

2016 Alfalfa Report

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Introduction

Alfalfa (*Medicago sativa*) has historically been the highest-yielding, highest-quality forage legume grown in Kentucky. It is an important part 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. Tables 16 and 17 (Roundup Ready varieties) shows a summary of all alfalfa varieties tested

in Kentucky during the past 16 years. The UK Forage Extension website, 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 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 (non-dormant). 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 also have begun to report a winter survival index (WS) that ranges from 1 to 6.

Table 1. Temperature and rainfall at Lexington, Kentucky, in 2011, 2012, 2013, 2014, 2015, and 2016.

	2011				2012				2013				2014				2015				2016 ²			
	Temp		Rainfall		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	°F	DEP	IN	DEP
JAN	29	-2	2.10	-0.76	38	+7	4.80	+1.94	38	+7	4.50	+1.64	25	-6	2.28	-.58	32	+1	2.17	-0.69	32	+1	0.80	-2.06
FEB	39	+4	6.34	+3.13	40	+5	5.39	+2.18	36	+1	1.78	-1.43	30	-5	5.47	+2.26	26	14	3.08	-0.13	38	+3	6.09	+2.88
MAR	47	+3	4.76	+0.36	56	+12	5.64	+1.24	39	-5	5.47	+1.07	39	-5	3.08	-1.32	45	+1	7.34	+2.94	52	+8	4.07	-0.33
APR	58	+3	12.36	+8.48	56	+1	3.26	-0.62	55	0	4.46	+0.58	58	+3	5.27	-1.89	57	+2	13.19	+9.31	57	+2	3.97	+0.09
MAY	64	0	6.72	+2.25	69	+5	4.02	-0.45	65	+1	5.23	+0.76	66	+2	5.72	+1.25	69	+5	3.02	-1.45	64	0	9.17	+4.70
JUN	74	+2	2.61	-1.05	73	+1	2.42	-1.24	72	0	7.32	+3.66	75	+3	2.93	-0.73	75	+3	8.20	+4.54	76	+4	5.09	+1.43
JUL	80	+4	6.29	1.29	81	+5	2.50	-2.50	72	-4	9.33	+4.33	74	-2	3.18	-1.82	77	+1	10.22	+5.22	79	+3	7.43	+2.43
AUG	75	0	2.89	-1.04	75	0	1.68	-2.25	72	-3	3.68	-0.25	76	+1	6.53	+2.60	74	-1	3.49	-0.44	79	+4	4.37	+0.44
SEP	66	-2	5.52	+2.32	67	-1	6.40	+3.20	67	-1	2.21	-0.99	69	+1	3.63	+4.3	72	+4	3.49	+0.29	74	+6	2.18	-1.02
OCT	55	-2	4.10	+1.53	55	-2	2.00	-0.57	55	-2	7.02	+4.45	57	0	5.55	+2.98	59	+2	2.78	+0.21	64	+7	0.37	-2.20
NOV	50	+5	9.53	+6.14	43	-2	1.81	-0.65	41	-4	3.06	-0.33	41	-4	2.79	-0.60	51	+6	3.72	+0.33				
DEC	41	+5	5.58	+1.60	42	+6	9.57	+4.94	36	0	4.19	+0.21	40	+4	2.47	-1.51	49	+13	8.42	+4.44				
Total			68.80	+24.25			49.49	+4.94			58.25	+13.70			49.4	+4.85			69.12	+24.57			43.54	+6.36

¹ DEP is departure from the long-term average.

² 2016 data is for ten months through October.

Table 2. Temperature and rainfall at Princeton, Kentucky, in 2011, 2012, 2013, 2014, 2015, and 2016.

