

2010 Alfalfa Report

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Introduction

Alfalfa (*Medicago sativa*) has historically been the highest yielding, highest quality forage legume grown in Kentucky. It forms the basis of Kentucky's cash hay enterprise and is an important component in dairy, horse, beef, and sheep diets. Choosing a good variety is a key step in establishing a stand of alfalfa. The choice of variety can impact yield, thickness of stand, and persistence.

This report provides yield data on alfalfa varieties included in current yield trials in Kentucky as well as guidelines for selecting alfalfa varieties. Table 11 shows a summary of all alfalfa varieties tested in Kentucky during the past 10-plus years. The UK Forage Extension web site at <www.uky.edu/Ag/Forage> contains electronic versions of all forage variety testing reports from Kentucky and surrounding states as well as a large number of other forage publications.

Considerations in Selecting an Alfalfa Variety

Local Adaptation and Persistence. High yields in variety tests over a range of years and locations are the best indication that a variety is locally adapted and persistent. Several varieties are adapted for use in Kentucky as determined from results in this report.

Winter-Hardiness. Each variety has a fall dormancy (FD) rating that ranges from 1 (very dormant) to 9 (nondormant). In general, varieties with lower dormancy ratings are more winter-hardy but are slower to initiate growth in the spring and show reduced fall growth. Therefore, fall dormancy can lead to reduced annual yields compared to less dormant varieties. Generally, alfalfa varieties with FD ratings of 2 to 5 will show good winter survival in Kentucky. Varieties with ratings of 6 and above are usually not winter-

hardy under Kentucky conditions. Many Kentucky producers have found that FD 4 varieties provide the best combination of yield and winter survival. In recent years some companies have also begun to report a winter survival index (WS). It ranges from 1 to 6; varieties with a WS of 1 show superior winter survival and varieties with a WS of 6 are not winter hardy.

Disease and Pest Resistance. In Kentucky, producers should use varieties that are resistant (R) to aphanomyces root rot (APH), phytophthora root rot (PRR) and anthracnose (AN) and have at least a moderate resistance (MR) to bacterial wilt (Bw), and fusarium wilt (Fw). Kentucky research indicates that aphanomyces root rot is a widespread problem in the state during stand establishment and that resistance is beneficial, particularly in soils also infested with phytophthora root rot.

Phytophthora root rot is a fungal disease associated with poorly drained soils or excessive rainfall. This disease causes yellowish- to reddish-brown areas on roots and crowns that eventually become black and rotten. The top growth of infected plants appears stunted and yellow.

Anthracnose, also caused by a fungus, attacks the stems of alfalfa, preventing water flow to the rest of the shoot and causing sudden wilting. These wilted shoots have a characteristic "shepherd's crook" appearance. Anthracnose can also cause a bluish-black crown rot. Bacterial wilt and fusarium wilt are infections of the water-conducting tissues of alfalfa roots and do not cause any noticeable root rot. These diseases prevent water flow to leaves, resulting in wilting of shoots and the eventual death of infected plants. Roots infected with bacterial wilt often have a yellowish-brown discoloration of the inner woody cylinder of the taproot. Fusarium infection can be recognized by brown-to-red streaks in the inner woody cylinder of the taproot.

Aphanomyces root rot is another fungal disease associated with poorly drained soils or excessive rainfall. Affected seedlings will be stunted but remain upright, unlike those with symptoms of damping off. In established plants, root symptoms are not as well defined as those for phytophthora root rot, but brown lesions on the taproot indicate where lateral roots were destroyed. This disease can be associated with phytophthora root rot, and together they may form a root disease complex. Aphanomyces root rot is known to affect new seedlings in Kentucky, but it is still unclear how it affects established alfalfa. In years with overly cool and wet spring weather, alfalfa stands have suffered great damage due to aphanomyces when planted with varieties that are susceptible to this disease.

Certain alfalfa varieties are reported to have resistance to sclerotinia crown and stem rot; however, research at the University of Kentucky has shown that many of these varieties have only limited resistance when conditions are ideal for disease development. Therefore, the best prevention against sclerotinia is to plant by mid-August if fall seeding or plant in the spring. If seeding in the fall, sclerotinia-resistant varieties can provide additional insurance.

Seed Quality. Buy premium-quality seed that is high in germination and purity and free from weed seed. Buy certified seed or proprietary seed of an improved variety. An improved variety is one that has performed well in independent trials, such as those that are reported in this publication or others like it. Other information on the label will include the test date, which must be within the previous nine months, the level of germination, and other crop and weed seed. Order seed well in advance of planting time to assure that it will be available when needed.

Table 1. Temperature and rainfall at Lexington, Kentucky in 2006, 2007, 2008, 2009, and 2010.

