WISCONSIN ALFALFA YIELD AND PERSISTENCE (WAYP) PROGRAM
2015 SUMMARY REPORT

Program Objectives:

1. To verify the yield and quality of alfalfa harvested from production fields over the life of the stand beginning with the first production year (year after seeding).
2. To quantify decreases in stand productivity of alfalfa fields as they age.

2015 Overview:

This summary now includes nine years of project data. Once again, UW-Extension agents were asked to identify forage producers who would be willing to weigh and sample forage from a 2014-seeded field and continue to do so for the life of the stand. A total of 10 fields from 5 different farms were enrolled in the program in 2015. 14 fields continued from previous years. The current summary includes data for the second and third production years from fields entered into the program in 2012 (2011 seedings) through 2015 (2014 seedings). There was one fourth-year stand remaining in the project, but the stand was terminated after 1st cutting. As is always the case in these types of studies, there is some attrition of fields over time. This is either because the farmer decided to terminate the field because of declining productivity or critical yield or forage quality data for a cutting or multiple cuttings could not be obtained. This year there were 10 fields dropped from the project that participated in 2014. All were terminated because of winterkill. Production data was collected for 24 fields in 2015 with a total of over 4,800 dry matter tons of forage harvested, weighed, and sampled from over 1,100 acres. A summary of all project fields (current and past) is presented in Table 1.

2015 Weather

The growing season overall was very close to normal in terms of temperature and precipitation for many areas. Some areas were cooler and drier in early summer, but this balanced out in late summer. September was the warmest on record for many places. Significant winterkill and heaving affected eastern and central areas of the state. The spring was mostly dry and warm, which resulted in timely planting and rapid alfalfa growth in May. First cutting varied widely with many fields being harvested the week before Memorial Day at high quality and others being delayed one to two weeks because of heavy rains that started on Memorial Day weekend. Some of these delayed fields caught up and still had four cuts while other only had three. Many stands had good fall growth and went into the fall looking healthy.

2014 Weather

For the second consecutive year the growing season began with cool, wet weather. Both planting and crop development were delayed. Alfalfa harvest finally began the end of May and continued through mid-June. Heavy rains fell at the beginning of June in much of the state. Wet conditions also delayed the second cutting, often causing forage quality to be lower than desired for feeding dairy cows. Growing degree units remained below normal for much of the summer, though fields eventually dried for a timely third and (in some cases) fourth cutting. Many of the northeast Wisconsin project fields had fourth cut harvested in mid-September. Overall, the growing season could be characterized as being cool and wet.

2013 Weather

The growing season began with the realization for many farmers that there was going to be significant alfalfa winter injury and kill, especially on older stands. The spring was extremely cool with persistent rain events. This delayed plant development of existing alfalfa and planting of new seedings. Crop growth lagged behind normal for most of the summer as temperatures struggled to stay near historical averages, but there were plenty of extremes. Daily high temperatures in July ranged from the 60's to the 90's. September provided above average temperatures. In the end, growing degree units were slightly below normal and precipitation was slightly above normal.

2012 Weather

The year was one of the earliest and driest growing seasons on record for much of the state. Extreme drought conditions persisted in the southern half of the state from mid-May through late-July. September was also extremely dry, which impacted fall forage production in many areas. Growing degree units were also well above the 30-year average with a number of days exceeding the 90 degree mark. While some areas in southern Wisconsin suffered with drought, other areas in the north received adequate rainfall and recorded record high crop yields.

Table 1. Field background information

Field #	1st Production Year	County	Seeding Mo/Yr.	Seeding Rate (lb/ac)	Field Size (ac)	Notes
107	2007	Outagamie	05/06	15	103.7	dropped in 2010
207	2007	Outagamie	04/06	16	79.3	dropped in 2010
307	2007	Outagamie	04/06	16	37.0	no '08 1st-cut data
407	2007	Outagamie	04/06	16	156.7	dropped in 2010
507	2007	St. Croix	08/06	NA	51.0	dropped in 2010
607	2007	Waupaca	04/06	15	24.1	dropped in 2008
707	2007	Fond du Lac	04/06	17	15.7	dropped in 2008
807	2007	Fond du Lac	04/06	17	39.7	dropped in 2011
108	2008	Chippewa	04/07	15	18.8	dropped in 2010
208	2008	Marathon	04/07	15	5.2	dropped in 2012
308	2008	Winnebago	05/07	15	115	dropped in 2012
408	2008	Winnebago	08/07	15	36.0	dropped in 2012
508	2008	Winnebago	05/07	15	22.0	dropped in 2012
608	2008	Outagamie	05/07	20	83.7	dropped in 2012
708	2008	Outagamie	04/07	16	147.8	dropped in 2012
808	2008	Outagamie	04/07	16	53.0	dropped in 2012
908	2008	Outagamie	05/07	15	50.3	dropped in 2012
1008	2008	Outagamie	08/07	15	194.8	dropped in 2009
109	2009	St. Croix	08/08	NA	41	dropped in 2012
209	2009	Winnebago	04/08	15	67	dropped in 2013
309	2009	Winnebago	08/08	15	78	dropped in 2012
409	2009	Brown	08/08	18	75	dropped in 2012
509	2009	Chippewa	04/08	15	16.2	dropped in 2010
609	2009	Calumet	04/08	12	15	dropped in 2012
709	2009	Outagamie	05/08	20	74.8	dropped in 2011
809	2009	Outagamie	05/08	20	63	dropped in 2011
110	2010	Outagamie	05/09	16	48	dropped in 2011
210	2010	Outagamie	05/09	16	110.2	dropped in 2013
310	2010	Outagamie	05/09	16	61.7	dropped in 2013
410	2010	Outagamie	05/09	16	111	dropped in 2013
510	2010	Fond du Lac	04/09	17	50.3	dropped in 2013
610	2010	Fond du Lac	04/09	17	19.3	dropped in 2013
111	2011	Fond du Lac	04/10	17	10	dropped in 2014
211	2011	Brown	04/10	17	35.7	dropped in 2013
311	2011	Outagamie	05/10	20/+4 TF	75.8	dropped in 2012
411	2011	Outagamie	05/10	20/+4 TF	72	dropped in 2012
112	2012	St. Croix	08/11	16	73.9	dropped in 2013
212	2012	Kewaunee	05/11	17	73.5	only 1 cut in 2015
312	2012	Outagamie	05/11	16	143.6	dropped in 2015
412	2012	Outagamie	05/11	16	75	dropped in 2015
512	2012	Outagamie	05/11	16	189	dropped in 2015
612	2012	Outagamie	05/11	16	45.9	dropped in 2015
712	2012	Outagamie	05/11	16	38.7	dropped in 2014
812	2012	Dodge	05/11	16	59.6	dropped in 2014
113	2013	Columbia	08/12	15	44.6	
213	2013	Outagamie	04/12	16	150.7	dropped in 2015
313	2013	Outagamie	04/12	16	54	dropped in 2015
413	2013	Outagamie	04/12	16	79.3	dropped in 2015
513	2013	Brown	08/12	28	156	dropped in 2014
114	2014	Fond du Lac	04/13	19	32.8	
214	2014	Fond du Lac	07/13	17	35.7	
314	2014	Fond du Lac	05/13	15	9.4	
414	2014	Fond du Lac	05/13	18	20.3	
514	2014	Kewaunee	05/13	21	32	
614	2014	Door	05/13	18	60.8	

