

Determining the Value of Standing Alfalfa in 2020

Kevin Jarek - UW-Madison, Division of Extension, Crops and Soils Agent - Outagamie County

The “fair” value of any given alfalfa stand can vary tremendously. The absence of daily quotes as compared to other agricultural commodities (grains) requires us to rely on the most recent hay market prices available at <https://fyi.extension.wisc.edu/forage/h-m-r/>. The two 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:

- A) Expected Dry Matter (DM) Yield in Tons per Acre B) Estimated Harvesting Costs per Acre**

Expected Dry Matter (DM) yield can be estimated by measuring stand density as illustrated below or utilizing multi-year data from the Wisconsin Alfalfa Yield and Persistence (WAYP) project conducted by the University of Wisconsin – Division of Extension. The most recent summary (2018) is located at:

<https://fyi.extension.wisc.edu/forage/files/2019/03/2018-WI-Alfalfa-Yield-Persistence-Summary.pdf>.

- Stand Density:** Alfalfa stand measurements of an **average of 55 stems per square foot** are defined as “not limiting yield potential”. Unfortunately, this year many existing fields have less than 40 stems per square foot. Previously, stands with lower stem counts would be rotated out of production. However, given Wisconsin hay stocks are at a record 70-year low, many farmers need to keep some of these stands in the rotation during the 2020 growing season. Due to the high variability throughout many fields, it would be wise for buyers and sellers to evaluate stands to determine a realistic potential yield before a sale is agreed upon. Wisconsin Alfalfa Yield and Persistence project data can help you estimate yield based on actual on-farm data collected over the past 12 years.

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?

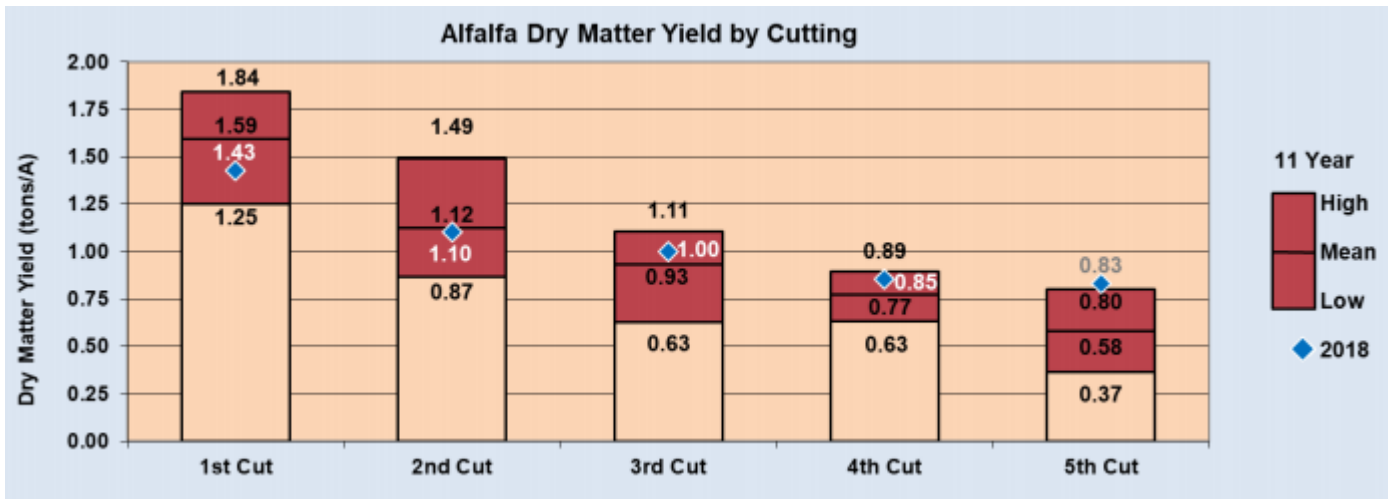
- Percentage of Overall Season Yield Per Cutting:** Data from the WAYP project over the past decade illustrates the average percentage of total season yield distribution in each cutting as follows:

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)