	2011				2012				2013				2014				2015				2016 ²			
	Temp		Rainfall		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	°F	DEP	IN	DEP
JAN	32	-2	2.35	-1.45	40	+6	3.01	-0.79	38	+4	6.31	+2.51	30	-4	1.70	-2.10	34	0	1.51	-2.29	35	+1	1.37	-2.43
FEB	40	+2	5.71	+1.28	54	+6	1.73	-2.70	39	+1	3.09	-1.34	32	-6	4.75	+0.32	28	-10	4.16	-0.27	40	+2	4.23	-0.20
MAR	50	+3	5.54	+0.60	60	+13	3.27	-1.67	42	-5	4.34	-0.60	43	-4	7.43	-0.51	46	-1	6.83	+1.89	53	+6	7.3	+2.36
APR	61	+2	16.15	+11.35	60	+1	0.62	-4.18	57	-2	5.72	+0.92	59	0	8.5	+3.70	60	+1	7.38	+2.58	59	0	4.41	-0.39
MAY	66	-1	7.22	+2.26	71	+4	1.36	-3.60	66	-1	4.26	-0.70	68	+1	1.96	-3.00	68	+1	3.52	-1.44	64	-3	6.21	+1.25
JUN	77	+2	4.60	+0.75	74	-5	2.38	-1.47	74	-1	7.55	+3.70	76	+1	3.25	-0.60	76	+1	2.85	-1.00	77	+2	2.18	-1.67
JUL	81	+3	2.98	-1.31	83	+5	1.40	-2.89	75	-3	4.44	+0.15	73	-5	1.56	-2.73	79	+1	8.83	+4.54	80	+2	12.72	+8.43
AUG	77	0	3.95	-0.06	77	0	4.27	+0.26	75	-2	5.59	+1.58	78	0	9.33	+5.32	73	-4	2.90	-1.11	78	+2	5.37	+1.36
SEP	68	-3	3.86	+0.53	69	-2	5.45	+1.82	71	0	5.37	+2.04	69	-2	0.97	-2.36	71	0	0.82	-2.51	73	+2	1.33	-2.00
OCT	57	-2	1.35	-1.70	57	-2	2.94	-0.11	59	0	4.04	+0.99	59	0	4.36	+1.31	60	+1	4.15	+1.10	65	+6	0.25	-2.80
NOV	51	+4	9.12	+4.49	45	-2	2.11	-2.52	44	-3	1.37	-3.26	41	-6	2.02	-2.61	53	+6	5.95	+1.32				
DEC	42	+3	6.13	+1.09	45	+6	4.77	-0.27	38	-1	5.41	+0.37	40	+1	1.84	-3.20	49	+10	6.37	+1.33				
Total			68.96	+17.83			33.01	-18.12			57.49	+6.36			44.67	-6.46			55.27	+4.14			45.37	+3.91

¹ DEP is departure from the long-term average.

² 2016 data is for ten months through October.

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 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 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 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 some 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

Table 5. Dry matter yields, seedling vigor, and stand persistence of Roundup Ready alfalfa varieties sown August 9, 2012, at Lexington, Kentucky.¹

Variety	Seedling Vigor ² , Sep 27, 2012	Percent Stand												Yield (tons/acre)													
		2012			2013			2014			2015			2016			2015			2016			4-year Total				
		Sep 27	Mar 20	Sep 26	Apr 1	Oct 6	Apr 2	Oct 15	Mar 18	Sep 27	Total	2013	Total	2014	Total	2015	Total	2016	Total	2015	Total	2016	Total	Sep 19	Total		
Commercial Varieties-Available for Farm Use																											
Tonnica RR	4.6	100	100	100	97	96	94	95	93	89	6.37	6.05	5.78	1.87	1.88	1.39	1.11	0.55	6.80	25.00*							
6516R RR	4.8	99	99	99	98	97	96	96	94	89	5.87	6.21	5.95	1.94	1.77	1.57	1.05	0.61	6.95	24.98*							
DKA46-16 RR	4.5	99	100	100	99	100	99	99	95	91	5.90	5.61	6.13	1.58	1.71	1.58	0.97	0.49	6.33	23.96*							
WL 372HQ RR	4.1	100	100	100	98	99	98	97	96	88	5.92	5.88	5.90	1.78	1.72	1.13	1.06	0.51	6.19	23.90*							
Ameristand 445TQ RR	4.1	100	100	100	99	99	99	99	98	93	5.61	5.33	6.28	1.56	1.72	1.47	1.25	0.53	6.54	23.77*							
WL 355 RR	3.9	99	100	100	97	99	97	97	94	88	5.46	5.54	5.87	2.03	1.68	1.34	0.85	0.54	6.44	23.31*							
AphaTron RR	4.3	100	100	100	99	98	96	97	95	88	5.66	5.50	5.88	1.89	1.62	1.16	0.94	0.46	6.08	23.12*							
Stratica RR	3.6	94	95	95	91	96	93	94	86	79	6.10	5.64	5.63	1.62	1.59	1.13	0.84	0.47	5.65	23.02*							
Consistency 4:10 RR	4.1	98	98	98	97	98	96	97	95	90	5.62	5.25	6.03	1.70	1.55	1.02	1.30	0.43	6.00	22.90*							
Ameristand 405T RR	4.5	100	100	100	99	98	95	94	92	86	5.92	5.15	5.70	1.86	1.35	1.42	0.85	0.55	6.02	22.81*							
54R02 RR	4.5	94	96	97	97	97	96	96	94	91	5.45	5.46	5.85	1.80	1.78	1.06	0.90	0.47	6.01	22.78*							
WL 356HQ RR	4.1	100	100	100	97	97	95	95	94	88	5.50	5.17	5.60	1.75	1.91	1.21	1.02	0.57	6.46	22.72							
DKA41-18 RR	4.1	98	99	99	95	97	96	97	96	87	5.45	5.41	6.09	1.48	1.51	1.39	0.89	0.44	5.71	22.66							
Ameristand 433T RR	3.4	92	94	93	91	92	90	90	89	83	5.27	5.18	5.97	1.62	1.23	1.13	0.90	0.39	5.26	21.67							
Alfagraze 300 RR	3.6	97	98	98	96	97	97	96	94	90	4.89	4.92	6.07	1.82	1.49	1.16	0.84	0.45	5.76	21.63							
Mean	4.2	98	98	98	96	97	96	96	94	88	5.67	5.48	5.92	1.75	1.63	1.28	0.98	0.50	6.15	23.21							
CV/%	14.9	2	2	2	2	2	2	2	4	6	10.03	10.37	8.37	17.97	18.61	26.07	27.04	15.96	12.42	1.85							
LSD,0.05	0.9	3	2	2	3	2	3	3	5	7	0.81	0.81	0.71	0.45	0.43	0.48	0.38	0.11	1.09	2.27							

