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Cornhusker Economics

Estimating a Fair Value for Standing Forage

Market Report	Year Ago	4 Wks Ago	7-24-20
<u>Livestock and Products.</u>			
<u>Weekly Average</u>			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.	*	*	*
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb. . . .	186.11	169.84	173.03
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb. . . .	158.10	136.65	151.24
Choice Boxed Beef, 600-750 lb. Carcass.	213.09	210.20	201.56
Western Corn Belt Base Hog Price Carcass, Negotiated	*	*	*
Pork Carcass Cutout, 185 lb. Carcass 51-52% Lean.	81.62	64.48	69.94
Slaughter Lambs, woolled and shorn, 135-165 lb. National.	159.56	103.83	104.54
National Carcass Lamb Cutout FOB.	395.06	415.16	NA
<u>Crops.</u>			
<u>Daily Spot Prices</u>			
Wheat, No. 1, H.W. Imperial, bu.	3.97	3.90	4.03
Corn, No. 2, Yellow Columbus, bu.	4.18	2.99	2.91
Soybeans, No. 1, Yellow Columbus, bu.	8.00	7.92	8.23
Grain Sorghum, No.2, Yellow Dorchester, cwt.	6.55	6.18	6.16
Oats, No. 2, Heavy Minneapolis, Mn, bu.	3.03	3.67	3.31
<u>Feed</u>			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	*	172.00	*
Alfalfa, Large Rounds, Good Platte Valley, ton.	115.00	*	*
Grass Hay, Large Rounds, Good Nebraska, ton.	105.00	75.00	*
Dried Distillers Grains, 10% Moisture Nebraska Average.	143.50	121.29	122.60
Wet Distillers Grains, 65-70% Moisture Nebraska Average.	38.00	33.23	39.17
* No Market			

Several things need to be considered when deciding what value to place on standing forage. Forage prices reflect current inventories, demand, expected current season production and associated yield risk, and quality characteristics. Standing forage can be harvested in a number of different ways which need to be considered when pricing it. Below, we provide a few general thoughts and questions concerning harvesting method and comparable feed value to consider when pricing standing forage. We follow with a few examples illustrating pricing calculations for forage mechanically harvested as hay, haylage, and silage. We close with pricing considerations for forage harvested by grazing.

Harvesting Method

The method of harvesting the forage will determine how to price it in the marketplace, how to adjust for harvesting costs, and the risk factors involved that may need to be considered. Will the forage be mechanically harvested or grazed? If it is mechanically harvested, will it be harvested as hay, haylage or silage? Since it is being sold as standing forage, the harvest costs should be borne by the purchaser. However, there are several hidden costs to consider including risk.

Comparable Feed Value

Finding a comparable feed value will largely be determined by the harvesting method. If the forage is to be harvested as hay, then a price for hay of comparable feeding value should be used. Forage harvested as haylage should be priced based on comparable hay prices adjusted for differences in dry matter content. If the forage is harvested as silage, then the price of corn silage can be used as a starting point and adjusted for differences in feeding value. If the forage is grazed, local grazing rates adjusted for additional grazing cost

may apply on a per head per day basis but per acre rates would need to be further adjusted to fit the specific production situation

Forage Harvested as Hay

If the forage is to be harvested as hay, the market price for hay of comparable quality can be used as a basis. For example, sorghum x sudangrass and pearl millet hay at boot or early head would be equivalent to good grass hay. At early to mid-dough stage, they would be equivalent to fair grass hay. However, the market price for hay includes harvest costs. Therefore, hay harvesting cost for the forage needs to be estimated and subtracted from the market price for hay of comparable quality to estimate a fair value for the standing forage. Furthermore, it may be appropriate to adjust the price down by a risk factor of 10-20% because the buyer of the standing forage is assuming the risk of having low quality hay due to weather damage. The magnitude of this adjustment depends on the extent of the perceived risk.

We constructed a spreadsheet to help producers with estimating a fair value for their standing forage. This

tool (available for download at <https://farm.unl.edu/forage>) was used to construct the examples that follow. For example, if comparable hay is valued at \$90 per ton, the value of the alternative forage standing in the field can be calculated as \$56 per ton or \$265 per acre using the following steps (see Figure 1). Yield is estimated for the standing forage harvested as hay at 4.7 tons per acre and the average bale size is estimated at 1,300 pounds. These are used to calculate an estimate of 7.2 bales per acre. From the 2020 Nebraska Farm Custom Rates, (<https://farm.unl.edu/customrates>), mowing costs are estimated at \$15 per acre, raking costs are estimated at \$5 per acre, and baling costs are estimated at \$15 per bale. On a per acre basis, the cost of making hay (mowing, raking and baling) is estimated at \$128.46. This equates to \$17.77 per bale or an estimated harvesting cost of \$27.33 per ton. This cost subtracted from the market value of \$90 per ton results in a price of \$62.67 per ton standing in the field. This value is then adjusted down by a 10% risk factor to arrive at a price of \$56 per ton for the forage standing in the field or an estimated \$56 per ton.

