



# 2018 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 12 and 13 (Roundup Ready varieties) shows a summary of all alfalfa varieties tested in Kentucky during the past 16 years. The UK Forage Extension website, at forages.ca.uky.edu 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. 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. 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. Affect-

Table 1. Temperature and rainfall at Lexington, Kentucky, in 2013, 2014, 2015, 2016, 2017, and 2018.

	2013				2014				2015				2016				2017				2018 <sup>2</sup>			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall		Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
	°F	DEP <sup>1</sup>	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	38	+7	4.50	+1.64	25	-6	2.28	-0.58	32	+1	2.17	-0.69	32	+1	0.80	-2.06	40	+9	6.81	+3.95	31	0	2.01	-0.85
FEB	36	+1	1.78	-1.43	30	-5	5.47	+2.26	26	-9	3.08	-0.13	38	+3	6.09	+2.88	47	+12	4.46	+1.25	45	+10	9.77	+6.56
MAR	39	-5	5.47	+1.07	39	-5	3.08	-1.32	45	+1	7.34	+2.94	52	+8	4.07	-0.33	48	+4	3.34	-1.06	42	-2	5.16	+0.76
APR	55	0	4.46	+0.58	58	+3	5.27	-1.89	57	+2	13.19	+9.31	57	+2	3.97	+0.09	62	+7	4.17	+0.29	50	-5	5.52	+1.64
MAY	65	+1	5.23	+0.76	66	+2	5.72	+1.25	69	+5	3.02	-1.45	64	0	9.17	+4.70	66	+2	7.74	+3.27	73	+9	8.39	+3.92
JUN	72	0	7.32	+3.66	75	+3	2.93	-0.73	75	+3	8.20	+4.54	76	+4	5.09	+1.43	73	+1	7.68	+4.02	76	+4	6.42	+2.76
JUL	72	-4	9.33	+4.33	74	-2	3.18	-1.82	77	+1	10.22	+5.22	79	+3	7.43	+2.43	76	0	4.49	-0.51	77	+1	6.15	+1.15
AUG	72	-3	3.68	-0.25	76	+1	6.53	+2.60	74	-1	3.49	-0.44	79	+4	4.37	+0.44	74	-1	6.66	+2.73	77	+2	6.45	2.52
SEP	67	-1	2.21	-0.99	69	+1	3.63	+0.43	72	+4	3.49	+0.29	74	+6	2.18	-1.02	69	+1	4.72	+1.52	74	+6	12.88	+9.68
OCT	55	-2	7.02	+4.45	57	0	5.55	+2.98	59	+2	2.78	+0.21	64	+7	0.37	-2.20	60	+3	6.06	+3.49	59	+2	6.54	+3.97
NOV	41	-4	3.06	-0.33	41	-4	2.79	-0.60	51	+6	3.72	+0.33	51	+6	1.94	-1.45	47	+2	3.09	-0.30				
DEC	36	0	4.19	+0.21	40	+4	2.47	-1.51	49	+13	8.42	+4.44	37	+1	9.4	+5.42	35	-1	2.66	-1.32				
Total			58.25	+13.70			49.40	+4.85			69.12	+24.57			54.88	+10.33			61.88	+17.33			69.29	+32.11

<sup>1</sup> DEP is departure from the long-term average.

<sup>2</sup> 2018 data is for ten months through October.

ed 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. Ideally, choose a variety that has resistance to Aphanomyces root rot Race 1 and Race 2.

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.

**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 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

The current alfalfa variety tests shown in this report were established at Lexington (2012, 2015, 2016, 2017, and 2018) as part of the forage variety testing program. The summary reports also contain past years results from alfalfa tests in Princeton, Bowling Green, Eden Shale and Quicksand as well as Lexington. The soil in Lexington is a well drained silt loam (Maury) and is well suited for alfalfa production.

Table 2. Dry matter yields, seedling vigor, and stand persistence of alfalfa varieties sown August 9, 2012, at Lexington, Kentucky.