	2006				2007				2008				2009				2010 ²			
	Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	42	+11	4.77	+1.91	37	+6	2.93	+0.07	32	+2	3.91	+1.05	28	-3	2.45	-0.41	29	-2	2.40	-0.46
FEB	36	+1	2.13	-1.08	27	-8	1.83	-1.38	36	+1	6.11	+2.90	38	+3	2.86	-0.35	29	-6	1.38	-1.83
MAR	44	0	3.05	-1.35	52	+8	1.97	-2.43	44	+1	6.51	+1.91	48	+4	2.19	-2.21	47	+3	1.05	-3.35
APR	59	+4	3.52	-0.36	53	-2	3.87	-0.01	55	0	5.89	+2.01	55	0	4.48	+0.60	59	+4	2.74	-1.14
MAY	62	-2	2.99	-1.48	68	+4	1.45	-3.02	62	-2	4.33	+0.14	64	0	5.05	+0.58	67	+3	7.84	+3.37
JUN	70	-2	1.82	-1.84	74	+2	1.77	-1.89	74	+2	3.59	-0.07	74	+2	5.41	-1.75	76	+4	4.61	+0.95
JUL	76	0	5.13	+0.13	74	-2	6.90	+1.90	76	0	3.41	-1.59	71	-5	5.89	+0.89	78	+2	5.49	+0.49
AUG	76	+1	3.23	-0.70	80	+5	2.56	-1.37	75	0	2.18	-1.75	73	-2	5.38	+1.45	78	+3	1.54	-2.39
SEP	64	-4	9.27	+6.07	72	+4	1.15	-2.05	72	+4	1.42	-1.78	68	0	5.37	+2.17	71	+3	1.14	-2.06
OCT	54	-3	4.88	+2.31	63	+6	5.28	+2.71	57	0	1.53	-1.04	54	-3	4.83	+2.26	59	+2	1.22	-1.35
NOV	47	+2	1.78	-1.61	46	+1	2.86	-0.53	43	-2	2.53	-0.86	49	+4	0.94	-2.45				
DEC	42	+6	2.45	-1.53	40	+4	5.29	+1.31	35	-1	6.03	+2.05	36	0	3.86	-0.12				
Total			45.02	+0.47			37.86	-6.69			47.24	+2.69			48.71	+4.16			29.41	-7.77

¹ DEP is departure from the long-term average.

² 2010 data is for 10 months through October.

Description of the Tests

Alfalfa variety tests were established at Lexington (2006 and 2008), Princeton (2008 and 2009), and Bowling Green (2006) as part of the forage variety testing program. Trials were planted in Lexington and Bowling Green in the spring of 2006 but failed due to poor establishment conditions. They were replanted in August of 2006. A trial was planted in Lexington in the spring of 2010 but did not establish well, so it was replanted in August of 2010. The soils at most locations are well suited to alfalfa because they are generally well-drained silt loam soils (Maury, Crider, and Pembroke at Lexington, Princeton, and Bowling Green, respectively).

Plots were 5 by 20 feet in a randomized complete block design with four replications with a harvested plot area of 5 by 15 feet. In each test, 20 pounds of seed per acre were planted into a prepared seedbed using a disk drill. Plots were harvested with a sickle-type forage plot harvester. First cuttings in the seeding year were delayed to allow alfalfa to reach maturity, indicated by full bloom. Otherwise, harvests were taken when the alfalfa was in the bud-to-early flower stage. Fresh weight samples were taken at each harvest to calculate percentage of dry matter production. Management of all tests for establishment, fertility, pest

control, and harvest management was according to Kentucky Cooperative Extension recommendations. Pests (weeds and insects) were controlled so that they would not limit yield or persistence.

Results and Discussion

Weather data for Lexington, Princeton, and Bowling Green are presented in Tables 1 through 4.

Yield data (on a dry matter basis) for all tests are reported in Tables 5 through 9. Stated yields are adjusted for percentage of weeds; therefore, the value listed is for the crop only. Varieties are listed in order from highest to lowest total production (for the life of the test). Experimental varieties are listed separately at the bottom of the tables and are not available com-

mercially. Yields are given by cutting date for 2010 and as total annual production.

Statistical analyses were performed on all alfalfa yield data (including experiments) to determine if the apparent differences are due to variety. Varieties not significantly different from the highest numerical value in a column are marked with an asterisk (*). To determine if two varieties are statistically different, compare the difference between the two varieties to the Least Significant Difference (LSD) at the bottom of the column. If the difference is equal to or greater than the LSD, the varieties are truly different when grown under the conditions at a given location. The Coefficient of Variation (CV), which is a measure of the variability of the data, is included for each column of means. Low variability is desirable,

Table 2. Temperature and rainfall at Princeton, Kentucky in 2008, 2009, and 2010.

	2008				2009				2010 ²			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	37	+3	2.40	-1.40	33	-1	0.94	-2.86	31	-3	3.06	-0.74
FEB	39	+1	6.76	+2.33	42	+4	3.28	-1.15	33	-5	1.54	-2.89
MAR	48	+1	7.55	+2.61	53	+6	2.89	-2.05	48	+1	3.24	-1.7
APR	58	-1	6.56	+1.76	58	-1	5.35	+0.55	62	3	3.3	-1.54
MAY	65	-2	6.19	+1.23	67	0	6.14	+1.18	69	+2	10.41	+5.45
JUN	78	+3	1.24	-2.61	77	+2	7.97	+4.12	79	4	4.82	0.97
JUL	79	+1	5.12	+0.83	74	-4	7.45	+3.16	80	2	2.73	-1.56
AUG	77	0	0.69	-3.32	75	-2	2.44	-1.60	81	4	2.46	-1.55
SEP	74	+3	0.61	-2.72	71	0	4.61	+1.28	72	1	0.94	-2.39
OCT	60	+1	2.21	-0.84	55	-4	9.08	+6.03	60	+1	0.97	-2.08
NOV	46	-1	2.59	-2.04	52	+5	1.50	-3.13				
DEC	39	0	6.49	+1.95	36	-3	2.73	-2.31				
Total			48.95	-2.18			54.31	+3.22			33.47	-7.99

¹ DEP is departure from the long-term average.