¹ This trial was sprayed with Roundup once in 2012 and 2013, twice in 2014, once in 2015, and twice in 2016.

² Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

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

Table 6. Dry matter yields and stand persistence of alfalfa varieties sown March 31, 2015, at Lexington, Kentucky.

Variety	Percent Stand				Yield (tons/acre)							2-year Total
	2015		2016		2015 Total	2016						
	Jun 12	Oct 15	Mar 18	Sep 27		May 6	Jun 9	Jul 13	Aug 16	Sep 19	Total	
Commercial Varieties-Available for Farm Use												
Caliber	95	97	97	94	2.08	2.61	1.43	1.29	1.21	0.48	7.02	9.10*
Fierce	92	94	94	89	1.97	2.38	1.17	1.18	1.20	0.45	6.40	8.37*
Ameristand 403T Plus	89	95	95	92	1.47	2.29	1.33	1.37	1.42	0.47	6.87	8.34*
FSG-426	95	97	97	94	2.01	2.39	1.41	0.90	0.96	0.44	6.10	8.11*
Ameristand 427TQ	99	98	97	92	1.71	2.23	1.19	1.41	1.09	0.43	6.36	8.07*
Buffalo	96	95	94	89	1.36	2.36	0.97	1.36	1.14	0.43	6.25	7.61
Contender	95	96	96	91	1.77	2.15	1.18	1.19	0.87	0.37	5.76	7.53
Saranac AR (certified)	81	88	89	89	1.23	2.18	1.08	1.18	1.28	0.48	6.21	7.43
Mean	92	95	95	91	1.70	2.33	1.22	1.24	1.15	0.44	6.37	8.07
CV,%	8	5	5	4	20.84	14.59	25.11	15.31	20.68	11.18	12.22	11.24
LSD,0.05	11	7	7	6	0.52	0.50	0.45	0.28	0.35	0.07	1.15	1.33

*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 Roundup Ready alfalfa varieties sown March 31, 2015, at Lexington, Kentucky.¹

Variety	Percent Stand				Yield (tons/acre)							2-year Total
	2015		2016		2015 Total	2016						
	Jun 12	Oct 15	Mar 18	Sep 27		May 6	Jun 9	Jul 13	Aug 16	Sep 19	Total	
Commercial Varieties-Available for Farm Use												
54R02 RR	99	99	98	96	2.61	2.24	1.69	1.70	1.23	0.63	7.49	10.10*
55VR08 RR	100	100	100	98	2.42	1.99	1.79	1.53	1.12	0.49	6.92	9.34*
Alfagraze 600 RR	99	100	98	95	2.67	1.76	1.52	1.43	1.25	0.60	6.55	9.22*
Ameristand 405T RR	99	99	99	97	2.21	1.98	1.57	1.64	1.10	0.58	6.87	9.08*
WL 356HQ RR	97	98	98	96	1.79	1.85	1.78	1.48	1.38	0.61	7.10	8.89*
Ameristand 433T RR	98	99	99	95	2.13	1.91	1.43	1.48	1.15	0.59	6.57	8.70*
Ameristand 445TQ RR	99	98	99	98	2.06	1.86	1.69	1.47	1.11	0.49	6.62	8.68*
428 RR	97	97	98	96	1.79	1.96	1.29	1.60	0.98	0.51	6.35	8.14*
Alfagraze 300 RR	98	99	99	97	1.64	1.84	1.22	1.23	1.29	0.47	6.05	7.68
55VR06 RR	99	99	99	97	1.61	1.60	1.51	1.35	1.03	0.42	5.92	7.53
Mean	98	99	99	96	2.09	1.90	1.55	1.49	1.17	0.54	6.64	8.73
CV,%	2	2	2	2	30.03	22.03	19.66	19.71	22.88	20.68	15.77	18.14
LSD,0.05	3	3	3	3	0.91	0.61	0.44	0.43	0.39	0.16	1.52	2.30