Variety	FD <sup>1</sup>	Seedling Vigor <sup>2</sup> Sep 27, 2012	Percent Stand												Yield (tons/acre)						6-year Total						
			2012	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018	2018	2018	2018	2018								
<b>Commercial Varieties-Available for Farm Use</b>																											
55V50	5	5.0	100	100	100	100	99	98	92	91	89	88	69	86.5	6.48	6.84	6.96	5.82	0.94	1.33	0.70	0.63	0.52	4.11	38.86*		
Phoenix	5	4.8	98	99	97	95	94	91	86	87	86	86	60	8.58	6.27	6.28	6.04	5.97	0.89	1.30	0.71	0.56	0.60	4.07	37.21*		
PGI 1529	5	5.0	100	100	100	100	99	98	91	89	90	84	68	8.04	6.47	6.21	6.53	5.81	0.85	1.34	0.83	0.67	0.48	4.15	37.20*		
4030	4	4.5	99	100	99	98	96	97	86	85	85	70	82.0	5.96	6.20	5.84	6.07	1.02	1.48	0.70	0.68	0.48	0.48	4.35	36.63*		
Bulldog-505	5	5.0	100	100	99	98	97	96	92	91	91	86	74	8.00	6.24	5.78	6.24	5.72	1.01	1.34	0.76	0.65	0.51	4.27	36.24*		
Radiance HD	4	4.5	99	100	100	98	97	94	95	93	86	85	83	80	6.32	5.95	5.85	5.27	0.84	1.31	0.76	0.65	0.49	4.06	35.74*		
Evermore	5	4.8	100	100	100	98	97	96	89	89	88	86	65	8.30	5.92	5.33	6.06	5.47	0.88	1.47	0.74	0.78	0.32	4.19	35.27*		
Caliber	4	4.3	98	100	99	97	95	96	88	86	87	84	69	8.14	5.92	5.96	5.62	5.56	0.65	1.22	0.74	0.65	0.54	3.80	34.99*		
Saranac AR (certified)	4	4.8	100	100	96	96	93	94	93	84	71	40	7.86	5.83	5.82	5.97	5.13	0.60	1.23	0.60	0.66	0.69	0.36	3.55	34.16		
Withstand	4	4.8	100	100	98	98	96	94	84	84	84	83	64	7.84	6.07	5.34	5.59	5.15	0.86	1.24	0.70	0.67	0.45	3.91	33.90		
Ameristand 403T	4	5.0	100	100	100	98	98	97	96	91	90	89	85	64	8.04	5.94	4.87	5.37	0.73	1.32	0.78	0.57	0.34	3.74	33.34		
Arc (certified)	4	4.9	100	100	96	94	95	91	92	90	81	79	71	68	7.40	5.68	5.33	4.95	0.70	1.17	0.73	0.56	0.38	3.55	32.39		
<b>Experimental Varieties</b>																											
CW065030	5	4.8	100	100	100	98	98	97	91	90	91	89	73	7.81	6.37	6.08	6.37	5.85	1.04	1.28	0.76	0.63	0.64	4.34	36.81*		
GA-ALFG-1		5.0	100	99	97	96	95	95	88	86	76	66	51	7.21	5.63	5.65	5.93	4.38	0.62	1.15	0.79	0.58	0.43	3.57	32.37		
Mean		4.8	99	100	99	98	96	95	88	87	84	82	62	8.02	6.08	5.88	5.94	5.47	0.83	1.30	0.74	0.64	0.47	3.98	35.37		
CV%		6.2	1	1	2	2	3	4	6	9	10	20	74.6	8.38	11.27	14.26	16.28	32.26	16.73	18.09	31.06	35.74	15.50	8.74	8.74		
LSD <sub>0.05</sub>		0.4	2	1	3	2	3	4	3	3	5	7	11	12	17	0.86	0.73	0.95	1.21	1.27	0.38	0.31	0.19	0.28	0.24	0.88	4.42

<sup>1</sup> FD=Fall Dormancy

<sup>2</sup> Vigor score based on a scale of 1 to 5 with 5 being the most vigorous growth.

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

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 seedling 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 (P, K, Boron, and lime based on regular soil tests), 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. Roundup was applied for weed control in the Roundup Ready trials.

## Results and Discussion

Weather data for Lexington is presented in Table 1. Yield data (on a dry matter basis) for all tests are reported in Tables 2 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 commercially. Yields are given by cutting date for 2018 and as total annual production.