Table 1. Field background information (**continued**)

Field #	1st Production Year	County	Seeding Mo/Yr.	Seeding Rate (lb/ac)	Field Size (ac)	Notes
714	2014	Columbia	04/13	14	9.4	
814	2014	Pierce	09/13	15	16.3	
914	2014	Marathon	07/13	12	14.2	
1014	2014	Marathon	06/13	15	32.5	
1114	2014	Outagamie	05/13	16	104.3	dropped in 2015
1214	2014	Outagamie	05/13	16	156.8	dropped in 2015
1314	2014	Outagamie	06/13	16	69	dropped in 2015
1414	2014	Outagamie	05/13	20/+3.5 TF	38.9	
1514	2014	Outagamie	06/13	20/+3.5 TF	76.7	
115	2015	Manitowoc	06/14	16	19.3	
215	2015	Door	07/14	18	52.0	
315	2015	Outagamie	05/14	16	55.7	
415	2015	Outagamie	05/14	16	110.2	
515	2015	Outagamie	05/14	16	86.5	
615	2015	Outagamie	05/14	16	45.8	
715	2015	Outagamie	05/14	16	225.0	
815	2015	Marathon	06/14	18	11.4	
915	2015	Marathon	06/14	15	5.61	
1015	2015	Columbia	04/14	15	15.9	

Data Collection:
Project fields were identified and an accurate measure of field size was determined (if not previously known). Forage yield from an entire project field was weighed (usually this was done with an on-farm drive-over scale). Both empty and full weights for all trucks/wagons used were recorded. Beginning in 2008, two forage samples from each harvest were taken and submitted to the Marshfield Soil and Forage Analysis Laboratory (only one sample was submitted per harvest in 2007) for NIR analysis. Data from the two forage samples was averaged and recorded into a spreadsheet by the local coordinator. The data was then shared with the producer following each harvest. At the end of the season, all data was collected and summarized for this report.

Harvest Schedules:
Mean cutting dates by year are presented in Table 2 and cutting dates for all project fields harvested in 2015 are presented in Table 3. Average first-cut date has ranged from May 16 in 2012 to June 10 in 2013. Regardless of first-cut date, the average fourth-cut date is generally close to September 1, though 2012 was much earlier and 2013 and 2014 were at least a week later. The large majority of fields in this study were cut four times. Across years and sites, 18 fields were cut three times, 132 fields were cut four times (generally prior to or soon after September 1), and 21 fields were cut five times (generally four times before September 1 with a final cut in October).

Table 2. Mean cutting dates by year

Year	1st Cut Date	2nd Cut Date	3rd Cut Date	4th Cut* Date	5th Cut Date
2007	22-May	24-June	25-July	30-Aug	21-Oct
2008	3-Jun	3-Jul	3-Aug	29-Aug	29-Oct
2009	31-May	1-Jul	4-Aug	5-Sep	
2010	22-May	28-Jun	2-Aug	29-Aug	12-Oct
2011	31-May	1-Jul	31-Jul	31-Aug	
2012	16-May	14-Jun	14-Jul	10-Aug	21-Sep**
2013	10-Jun	11-Jul	6-Aug	7-Sep	
2014	4-Jun	9-Jul	7-Aug	13-Sep	
2015	3-Jun	2-Jul	3-Aug	27-Aug	12-Sept
MEAN	**29-May**	**30-Jun**	**31-Jul**	**30-Aug**	**11-Oct**

*average excludes data where a 4th-cut was taken in October

** average includes 2 fields with 5th-cuts taken in late-August and 2 taken in early September

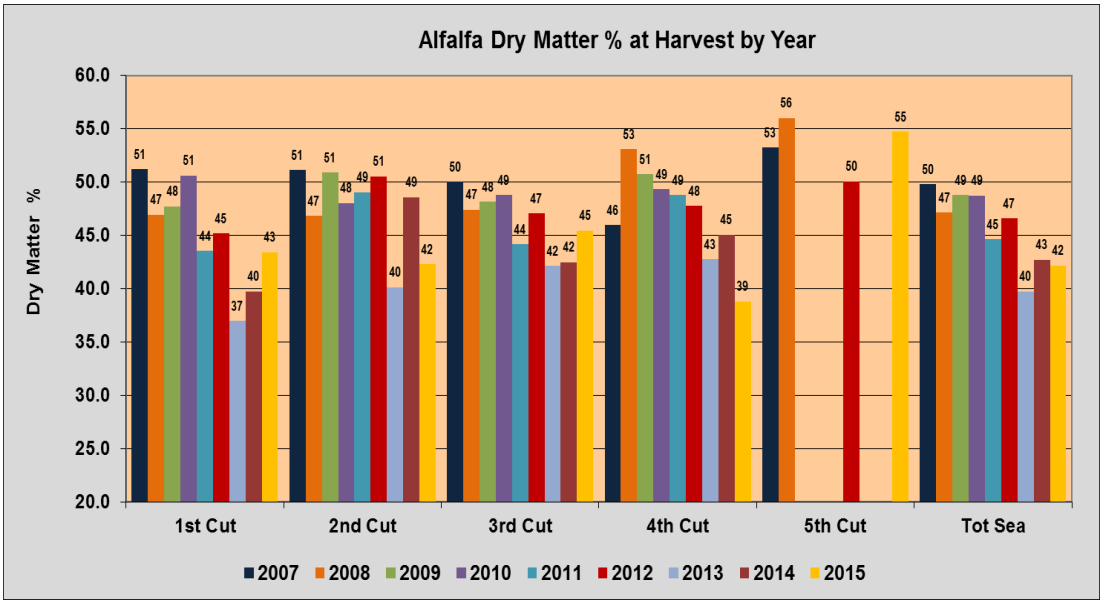
The 2015 growing season was marked by near average harvest dates for all cuttings (Table 2). First cut date had the widest range at 45 days (May 18 to July 2) since the project started (Table 3). Typically, first cut occurred over 19 days because of varying location and weather. This ranged from 13 in 2007 to 27 in 2008. Eight of the fields were cut before Memorial Day weekend. Most of the state received several inches of rain that weekend. Only two fields were cut the following week and ten were cut in early June. It kept raining and stayed wet through June in Marathon County where 1st cut did not occur until July. This also led to wide ranges in subsequent cuttings. Without the Marathon county data, the cut window would have been 22 days and average cut dates would have been 1-3 days earlier than average. Seven fields were cut 3 times this year, compared to only 12 in the previous 8 years. One field was cut 5 times by September 12. This was the 5th out of 21 times that a 5th cut occurred prior to October 1, with the other 4 all being in 2012. When fourth cut was the final cut, the date spanned from August 24 to September 3.

