

Determining the Value of Standing Alfalfa in 2023

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Determining the sale value of standing alfalfa is challenging due to the absence of daily price reports, as exist for agricultural grain commodities. Recent hay market prices are the best available proxy and are available through the UW-Madison Extension website at <https://cropsandsoils.extension.wisc.edu/hay-market-report/>. The three most significant factors to consider when determining the potential value for any individual cutting of alfalfa, or the stand for the entire growing season, include the following:

1. Expected dry matter (DM) yield in tons per acre
2. Estimated value of a ton of DM
3. Harvest costs



Ideally, producers would weigh all the forage harvested from each cutting from a particular field. This is the best way to ensure both parties are treated fairly in any formal arrangement in which standing alfalfa is bought or sold. Multiple forage samples should also be collected during the process of harvesting to determine an accurate value for the average dry matter (DM) content of the feed being sold. Once you have agreed upon a fair price or value for a ton of DM (may be with or without harvesting costs), you simply multiply the harvested tonnage by the agreed upon value per DM ton then adjust for harvesting costs. Unfortunately, not all farms have access to drive-over scales. When an on-farm scale is unavailable, making an effort to get at least one individual wagon or load weight from a state-certified scale at harvest will significantly improve the yield estimate accuracy relative to estimating without a scale.

Prior to harvest, or in addition to weigh wagons at harvest, expected dry matter (DM) yield can be estimated by measuring alfalfa stand density or by utilizing multi-year on-farm data sourced from the Wisconsin Alfalfa Yield and Persistence (WAYP) program. The project is managed by the University of Wisconsin-Madison/Division of Extension. The 2022 WAYP summary can be viewed at:

<https://arlington.ars.wisc.edu/wp-content/uploads/sites/115/2023/04/2022-WAYP-Summary.pdf>.

When determining a fair price for an individual cutting of alfalfa or all cuttings for the entire growing season, buyers and sellers should discuss the following six considerations.

- 1) **Stand Density:** Alfalfa stands with an **average of 55 stems per square foot** are defined as not being limited and having full season yield potential. Due to the high variability in alfalfa stem counts throughout many fields these past few growing seasons, it would be wise for buyers and sellers to evaluate stands to determine a realistic potential yield. WAYP project data can help you estimate DM yield derived from on-farm data collected over the past 16 years. Local growing conditions, alfalfa stand condition after overwintering, age of the stand, composition of the stand, soil texture/series, soil fertility, and soil drainage can all significantly impact alfalfa DM yields during any given growing season. It is not advisable to purchase standing alfalfa without taking each of these considerations into account before any final arrangement is agreed upon by all parties involved.

	stand density (stems/sq ft)	action	
	>55	stem density not limiting yield	
	40-55	some yield reduction expected	
	<39	consider replacing stand	

Source: Alfalfa Stand Assessment – Is This Stand Good Enough to Keep? – Dan Undersander, Forage Agronomist, UW-Madison