¹ This trial was sprayed with Roundup once in 2015 and twice in 2016.

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

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 the percentage of other crop and weed seed. Order seed well in advance of planting time to assure it will be available when needed.

Description of the Tests

Alfalfa variety tests were established at Lexington (2011, 2012, 2015, and 2016) and Princeton (2011, 2013, and 2015) as part of the forage variety testing program. The soils are well suited to alfalfa because they are generally well drained silt loam soils (Maury and Crider at Lexington and Princeton respectively).

Plots were 5 feet by 20 feet in a randomized complete block design with four replications with a harvested plot area of 5 feet 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.

Table 8. Dry matter yields and stand persistence of alfalfa varieties sown April 5, 2016, at Lexington, Kentucky.

Variety	Percent Stand		Yield (tons/acre)			
	2016		2016			
	Jun 16	Sep 27	Jul 14	Aug 18	Sep 19	Total
Commercial Varieties-Available for Farm Use						
Ameristand 403T Plus	97	93	1.01	0.86	0.45	2.31*
FSG 415BR	92	89	0.71	0.97	0.59	2.26*
Evermore	97	97	0.92	0.83	0.46	2.20*
GA-497HD	97	97	0.70	0.95	0.48	2.14*
WL 365HQ	98	95	0.76	0.86	0.49	2.10*
Rebound 6XT	96	94	0.72	0.92	0.39	2.04*
Contender	96	94	0.81	0.65	0.44	1.90*
Caliber	96	95	0.56	0.85	0.47	1.88*
Saranac AR (certified)	94	92	0.73	0.70	0.41	1.84*
Bulldog 505	93	91	0.53	0.60	0.33	1.46
Experimental Varieties						
AM-14-900	93	92	0.65	0.88	0.43	1.97*
AFX095026	92	91	0.70	0.81	0.45	1.96*
LS 905	95	95	0.80	0.64	0.35	1.79*
AFX095005	95	93	0.64	0.65	0.38	1.66
AM-09-600	95	94	0.60	0.56	0.45	1.60
NF11ALF0006	95	93	0.48	0.59	0.32	1.38
Mean	95	93	0.71	0.77	0.43	1.91
CV,%	4	4	39.11	29.84	20.95	21.81
LSD,0.05	5	6	0.39	0.33	0.13	0.59

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

Table 9. Dry matter yields and stand persistence of Roundup Ready alfalfa varieties sown April 7, 2011, at Princeton, Kentucky.