Table 3. Summary of 2015 Cutting Dates

Field ID#	County	1st Cut Date	2nd Cut Date	3rd Cut Date	4th Cut Date	5th Cut Date
212	Kewaunee	27-May				
113	Columbia	19-May	24-Jun	29-Jul	30-Aug	
114	Fond du Lac	22-May	24-Jun	24-Jul	26-Aug	
214	Fond du Lac	22-May	18-Jun	15-Jul	11-Aug	12-Sep
314	Fond du Lac	2-Jun	30-Jun	28-Jul	1-Sep	
414	Fond du Lac	19-May	22-Jun	20-Jul	24-Aug	
514	Kewaunee	3-Jun	8-Jul	24-Aug		
614	Door	31-May	29-Jun	27-Jul	30-Aug	
714	Columbia	18-May	23-Jun	29-Jul	1-Sep	
814	Pierce	20-May	18-Jun	14-Jul	3-Aug	
914	Marathon	1-Jul	22-Jul	1-Sep		
1014	Marathon	2-Jul	23-Jul	1-Sep		
1414	Outagamie	5-Jun	1-Jul	28-Jul		
1514	Outagamie	5-Jun	1-Jul	28-Jul	3-Sep	
115	Manitowoc	21-May	24-Jun	23-Jul	25-Aug	
215	Door	10-Jun	20-Jul	24-Aug		
315	Outagamie	4-Jun	28-Jun	27-Jul	31-Aug	
415	Outagamie	4-Jun	29-Jun	27-Jul	29-Aug	
515	Outagamie	4-Jun	28-Jun	28-Jul	30-Aug	
615	Outagamie	4-Jun	29-Jun	28-Jul	31-Aug	
715	Outagamie	3-Jun	28-Jun	27-Jul	1-Sep	
815	Marathon	2-Jul	28-Jul	3-Sep		
915	Marathon	2-Jul	22-Jul	3-Sep		
1015	Columbia	20-May	25-Jun	28-Jul	1-Sep	
MEAN		**3-Jun**	**2-Jul**	**3-Aug**	**27-Aug**	
EARLIEST		**18-May**	**18-Jun**	**14-Jul**	**3-Aug**	
LATEST		**2-Jul**	**28-Jul**	**3-Sep**	**3-Sep**	

Forage Dry Matter at Harvest:
Alfalfa was harvested as haylage for all but 16 individual cuttings over the nine years. Harvest dry matter data from the dry hay harvests was not included in the forage dry matter data means. Although project participants are not asked about storage structure, there is good reason to believe most of the farms are storing this forage in bunker or pile silos.

Throughout the duration of this project dry matter percentage of harvested forage has ranged from 40 to 50 percent (Figure 1); though individual cuttings and total-season field means sometimes exceeded 50 percent. It's been questioned if this is too dry for obtaining optimum storage porosity in a bunker or pile. The trend has been toward lower dry matter percentages in recent years. For 2015 the average dry matter across all cuttings was 42 percent; however, there was one field where the total-season dry matter exceeded 50 percent. It's unclear if this was purposeful or if it is simply attributable to environmental conditions. Eight fields finished the season with total-season dry matter means of under 40 percent.



Total Season Range for individual fields:

2007 (n=8):
41.6% - 54.2% DM
2008 (n=16):
37.0% - 54.4% DM
2009 (n=23):
37.9% - 59.2% DM
2010 (n=23):
37.4% - 54.9% DM
2011 (n=21):
35.3% - 52.1% DM
2012 (n=16):
40.2% - 51.1% DM
2013 (n=13):
33.4% - 43.3% DM
2014 (n=24):
33.9% - 56.2% DM
2015 (n=24):
33.5% - 51.3% DM

Figure 1. Average dry matter of harvested forage by cutting and as a weighted average for the total season (2007-2015).

Forage Dry Matter Yield:

Average yield by cutting and for the season in each project year are presented in Figure 2. The highest average dry matter yield per acre of 5.0 tons was in 2007 and 2010. A record low total-season dry matter yield average was set in 2013 at 3.7 tons per acre.

In 2015 the average yield across all fields was 4.4 tons per acre, which matched the nine year average and was identical to last year. First-cut yield of 1.7 tons per acre was the second highest, slightly below 1.8 tons per acre in 2010. This was likely because of delayed harvest in several fields. Second-cut yield has been unchanged for 3 years at 1.1 tons per acre. The third-cut average yield of 1.1 tons per acre tied the record from three previous years. The fifth-cut yield of 0.7 tons per acre also tied the record. Detailed yield data for each field by year are presented in Appendix A. Once again there was extreme variation between fields in 2015. Yields ranged from a high of 5.9 to a low of 2.7 tons per acre. No fields exceeded 6.0 tons per acre which has been the benchmark for top yields in the study having only been reached 9 times over 9 years. The highest yielding field since the project's inception was 6.55 tons per acre in 2012. In contrast, there were 7 fields that did not reach 4.0 tons per acre (Figure 3 and Appendix A).

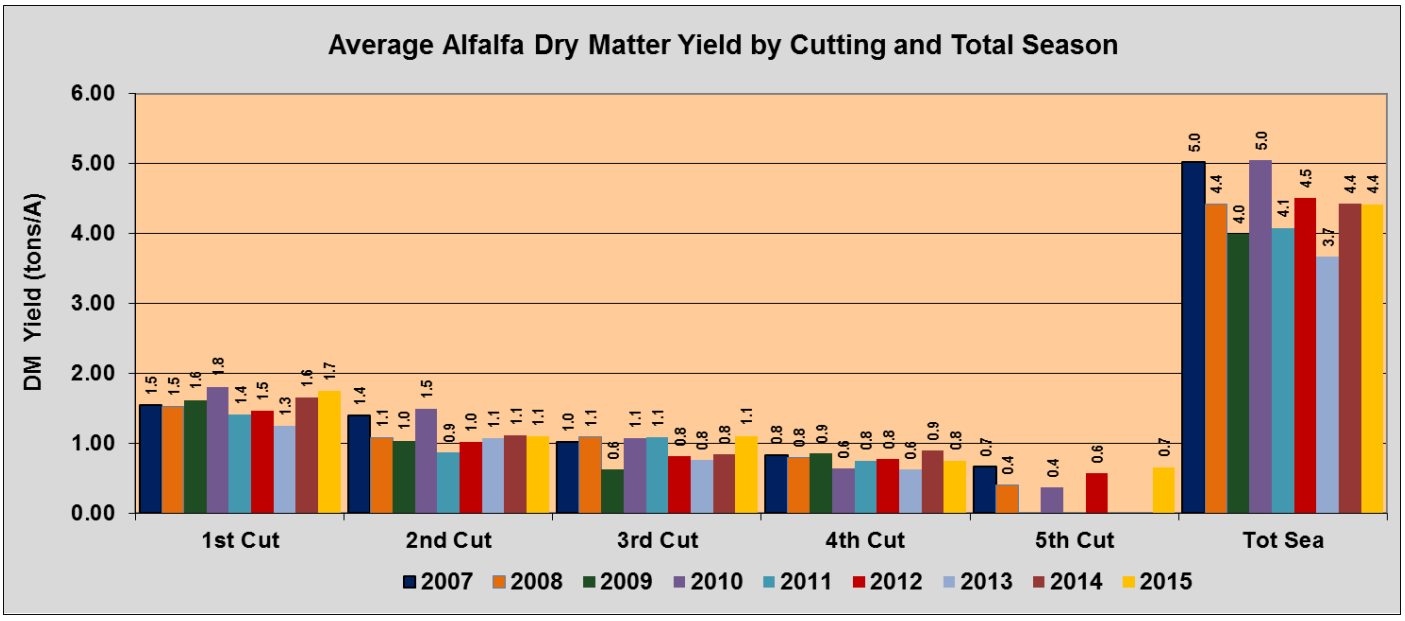


Figure 2. Average dry matter yield by cutting and for the total season. Data segregated by calendar year. (2007-15)