² 2010 data is for 10 months through October.

Table 3. Temperature and rainfall at Bowling Green, Kentucky (airport location) in 2006, 2007, 2008, 2009, and 2010.

	2006				2007				2008				2009				2010 ²			
	Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall		Temp.		Rainfall	
	°F	DEP ¹	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	45	+11	4.89	+1.07	39	+5	4.04	+0.22	35	+1	3.56	-0.26	34	0	2.93	-0.89	32	-2	2.98	-0.84
FEB	38	0	2.28	-1.85	34	-4	2.00	-2.13	40	+2	4.05	-0.08	43	+5	3.33	-0.80	34	-4	2.07	-2.06
MAR	49	+3	2.75	-2.35	56	+10	1.34	-3.76	48	+2	5.86	+0.76	51	5	3.08	-2.02	49	3	2.29	-2.81
APR	63	+6	4.51	+0.19	56	-1	3.65	-0.67	57	0	5.41	+1.09	58	+1	4.44	+0.12	62	5	3.21	-1.11
MAY	65	-1	3.63	-1.31	70	+4	3.57	-1.37	66	0	5.38	+0.44	68	+2	6.66	+1.72	69	3	11.00	6.06
JUN	74	-1	2.66	-1.51	76	+1	2.65	-1.52	78	+3	1.20	-2.97	77	+2	7.31	+3.14	80	5	6.24	2.07
JUL	79	+1	3.30	-1.44	78	0	2.02	-2.72	79	+1	5.52	+0.78	75	-3	9.08	+4.34	81	3	4.48	-0.26
AUG	80	+3	5.97	+2.46	85	+8	0.94	-2.57	77	0	0.74	-2.77	76	-1	1.77	-1.74	81	4	5.60	2.09
SEP	67	-3	6.78	+3.06	75	+5	1.89	-1.83	73	+3	1.58	-2.14	72	+2	5.73	+2.01	73	3	1.14	-2.58
OCT	56	-2	4.01	+0.99	64	+6	8.38	+5.36	59	+1	3.75	+0.73	57	-1	7.60	+4.58	61	3	1.85	-1.17
NOV	49	+3	3.07	-1.36	48	+2	3.95	-0.48	46	0	1.71	-2.72	51	5	0.88	-3.55				
DEC	43	+5	3.54	-1.49	43	+5	7.1	+2.07	39	+1	6.12	+1.09	39	1	3.86	-1.17				
Total			47.39	-3.54			41.53	-9.40			44.58	-6.05			56.67	+5.74			40.86	-0.61

¹ DEP is departure from the long-term average.

² 2010 data is for 10 months through October.

and increased variability within a study results in higher CVs and larger LSDs.

Table 10 summarizes information about fall dormancy, disease resistance, and yield performance across years and locations for all the varieties currently included in the tests discussed in this report. Varieties are listed in alphabetical order, with the experimental varieties at the bottom. Remember that experimental varieties are not available for farm use; commercial varieties can be purchased through dealerships. In Table 10, open blocks indicate that the variety was not in that particular test (labeled at the top of the column); an X means that the variety was in the test but yielded significantly less than the top-yielding variety. A single asterisk (*) means that the variety was not significantly different from the top-yielding variety based on the 0.05 LSD. It is best to choose a variety that has performed well over several years and locations as indicated by the asterisks.

Table 11 is a summary of yield data from 1995 to 2010 of commercial varieties that have been entered in the Kentucky trials. The data is listed as a percentage of the mean of the commercial varieties entered in each specific trial. In other words, the mean for each trial is 100 percent—varieties with percentages over 100 yielded better than average, and varieties with percentages less than 100 yielded lower than average. Direct statistical comparisons of varieties cannot be made using the summary Table 11, but

these comparisons do help to identify varieties for further consideration. Varieties that have performed better than average over many years and at several locations have very stable performance; others may have performed very well in wet years or on particular soil types. These details may influence variety choice, and the information can be found in the yearly reports. See footnote in Table 11 to determine which yearly report to refer to.