Variety	Percent Stand												Yield (tons/acre)						6-year Total							
	2011			2012			2013			2014			2015			2016										
	Jun 14	Oct 24	Mar 21	Oct 29	Mar 19	Oct 8	Apr 4	Oct 22	Apr 14	Oct 23	Mar 22	Sep 23	Total	2011	2012	2013	2014	2015		2016	May 4	Jun 7	Jul 20	Aug 23	Total	
Commercial Varieties-Available for Farm Use																										
54R02 RR	94	94	94	96	97	94	91	83	83	84	84	75	21	1.72	4.58	7.17	4.37	4.81	4.81	1.05	0.88	1.26	0.50	0.50	3.69	26.34*
Consistency 4.10 RR	99	99	99	99	99	98	96	86	86	79	73	15	15	1.64	4.26	6.46	4.23	5.23	5.23	1.39	0.85	1.15	0.57	0.57	3.96	25.79*
WL 355 RR	98	98	97	98	98	96	96	85	93	90	74	15	15	1.43	4.01	6.51	4.75	4.56	4.56	1.32	0.64	1.08	0.49	0.49	3.53	25.75*
DKA41-18 RR	98	97	96	97	96	94	94	88	88	88	69	24	24	1.48	4.16	6.70	4.13	4.35	4.35	1.60	0.78	1.25	0.39	0.39	4.02	25.55*
Ameristand 405T RR	96	96	97	96	96	94	94	92	91	89	81	18	18	1.47	3.95	6.99	4.06	4.67	4.67	0.95	0.91	1.03	0.48	0.48	3.37	24.51*
Alfagraze 300 RR	94	94	93	93	93	92	89	75	82	83	61	9	9	1.24	3.88	6.00	3.64	4.26	4.26	1.48	0.48	0.84	0.36	0.36	3.15	23.60*
Experimental Varieties																										
FG R47M120 RR	94	97	96	97	97	94	94	90	90	86	78	23	23	1.61	4.30	6.90	4.57	5.03	5.03	1.52	0.77	1.22	0.45	0.45	3.97	26.38*
FG R46M162 RR	98	98	98	94	93	92	93	90	92	88	75	23	23	1.53	3.92	6.60	4.35	4.64	4.64	0.97	0.68	1.38	0.47	0.47	3.50	25.15*
FG R47M312 RR	92	94	94	95	93	93	93	89	89	89	79	35	35	1.41	4.04	6.65	4.32	4.73	4.73	1.29	0.89	0.90	0.61	0.61	3.69	24.84*
FG R47M319 RR	98	98	99	98	95	93	93	90	89	84	78	24	24	1.59	4.05	6.10	4.28	4.64	4.64	1.24	0.86	1.04	0.55	0.55	3.69	24.36*
Mean	96	96	96	96	95	93	93	87	88	86	74	21	21	1.51	4.11	6.61	4.27	4.69	4.69	1.28	0.77	1.12	0.49	0.49	3.66	25.25
CV,%	3	3	2	2	2	3	3	20	11	8	16	42	42	13.66	10.05	7.26	11.84	14.40	28.21	29.88	29.02	45.38	15.61	15.61	7.92	7.92
LSD 0.05	4	4	3	3	3	5	5	19	14	11	17	13	13	0.30	0.60	0.70	0.79	0.98	0.52	0.34	0.47	0.32	0.32	0.83	0.83	3.11

This trial was sprayed with Roundup once in 2012 and twice in 2013, 2014, 2015 and 2016.

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

Table 10. Dry matter yields and stand persistence of alfalfa varieties sown August 23, 2013, at Princeton, Kentucky.