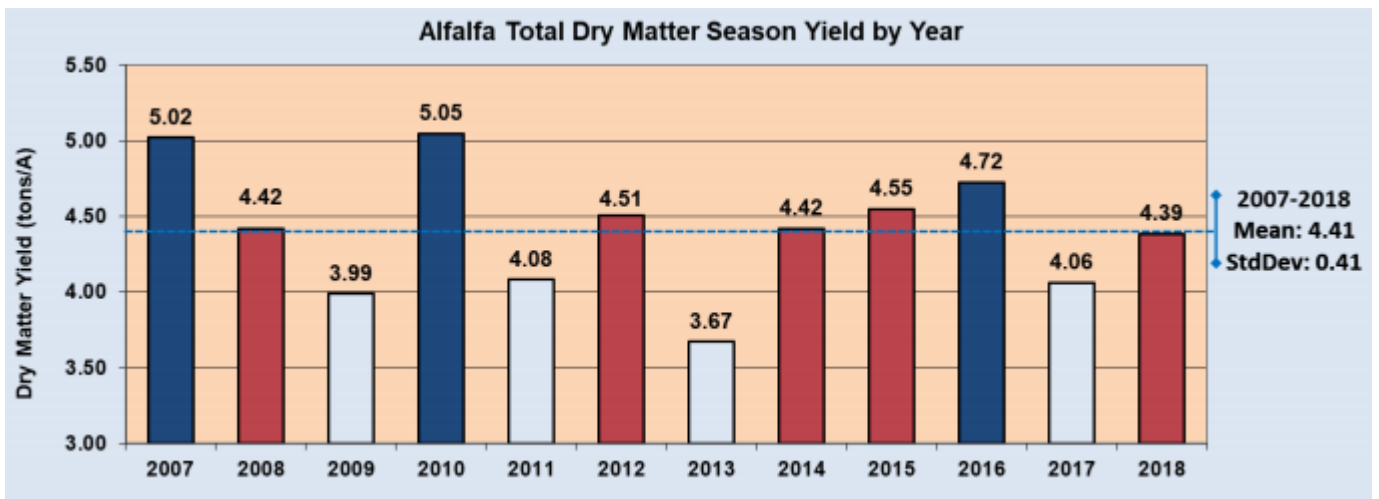
5 cut system – 31% (1st crop) – 23% (2nd crop) – 18% (3rd crop) – 16% (4th crop) – 12% (5th crop)

The following chart illustrates the observed range of alfalfa DM yield in tons per acre over the life of the WAYP project. Participating farms provided data for the life of the stand beginning with the first full production year following new seeding. Fifth crop data was collected and included in years when a fifth cutting was available. It should be noted first through fourth cutting represents the largest percentage of the data in the WAYP. The average DM yield of first through fourth crop is 4.41 tons of DM per acre.



Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary, 2018

3) **Total Season Yield:** The WAYP project has an observed range of less than 3.0 tons DM yield per acre up to 6.0 tons DM per acre during any given growing season since data was first collected beginning in 2007. The most frequently observed yield has been **4.0-4.49 Tons per DM per Year**. This year alfalfa stands that may normally produce a first cutting of 1.5-1.8 tons DM per acre may only produce 1.0-1.4 tons DM per acre (or less) given the widespread severity of heaving and winterkill damage across Northeastern and East-Central Wisconsin fields.



Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary, 2018

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 including Relative Forage Quality (RFQ) or Relative Feed Value (RFV). Alfalfa purchased from the field has an unstable quality as weather risk, maturity and leaf shatter need to be considered and accounted for when determining the final price. An adjustment of 15 percent to the value of the alfalfa is a reasonable method to account for the buyer's risk.



5) **Harvesting Cost:** Based on the most recent costs posted in the **Wisconsin Custom Rate Guide 2017** https://www.nass.usda.gov/Statistics_by_State/Wisconsin/Publications/WI-CRate17.pdf or **2020 Iowa Farm Custom Rate Survey** <https://store.extension.iastate.edu/product/2020-iowa-farm-custom-rate-survey>, one would expect to pay the following for the field operations identified below:

<u>Mowing and Conditioning per acre:</u>	<u>Windrow Merging per acre:</u>	<u>Chopping, Hauling, and Filling Upright Silo per acre</u>
\$5-\$50 per acre, \$14.20 statewide average (WI)	\$3-\$40 per acre, \$11.60 statewide average (WI)	Pull Type Forage Harvester \$50-\$100 per acre, \$71.10 statewide average (WI)
		Self-Propelled Forage Harvester \$12.90-\$250 per acre, \$130.00 statewide average (WI)
\$12-\$20 per acre, \$15.30 statewide average (IA)	\$10-\$21.50 per acre, \$15.50 statewide average (IA)	Silage Chopping/Ton \$6-\$8.75/ton, \$7.25/ton statewide average (IA)

Determining the Value of a Ton of DM Alfalfa

The most recent Hay Market Demand and Price Report for the Upper Midwest is located on the University of Wisconsin – Division of Extension, Team Forage (<http://fyi.uwex.edu/forage/>) website with updates located at <https://fyi.extension.wisc.edu/forage/h-m-r/>. The most recent report available (May 11, 2020) indicates large square bales of Prime Quality (>151 RFV/RFQ) alfalfa averaged \$212 per ton. In contrast, alfalfa that tested Grade 1 Quality (125-150 RFV/RFQ), is currently valued at \$154 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 13 percent which means it is 87 percent DM or **0.87 DM**

\$212.00	X	as fed ton	=	\$243.68
as fed ton		0.87 ton DM		Ton DM
\$154.00	X	as fed ton	=	\$177.01
as fed ton		0.87 ton DM		Ton DM



So, which value above should be used: \$243.68 per ton of DM or \$177.01 per ton of DM? When is the last time you successfully harvested all your alfalfa without any weather damage? If we harvested two high quality (\$243.68 per ton) cuttings, and two average/slightly lower quality (\$177.01 per ton) cuttings the average would be approximately \$210.35 per ton of DM.