Summary

Consistent production of high yields of alfalfa is the result of good variety selection along with the implementation of good management techniques. For further information about alfalfa management, refer to the following College

of Agriculture publications, available at the local county Extension office and are listed in the “Publications” section of the UK Forage website, www.uky.edu/Ag/Forage:

- AGR-76—*Alfalfa: The Queen of the Forage Crops*
- AGR-64—*Establishing Forage Crops*
- AGR-90—*Inoculation of Forage Legumes*
- AGR-18—*Grain and Forage Crop Guide for Kentucky*
- AGR-1—*Lime and Fertilizer Recommendations*
- AGR-148—*Weed Control Strategies for Alfalfa and Other Forage Legume Crops*
- ENT-17—*Insect Management Recommendations for Field Crops and Livestock*
- PPA-10D—*Kentucky Plant Disease*

Table 4. Temperature and rainfall at the Western Kentucky University Farm at Bowling Green, Kentucky in 2008, 2009, and 2010.¹

	2008				2009				2010 ²			
	Temperature		Rainfall		Temperature		Rainfall		Temperature		Rainfall	
	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	34		4.11		32		5.86		30		3.17	
FEB	39		3.83		41		4.25		32		2.44	
MAR	47		6.45		50		3.20		47		2.33	
APR	56		5.05		56		4.45		60		3.47	
MAY	64		5.36		66		4.77		69		11.82	
JUN	76		1.73		75		5.12		79		3.89	
JUL	76		5.73		73		7.58		80		3.84	
AUG	75		0.64		74		1.99		79		4.45	
SEP	72		1.97		70		7.29		71		1.41	
OCT	58		4.24		55		6.11		59		1.67	
NOV	44		1.65		49		0.93					
DEC	38		6.74		37		3.92					
Total			47.50				55.47				35.49	

¹ Weather Station established in 2007 so no long term average data exists. Check Table 3 for comparison.

² 2010 data is for 10 months through October.

Management Guide for Forage Legumes

- AGR-137—*Alfalfa Hay: Quality Makes the Difference*
- PPFS-AG-F-04—“*Emergency*” *Inoculation for Poorly Nodulated Legumes*
- *Growing Alfalfa in the South*, a publication of the National Alfalfa & Forage Alliance, <http://www.alfalfa.org/pdf/alfalfainthesouth.pdf>

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Table 5. Dry matter yields, seedling vigor, and stand persistence of alfalfa varieties sown August 14, 2006 at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct 17, 2006	Percent Stand						Yield (tons/acre)						4-year Total									
		2006		2007		2008		2009		2010		2011			Total ²								
Commercial Varieties—Available for Farm Use																							
	Oct 17	Mar 26	Oct 11	Mar 27	Oct 13	Mar 24	Oct 7	Mar 29	Oct 15	Total	2007	Total	2008	Total	2009	Total	2010	May 10	Jun 10	Jul 16	Aug 13	Total	
Expedition	5.0	99	98	98	99	99	100	99	97	99	97	97	99	97	95	6.32	4.28	2.24	1.39	1.39	0.64	5.66	20.24*
L447HD	4.8	76	96	95	97	97	98	98	97	97	95	4.26	5.69	4.19	5.69	2.05	4.19	2.05	1.31	1.37	0.60	5.33	19.47*
Perform	5.0	100	98	98	97	98	98	98	97	98	97	4.12	3.99	3.99	5.62	2.14	3.99	2.14	1.34	1.22	0.63	5.33	19.07*
WL355RR	4.8	98	96	96	95	95	95	95	96	94	96	3.90	5.83	3.90	5.83	1.92	3.90	1.92	1.24	1.42	0.61	5.19	18.82*
DKA 41-18RR	4.3	99	98	98	98	99	98	99	97	96	97	4.06	5.62	3.95	5.62	1.91	3.95	1.91	1.31	1.33	0.62	5.17	18.79*
LegenDairy 5.0	5.0	100	95	95	94	96	96	96	99	95	95	3.53	3.79	3.79	5.75	1.94	3.79	1.94	1.25	1.37	0.65	5.21	18.27
Phoenix	4.8	99	98	98	98	98	98	98	97	97	95	3.64	3.89	3.89	5.66	1.95	3.89	1.95	1.24	1.20	0.58	4.97	18.16
Withstand	4.8	100	97	98	97	99	99	99	99	98	95	3.50	3.72	3.72	5.87	1.94	3.72	1.94	1.28	1.20	0.55	4.97	18.06
Ameristand 403T	5.0	100	98	98	99	99	99	99	99	98	96	3.69	3.74	3.74	5.57	1.86	3.74	1.86	1.29	1.13	0.63	4.91	17.92
WL343HQ	4.3	99	100	100	100	100	100	100	99	98	98	3.69	3.92	3.92	5.34	1.75	3.92	1.75	1.18	1.36	0.68	4.96	17.91
Radiant-AM	5.0	100	97	96	97	98	96	96	95	96	95	3.79	3.73	3.73	5.48	1.89	3.73	1.89	1.20	1.21	0.54	4.85	17.84
Saranac AR	4.8	100	96	96	95	94	92	93	93	93	91	3.46	3.48	3.48	4.95	1.74	3.48	1.74	1.07	1.12	0.47	4.40	16.30
Buffalo	5.0	99	99	98	99	99	97	99	97	94	93	3.67	3.63	3.63	4.69	1.54	3.63	1.54	1.02	1.04	0.48	4.07	16.06
Experimental Varieties																							
DS617	5.0	99	97	97	96	98	98	98	98	98	99	3.82	4.03	4.03	5.84	1.96	4.03	1.96	1.28	1.33	0.64	5.21	18.91*
Mean	4.8	97.6	97.3	97.2	96.9	97.8	97.5	97.6	96.7	95.1	3.79	3.87	3.87	5.59	1.92	3.87	1.92	1.24	1.26	0.59	5.02	18.27	
CV,%	7.6	12.3	2.7	2.8	4.1	2.9	3.1	2.5	3.0	3.5	9.36	10.68	7.87	7.87	15.46	11.22	15.52	11.22	15.52	11.29	9.30	6.68	
LSD, 0.05	0.5	17.2	3.8	3.9	5.7	4.1	4.3	3.5	4.2	4.8	0.51	0.59	0.63	0.63	0.34	0.20	0.26	0.20	0.26	0.10	0.67	1.74	

¹Vigor score based on a scale of 1 to 5, with 5 being the most vigorous seedling growth.