Statistical analyses were performed on all alfalfa yield data (including experimental) 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), a measure of the variability of the data, is included for each column of means. Low variability is desirable; increased

Table 3. Dry matter yields, seedling vigor, and stand persistence of Roundup Ready alfalfa varieties sown August 9, 2012, at Lexington, Kentucky. 1

Variety	Commercial Varieties- Available for Farm Use	FD <sup>2</sup>	Seedling Vigor <sup>3</sup> Sep 27, 2012	Percent Stand												Yield (tons/acre)															
				2012		2013		2014		2015		2016		2017		2018		2017		2018		2018									
				Sep 27	Mar 20	Sep 26	Apr 1	Oct 6	Apr 2	Oct 15	Mar 18	Sep 28	Feb 23	Sep 26	Mar 14	Sep 25	Total	2013	Total	2014	Total	2015	Total	2016	Total	2017	Total	2018	Total	2018	Total
6516R RR		5	4.8	99	99	99	98	97	96	96	94	89	88	86	84	5.87	6.21	5.95	6.95	5.86	0.81	1.44	1.06	0.62	0.58	4.51	35.36*				
Tommica RR		5	4.6	100	100	100	97	96	94	95	93	89	86	85	84	6.37	6.05	5.78	6.80	5.81	0.59	1.51	0.92	0.68	0.50	4.20	35.02*				
Ameristand 445TQ RR		4	4.1	100	100	100	99	99	99	98	98	93	91	91	91	5.61	5.33	6.28	6.54	6.29	0.92	1.75	0.87	0.90	0.53	4.96	35.01*				
DKA44-16 RR		4	4.5	99	100	100	99	100	99	99	95	91	89	91	89	5.90	5.61	6.13	6.33	6.48	0.80	1.43	0.82	0.68	0.57	4.30	34.74*				
WL 372HQ RR		5	4.1	100	100	100	98	99	98	97	96	88	86	87	87	5.92	5.88	5.90	6.19	5.79	0.75	1.44	0.81	0.77	0.61	4.38	34.07*				
Consistency 4.10 RR		4	4.1	98	98	98	97	98	96	97	95	90	89	88	86	5.62	5.25	6.03	6.00	5.94	0.93	1.58	0.97	0.75	0.55	4.78	33.63*				
WL 356HQ RR		4	4.1	100	100	100	97	97	95	95	94	88	87	83	81	5.50	5.17	5.60	6.46	6.15	0.82	1.41	0.91	0.77	0.60	4.50	33.38*				
Ameristand 405T RR		4	4.5	100	100	100	99	98	95	94	92	86	84	83	81	5.92	5.15	5.70	6.02	5.70	0.98	1.41	1.02	0.77	0.63	4.81	33.30*				
DKA41-18 RR		4	4.1	98	99	99	95	97	96	97	96	87	84	86	85	5.45	5.41	6.09	5.71	6.05	0.56	1.62	0.98	0.81	0.61	4.57	33.28*				
AlphaIron RR		4	4.3	100	100	100	99	98	96	97	95	88	86	90	89	5.66	5.50	5.88	6.08	5.89	0.76	1.38	0.76	0.72	0.54	4.17	33.18*				
WL 355 RR		4	3.9	99	100	100	97	99	97	97	94	88	89	88	86	5.46	5.54	5.87	6.44	5.67	0.55	1.34	0.85	0.72	0.48	3.93	32.91*				
Stratica RR		4	3.6	94	95	95	91	96	93	94	86	79	78	79	75	6.10	5.64	5.63	5.65	5.50	0.68	1.23	0.68	0.71	0.64	3.95	32.47				
54R02 RR		4	4.5	94	96	97	97	97	96	96	94	91	85	85	83	5.45	5.46	5.85	6.01	5.57	0.68	1.28	0.72	0.67	0.57	3.92	32.27				
Alfagraze 300 RR		3	3.6	97	98	98	96	97	97	96	94	90	88	86	84	4.89	4.92	6.07	5.76	5.49	0.81	1.52	0.98	0.78	0.53	4.62	31.74				
Ameristand 433T RR		3	3.4	92	94	93	91	92	90	90	89	83	80	80	79	5.27	5.18	5.97	5.26	4.72	0.97	1.42	0.95	0.55	4.40	30.79					
Mean				98	98	98	96	97	96	96	94	88	86	86	85	5.67	5.48	5.92	6.15	5.80	0.77	1.45	0.89	0.73	0.56	4.40	33.41				
CV,%				14.9	2	2	2	2	2	2	4	6	5	6	5	10.03	10.37	8.37	12.42	9.85	34.80	15.68	16.11	20.76	27.54	11.85	5.37				
LSD <sub>0.05</sub>				0.9	3	2	3	2	3	3	5	7	6	7	7	0.81	0.81	0.71	1.09	0.81	0.38	0.32	0.20	0.22	0.22	0.74	2.56				