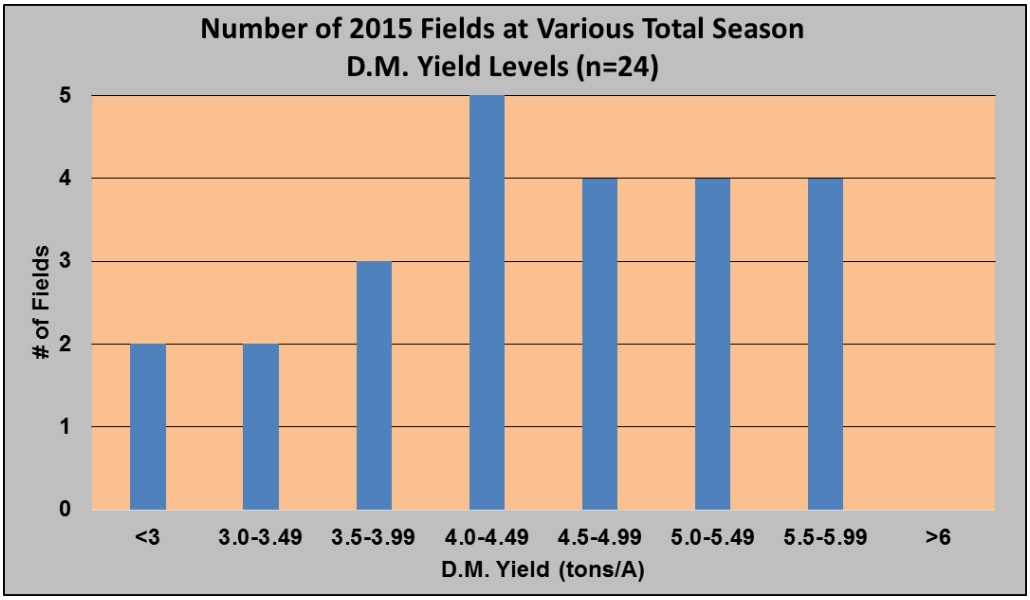


Figure 3. Number of 2015 fields at various total season dry matter yield levels (n=24)

Alfalfa Persistence:

In-season: An analysis was done to determine the percent of total season yield for each cutting (Table 4). Data was summarized for 3-, 4-, and 5-cut systems for all project years. Five-cut fields were also included in the 4-cut summary with the final fall harvest not included in the total season yield. It's significant to note the wide variation in percent yield for an individual cutting. In some cases, this is the result of environmental conditions (e.g. drought) previous to the harvest while in other situations it's simply a function of cutting date (Tables 2 and 3).

Between years: Persistence is influenced over time by the age of the stand, cutting schedule, and environment. For this project, persistence is being measured as a percent of 1st production year dry matter yield. Persistence data in Table 5 consists of 2006 through 2014-seeded fields and is averaged over all cutting schedules. Although ranges indicate a wide variation, average forage yield in the 2nd and 3rd production year have been comparable to the 1st production year. The yield for 4th-year stands drops to 74 percent of the 1st-production year. Time will tell if these trends continue, but to date it appears that keeping stands for at least three production years seems to be the prudent decision.

Table 4. Average percent of total season yield by cutting for 3, 4 and 5 cut harvest systems* (2007-15)

3-cut system (n=18 site years)

	1st cut	2nd cut	3rd cut
Mean	44	29	26
Low	26	15	16
High	59	43	50

4-cut system (n=132 site years)

	1st cut	2nd cut	3rd cut	4th cut
Mean	36	25	21	18
Low	20	14	5	9
High	58	37	34	30

5-cut system (4+1 fall) (n=21 site years)

	1st cut	2nd cut	3rd cut	4th cut	5th cut
Mean	31	23	18	16	12
Low	21	14	10	9	6
High	41	39	26	24	18

* high and low figures are for individual cuttings and will not add to 100%

Table 5. Percent of 1st production year yield by cutting and total season for 2nd and 3rd production year stands.

2nd Production Year Stands (n=52 site years)

	1st cut	2nd cut	3rd cut	4th cut	Tot Sea
Mean	116	107	122	96	103
Low	44	39	23	46	69
High	275	351	491	180	236

3rd Production Year Stands (n=31 site years)

	1st cut	2nd cut	3rd cut	4th cut	Tot Sea
Mean	108	109	98	100	98
Low	57	43	32	23	63
High	250	299	264	169	183

4th Production Year Stands (n=12 site years)

	1st cut	2nd cut	3rd cut	4th cut	Tot Sea
Mean	85	86	93	70	74
Low	38	47	54	23	26
High	138	147	141	114	115

Forage Quality:

Forage quality, although extremely important, is not the primary focus of this project. However, it is impossible to evaluate changes in management to maximize yield and persistence without considering the impact on forage quality. Harvested forage quality in 2015 showed more consistency from cutting to cutting than in prior years (Figures 3 through 8). Total season mean RFQ was 163; nearly identical to 2014, but less than five other previous project years (Figure 7). Individual cutting average was very consistent ranging from 169 on first cut to 164 on third with second and fourth cuts both at 168. The overall average is less than the individual cuts because it is weighted by cut and field. Some fields had greater proportions of lower quality forage in early cuts and only had 3 cuts. It also should be noted that RFQ in first cut averaged 169, but ranged from 245 to 88

Other notable forage quality results from 2015 included:

- Third lowest mean crude protein percent for both first and third cutting. Tie for third-highest for second cutting. Second lowest overall average crude protein percent (Figure 3).
- Highest average NDF percent for fourth cut and the total season mean. Other cuts were in the top three or four (Figure 4).
- Second highest NDFD percent in second and third cutting and the total season mean. Overall, NDFD percent was fairly consistent across cuts and at a high level. Third cutting also did not drop as much as in previous years. This could be a result of cool mid-summer temperatures (Figures 5 and 6).
- Mean Milk/Ton values were also fairly consistent across the first four cuttings, staying within a 125 lb range. Last year this was a 438 lb range. Both second and third cutting were the second highest Milk/Ton values (Figure 8).

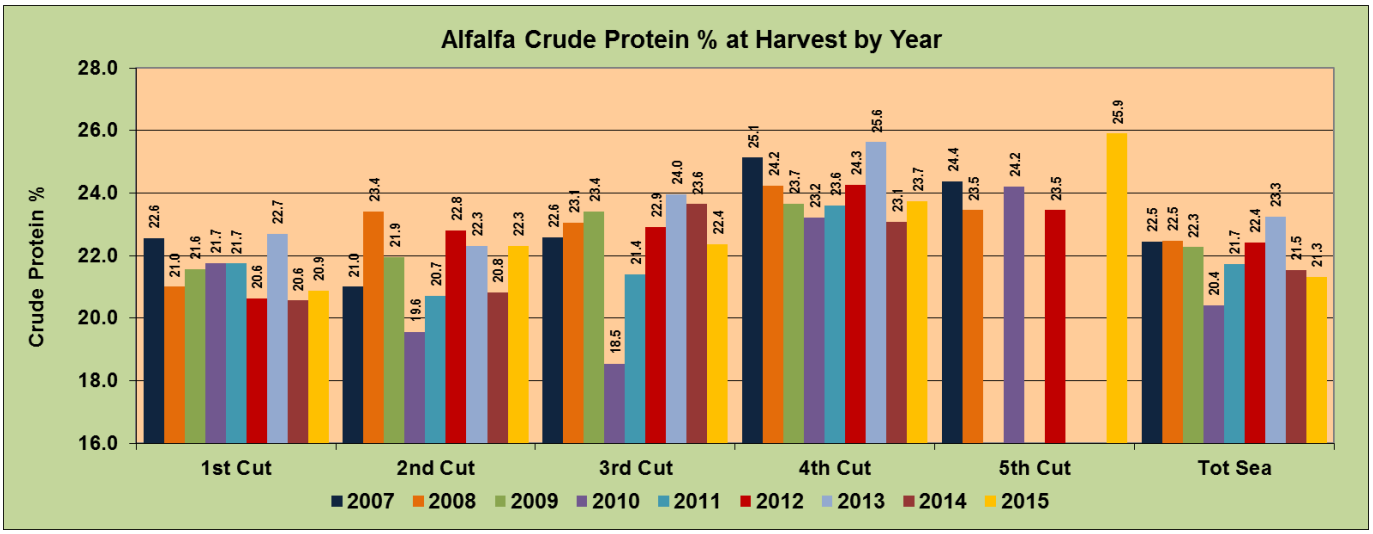


Figure 3. Average crude protein percent by cutting and weighted average for the total season (2007-2015).