²Due to very dry weather there was not enough growth for a fall harvest.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 6. Dry matter yields, seedling vigor, and stand persistence of alfalfa varieties sown August 24, 2006 at Bowling Green, Kentucky.

Variety	Seedling Vigor ¹ Oct 30, 2006	Percent Stand												Yield (tons/acre)								4-year Total
		2006		2007		2008		2009		2010		2007		2008		2009		2010				
		Oct 30	Mar 16	Oct 29	Apr 14	Oct 31	Nov 4	Oct 13	Total	Oct 13	Total	Oct 13	Total	Oct 13	Total	Oct 13	Total	Oct 13	Total			
Commercial Varieties—Available for Farm Use																						
Withstand	4.8	99	100	99	99	96	92	86	1.62	3.51	4.77	1.71	1.12	0.59	0.46	3.88	13.78*					
LegenDairy 5.0	4.8	100	100	98	98	96	95	92	1.03	3.33	5.04	1.72	1.24	0.50	0.45	3.90	13.29*					
Rebound 5.0	4.5	100	100	98	99	97	93	92	1.28	3.35	4.72	1.58	1.19	0.48	0.43	3.67	13.02*					
Escalade	5.0	100	99	98	96	98	93	86	1.17	3.25	4.65	1.63	1.24	0.47	0.42	3.76	12.82*					
6415	5.0	100	100	100	97	99	94	84	1.05	3.23	4.54	1.79	1.26	0.46	0.42	3.92	12.74*					
TripleTrust 450	5.0	100	99	99	100	100	97	91	1.19	3.26	4.66	1.64	1.22	0.36	0.38	3.60	12.70*					
Phirst	4.8	100	99	98	97	97	95	85	0.98	3.34	4.67	1.60	1.07	0.34	0.39	3.40	12.39*					
Integrity	5.0	100	100	100	100	99	95	79	1.16	3.25	4.50	1.60	1.09	0.34	0.33	3.36	12.27*					
Dynagro Everlast	5.0	100	100	99	98	98	90	79	1.10	3.19	4.39	1.54	1.15	0.38	0.42	3.49	12.16*					
Evermore	4.8	100	100	99	100	97	78	73	1.33	3.43	4.26	1.43	0.97	0.37	0.37	3.13	12.15*					
WL348AP	4.8	99	100	98	100	96	88	80	1.14	3.40	4.07	1.56	1.10	0.32	0.36	3.34	11.96					
Phoenix	4.8	99	99	98	96	94	81	75	1.06	3.19	4.14	1.44	1.01	0.42	0.36	3.22	11.62					
Saranac AR (certified)	4.5	100	100	98	97	95	76	64	0.89	2.98	4.04	1.39	0.95	0.26	0.26	2.87	10.79					
Enforcer	4.0	97	96	97	92	83	68	64	0.98	2.76	3.45	1.25	0.92	0.32	0.29	2.79	9.97					
Buffalo	4.3	100	99	99	98	92	75	68	1.01	2.70	3.51	1.22	0.83	0.25	0.22	2.52	9.74					
Experimental Varieties																						
MP04	4.8	100	100	100	100	99	94	85	1.23	3.41	4.82	1.53	1.11	0.38	0.35	3.38	12.84*					
AA109E	4.5	99	100	100	99	98	95	89	1.09	3.28	4.60	1.64	1.20	0.46	0.41	3.71	12.67*					
Mean	4.7	99.5	99.2	98.6	97.8	96.1	88.1	80.5	1.14	3.23	4.40	1.54	1.10	0.39	0.37	3.41	12.17					
CV,%	9.4	1.6	1.0	1.8	3.7	5.3	13.2	14.6	26.19	8.48	12.50	13.27	17.04	18.10	19.13	17.63	10.20					
LSD, 0.05	0.6	2.3	1.4	3.5	5.1	7.3	16.6	16.8	0.42	0.39	0.78	0.29	0.27	0.10	0.10	0.61	1.77					

¹Vigor score based on a scale of 1 to 5, with 5 being the most vigorous seedling growth.

²Due to very dry weather there was not enough growth for a fall harvest.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 7. Dry matter yields and stand persistence of alfalfa varieties sown April 8, 2008 at Lexington, Kentucky.