Variety	Percent Stand												Yield (tons/acre)						3-year Total						
	2013			2014			2015			2016			2016												
	Sep 17	Apr 4	Oct 22	Apr 14	Oct 23	Mar 22	Sep 23	Total	2013	2014	2015	2016	May 4	Jun 7	Jul 20	Aug 23	Total								
Commercial Varieties-Available for Farm Use																									
FSG 424	100	100	100	100	100	99	97	85	89	86	75	23	23	7.51	8.96	7.51	2.39	1.62	1.73	1.73	1.20	0.86	6.95	23.42*	
GA-535	100	100	100	100	100	100	97	93	89	89	74	23	23	7.45	8.99	7.45	2.36	1.73	1.65	1.65	0.86	0.86	6.60	23.04*	
55V50	100	100	100	100	100	100	99	82	88	81	71	23	23	7.15	8.81	7.15	2.52	1.64	1.78	1.78	0.82	0.82	6.76	22.73*	
DG 4210	100	99	100	100	100	100	99	88	86	83	23	23	23	8.56	6.83	2.38	1.84	1.84	1.65	1.65	0.98	0.98	6.85	22.25*	
Bulldog-505	100	100	100	100	100	100	98	92	85	75	20	20	20	8.52	7.15	2.04	1.92	1.76	1.76	1.76	0.77	0.77	6.49	22.16*	
FSG 403LR	100	100	100	100	100	100	97	88	83	78	23	23	23	7.18	8.36	7.18	2.05	1.65	1.65	1.65	1.21	1.21	6.57	22.11*	
L455HD	100	99	100	100	100	99	98	87	87	81	68	23	23	6.89	8.14	6.89	2.19	1.77	1.59	1.59	0.77	0.77	6.31	21.34*	
Saranac AR (certified)	100	96	100	100	100	100	95	54	54	81	68	23	23	6.98	8.16	6.98	2.08	1.47	1.55	1.55	0.86	0.86	5.96	21.11*	
Ameristand 403T	100	100	100	100	100	100	97	73	73	74	68	23	23	6.84	7.74	6.84	2.14	1.46	1.78	1.78	0.94	0.94	6.32	20.90	
Optimus	100	100	100	100	100	100	99	90	90	74	69	23	23	6.92	7.74	6.92	2.03	1.68	1.55	1.55	0.71	0.71	5.97	20.63	
FSG 524	100	99	98	98	99	99	98	86	86	78	68	23	23	6.82	7.87	6.82	1.86	1.54	1.61	1.61	0.89	0.89	5.89	20.59	
Arc (certified)	100	98	99	98	99	98	93	89	36	80	69	23	23	6.92	8.05	6.92	1.84	1.39	1.57	1.57	0.79	0.79	5.59	20.56	
Buffalo	94	85	93	93	93	91	82	45	45	74	66	23	23	6.61	7.42	6.61	1.83	1.39	1.69	1.69	0.63	0.63	5.55	19.58	
Experimental Varieties																									
LS905	100	100	100	100	100	100	98	89	89	79	72	23	23	7.48	7.92	7.48	2.33	1.59	1.63	1.63	0.82	0.82	6.37	21.78*	
CW 104038	100	100	100	100	99	99	97	68	68	80	69	23	23	6.90	8.01	6.90	2.15	1.34	1.56	1.56	0.79	0.79	5.84	20.75	
GA-ALFG-1	100	100	100	100	100	98	97	63	63	83	64	23	23	6.47	8.36	6.47	2.06	1.49	1.59	1.59	0.67	0.67	5.81	20.64	
LS804	100	100	99	99	99	98	98	88	88	79	68	23	23	6.48	7.97	6.48	2.25	1.68	1.62	1.62	0.63	0.63	6.17	20.63	
Mean	100	98	99	99	99	98	96	77	77	82	68	23	23	6.98	8.21	6.98	2.14	1.60	1.64	1.64	0.84	0.84	6.23	21.42	
CV,%	3	8	3	3	3	3	6	27	27	12	29	42	42	5.54	12.29	5.54	13.93	17.29	16.21	28.87	10.35	10.35	7.79	7.79	
LSD 0.05	4	11	4	4	4	5	8	29	29	14	14	13	13	0.55	1.44	0.55	0.43	0.39	0.38	0.38	0.35	0.35	0.92	0.92	2.37

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

Table 12. Dry matter yields, seedling vigor, and stand persistence of alfalfa varieties sown August 25, 2015, at Princeton, Kentucky.

Variety	Seedling Vigor ¹ Oct 23, 2015	Percent Stand			Yield (tons/acre)					
		2015		2016	2016					
		Oct 23	Mar 22	Sep 23	May 4	Jun 7	Jul 20	Aug 23	Sep 23	Total
Commercial Varieties-Available for Farm Use										
Contender	4.9	100	100	97	2.89	1.78	1.94	0.99	0.56	8.16*
Caliber	4.5	100	100	97	2.71	1.91	1.90	0.85	0.51	7.86*
Ameristand 427TQ	4.5	100	100	99	2.48	1.94	1.71	0.98	0.70	7.82*
Fierce	4.9	100	100	100	2.68	1.46	1.95	0.92	0.62	7.63*
Ameristand 403TPlus	4.6	100	100	100	2.62	1.53	1.74	0.98	0.62	7.49
FSG-426	4.8	100	100	98	2.43	1.52	1.73	1.01	0.59	7.28
Saranac AR (certified)	4.6	100	100	97	2.73	1.47	1.75	0.71	0.37	7.04
Buffalo	4.1	100	100	84	2.48	1.68	1.70	0.76	0.30	6.92
Mean	4.6	100	100	96	2.62	1.66	1.80	0.90	0.53	7.52
CV,%	9.9	0	0	9	10.07	17.56	9.47	13.17	25.81	5.18
LSD,0.05	0.7	0	0	12	0.39	0.43	0.25	0.17	0.20	0.57

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

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

Table 13. Dry matter yields, seedling vigor, and stand persistence of Roundup Ready alfalfa varieties sown August 25, 2015, at Princeton, Kentucky.¹