1 This trial was sprayed with Roundup once in 2012 and 2013, twice in 2014, once in 2015, twice in 2016, and once in 2017 and 2018.

2 FD=Fall Dormancy

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

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

**Table 4. Dry matter yields and stand persistence of alfalfa varieties sown March 31, 2015, at Lexington, Kentucky.**

Variety	FD <sup>1</sup>	Percent Stand								Yield (tons/acre)									4-year Total
		2015		2016		2017		2018		2015	2016	2017	2018				Total		
		Jun 12	Oct 15	Mar 18	Sep 27	Feb 23	Sep 26	Mar 14	Sep 25	Total	Total	Total	May 10	Jun 13	Jul 10	Aug 13		Sep 12	
<b>Commercial Varieties-Available for Farm Use</b>																			
Ameristand 427TQ	4	99	98	97	92	91	91	91	90	1.71	6.36	6.82	0.88	1.27	0.90	0.88	0.53	4.45	19.34*
Caliber	4	95	97	97	94	93	93	93	92	2.08	7.02	5.31	0.95	1.29	0.88	0.78	0.50	4.40	18.81*
Ameristand 403T Plus	4	89	95	95	92	90	89	88	88	1.47	6.87	5.84	0.80	1.34	0.76	0.77	0.67	4.33	18.51*
Fierce	4	92	94	94	89	85	85	86	85	1.97	6.40	5.67	0.83	1.18	0.93	0.70	0.49	4.13	18.17*
FSG-426	4	95	97	97	94	92	94	94	94	2.01	6.10	5.91	0.68	1.02	0.88	0.86	0.56	4.01	18.03*
Contender	5	95	96	96	91	92	90	90	87	1.77	5.76	6.09	0.77	1.26	0.64	0.84	0.56	4.07	17.68
Saranac AR (certified)	4	81	88	89	89	86	84	82	73	1.23	6.21	5.89	0.74	1.23	0.67	0.67	0.40	3.70	17.02
Buffalo		96	95	94	89	86	81	79	73	1.36	6.25	4.82	0.44	1.17	0.64	0.72	0.40	3.38	15.81
Mean		92	95	95	91	89	88	88	85	1.70	6.37	5.79	0.76	1.22	0.79	0.78	0.51	4.06	17.92
CV,%		8	5	5	4	4	5	6	7	20.84	12.22	8.05	40.56	17.42	21.26	24.96	18.45	14.49	6.11
LSD,0.05		11	7	7	6	6	7	8	8	0.52	1.15	0.69	0.45	0.31	0.25	0.29	0.14	0.86	1.61

<sup>1</sup> FD=Fall Dormancy

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

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

Tables 10 and 11 (Roundup Ready varieties) summarize information about fall dormancy, disease resistance, and yield performance across years and locations for all the varieties 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 Tables 10 and 11, open blocks indicate the variety was not in that particular test (labeled at the top of the

column); an “x” means the variety was in the test but yielded significantly less than the top-yielding variety. A single asterisk (\*) means 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.

Tables 12 and 13 (Roundup Ready varieties) are summaries of yield data from 2000 to 2018 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 Tables 12 and 13, 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 stable performance; others may have performed well in wet years or on particular soil types. See footnotes in Tables 12 and 13 to determine which yearly report should be referenced.

