

Corn silage: What did we learn from the 2014 frost?

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The killing frost that affected a good part of Quebec in mid-September 2014 could have had drastic consequences, particularly for dairy producers who use corn silage as a major forage component in their rations. Fortunately, their vigilance helped mitigate the damage.

With all the talk of global warming, we had no reason to expect what occurred the night of September 18 to 19. Will it happen again? It's hard to say. Nonetheless, there are lessons to be learned from the experience. Agriculture has its share of challenges; when it isn't the weather, it's markets, mechanics, or manpower. As they say, you have to be made of strong stuff. The September 2014 frost forced dairy farmers to take note of the situation, assess the damage, change their plans, and take quick action. Many of them were able to salvage something from the wreckage.

Whole-plant, not milk line

The milk line is no longer the criterion for deciding when to ensile. Instead, whole-plant dry matter is the factor to consider, but the optimal range is tight and depends on, among other factors, the structure used for storage. In the days following September 19, the corn plants dried out quickly. Producers had to scout their fields almost daily, taking representative plant samples, doing moisture tests, and standing ready.

Figure 1 shows that most producers managed well. Some farmers harvested corn silage that was too dry, but they probably had little choice due to factors such as contract workers overloaded with work or fields too wet for ensiling.

Starch content

Beyond the debate on the choice of hybrid, the fact remains that the grain does contribute to the energy content of corn silage. The killing frost on September 19 brought the grain maturing process to a halt. The plants were dead and the only thing left to do was to take what was there. Choice of hybrid, seeding date and growth conditions no longer mattered, since there was no chance of recovery. Figure 2 shows that the crops were nowhere near maturity. Some producers were perhaps too ambitious, seeding hybrids that were a little late for the average year. The average starch content of the samples analysed was 29.5 per cent. In contrast, the average starch content at Valacta's lab in 2010 was 35.5 per cent. Quite a difference!

The cows noticed

Cows express themselves via the bulk tank: in kg of milk, protein content, and milk urea nitrogen. Producers were surprised to see urea nitrogen levels climb to 15 and 16 with rations in which the forage content was mostly corn silage. In many cases, they had to add more grain than the feeding software prescribed. The mathematical models were sometimes foiled. This is where one fully appreciates the importance of measuring parameters such as soluble protein, starch, starch digestibility, lactic acid, and acetic acid in corn silage.

Fermentation generally occurs rapidly in corn silage, and the quick drop in pH gives silage microbes little time to solubilize protein and convert sugars and starch into lactic and acetic acid. This explains why silage is said to be unstable at feed-out, but that's another story.

Reduce risk

When you read this article, it is highly unlikely that Quebec will have been hit by a killing frost in 2015. Some producers may have already finished ensiling their mature corn, while others will be keeping a close watch to ensure they harvest at the right time. Good management reduces the risk of things going wrong.

Winning strategies for good corn silage

Here is a brief review of the requisites for success, previously published in *Le producteur de lait québécois*, in September 2009:

1. Visit corn fields regularly because they change rapidly.
2. Monitor whole-plant dry matter content. Monitoring dry matter requires a little ingenuity, but dry matter content is a decisive factor in the success of a silage operation.
3. After a killing frost, every day counts, so act quickly. As soon as the plants die, the countdown begins.
4. Fill the silo quickly. It goes without saying: the faster the work gets done, the shorter the aerobic phase and the better the outcome.
5. Adjust chop length and roll clearance.
6. Remember that corn silage is often unstable at feed-out.

