to use in your feeding program over the next year.

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