Pricing Drought-Stressed Corn for Corn Silage

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With a “normal” corn crop, pricing a standing crop for silage can be “interesting”. Pricing a drought-stressed corn crop is even more interesting. What is the actual nutrient content of the crop? How well will the crop ferment? Will nitrate levels put the potential silage crop at risk? There are many unknowns, with the biggest challenge being how to determine the dollar value to assign to that risk.

The value of drought-stressed corn silage can be estimated using expected nutrient composition and the cost of the nutrients. The average composition of drought-stressed corn silage in Table 1 is reasonable, but the composition of silage for a specific situation (e.g., hybrid, growing conditions, etc.) could be substantially different. The nutrient values were calculated based on numerous feed prices in central Ohio.

Table 1. Average composition of drought-stressed corn silage and current (Jan-July 2012) value of nutrients in Ohio.

Nutrient	Concentration	Units/T of DM	Nutrient cost	Economic value
NEL	0.60 Mcal/lb	1200 Mcal	$0.15/Mcal	$180
Metabolizable protein	6.6%	132 lbs	$0.35/lb	$46
Non-effective NDF	12.5%	250 lbs	-$0.05/lb	-$13
Effective NDF	37.5%	750 lbs	$0.0/lb	$0
Total value				$213/T of DM

[1] DM = dry matter, Mcal = megacalories, eNDF and neNDF = effective and non-effective neutral detergent fiber, NEL = net energy for lactation.

The $213/ton of DM (±$20) or $75/ton (± $7) assuming 35% dry matter is the value for the corn silage *when fed to the cow* and includes harvest and storage costs and shrink. It assumes the fermented feed is excellent quality and will allow for high dry matter intakes and good production when fed in a balanced diet. When corn is standing in the field you do not know whether the resulting silage will turn out good or bad. Making silage from drought- stressed corn has some additional risks that must be considered when pricing. It could be high in nitrates, which in the worst situation will make the silage totally unacceptable as a feed (for additional information on nitrates see: http://ohioline.osu.edu/as-fact/0003.html). The silage may have much higher fiber and lower energy than anticipated. We are using the composition of ‘average’ immature corn silage for these calculations. Drought stress can greatly affect the composition of the corn plant and therefor it’s value.

If you are purchasing standing corn, the purchase price must be adjusted to account for these costs and risks. When you purchase standing corn, in contrast to buying fermented corn silage, the user of the silage (e.g., the dairy farmer) assumes those risks and the price of standing corn should be discounted to account for the risk. We cannot give you a value for risk; each buyer must determine that value for themselves based on the conditions of the crop they are purchasing and negotiate the final price with the seller.

In addition, for more than 6 years, good corn silage (made from normally developed corn plants) has almost always been a 'bargain' feed in that its market price is 15 to 25% less than the value of its nutrients. Based on this historic relationship, corn silage with a nutrient value of $213/T of dry matter (see Table 1.) would sell for about $170/ton of dry matter ($60/ton at 35% dry matter) – remember that this value is for good quality corn silage in front of the cow. This normal relationship between corn silage selling price and corn silage value should also be considered in the negotiations.

Example: Price of Standing Corn (assumed 35% dry matter)

Nutrient value of corn silage when fed to cow: $75/ton of 35% DM silage

Harvest costs - $ 6 to 11/ton depending on yield[1]

Storage costs - $ 9/ton

Shrink (13%) - $ 10/ton

Risk? - $??? (this could be substantial)

= Price of standing corn $48/ton at 35% dry matter (± $5) minus the value of risk.

If you apply the typical selling price vs. nutrient value discount of ~20%, this becomes $38/ton at 35% DM.

[1]Lower cost for "normal" corn silage yields, higher cost for lower, drought-stressed corn silage yields.

For many people both the price of corn silage as fed to the cow ($60-75/ton) and the price of standing corn ($38 to 48/ton ± $5) seems high (and they are). However, you have to consider replacement costs, i.e., what will it cost if you have to purchase other feeds to replace the nutrients provided by corn silage. **These are the maximum prices a farmer should pay for purchasing corn silage or standing corn**.

Calculating the Floor Price

The lowest price (on a per acre basis) a seller (the grower) should be willing to sell standing corn as corn silage is equal to the estimated dollar return per acre if the crop was sold as grain. The seller should first estimate the potential grain yield and multiply that by the estimated market price he thinks he will receive when it is sold. The seller should then estimate potential silage yield (see slides 4-7 in 'Pricing Corn Silage in 2007" at http://dairy.osu.edu/resource/OSU%20Dairy%20Pubs.html. **The estimated dollar return per acre for the crop sold as grain divided by the estimated silage yield per acre would be the floor price per ton of corn silage for these negotiations**. At a price below this floor, the grower would be better off harvesting and selling the crop as grain. For "normal" corn, the cost of harvesting the crop as grain approximately offsets the value of nutrients that are removed with the corn plant that would be left in the field if the crop were not harvested as silage.

Additional articles on pricing corn silage are available at http://dairy.osu.edu.