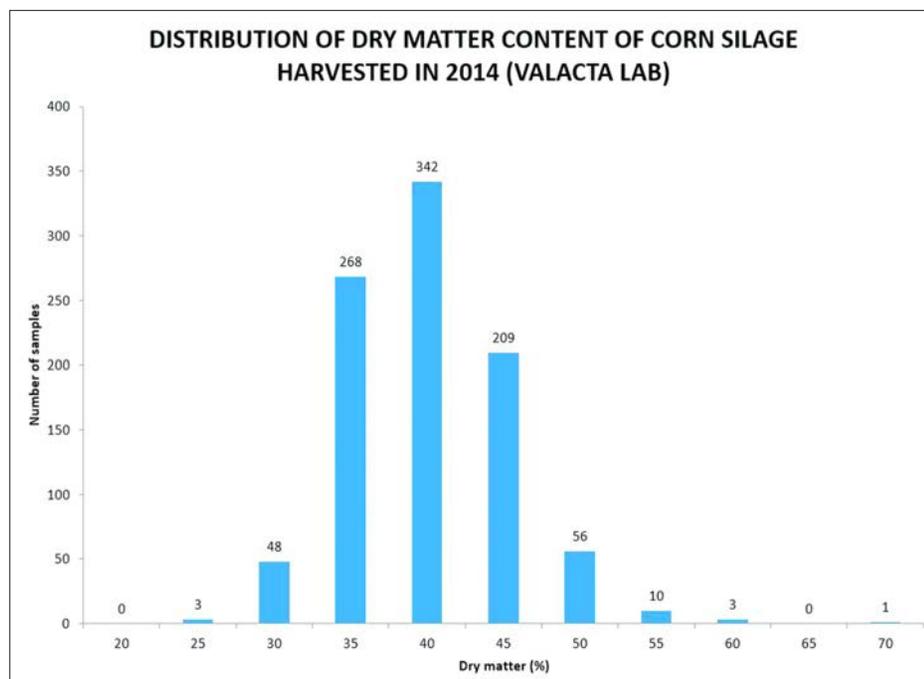


Figure 1

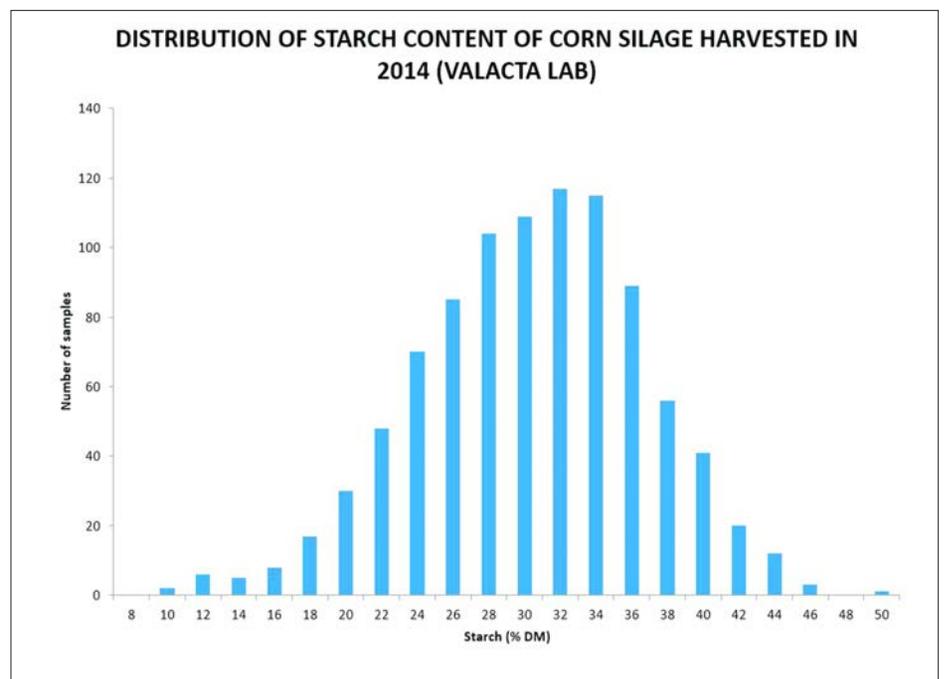


Figure 2