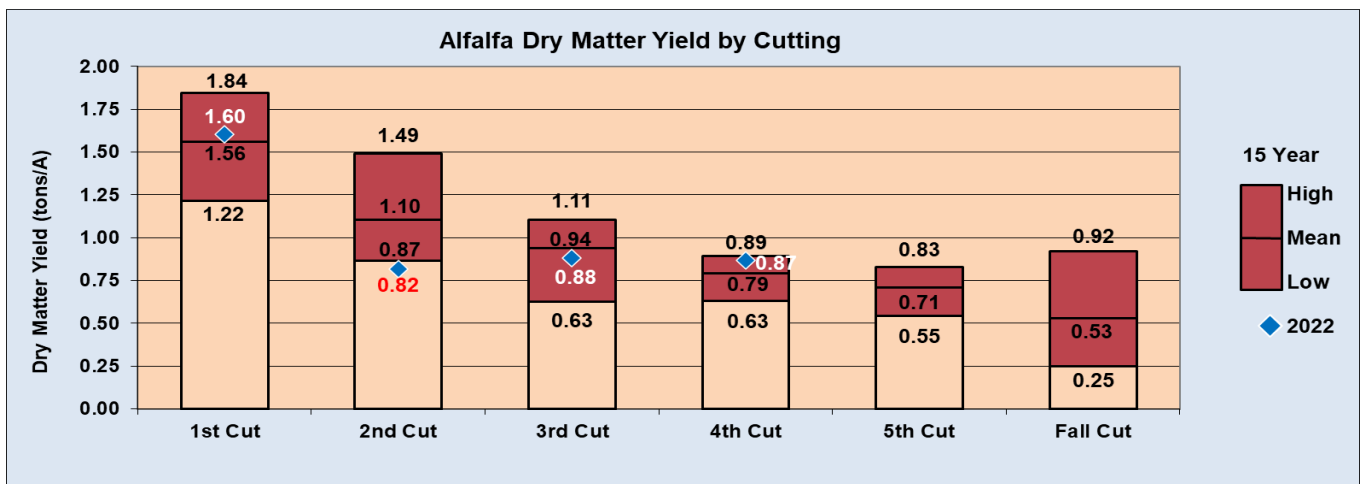
2) Average Yield Distribution Per Cutting as Determined by the WAYP Program On-Farm Data:

3 cut system – 46% (1st crop) – 28% (2nd crop) – 26% (3rd crop)

4 cut system – 36% (1st crop) – 25% (2nd crop) – 21% (3rd crop) – 18% (4th crop)

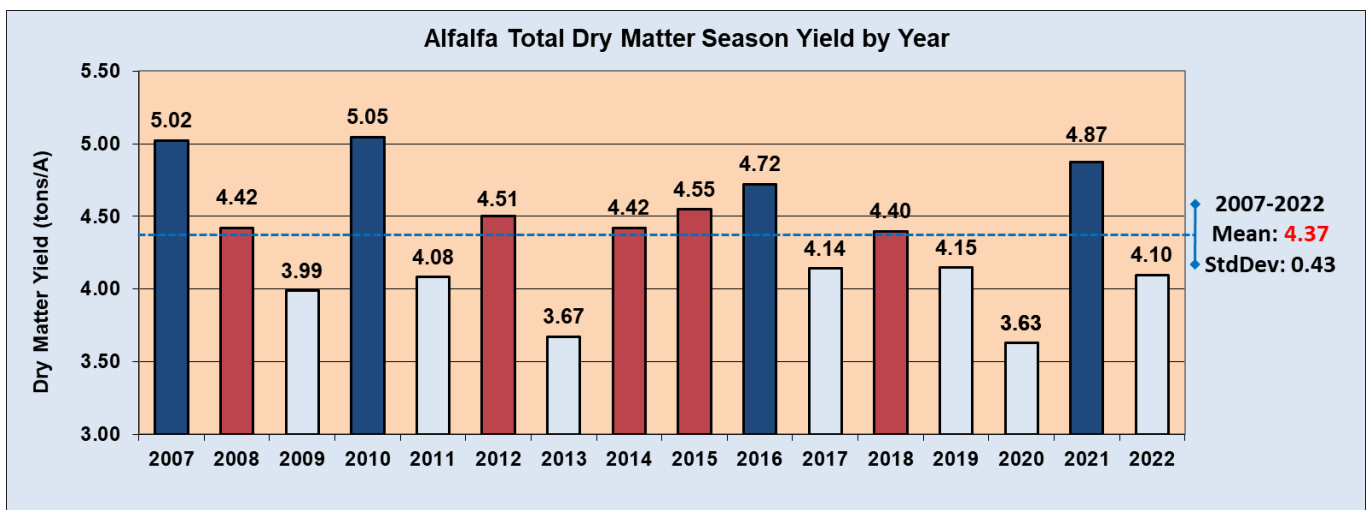
5 cut system – 32% (1st crop) – 21% (2nd crop) – 18% (3rd crop) – 16% (4th crop) – 13% (5th crop/fall cut)

WAYP data collection begins with the first full production year following new seeding. Fifth cutting (September) and late fall cutting (October/November) data were collected in years when available. It should be noted that four-cut systems represent the largest percentage of the data. The low, mean (average), and high values for DM yield over the life of the project are illustrated below. In addition, 2022 data is included so you can compare the most recent year's data to the other benchmark measurements established over the past 16 years.