Variety	Seedling Vigor ² Oct 23, 2015	Percent Stand			Yield (tons/acre)					
		2015		2016	2016					
		Oct 23	Mar 22	Sep 23	May 4	Jun 7	Jul 20	Aug 23	Sep 23	Total
Commercial Varieties-Available for Farm Use										
55VR08 RR	4.5	100	100	100	3.23	1.93	2.23	1.05	0.50	8.95*
WL 355 RR	3.5	100	100	98	3.20	1.68	2.34	0.92	0.37	8.50*
Ameristand 405T RR	3.8	100	100	100	2.97	1.90	2.06	0.88	0.52	8.32*
DKA41-18 RR	3.6	100	100	99	2.93	1.95	1.92	0.92	0.44	8.16*
54R02 RR	4.5	100	100	100	2.86	1.81	1.95	0.88	0.62	8.12*
Ameristand 433T RR	4.5	100	100	99	2.80	1.83	1.90	0.84	0.37	7.75
Alfagraze 300 RR	4.0	100	100	98	2.84	1.86	1.96	0.84	0.23	7.73
Alfagaze 600 RR	5.0	100	100	97	2.38	1.63	1.69	0.64	0.55	6.89
Mean	4.2	100	100	99	2.90	1.82	2.01	0.87	0.45	8.05
CV,%	11.9	0	0	2	9.30	10.71	22.65	16.29	27.32	7.34
LSD,0.05	0.7	0	0	3	0.40	0.29	0.67	0.21	0.18	0.87

¹ This trial was sprayed with Roundup twice in 2016.

² Vigor score based on a scale of 1 to 5 with 5 being the most vigorous seedling growth.

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

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 or in the "Publications" section of the UK Forage website, at www.uky.edu/Ag/Forage.

- Alfalfa: The Queen of the Forage Crops (AGR-76)
- Establishing Forage Crops (AGR-64)
- Inoculation of Forage Legumes (AGR-90)
- Grain and Forage Crop Guide for Kentucky (AGR-18)

- Lime and Fertilizer Recommendations (AGR-1)
- Weed Control Strategies for Alfalfa and Other Forage Legume Crops (AGR-148)
- Insect Management Recommendations for Field Crops and Livestock (ENT-17)
- Alfalfa Hay: Quality Makes the Difference (AGR-137)
- "Emergency" Inoculation for Poorly Nodulated Legumes (PPFS-AG-F-04)
- Common Alfalfa Seedling Diseases and Disorders (PPFS-AG-F-03)
- Managing Diseases of Alfalfa (PPFS-AG-F-09)
- Managing Legume-Induced Bloat in Cattle (ID-186)
- Growing Alfalfa in the South, a publication of the National Alfalfa & Forage

Alliance, www.alfalfa.org/pdf/alfalfainthesouth.pdf

- Alfalfa Management Guide, www.crops.org/files/publications/alfalfa-management-guide.pdf
- Alfalfa Analyst (ID guide to alfalfa disease and insect damage and soil fertility deficiencies), www.alfalfa.org/pdf/AlfalfaAnalyst.pdf
- Alfalfa Variety Ratings, Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties, www.alfalfa.org/varietyLeaflet.php

About the Authors

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Table 15. Characterization and performance of Roundup Ready alfalfa varieties across years and locations in Kentucky.

Variety	Proprietor	Variety Characteristics ¹										Lexington										Princeton															
		Disease Resistance ²					2012 ³					2011					2013					2015															
		FD ⁴	Bw	Fw	An	PRR	APH	13	14	15	16	16	15	14	13	12	11	11	12	13	14	15	16	16	15	14	13	12	11	11	12	13	14	15	16		
Commercial Varieties-Available for Farm Use																																					
428 RR	Allied Seed, L.L.C.	4	HR	HR	HR	HR	HR	HR	HR	HR																											
54R02 RR	Pioneer Hi-Bred	4	HR	HR	HR	HR	HR	HR	HR	HR	x ⁵																										
55VR06 RR	Dupont Pioneer	-	-	-	-	-	-	-	-	-																											
55VR08 RR	Dupont Pioneer	5	-	HR	HR	HR	HR	HR	HR	HR																											
6516R RR	NEXGROW	5	HR	-	HR	HR	HR	HR	HR	HR	*																										
Alfagraze 300 RR	America's Alfalfa	3	HR	R	HR	HR	HR	HR	HR	HR	X																										
Alfagraze 600 RR	America's Alfalfa	6	-	R	HR	R	R	R	R	R																											
Ameristand 405T RR	America's Alfalfa	4	HR	HR	HR	HR	HR	HR	HR	HR	*	X																									
Ameristand 433T RR	America's Alfalfa	3	HR	R	HR	R	HR	HR	HR	HR	X																										
Ameristand 455TQ RR	America's Alfalfa	4	HR	HR	HR	HR	HR	HR	HR	HR	*	X																									
AphaTron RR	Croplan Genetics	4	HR	HR	HR	HR	HR	HR	HR	HR	*																										
Consistency 4.10 RR	Croplan Genetics	4	HR	HR	HR	HR	HR	HR	HR	HR	*	X																									
DKA 41-18 RR	Monsanto	4	HR	HR	HR	HR	HR	HR	HR	HR	*																										
DKA 44-16 RR	Monsanto	4	HR	HR	HR	HR	HR	HR	HR	HR	*																										
Stratica RR	Croplan Genetics	4	HR	HR	HR	HR	HR	HR	HR	HR	*																										
Tonnica RR	Croplan Genetics	5	HR	HR	HR	HR	HR	HR	HR	HR	*																										
WL 355 RR	W-L Research	4	HR	HR	HR	HR	HR	HR	HR	HR	X																										
WL 356HQ RR	W-L Research	4	HR	HR	HR	HR	HR	HR	HR	HR	*	X																									
WL 372HQ RR	W-L Research	5	HR	HR	HR	HR	HR	HR	HR	HR	*																										
Experimental Varieties																																					
FG R46M162 RR	Forage Genetics	4	HR	HR	HR	HR	HR	HR	HR	HR																											
FG R47M120 RR	Forage Genetics	4	HR	HR	HR	HR	HR	HR	HR	HR																											
FG R47M312 RR	Forage Genetics	4	HR	HR	HR	HR	HR	HR	HR	HR																											
FG R47M319 RR	Forage Genetics	4	HR	HR	HR	HR	HR	HR	HR	HR																											