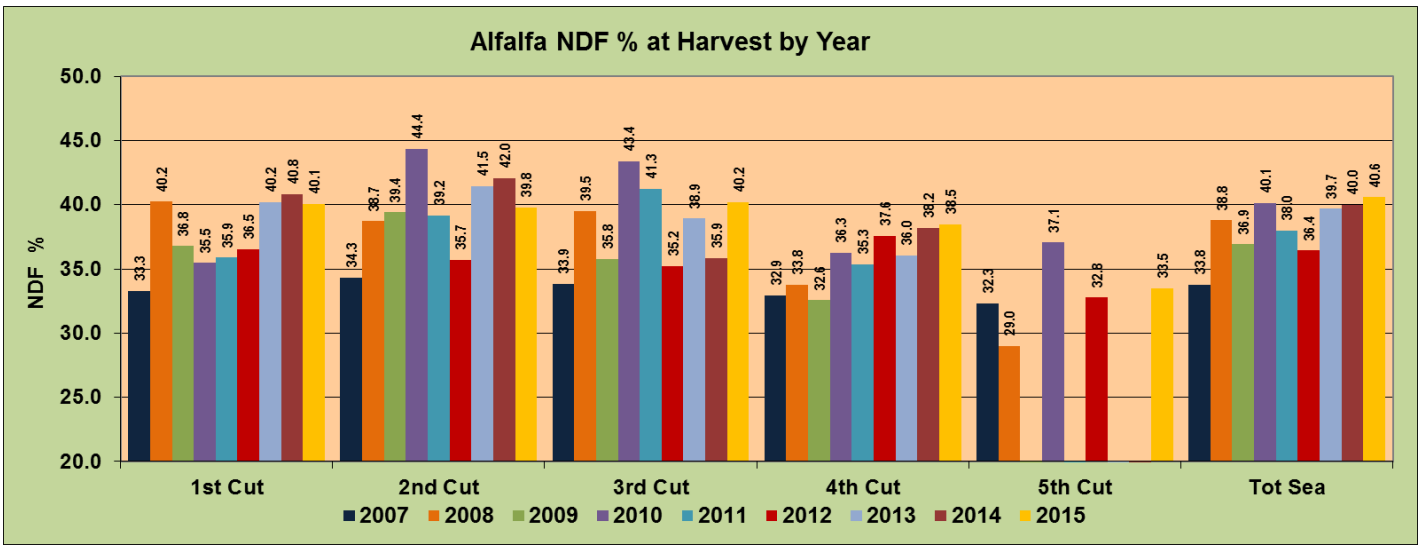


Figure 4. Average NDF percent by cutting and weighted average for the total season (2007-2015).

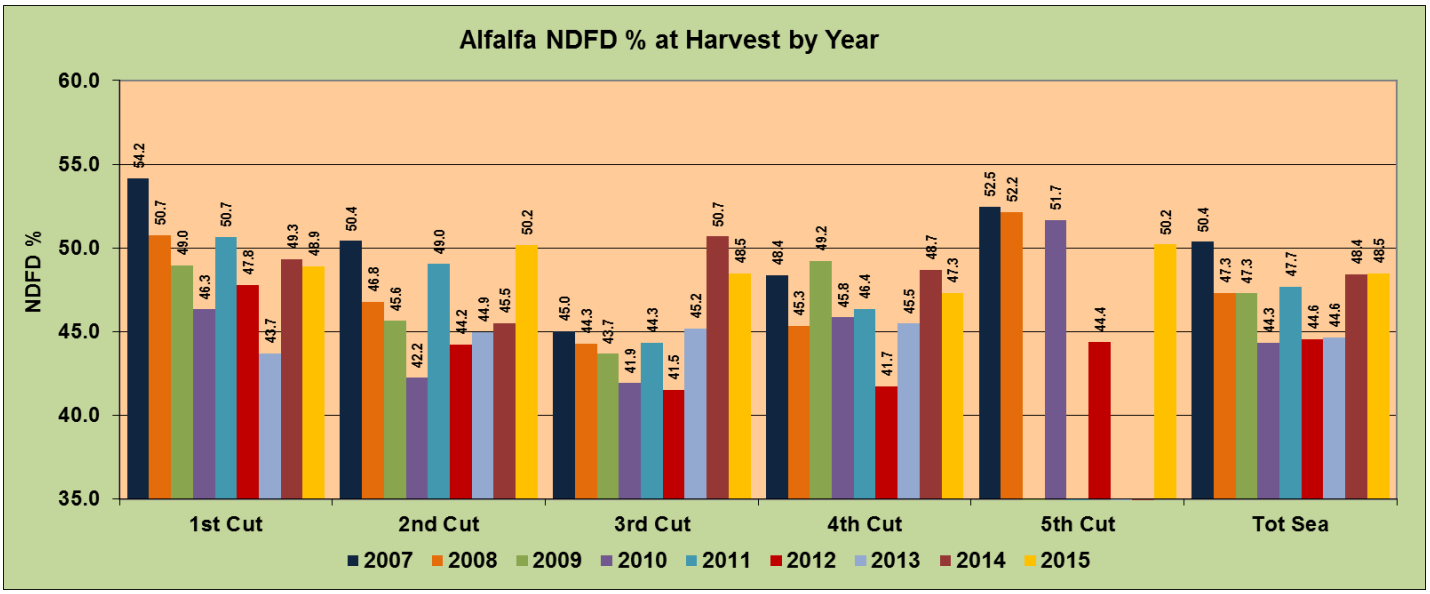


Figure 5. Average NDFD percent by cutting and weighted average for the total season (2007-2015).