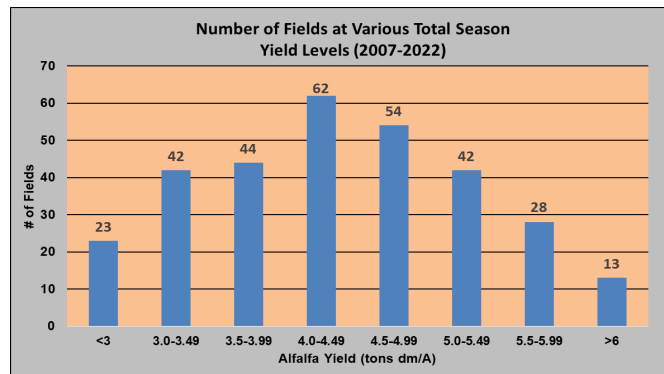
Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary, 2022

- 3) **Historic Total Season Yield:** The WAYP program has an observed yield range of less than 3.0 tons to more than 6.0 tons DM per acre. The most frequently observed yield has been **4.0-4.49 Tons DM per acre per year**. The following chart illustrates the annually observed mean of alfalfa DM yield in tons per acre from 2007-2022. The average yield of first through fourth crops over the project is 4.37 tons DM per acre. The 2022 growing season data resulted in a 4.10 tons of DM yield, below the 16-year mean.



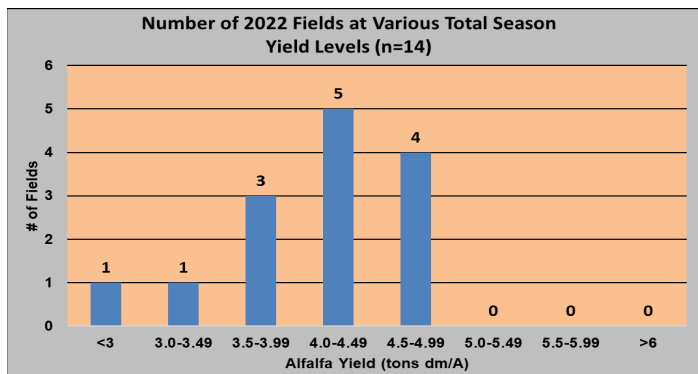
Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary, 2022

Dry Matter Yield Level Distribution from 2007-2022



Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary

Dry Matter Yield Distribution 2022 Growing



Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary, 2022

- 4) **Weather Risk and Field Losses:** Management practices applied to the site by the buyer during the cutting and harvesting of alfalfa will influence the final quality measurements. Purchased baled hay may have a known, measured quality from a forage test. Alfalfa purchased standing in the field has unknown quality until after harvest due to weather risk, insect or disease pressure, maturity at cutting, leaf shatter, and harvesting losses. These factors should be considered and accounted for when determining the final price. An adjustment of 25 percent to the value of the alfalfa standing in the field may be considered a reasonable method to further account for the buyer's risk. The buyer and seller can decide if they wish to use a factor other than 25%.



Merging alfalfa windrows before harvest

5) Determining the Value of a Ton of DM Alfalfa



Small square bales being harvested in Outagamie County

The Hay Market Demand and Price Report for the Upper Midwest is located at <https://cropsandsoils.extension.wisc.edu/hay-market-report/> on the UW-Madison Division of Extension Crops and Soils website. It is updated regularly. The **April 10, 2023** report indicates large square bales of Prime Quality (>151 RFV/RFQ) alfalfa averaged \$274.00 per ton. The value of a ton of DM is determined via the following calculations:

Price for a Ton of DM

As baled hay, assume moisture of 15 percent, which means it is 85 percent DM or **0.85**

$$\frac{\$274.00}{\text{as fed ton}} \times \frac{\text{as fed ton}}{0.85 \text{ ton DM}} = \frac{\$322.35}{\text{ton DM}}$$

Using a value of \$322.35 per ton DM and applying a 25% risk adjustment, we end up with a risk adjusted value for a ton of DM standing alfalfa as follows:

$$\$322.35 \times 0.25 = \$80.59$$

$$\$322.35 - \$80.59 = \mathbf{\$241.76 \text{ per ton of DM.}}$$

- 6) **Harvesting Cost:** Custom harvest operation can be used to estimate harvest operation expenses and can be found in the **Wisconsin DATCP Custom Rate Guide 2020** at <https://fyi.extension.wisc.edu/news/2021/05/12/2020-custom-rate-guide/> or the **2023 Iowa Farm Custom Rate Survey** at <https://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf>. Examples from these sources for individual field operations are identified below:

<u>Mowing and Conditioning per acre:</u>	<u>Windrow Merging per acre:</u>	<u>Chopping, Hauling, and Filling per acre:</u>
\$16.61 per acre, statewide average (WI - 2020)	\$14.00 per acre, statewide average (WI - 2020)	\$55.00 -\$75.00 per acre, \$65.00 average *
\$10.50 -\$21 per acre, \$16.60 statewide average (IA - 2023)	\$16.00 - \$20.00 per acre, \$17.80 statewide average (IA - 2023)	Visit the WI Custom Rate Guide for charges expressed in <i>dollars/hour</i> or <i>dollars/ton</i> to calculate costs using those posted values.

*Estimated range based on farm data, 2020 WI Custom Rate Guide does not provide per acre cost.

Using the most recent values, from Iowa State, one may spend \$17 per acre cutting and conditioning the alfalfa, \$18 per acre merging the alfalfa, and \$65.00 per acre chopping, hauling, and filling an upright silo or a bunker silo (**adjust your costs as needed**) resulting in \$100.00 per acre invested for each cutting. **Your harvesting costs may be higher or lower than those cited here.** If you harvest four (4) cuttings, total harvest costs are \$400.00/acre for the season (\$100.00 X 4 cuttings = \$400.00).



Harvesting 1st cut alfalfa haylage in Outagamie County

Using the yield per cutting data presented above, from the WAYP project, we can estimate the value of each cutting over the course of a season, based on total estimated DM yield.

Harvesting **4.0 tons of DM** total value would be \$967.04 less harvesting costs \$400.00 = **\$567.04 net**

1st Cutting = \$ 567.04 X 36% of total yield (1.44 tons DM) for the season = \$204.13

2nd Cutting = \$ 567.04 X 25% of total yield (1.00 tons DM) for the season = \$141.76

3rd Cutting = \$ 567.04 X 21% of total yield (0.84 tons DM) for the season = \$119.08

4th Cutting = \$ 567.04 X 18% of total yield (0.72 tons DM) for the season = \$102.07

Harvesting **4.5 tons of DM** total value would be \$1,087.92 less harvesting costs \$400.00 = **\$687.92 net**

1st Cutting = \$ 687.92 X 36% of total yield (1.62 tons DM) for the season = \$247.65

2nd Cutting = \$687.92 X 25% of total yield (1.13 tons DM) for the season = \$171.98

3rd Cutting = \$687.92 X 21% of total yield (0.94 tons DM) for the season = \$144.46

4th Cutting = \$687.92 X 18% of total yield (0.81 tons DM) for the season = \$123.83

Harvesting **5.0 tons of DM** total value would be \$1,208.80 less harvesting costs \$400.00 = **\$808.80 net**

1st Cutting = \$ 808.80 X 36% of total yield (1.80 tons DM) for the season = \$291.17

2nd Cutting = \$ 808.80 X 25% of total yield (1.25 tons DM) for the season = \$202.20

3rd Cutting = \$ 808.80 X 21% of total yield (1.05 tons DM) for the season = \$169.85