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: 5 = 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.

Table 17. Summary of Kentucky Roundup Ready alfalfa yield trials 2011-2016 (yield shown as a percentage of the mean of the commercial varieties in the test).

Variety	Proprietor	Variety Characteristics ¹						Lexington		Princeton		Quicksand	Mean ⁵ (# trials)
		FD	Disease Resistance ²					12 ^{3,4}	15	11	13	14	
			Bw	Fw	An	PRR	APH	3yr ⁶	2yr	5yr	4yr	2yr	
Alfagraze 300 RR	America's Alfalfa	3	HR	R	HR	HR	HR	93	88	93	99		93(4)
Alfagraze 600 RR	America's Alfalfa	6		R	HR	R	R		106			93	100(2)
Ameristand 405T RR	America's Alfalfa	4	HR	HR	HR	HR	HR	98	104	97	100	93	99(5)
Ameristand 433T RR	America's Alfalfa	3	HR	R	R	HR	HR	93	100		95	107	99(4)
Ameristand 445TQ RR	America's Alfalfa	4	HR	HR	HR	HR	HR	102	99		100		100(3)
AphaTron RR	Croplan Genetics	4	HR	HR	HR	HR	HR	100			98		99(2)
Consistency 4.10 RR	Croplan Genetics	4	HR	HR	HR	HR	HR	99		102			101(2)
DKA-41-18 RR	Monsanto	4	HR	HR	HR	HR	HR	98		101			100(2)
DKA 44-16 RR	Monsanto	4	HR	HR	HR	HR	HR	103			100		102(2)
Stratica RR	Croplan Genetics	4	HR	HR	HR	HR	HR	99			96		98(2)
Tonnica RR	Crop Genetics	5	HR	HR	HR	HR	HR	108			101		105(2)
WL 355 RR	W-L Research	4	HR	HR	HR	HR	HR	100		102			101(2)
WL 356HQ RR	W-L Research	5	HR	HR	HR	HR	HR	98	102		96		99(3)
WL 372HQ RR	W-L Research	5	HR	HR	HR	HR	HR	103			106		105(2)
428 RR	Allied Seed	4	HR	HR	HR	HR	HR		93		104	111	103(3)
54R02 RR	Dupont Pioneer	4	HR	HR	HR	HR	HR	98	116	104		97	104(4)
55VR06 RR	Dupont Pioneer	5	HR	R	Hr	HR	HR		86			99	93(2)
55VR08 RR	Dupont Pioneer	5	-	HR	HR	HR	HR		107				-
6516R RR	NEXGROW	5	HR	-	HR	HR	HR	108			109		109(2)

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 Year trial was established.

⁴ Use this summary table as a guide in making variety decisions, but refer to specific yearly reports to determine statistical differences in forage yield between varieties. To find actual yields, look in the yearly report for the final year of each specific test. For example, the Princeton trial planted in 2011 was harvested for five years, so the final yield report would be "2016 Alfalfa Report" archived in the KY Forage website at <www.uky.edu/Ag/Forage>.

⁵ Mean only presented when respective variety was included in two or more trials.

⁶ Number of years of data.