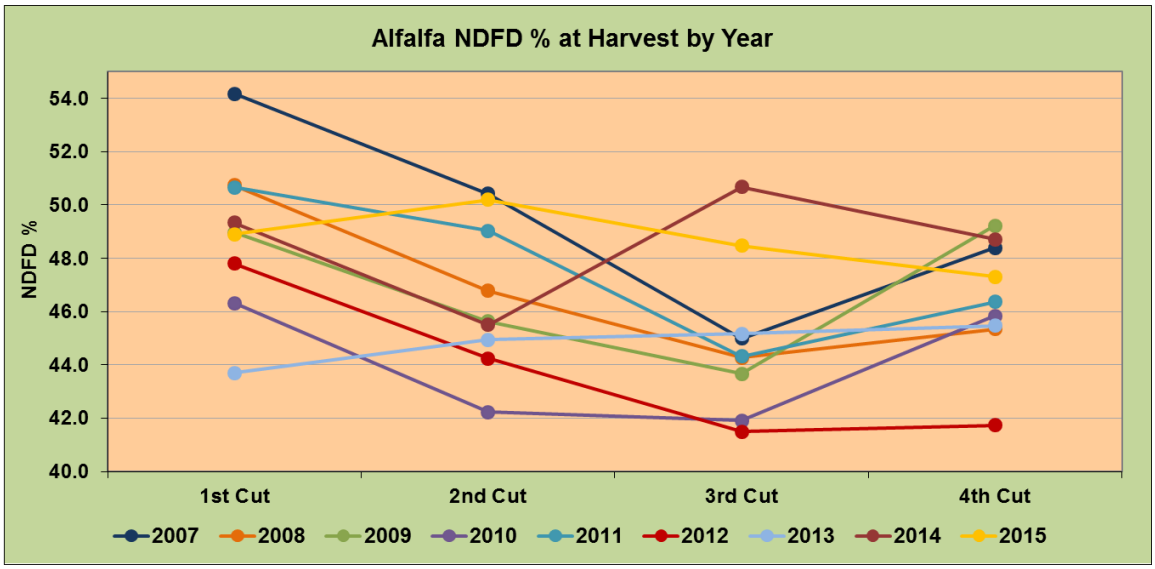


Figure 6. Average NDFD percent by cutting (2007-2015).

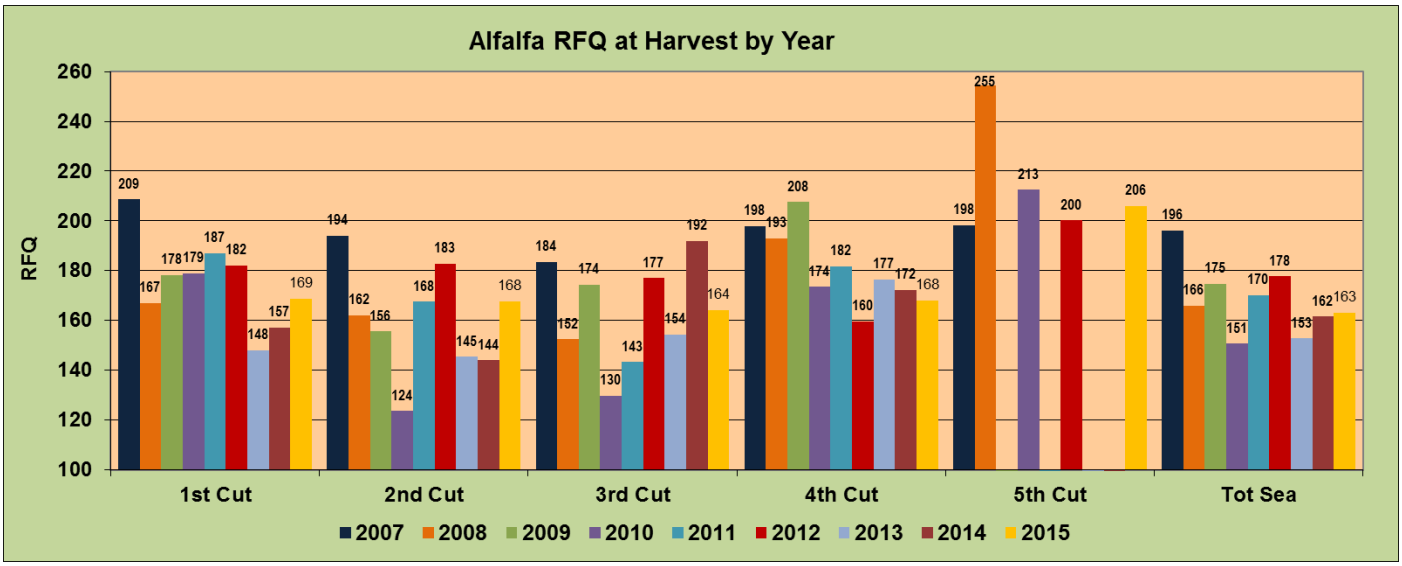


Figure 7. Average Relative Forage Quality (RFQ) by cutting and weighted average for the total season (2007-2015).

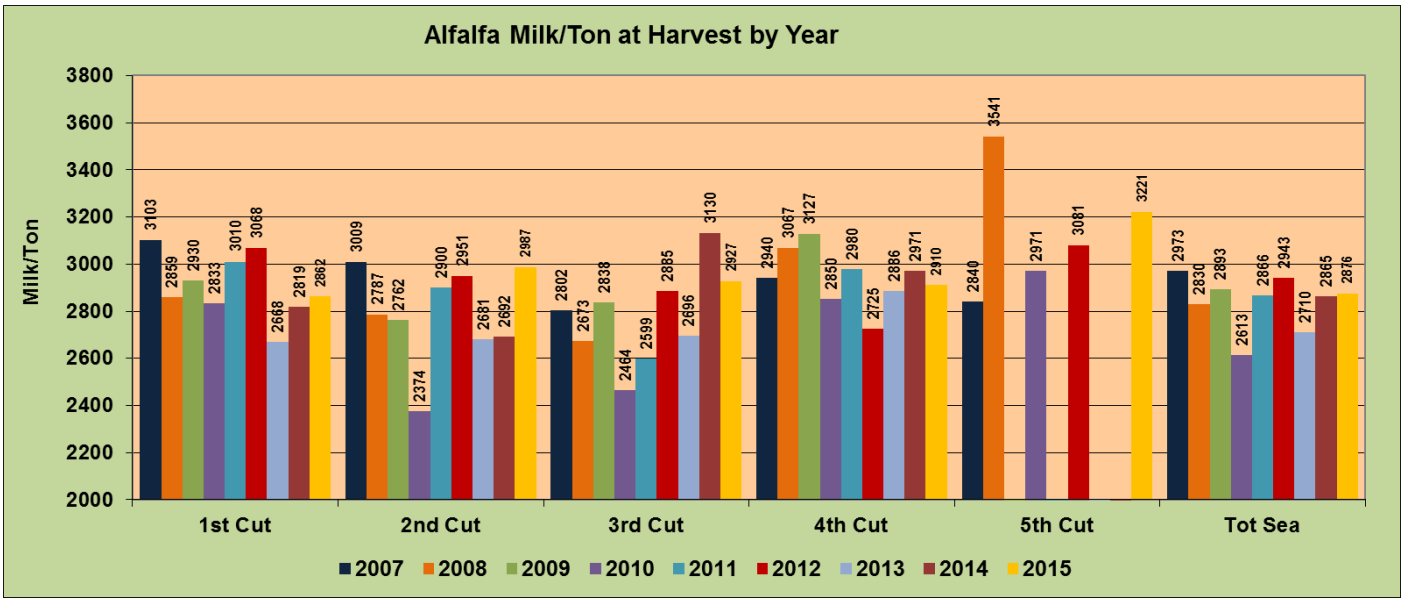


Figure 8. Average Milk per Ton by cutting and weighted average for the total season (2007-2015).

Summary:
The Wisconsin Alfalfa Yield and Persistence Program is designed to provide forage growers and agricultural professionals a unique look at what is happening at the farm level. As more fields are entered and years pass, the reliability of information continues to increase. Environmental conditions have had a profound influence on both yield and no two years being exactly alike.