**Table 5. Dry matter yields and stand persistence of Roundup Ready alfalfa varieties sown March 31, 2015, at Lexington, Kentucky.<sup>1</sup>**

Variety	FD <sup>2</sup>	Percent Stand								Yield (tons/acre)									4-year Total
		2015		2016		2017		2018		2015	2016	2017	2018				Total		
		Jun 12	Oct 15	Mar 18	Sep 27	Feb 23	Sep 26	Mar 14	Sep 25	Total	Total	Total	May 10	Jun 13	Jul 10	Aug 13		Sep 12	
<b>Commercial Varieties-Available for Farm Use</b>																			
54R02 RR	4	99	99	98	96	95	95	95	93	2.61	7.49	6.56	1.03	1.37	1.01	0.97	0.73	5.11	21.76*
55VR08 RR	5	100	100	100	98	97	97	95	97	2.42	6.92	7.11	0.89	1.43	0.94	0.84	0.62	4.72	21.16*
Ameristand 445TQ RR	4	99	98	99	98	96	97	97	92	2.06	6.62	6.75	1.16	1.48	0.99	0.95	0.76	5.34	20.77*
Ameristand 405T RR	4	99	99	99	97	96	96	96	94	2.21	6.87	6.91	0.79	1.27	1.02	0.80	0.62	4.50	20.48*
Alfagraze 600 RR	6	99	100	98	95	94	95	93	89	2.67	6.55	6.25	0.80	1.52	0.87	0.84	0.69	4.72	20.19*
Ameristand 433T RR	3	98	99	99	95	94	95	95	94	2.13	6.57	6.09	1.37	1.46	0.89	0.80	0.59	5.10	19.89*
WL 356HQ RR	4	97	98	98	96	96	96	96	92	1.79	7.10	6.26	0.94	1.32	0.87	0.82	0.65	4.60	19.75*
428 RR	4	97	97	98	96	95	96	95	94	1.79	6.35	6.08	1.16	1.38	0.99	0.93	0.67	5.13	19.35*
Alfagraze 300 RR	3	98	99	99	97	96	96	95	92	1.64	6.05	6.81	0.92	1.31	0.92	0.88	0.62	4.66	19.15*
55V06 RR	5	99	99	99	97	96	96	95	95	1.61	5.92	6.19	0.85	1.25	1.02	0.95	0.62	4.69	18.40*
Mean		98	99	99	96	95	96	95	93	2.09	6.64	6.50	0.99	1.38	0.95	0.88	0.66	4.86	20.09
CV,%		2	2	2	2	2	2	2	3	30.03	15.77	12.59	28.38	14.79	16.46	22.49	23.87	13.36	12.95
LSD,0.05		2	2	2	3	2	2	3	4	0.91	1.52	1.19	0.41	0.30	0.23	0.29	0.23	0.94	3.77

<sup>1</sup> This trial was sprayed with Roundup once in 2015, twice in 2016, and once in 2017 and 2018.

<sup>2</sup> FD=Fall Dormancy

\*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 April 5, 2016, at Lexington, Kentucky.<sup>1</sup>**

Variety	FD <sup>2</sup>	Percent Stand						Yield (tons/acre)								2-year Total
		2016		2017		2018		2017		2018						
		Jun 16	Sep 27	Feb 23	Sep 26	Mar 14	Sep 25	Total	May 10	Jun 13	Jul 10	Aug 13	Sep 12	Total		
<b>Commercial Varieties-Available for Farm Use</b>																
55VRO8 RR	5	99	94	94	94	94	93	7.73	1.02	1.71	0.84	0.86	0.53	4.95	12.69*	
Stratica RR	4	96	94	94	95	93	92	7.53	1.08	1.54	0.76	1.03	0.50	4.92	12.45*	
Alfagraze 300 RR	3	99	99	98	98	98	96	7.32	1.04	1.78	0.86	0.86	0.37	4.91	12.22*	
Ameristand 433T RR	3	97	93	92	95	93	92	7.38	0.92	1.60	0.78	0.87	0.50	4.67	12.05*	
428 RR	4	98	86	86	87	88	88	7.06	1.10	1.38	0.82	0.94	0.51	4.75	11.80*	
54RO2 RR	4	96	92	92	92	91	89	7.05	1.17	1.44	0.64	0.87	0.44	4.55	11.60*	
Ameristand 405T RR	4	94	88	89	89	90	87	6.53	0.73	1.23	0.82	0.79	0.46	4.02	10.55	
Mean		97	92	92	93	92	91	7.25	1.00	1.53	0.79	0.89	0.47	4.68	11.93	
CV,%		3	9	9	8	7	7	9.39	28.60	16.65	23.26	14.66	28.88	13.27	8.87	
LSD,0.05		4	12	11	10	9	9	0.96	0.40	0.36	0.26	0.18	0.19	0.88	1.50	

<sup>1</sup> This trial was sprayed with Roundup twice in 2016, and once in 2017 and 2018.