One may harvest four high quality cuttings, or one may harvest four lower quality cuttings. If we were to simply take $\$243.68 \times 0.15$ (15 percent deduction for weather risk/field losses) = \$36.55, so $\$243.68 - \$36.55 = \$207.13$. Whether one decides to average the values of two quality levels, or simply deduct 15 percent from the highest value alfalfa, we arrive at a fair adjustment for the buyer, approximately \$209 per ton of DM.

Using values cited earlier, one would spend \$15 per acre cutting and conditioning the alfalfa, \$14 per acre merging the alfalfa, and \$100 per acre (average between pull type and self-propelled units – adjust your costs as needed) chopping, hauling, and filling a silo results in a little over \$129 per acre invested for each cutting. One’s harvesting costs may be higher or lower than those cited here; however, this is what is used in this example. If one harvests four (4) cuttings, total harvest costs are \$516/acre for the season ($\$129 \times 4$ cuttings = \$516.00). If the buyer’s harvesting costs are less, one can adjust downward. If the buyer’s harvesting costs are higher, one can adjust upward. While the landowner who established the alfalfa has the expense of the land, taxes, seed, chemical, and fertilizer, the buyer not only has the harvesting costs, but, assumes field losses and weather risk exceeding the 15 percent adjustment.

Once one has calculated or agreed upon the value of a ton of DM and has made a reasonable yield estimate, one may proceed. In this first example we used a 4.0-ton DM yield for the season at a value of \$209 per ton DM. Four (4) tons of DM \times \$209 per ton DM = a final harvested value of \$836. After we deduct the cost of harvesting, approximately \$516 ($4 \times \129), we are left with the following:

If we harvested **4.0 tons of DM**, our total value would be \$836 less harvesting costs of \$516 = **\$320 residual**

1st cutting = \$ 320 \times 36% of total yield (1.44 tons DM) for the season = \$115.20

2nd cutting = \$ 320 \times 25% of total yield (1.00 tons DM) for the season = \$ 80.00

3rd cutting = \$ 320 \times 21% of total yield (0.84 tons DM) for the season = \$67.20

4th cutting = \$ 320 \times 18% of total yield (0.72 tons DM) for the season = \$57.60

If you harvested **4.5 tons of DM**, our total value would be \$941 less harvesting costs of \$516 = **\$425 residual**

1st cutting = \$ 425 \times 36% of total yield (1.62 tons DM) for the season = \$153.00

2nd cutting = \$ 425 \times 25% of total yield (1.13 tons DM) for the season = \$106.25

3rd cutting = \$ 425 \times 21% of total yield (0.95 tons DM) for the season = \$ 89.25

4th cutting = \$ 425 \times 18% of total yield (0.81 tons DM) for the season = \$ 76.50

If you harvested **5.0 tons of DM**, our total value would be \$1,045 less harvesting costs of \$516 = **\$529 residual**

1st cutting = \$ 529 \times 36% of total yield (1.80 tons DM) for the season = \$190.44

2nd cutting = \$ 529 \times 25% of total yield (1.25 tons DM) for the season = \$132.25

3rd cutting = \$ 529 \times 21% of total yield (1.05 tons DM) for the season = \$111.09

4th cutting = \$ 529 \times 18% of total yield (0.90 tons DM) for the season = \$ 95.22

Summary

When purchasing alfalfa by the cutting or by the acre, calculating the value of standing alfalfa may be difficult given the widespread variability in fields this year. Focusing time and effort on the two most influential considerations when determining the value of standing alfalfa can help. The buyer needs to estimate as accurately as possible what the potential DM yield may be, and the seller needs to account for reasonable harvesting costs associated with getting the crop out of the field. The best option is always to weigh and measure the crop as it is harvested and to adjust for DM. However, if that is not an option, walking the fields, estimating stems counts per square foot, and assessing overall plant health will help both parties arrive at a fair value.



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

Greg Blonde, UW-Madison, Division of Extension, Waupaca County Agriculture Agent, has documented additional methods to calculate the value of standing alfalfa at <https://fyi.extension.wisc.edu/dairy/whats-standing-alfalfa-worth-in-2020/>. Greg has also developed an app that can be downloaded for **free** from the Google Play Store 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”.