Acknowledgements:
First and foremost, UW-Extension Team Forage wishes to thank the producers who took the extra time and effort to obtain weights and forage samples for the project fields at each cutting.

Past and Present UW coordinators for this project:

Mike Bertram, Columbia County	Scott Gunderson, Manitowoc County	Bryce Larson, Calumet County
Aerica Bjurstrom, Kewaunee County	Mark Hagedorn, Brown County	Mike Rankin, Fond du Lac County
Greg Blonde, Waupaca County	Kevin Jarek, Outagamie County	Nick Schneider, Winnebago County
Jason Cavadini, Marathon County	Tina Kohlman, Fond du Lac County	Ryan Sterry, St. Croix County
Jerry Clark, Chippewa County	David Laatsch, Dodge County	Amy Vandebrake, Pierce County

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Appendix A. Dry matter yield by field, harvest year, cutting, and for the total season.

Field ID#	Harvest Year	1st Cut DM Yld	2nd Cut DM Yld	3rd Cut DM Yld	4th Cut DM Yld	5th Cut DM Yld	Tot Sea DM Yld
107	2007	1.57	1.53	0.95	0.59	0.34	4.98
207	2007	1.52	1.33	1.00	0.70	0.73	5.27
307	2007	1.54	1.51	1.30	0.90	0.88	6.12
407	2007	1.41	1.57	1.11	0.80	0.71	5.59
507	2007	1.00	1.02	0.37			2.39
607	2007	1.79	1.77	1.20	1.14		5.90
707	2007	1.75	1.23	0.81	0.63		4.41
807	2007	1.79	1.19	1.42	1.10		5.51
Mean	**2007**	**1.55**	**1.39**	**1.02**	**0.84**	**0.67**	**5.02**
Low	**2007**	**1.00**	**1.02**	**0.37**	**0.59**	**0.34**	**2.39**
High	**2007**	**1.79**	**1.77**	**1.42**	**1.14**	**0.88**	**6.12**
107	2008	1.28	1.11	1.07	0.43		3.89
207	2008	1.34	1.08	1.14	0.68		4.23
307	2008	NA	0.86	0.91	0.78		---
407	2008	NA	1.14	1.09	0.68		---
507	2008	1.95	1.08	0.76			3.79
807	2008	2.23	1.73	1.31	0.82		6.08
108	2008	1.38	0.74	1.15			3.27
208	2008	2.08	1.54	0.84			4.46
308	2008	1.46	0.83	1.27	0.93	0.45	4.95
408	2008	0.86	0.49	0.85	0.50		2.70
508	2008	2.01	0.72	1.20	0.98	0.37	5.29
608	2008	1.39	1.78	1.54	0.92		5.63
708	2008	1.28	1.05	1.18	0.89		4.40
808	2008	1.81	1.20	1.27	0.79		5.07
908	2008	0.73	0.94	0.89	1.12		3.68
1008	2008	NA	1.06	0.97	0.83		---
Mean	**2008**	**1.52**	**1.08**	**1.09**	**0.80**	**0.41**	**4.42**
Low	**2008**	**0.73**	**0.49**	**0.76**	**0.43**	**0.37**	**2.70**
High	**2008**	**2.23**	**1.78**	**1.54**	**1.12**	**0.45**	**6.08**
107	2009	0.95	1.06	0.30	0.99		3.31
207	2009	1.28	1.23	0.53	1.00		4.04
307	2009	1.02	1.23	0.69	0.93		3.87
407	2009	1.59	1.02	0.53	0.85		3.99
507	2009	1.38	0.90	0.49	0.76		3.53
807	2009	1.56	0.99	0.98	0.62		4.15
108	2009	1.52	0.83	0.80			3.15
208	2009	1.77	1.18	1.33			4.28
308	2009	1.24	0.94	0.56	1.15		3.89
408	2009	1.80	0.80	0.20	0.64		3.43
508	2009	1.74	1.00	0.59	0.98		4.32
608	2009	2.19	1.23	0.88	0.78		5.07
708	2009	1.40	1.34	0.63	0.98		4.35
808	2009	2.07	1.16	0.59	0.55		4.37
908	2009	1.88	0.99	0.30	0.95		4.13
109	2009	0.57	0.55	1.09			2.21
209	2009	1.92	1.60	0.69	1.06		5.27
309	2009	1.14	0.84	0.43	1.05		3.46
409	2009	1.45	1.24	0.35	0.32		3.37
509	2009	2.05	0.88	0.57			3.49
609	2009	2.36	0.58	0.20	0.95		4.10

Field ID#	Harvest Year	1st Cut DM Yld	2nd Cut DM Yld	3rd Cut DM Yld	4th Cut DM Yld	5th Cut DM Yld	Tot Sea DM Yld
709	2009	2.27	1.25	0.82	0.92		5.26
809	2009	2.08	1.03	0.85	0.72		4.68
Mean	**2009**	**1.62**	**1.04**	**0.63**	**0.85**		**3.99**
Low	**2009**	**0.57**	**0.55**	**0.20**	**0.32**		**2.21**
High	**2009**	**2.36**	**1.60**	**1.33**	**1.15**		**5.27**
307	2010	1.16	1.24	1.24	0.52		4.17
807	2010	1.38	1.32	1.22	0.81		4.74
208	2010	1.99	1.65	1.26	0.62		5.52
308	2010	1.65	1.66	0.85	0.41		4.57
408	2010	1.85	1.46	0.76	0.51		4.58
508	2010	1.88	1.81	0.69	0.48		4.86
608	2010	2.09	1.79	1.46	0.82		6.16
708	2010	1.45	1.33	1.39	0.67		4.84
808	2010	1.66	1.77	1.57	0.90		5.91
908	2010	1.83	0.84	1.27	0.51		4.45
109	2010	1.57	1.42	0.90	1.33		5.23
209	2010	1.91	1.80	1.09	0.91		5.71
309	2010	2.16	1.85	0.91	0.70		5.61
409	2010	1.43	0.96	0.55	0.39		3.33
609	2010	2.34	1.78	1.05	1.00		6.17
709	2010	2.32	0.94	1.08	0.57		4.90
809	2010	1.86	1.67	1.07	0.47		5.07
110	2010	1.46	1.65	1.40	0.54		5.05
210	2010	2.07	1.76	0.94	0.51		5.28
310	2010	1.59	1.21	0.97	0.57		4.33
410	2010	2.00	1.26	0.94	0.41		4.61
510	2010	1.87	1.69	1.05	0.62	0.39	5.62
610	2010	2.08	1.40	1.09	0.46	0.34	5.37
Mean	**2010**	**1.81**	**1.49**	**1.08**	**0.64**	**0.37**	**5.05**
Low	**2010**	**1.16**	**0.84**	**0.55**	**0.39**	**0.34**	**3.33**
High	**2010**	**2.34**	**1.85**	**1.57**	**1.33**	**0.39**	**6.17**
208	2011	0.78	0.90	1.05	0.45		3.18
308	2011	1.31	1.12	0.85	0.79		4.06
408	2011	1.19	0.72	0.67	0.51		3.09
508	2011	1.25	0.85	0.65	0.69		3.44
608	2011	1.10	0.83	1.16	0.45		3.54
708	2011	1.50	0.75	1.37	0.78		4.41
808	2011	1.07	0.65	1.15	0.90		3.77
908	2011	0.92	0.52	0.87	0.49		2.80
109	2011	1.29	0.97	1.03	0.76		4.05
209	2011	1.59	1.02	0.92	0.92		4.45
309	2011	1.53	1.15	1.14	0.95		4.77
409	2011	1.27	0.81	0.47	0.48		3.03
609	2011	1.76	0.90	1.68	0.78		5.12
210	2011	1.13	0.72	1.04	0.80		3.69
310	2011	1.25	0.63	0.97	0.78		3.63
410	2011	1.33	0.60	1.08	0.57		3.58
510	2011	1.47	1.08	1.07	0.73		4.35
610	2011	1.41	0.92	0.88	0.83		4.04
111	2011	2.45	1.29	1.32	1.19		6.26
211	2011	1.39	0.85	1.20	1.10		4.55
311	2011	2.30	0.94	1.66	1.00		5.90
411	2011	1.70	NA	1.68	0.64		NA