4th Cutting = \$ 808.80 X 18% of total yield (0.90 tons DM) for the season = \$145.58



Harvesting **5.5 tons of DM** total value would be \$1,329.68 less harvesting costs \$400.00 = **\$929.68 net**

1st Cutting = \$ 929.68 X 36% of total yield (1.98 tons DM) for the season = \$334.69

2nd Cutting = \$ 929.68 X 25% of total yield (1.38 tons DM) for the season = \$232.42

3rd Cutting = \$ 929.68 X 21% of total yield (1.15 tons DM) for the season = \$195.23

4th Cutting = \$ 929.68 X 18% of total yield (0.99 tons DM) for the season = \$167.34

Harvesting **6.0 tons of DM** total value would be \$1,450.56 less harvesting costs \$400.00 = **\$1,050.56 net**

1st Cutting = \$ 1,050.56 X 36% of total yield (2.16 tons DM) for the season = \$378.20

2nd Cutting = \$ 1,050.56 X 25% of total yield (1.50 tons DM) for the season = \$262.64

3rd Cutting = \$ 1,050.56 X 21% of total yield (1.26 tons DM) for the season = \$220.62

4th Cutting = \$ 1,050.56 X 18% of total yield (1.08 tons DM) for the season = \$189.10



Harvesting **6.5 tons of DM** total value would be \$1,571.44 less harvesting costs \$400.00 = **\$1,171.44 net**

1st Cutting = \$ 1,171.44 X 36% of total yield (2.34 tons DM) for the season = \$421.72

2nd Cutting = \$ 1,171.44 X 25% of total yield (1.63 tons DM) for the season = \$292.86

3rd Cutting = \$ 1,171.44 X 21% of total yield (1.36 tons DM) for the season = \$246.00

4th Cutting = \$ 1,171.44 X 18% of total yield (1.17 tons DM) for the season = \$210.86

Maximizing yield potential

If full alfalfa yield potential is to be achieved, a soil nutrient management plan should be implemented beginning with current soil tests. Following UW recommendations for applying nutrients will optimize money spent on fertilizer. Every cutting of alfalfa removes a significant amount of potassium (K) from the soil. A one-hundred-pound application of potash fertilizer (0-0-60 or 0-0-62) provides 60 or 62 lbs. of K₂O per acre.

Pest management also needs to be considered. Guidelines for treatment thresholds for potato leafhoppers are at <https://fyi.extension.wisc.edu/forage/cut-bale-scout/>.

Additional Considerations

The best way to determine the potential value of standing alfalfa for both the buyer and the seller in any transaction would be to consider local conditions, pricing, and data to develop a crop enterprise budget. This budget should accurately reflect the true costs of production (cropland rental rates, crop input costs, etc.) where a particular transaction is expected to occur. Crop enterprise budgets for forage and grain crops are available for viewing and download at:

<https://cropsandsoils.extension.wisc.edu/article-topic/economics-budgets-financial/>



The National Agricultural Statistics Service (NASS) collects and publishes individual county averages for non-irrigated cropland cash rental rates in Wisconsin annually. The most recent data (8-26-22) is available at: <https://www.nass.usda.gov/Statistics by State/Wisconsin/Publications/County Estimates/>.

Summary

Pricing alfalfa by the cutting, or by the acre may be difficult given the widespread yield variability between and within fields. Weighing the harvested forage is the most accurate way to determine alfalfa yield. Focusing time and effort on three significant considerations when determining the value of standing alfalfa can help.



Alfalfa stand that may be limited by stem counts

1. Estimate yield as accurately as possible.
2. Account for reasonable harvesting costs.
3. Consider risk of harvest and weather loss.

Additional Methods for Determining the Value of Alfalfa – Is There an App for That?

Additional methods to calculate the value of standing alfalfa developed by the University of Wisconsin – Madison Division of Extension can be downloaded for **free** at <https://play.google.com/store/apps/details?id=com.smartmappsconsulting.haypricing>. Those with iPhones and iPads can download the app from the Apple Store by searching “Hay Pricing”.

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