Hay		
Market value of comparable hay (\$/ton)		\$90
<i>Alternative Forage Information</i>		
Estimated yield (tons/acre)	4.7	
Bale size (lbs.)	1,300	
Bales per acre	7.2	
	\$/ac	\$/bale
Mowing	15.00	2.07
Raking	5.00	0.69
Baling	108.46	15.00
Cost of making hay	128.46	17.77
Cost \$/ton for hay making		27.33
Harvest risk adjustment (10-20%)	10%	(6.27)
Value in field for forage (\$/ton of hay)		\$56
Value per acre		\$265

Figure 1: Example calculation of the value of standing forage harvested as hay.

Forage Harvested as Haylage

The value per acre of standing forage harvested as haylage should not differ from the value of it harvested as hay. However, on a per ton basis, the haylage value needs to be adjusted for moisture content. For example, in Figure 1, standing forage priced at \$265 per acre would be \$56 per ton harvested as hay. Harvested as haylage, it can be expected to have about twice the moisture content. Thus, the haylage yield would be roughly double at 9.4 tons per acre (4.7 tons times 2) and the price per ton would be roughly half at \$28 per ton (\$265 divided by 9.4) compared to if it is harvested as hay. An argument can be made that harvesting the forage as haylage does not warrant the same risk adjustment factor as harvesting the forage as hay. However, the harvest and handling cost of haylage may offset any reduction in risk. Evaluating these tradeoffs is best thought of as a linked decision for the buyer once the standing forage is purchased at the agreed upon price per acre.

Forage Harvested as Silage

If the forage is to be harvested as silage, it is usually easiest to compare it to the value of standing corn since that value will determine the value of corn

silage. The value of standing corn is equal to 7.65 times the price of corn if the following assumptions hold: (1) corn grain is 85% dry matter (DM) content; (2) corn silage is 35% DM content; (3) corn grain makes up 52% of the standing corn content on a DM basis; and (4) harvesting costs for corn grain are equal to the replacement value of additional nutrients harvested from the field as silage as opposed to corn grain. Assumption (4) is highly dependent upon local market prices for harvesting corn, fertilizer purchases and application costs. If these assumptions don't hold, the parameter 7.65 should be adjusted to reflect actual conditions. The Value of Standing Forage tool (<https://farm.unl.edu/forage>) contains a worksheet to help producers make this adjustment, if necessary.

Knowing the value of standing corn, the value of other alternative standing forages can be calculated based on their relative feed value. This is determined by comparing total digestible nutrients (TDN) on a DM basis. For example, sorghum x sudangrass and pearl millet silages are usually 15 to 20% lower in energy than corn silage. They usually contain between 60 and 56% TDN from early-head to mid-dough stage. Whereas at soft dough

Silage		
	\$/bushel Delivered	Multiplier
Market Value of Corn Grain	3.50	7.65
	\$/ton in Field	Moisture Content (%)
Market Value of Corn Silage	26.78	65
	Estimated Yield (tons/acre)	Moisture Content (%)
Alternative Forage Information	12.0	65
	Corn Silage	Alternative Forage
TDN Content on Dry Matter (DM) Basis	72	60
	Value Ratio	
Market Value of Alternative Forage Relative to Corn Silage	0.833	
Alternative Standing Forage priced for Silage (\$/ton as-is in field)	\$22.31	
Alternative Standing Forage priced for Silage (\$/acre)	\$268	

Figure 2: Example calculation of the value of standing forage harvested as silage.

grain sorghum is usually about 90% the energy value of corn silage (65% TDN). If corn price is \$3.50 per bushel, \$3.50 multiplied by a factor of 7.65 equates to \$26.78 per ton of corn silage value standing in the field (Figure 2). If the alternative forage is equivalent to corn silage in terms of DM content (65% moisture content) and the TDN is estimated at 60 for the alternative forage silage versus 72 for the corn silage, then the price of the standing forage is 0.833 times the value of standing corn, or \$22.31 per ton. A yield of 12 tons per acre on a wet basis equates to a price of \$268 per acre standing in the field.

Forage Harvested by Grazing

Valuing of standing forage being sold for grazing purposes should take into consideration the quantity of forage and nutrients in the field throughout the grazing period as well as additional costs to the cattle producer to utilize the forage. A written agreement is highly recommended to minimize any misunderstandings in regards to grazing dates, residual forage cover desired throughout the grazing period, fencing responsibilities, water availability, animal care expectations, and liability concerns.

If the desire is to charge a flat rate per acre, a starting point for negotiations for the example in Figure 2 may be \$67 per acre under the assumptions that only 25% of the forage is consumed by the cattle and all additional costs associated with grazing are the responsibility of the cattle producer. (It is common in the “take half, leave half” grazing practice for 25% of the above ground forage to be consumed by the cattle, 25% trampled into the ground and 50% left as above ground cover on the field.) The cattle producer would receive the benefit of almost 2.7 animal unit months (AUMs) per acre ($12 \times 2000 \times 0.35 \times 0.25 = 2100$ lbs./acre DM consumed, 1 AUM = 780 lbs. DM). This equates to a rate of \$25 per AUM paid to the crop producer. The cattle producer is assuming all grazing expenses and associated risk, more than normally associated with a rate charged per head per unit of time grazing.

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