Variety	Percent Stand					Yield (tons/acre)							3-year Total
	2008		2009		2010	2008	2009	2010					
	Oct 21	Mar 24	Oct 7	Mar 29	Oct 15	Total	Total	May 10	Jun 10	Jul 14	Aug 13	Total ¹	
Commercial Varieties—Available for Farm Use													
DKA 50-18	84	74	89	88	84	0.87	5.55	2.12	1.30	1.61	0.81	5.84	12.26*
FSG 528SF	89	93	93	93	89	0.72	5.54	2.16	1.35	1.54	0.77	5.81	12.07*
Garst 6417	90	88	89	89	84	0.73	5.30	2.04	1.36	1.53	0.72	5.65	11.68*
Rebound 5.0	84	84	88	88	82	0.73	5.34	2.01	1.41	1.51	0.65	5.59	11.66*
Garst 6552	85	84	84	87	86	0.77	5.17	1.96	1.30	1.57	0.83	5.66	11.60*
A5225	88	85	86	86	84	0.59	5.38	2.02	1.29	1.49	0.78	5.57	11.54*
WL 343HQ	91	93	94	95	91	0.68	5.51	1.93	1.20	1.43	0.77	5.33	11.52*
Phoenix	91	89	90	90	89	0.57	5.36	2.13	1.26	1.42	0.67	5.48	11.41*
WL 363HQ	90	89	90	91	89	0.52	5.12	1.94	1.26	1.66	0.82	5.67	11.32*
DKA 43-13	84	83	89	88	87	0.58	5.39	1.64	1.21	1.57	0.87	5.29	11.26*
A4440	88	89	91	89	86	0.65	4.95	2.08	1.30	1.48	0.75	5.62	11.23*
Genoa	73	68	79	80	78	0.61	5.25	2.00	1.22	1.42	0.70	5.34	11.21*
PGI 459	93	90	93	94	89	0.53	5.18	1.94	1.25	1.53	0.75	5.47	11.18*
Anchormate	96	96	95	95	94	0.74	4.98	2.14	1.34	1.35	0.62	5.46	11.17*
Ameristand 403T	70	65	73	73	75	0.60	4.68	1.87	1.29	1.42	0.67	5.24	10.52
Buffalo	89	90	90	89	84	0.68	4.77	1.75	1.15	1.39	0.62	4.91	10.36
Withstand	76	78	76	76	75	0.52	4.79	1.86	1.25	1.34	0.57	5.02	10.32
Saranac AR (certified)	88	85	85	88	88	0.73	4.54	2.06	1.23	1.20	0.56	5.05	10.32
Mean	85.9	84.4	87.3	87.5	85.1	0.66	5.16	1.98	1.27	1.47	0.72	5.44	11.26
CV,%	9.9	10.5	6.8	5.9	5.9	35.01	8.80	10.84	11.70	12.89	10.13	6.41	7.63
LSD, 0.05	12.1	12.5	8.4	7.3	7.2	0.33	0.64	0.30	0.21	0.27	0.10	0.50	1.22

¹ Due to very dry weather, there was not enough growth for a fall harvest.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 8. Dry matter yields and stand persistence of alfalfa varieties sown April 17, 2008 at Princeton, Kentucky.

Variety	Percent Stand						Yield (tons/acre)							3-year Total
	2008		2009		2010		2008	2009	2010					
	May 21	Oct 30	Apr 17	Oct 28	Mar 18	Oct 12	Total	Total	May 18	Jun 16	Jul 22	Aug 19	Total ¹	
Commercial Varieties—Available for Farm Use														
Genoa	99	97	95	93	95	91	0.58	4.19	1.29	1.28	0.51	0.10	3.19	7.96*
USG 681HY	100	93	94	91	93	90	0.59	3.99	1.36	1.21	0.50	0.10	3.17	7.74*
A5225	100	95	96	96	95	88	0.57	3.90	1.31	1.16	0.47	0.08	3.03	7.49*
FSG 408DP	100	94	95	91	93	88	0.51	3.69	1.36	1.27	0.46	0.10	3.18	7.38*
Phoenix	96	91	85	85	85	76	0.49	3.64	1.36	1.21	0.43	0.07	3.07	7.20*
Ameristand 403T	98	88	83	84	89	79	0.56	3.62	1.12	1.23	0.43	0.07	2.86	7.05*
Withstand	96	89	84	88	88	81	0.45	3.52	1.37	1.16	0.44	0.09	3.05	7.02
Mariner III	98	90	86	86	85	84	0.47	3.55	1.27	1.08	0.42	0.08	2.85	6.88
WL 343HQ	99	90	89	96	93	88	0.41	3.39	1.30	1.18	0.47	0.08	3.03	6.83
Arc	98	86	89	78	78	71	0.46	3.34	1.25	1.09	0.33	0.06	2.73	6.53
Saranac AR (certified)	99	86	83	79	80	81	0.49	2.92	1.17	1.18	0.37	0.10	2.82	6.23
Buffalo	100	91	89	66	68	61	0.54	3.16	0.99	0.92	0.31	0.05	2.26	5.96
Experimental Varieties														
CW 24027	99	94	95	96	96	88	0.61	4.06	1.28	1.14	0.49	0.07	2.99	7.66*
TS 4027	99	88	83	83	80	73	0.64	3.66	1.22	1.21	0.52	0.07	3.02	7.32*
Mean	98.5	90.8	88.8	86.4	86.7	81.3	0.53	3.62	1.26	1.16	0.48	0.08	2.95	7.09
CV,%	1.1	5.7	8.7	9.4	9.3	13.0	20.82	13.10	10.30	11.90	16.54	42.72	9.52	9.02
LSD, 0.05	1.5	7.4	11.0	11.7	11.6	15.1	0.16	0.68	0.19	0.20	0.10	0.05	0.40	0.91

¹ Due to very dry weather, there was not enough growth for a fall harvest.

* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 9. Dry matter yields, seedling vigor, and stand persistence of alfalfa varieties sown April 17, 2009 at Princeton, Kentucky.

Variety	Seedling Vigor ¹ May 12, 2009	Percent Stand				Yield (tons/acre)						2-year Total
		2009		2010		2009	2010					
		May 12	Oct 28	Mar 18	Oct 12	Total	May 18	Jun 16	Jul 22	Aug 19	Total ²	
Commercial Varieties—Available for Farm Use												
Ameristand 403T	3.3	98	94	94	96	2.09	1.47	1.48	0.72	0.18	3.85	5.94*
LS605	2.8	99	96	97	97	1.72	1.58	1.39	0.67	0.20	3.85	5.57*
WL 363HQ	3.5	96	96	96	98	1.84	1.51	1.28	0.69	0.24	3.72	5.57*
Adrenalin	2.8	98	91	91	95	1.74	1.60	1.34	0.62	0.21	3.77	5.50*
Ameristand 407TQ	4.3	100	97	97	97	1.65	1.60	1.43	0.62	0.16	3.82	5.46*
Syngenta 6422Q	3.3	95	97	97	96	1.63	1.36	1.40	0.68	0.21	3.65	5.28*
Ameristand 403TPlus	3.5	100	95	95	95	1.57	1.40	1.45	0.61	0.16	3.61	5.18*
Saranac AR (certified)	3.3	99	91	90	94	1.60	1.48	1.33	0.57	0.19	3.56	5.16*
Rebound 5.0	2.8	95	96	90	93	1.48	1.48	1.30	0.65	0.21	3.64	5.11*
Archer III	3.0	98	97	95	97	1.53	1.45	1.34	0.57	0.21	3.57	5.09*
Buffalo	3.3	100	91	93	94	1.61	1.40	1.25	0.61	0.16	3.42	5.03
KingFisher 243	1.3	94	93	92	93	1.44	1.28	1.20	0.49	0.18	3.16	4.60
Experimental Varieties												
BYEXP723	3.8	98	98	97	96	2.16	1.48	1.52	0.81	0.21	4.02	6.18*
TS 4010/A4535	3.5	100	98	97	97	1.68	1.48	1.48	0.71	0.19	3.85	5.53*
GA505	2.8	99	95	93	93	1.72	1.28	1.38	0.61	0.18	3.45	5.18*
GA-APGC	4.0	98	91	94	97	1.63	1.37	1.31	0.50	0.16	3.34	4.97
CW 055023/PGI557	3.8	100	97	96	97	1.43	1.47	1.21	0.60	0.20	3.49	4.92
GA-MPX	1.8	96	92	93	96	1.42	1.28	1.19	0.52	0.13	3.12	4.54
Mean	3.1	97.8	94.6	94.2	95.3	1.66	1.44	1.35	0.62	0.19	3.61	5.27
CV,%	37.6	4.3	4.8	4.1	3.1	24.87	15.82	13.99	22.51	21.22	12.72	15.23
LSD, 0.05	1.7	5.9	6.5	5.5	4.1	0.59	0.32	0.27	0.20	0.06	0.65	1.14

¹Vigor score based on a scale of 1 to 5, with 5 being the most vigorous seedling growth.

²Due to very dry weather, there was not enough growth for a fall harvest.

*Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.

Table 10. Characterization and performance of alfalfa varieties across years and locations.