Field ID#	Harvest Year	1st Cut DM Yld	2nd Cut DM Yld	3rd Cut DM Yld	4th Cut DM Yld	5th Cut DM Yld	Tot Sea DM Yld
Mean	**2011**	**1.41**	**0.87**	**1.09**	**0.75**		**4.08**
Low	**2011**	**0.78**	**0.52**	**0.47**	**0.45**		**2.80**
High	**2011**	**2.45**	**1.29**	**1.68**	**1.19**		**6.26**
209	2012	1.47	1.01	0.97	0.40		3.85
210	2012	1.46	0.75	0.43	0.80	0.76	4.20
310	2012	1.22	0.67	0.45	0.69	0.45	3.48
410	2012	1.14	0.62	0.38	0.66	0.56	3.36
510	2012	1.20	1.13	0.74	0.63	0.73	4.44
610	2012	2.33	1.18	1.12	0.66		5.30
111	2012	2.03	1.79	1.55	1.18		6.55
211	2012	1.11	1.10	0.78	0.79	0.48	4.26
112	2012	1.46	0.85	1.11	0.85	0.63	4.90
212	2012	1.74	1.21	1.32	1.27		5.55
312	2012	1.65	0.78	0.59	0.70	0.68	4.40
412	2012	2.06	0.81	0.64	0.86	0.64	5.00
Mean	**2012**	**1.46**	**1.01**	**0.82**	**0.78**	**0.58**	**4.51**
Low	**2012**	**0.84**	**0.62**	**0.38**	**0.40**	**0.34**	**3.36**
High	**2012**	**2.33**	**1.88**	**1.55**	**1.27**	**0.76**	**6.55**
111	2013	1.70	0.85	0.87	0.94		4.35
212	2013	1.89	1.47	1.06	0.99		5.40
312	2013	1.20	1.02	0.65	0.48		3.35
412	2013	1.26	1.16	0.74	0.63		3.79
512	2013	1.30	1.11	0.80	0.65		3.87
612	2013	0.86	0.86	0.63	0.43		2.78
712	2013	0.83	1.03	0.65	0.44		2.95
812	2013	1.94	1.26	1.03	0.84		5.07
113	2013	2.27	1.80	1.19			5.26
213	2013	0.82	1.08	0.62	0.76		3.28
313	2013	0.82	0.83	0.51	0.60		2.76
413	2013	0.92	1.11	0.72	0.50		3.25
513	2013	0.47	0.40	0.44	0.30		1.62
Mean	**2013**	**1.25**	**1.08**	**0.76**	**0.63**		**3.67**
Low	**2013**	**0.47**	**0.40**	**0.44**	**0.30**		**1.62**
High	**2013**	**2.27**	**1.80**	**1.19**	**0.99**		**5.40**
212	2014	1.76	1.53	0.77	0.88		4.93
312	2014	1.69	0.97	0.70	0.80		4.16
412	2014	1.56	0.89	0.75	0.70		3.90
512	2014	1.48	0.59	0.76	0.65		3.48
612	2014	1.41	0.66	0.54	0.59		3.20
113	2014	1.80	1.70	1.24	1.03		5.79
213	2014	1.39	0.51	0.64	1.05		3.58
313	2014	1.09	0.53	0.66	0.84		3.13
413	2014	1.87	0.68	0.67	0.90		4.12
114	2014	1.93	1.88	1.24	1.25		6.28
214	2014	1.49	1.77	1.36	0.88		5.50
314	2014	1.88	1.14	1.02	0.73		4.77
414	2014	1.74	1.99	1.19	1.09		6.02
514	2014	1.77	0.89	0.55	0.75		3.95
614	2014	2.13	0.88	0.35	0.73		4.09
714	2014	2.96	1.24	1.02	0.91		6.12
814	2014	1.42	1.22	0.42	0.70		3.75
914	2014	1.18	1.20	0.93			3.31
1014	2014	2.04	1.58	1.20			4.82
1114	2014	1.42	0.73	0.76	0.74		3.65

Field ID#	Harvest Year	1st Cut DM Yld	2nd Cut DM Yld	3rd Cut DM Yld	4th Cut DM Yld	5th Cut DM Yld	Tot Sea DM Yld
1214	2014	1.23	0.54	0.95	0.70		3.42
1314	2014	1.20	0.49	0.88	0.83		3.39
1414	2014	1.28	1.93	0.72	1.31		5.23
1514	2014	1.87	1.24	0.81	1.58		5.50
Mean	**2014**	**1.65**	**1.12**	**0.84**	**0.89**		**4.42**
Low	**2014**	**1.09**	**0.49**	**0.35**	**0.59**		**3.13**
High	**2014**	**2.96**	**1.99**	**1.36**	**1.58**		**6.28**
212	2015	1.47					1.47
113	2015	1.59	1.50	1.61	0.85		5.55
114	2015	1.87	1.60	1.46	1.02		5.95
214	2015	1.25	0.88	0.88	0.72	0.66	4.40
314	2015	1.76	1.15	0.95	0.75		4.61
414	2015	1.67	1.60	1.24	0.64		5.14
514	2015	1.25	1.84	1.17			4.26
614	2015	2.89	1.21	0.86	0.70		5.67
714	2015	1.29	0.99	1.63	0.89		4.80
814	2015	1.30	0.77	0.95	0.35		3.37
914	2015	2.26	0.73	1.00			3.99
1014	2015	2.39	0.62	1.11			4.12
1414	2015	2.04	1.26	0.95	0.82		5.06
1514	2015	2.03	1.14	1.03	0.84		5.03
115	2015	1.16	1.30	0.87	0.77		4.10
215	2015	1.65	1.10	0.70			3.45
315	2015	1.53	0.76	1.19	1.07		4.55
415	2015	1.90	0.81	0.98	0.76		4.45
515	2015	1.98	0.91	1.02	0.76		4.66
615	2015	1.20	0.69	0.57	0.29		2.74
715	2015	1.51	0.83	0.95	0.63		3.92
815	2015	1.83	1.17	0.91			3.90
915	2015	2.33	1.05	1.91			5.28
1015	2015	1.81	1.36	1.49	0.95		5.60
Mean	**2015**	**1.81**	**1.15**	**1.16**	**0.75**	**0.66**	**4.42**
Low	**2015**	**1.16**	**0.62**	**0.57**	**0.29**	**0.66**	**1.47**
High	**2015**	**2.89**	**1.84**	**1.91**	**1.07**	**0.66**	**5.95**