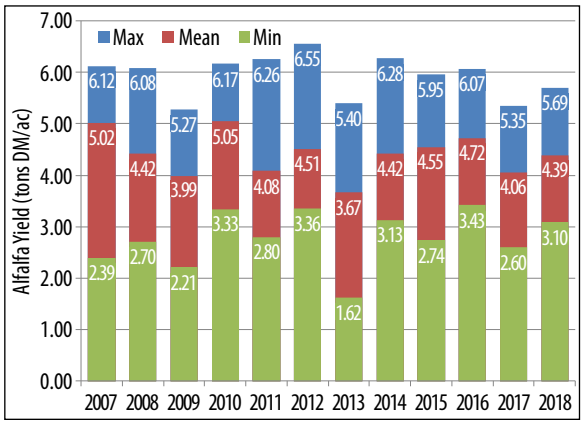
WISCONSIN– Alfalfa Yield & Persistence Project Update

Mike Bertram, University of Wisconsin-Madison

UWEX Team Forage initiated the Wisconsin Alfalfa Yield & Persistence (WAYP) Project in 2007 with two objectives. First, verify yield and quality harvested from production fields over the stand life beginning with the first production year (year after seeding). Second, quantify changes in stand productivity as fields age. Over 12 years, production data has been collected/summarized from 103 fields in 16 counties (Figure 1). This represents 231 site years, 6,611 acres, and over 58,000 tons of alfalfa dry matter (DM). All loads harvested on each field were weighed and two samples collected from each cutting to determine DM and quality. No special management was required. MFA has funded this study since 2009.

Figure 1. WAYP Alfalfa Yield by Year (2007-2018).



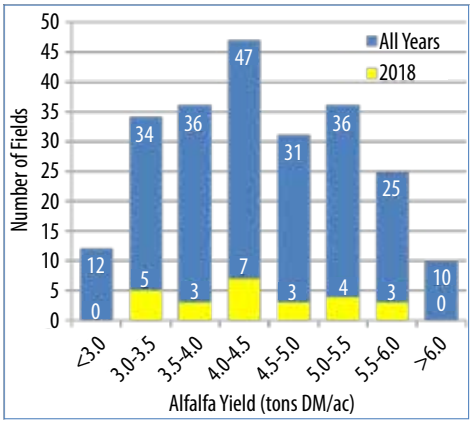
Cutting date was determined by each farmer (Table 1). In 2018, 25 fields were measured (14 - 1st year production, 8 - 2nd, 1- 3rd, 2 - 4th). Early season dates were similar to previous years, despite a cool, wet spring. Fourth cut was delayed by wet fields in late August.

Table 1. WAYP average cutting dates.

	1st Cut	2nd Cut	3rd Cut	4th Cut
2018	30-May	28-Jun	28-Jul	3-Sep
Prev. years	29-May	30-Jun	30-Jul	29-Aug

Alfalfa DM % at harvest ranged 40-50%, though individual cuttings and total-season field averages sometimes exceeded 50%. Trend has been toward increased DM % in recent years. For 2018, average DM across all cuttings was 45%; individual cuttings: 43% - 1st, 48% - 2nd, 49% - 3rd, and 45% - 4th.

Figure 2. WAYP yield distribution (2007-2018).



Alfalfa DM yield, in 2018, averaged 4.39 tons/ac (Figure 1) – nearly identical to the overall average annual yield for all years of 4.41 tons. Best yield was 5.69 tons/ac and the least was 3.10. Yields were similar to previous year's trend (Figure 2). Since 2007, 10 fields yielded >6 tons (benchmark for top yields); 12 fields measured <3 (tended to be older or weather-stressed stands).

Alfalfa persistence is calculated as distribution of yield in-season and change between years (Table 2). In each system, greatest yield was 1st cut; subsequent cuts yielded less. A wide range in percent yield for each individual cutting was observed. This resulted from environmental conditions previous to harvest or a function of cutting date.

Yield was influenced by the age of the stand, cutting schedule, and environment. Persistence was measured as a percent of 1st production year DM yield (Table 3). Although ranges had wide variation, average yields in 2nd and 3rd production years have been comparable to 1st production year. Yield in 4th production year dropped to 80% of 1st production year. To date it appears keeping stands for at least three years seems to be prudent.

Table 2. WAYP % of total season yield (2007-18).

	1st Cut	2nd Cut	3rd Cut	4th Cut	5th Cut
3-cut system	46	28	26		
4-cut system	36	25	21	18	
5-cut system	31	23	18	16	12

Table 3. WAYP % of 1st production year yield (2007-2018).

	1st Cut	2nd Cut	3rd Cut	4th Cut	Season
2nd Year	112	106	114	101	103
3rd Year	106	105	105	95	98
4th Year	84	83	94	77	80

Alfalfa quality, although extremely important, is not a primary focus of this project. However, it is impossible to evaluate changes in management to maximize yield and persistence without considering the impact on quality. Quality parameters averaged over all fields and cuttings in 2018 were: crude protein (CP) – 21.5%, neutral detergent fiber (NDF) – 39.2%, NDF digestibility (NDFD) – 50.9%, relative forage quality (RFQ) - 173, Milk/ton - 3,020 lbs.

The WAYP Project provides farmers and ag professionals a unique look at what is happening at the farm level. As fields are entered and years pass, reliability of information increases. Environmental conditions have had a profound influence on yield with no two years being alike. Thanks to participating farmers and UWEX coordinators who collect data. Financial support from MFA is greatly appreciated to cover forage analysis costs.

New fields will be added in 2019. Farmers interested in participating can contact their UWEX Office or Mike Bertram at mbertram@wisc.edu. View a full report at: bit.ly/2ZKUHIH.