Variety	Proprietor	Variety Characteristics ¹						Lexington						Princeton				Bowling Green					
		FD ⁴	Disease Resistance ²					2006 ³				2008		2008		2009		2006					
			Bw	Fw	An	PRR	APH	07	08	09	10	08	09	10	08	09	10	09	10	07	08	09	10
Commercial Varieties—Available for Farm Use																							
6415	Garst Seed Co.	4	HR	HR	HR	HR	HR													x ⁵	*	*	*
6417	Garst Seed Co.	4	HR	HR	HR	HR	HR					*	*	*									
6552	Garst Seed Co.	5	HR	HR	HR	HR	HR					*	*	*									
A-4440	Producers Choice	4	HR	HR	HR	HR	HR					*	*	*									
A5225	Producers Choice	5	HR	HR	HR	HR	R					*	*	*	*	*	*						
Adrenalin	Brett Young	4	HR	HR	HR	HR	HR													*	*		
Ameristand 403T	America's Alfalfa	4	HR	HR	HR	HR	HR	x	*	x	x	*	x	x	*	*	*	*	*	*			
Ameristand 403TPlus	America's Alfalfa	4	HR	HR	HR	HR	HR													x	*		
Ameristand 407TQ	America's Alfalfa	4	HRT	HR	HR	HR	HR													*	*		
Anchormate	ProSeed Marketing	-	-	-	-	-	-					*	*	*						x	x	x	
Arc (certified)	Public	4	LR	MR	HR	R	-													x	x	x	
Archer III	America's Alfalfa	5	HR	HR	HR	HR	HR														x	*	
Buffalo	Public	-	-	-	-	-	-	x	x	x	x	*	x	x	*	x	x	*	*	*	x	x	x
DKA 41-18RR	Monsanto	4	HR	HR	HR	HR	HR	*	*	*	*												
DKA 43-13	Monsanto	4	HR	HR	HR	HR	HR					*	*	x									
DKA 50-18	Monsanto	5	HR	HR	HR	HR	HR					*	*	*									
Dynagro Everlast	United Agri. Products	3.8	HR	HR	HR	HR	R													x	*	*	*
Enforcer	FFR/Southern States	4	HR	HR	HR	HR	HR														x	x	x
Escalade	Allied Seed, LLC	5	HR	HR	R	HR	R														x	*	*
Evermore	FFR/Southern States	5	HR	HR	HR	HR	HR														*	*	*
Expedition	Syngenta Seeds	5	HR	HR	R	RR	R	*	*	*	*												
FSG 408DP	Lewis Seed Company	4	HR	HR	HR	HR	R								*	*	*						
FSG 528SF	Lewis Seed Company	5	HR	R	HR	RR	R					*	*	*									
Genoa	Syngenta Seeds	4	HR	HR	HR	RR	HR					*	*	*	*	*	*						
Integrity	PGI Alfalfa, Inc.	4	HR	HR	HR	HR	HR														x	*	*
KingFisher 243	Cal/West Seeds	5	HR	HR	HR	HR	HR														x	x	
L447HD	Legacy Seeds, Inc.	4	HR	HR	HR	HR	HR	*	*	*	*												
LegenDairy 5.0	Croplan Genetics	3	HR	HR	HR	HR	HR	x	*	*	*	*									x	*	*
LS 605	Legacy Seeds, Inc.	4	HR	HR	HR	HR	HR														*	*	
Mariner III	Allied Seed, LLC	4	HR	HR	HR	HR	HR								x	*	*						
PerForm	Dairyland Research	4	HR	HR	HR	HR	HR	*	*	*	*												
Phirst	UniSouth Genetics, Inc.	4	HR	HR	HR	HR	R														x	*	*
Phoenix	FFR/Southern States	5	HR	HR	HR	HR	R	x	*	x	x	*	*	*	*	*	*	*	*		x	*	x
PGI 459	Producers Choice	4	HR	HR	HR	HR	R					x	*	*									
Rebound 5.0	Croplan Genetics	4	HR	HR	HR	HR	HR					*	*	*							x	*	*
Radiant-AM	Ampac Seed Company	4	HR	HR	HR	HR	HR	*	*	x	x												
Saranac AR (certified)	Public	4	MR	R	HR	LR	-	x	x	x	x	*	x	x	*	x	*	*	*	*	x	x	x
Syngenta 6422Q	Syngenta Seeds	4	HR	HR	HR	HR	HR														*	*	
TripleTrust 450	ABI Alfalfa, Inc.	5	HR	HR	HR	HR	HR														x	*	*
USG 681HY	UniSouth Genetics, Inc.	6	HR	HR	R	HR	-								*	*	*						
Withstand	FFR/Southern States	4	HR	HR	HR	HR	HR	x	*	*	x	x	x	x	x	x	*	*	*		*	*	*
WL 343HQ	W-L Research	4	HR	HR	HR	HR	HR	x	*	x	x	*	*	x	x	x	*						
WL 348AP	W-L Research	4	HR	HR	HR	HR	HR														x	*	x
WL 355RR	W-L Research	4	HR	HR	HR	HR	HR	*	*	*	*												
WL 363HQ	W-L Research	5	HR	HR	HR	HR	HR					x	*	*							*	*	
Experimental Varieties																							
AA109E	ABI Alfalfa, Inc.																				x	*	*
BYEXP 723	Brett Young	4	HR	HR	HR	HR	HR														*	*	
CW 055023/PGI 557	Producers Choice	5	HR	HR	HR	HR	HR														x	*	
CW 24027	Cal/West Seeds	4	HR	HR	HR	HR	HR							*	*	*							
DS617	Dairyland Research	4	HR	HR	HR	HR	HR	*	*	*	*												
GA 505	Univ. of Georgia																				*	*	
GA-APGC	Univ. of Georgia																				*	x	
GA-MPX	Univ. of Georgia																				x	x	
MP04	Cimarron USA	5	HR	HR	HR	HR	R														*	*	*
TS 4010/A4535	Producers Choice																				*	*	
TS4027	Target Seed, LLC	4	HR	HR	HR	HR	R								*	*	*						

¹ Variety characteristics: FD=fall dormancy, Bw=bacterial wilt, Fw=fusarium wilt, An=anthracnose, PRR=phytophthora root rot, APH-aphanomyces root rot. Information provided by seed companies.
² Disease resistance: S=susceptible, LR=low resistance, MR=moderate resistance, R=resistance, HR=high resistance.
³ Establishment year.
⁴ Fall dormancy-check varieties: 1=Spredor 3, 2=Vernal, 3=Ranger, 4=Saranac, 5=DuPuits.
⁵ x in the box indicates the variety was in the test but yielded significantly less than the top-ranked variety in the test. Open boxes indicate the variety was not in the test.
* Not significantly different from the top-ranked variety in the test.



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