<sup>2</sup> FD=Fall Dormancy

\*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 forages.ca.uky.edu.

- 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)
- Fertilizer Management in Alfalfa (AGR-210)
- “Emergency” Inoculation for Poorly Nodulated Legumes (PPFS-AG-F-04)
- Common Alfalfa Seedling Diseases and Disorders (PPFS-AG-F-03)

**Table 6. Dry matter yields and stand persistence of alfalfa varieties sown April 5, 2016, at Lexington, Kentucky.**

Variety	FD <sup>1</sup>	Percent Stand						Yield (tons/acre)								3-year Total		
		2016		2017		2018		2016		2017		2018						
		Jun 16	Sep 27	Feb 23	Sep 26	Mar 14	Sep 25	Total	Total	May 10	Jun 13	Jul 10	Aug 13	Sep 13	Total			
<b>Commercial Varieties-Available for Farm Use</b>																		
FSG 415BR	4	92	89	91	91	92	2.26	7.68	1.19	1.86	0.85	1.05	0.52	5.46	15.40*			
GA-497HD	5	97	97	96	96	94	2.14	7.50	1.31	1.77	1.00	1.01	0.63	5.73	15.37*			
Contender	5	96	94	93	94	93	2.19	7.74	1.27	1.76	0.98	1.03	0.62	5.66	15.31*			
Ameristand 403T Plus	4	97	93	91	92	91	2.31	7.69	1.13	1.71	0.95	0.83	0.63	5.24	15.24*			
Rebound 6XT	4	96	94	93	94	94	2.04	7.30	1.10	1.53	1.12	1.05	0.87	5.67	15.00*			
Evermore	5	97	97	96	96	96	2.20	6.95	1.16	1.85	1.02	1.06	0.64	5.73	14.88*			
Bulldog 505	5	93	91	90	90	90	1.46	7.62	1.13	1.73	0.95	1.01	0.66	5.49	14.56*			
Caliber	4	96	95	94	95	95	1.88	7.39	1.04	1.77	0.92	0.89	0.54	5.17	14.44*			
WL 365HQ	5	98	95	94	95	96	2.10	7.07	0.61	1.55	1.00	0.99	0.82	4.97	14.14			
Saranac AR (certified)	4	94	92	91	91	91	1.84	6.90	1.07	1.78	0.83	1.04	0.64	5.36	14.10			
<b>Experimental Varieties</b>																		
AFX095026	4	92	91	90	92	93	94	1.96	7.77	1.29	1.93	1.06	1.21	0.70	6.18	15.92*		
AFX095005	5	95	93	92	94	94	95	1.66	7.42	1.25	1.83	1.19	1.08	0.73	6.08	15.15*		
AM-14-900	4	93	92	92	95	94	93	1.97	7.68	1.22	1.70	0.96	0.90	0.65	5.42	15.07*		
AM-09-600	4	95	94	94	94	94	94	1.60	7.73	1.08	1.90	0.87	0.99	0.60	5.43	14.77*		
LS905	4	95	95	96	96	96	96	1.79	6.93	0.85	1.83	0.89	1.07	0.60	5.24	13.97		
NF11ALF006	6	95	93	91	92	91	92	1.38	5.65	0.79	1.71	0.99	1.00	0.56	5.05	12.08		
Mean		95	93	93	94	93	93	1.91	7.31	1.09	1.76	0.97	1.01	0.65	5.49	14.71		
CV,%		4	4	4	3	3	3	21.81	11.89	25.95	16.08	19.89	14.07	17.74	9.53	8.45		
LSD,0.05		5	6	5	4	4	4	0.59	1.24	0.40	0.28	0.28	0.20	0.16	0.75	1.77		

<sup>1</sup> FD=Fall Dormancy

\*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 5, 2017, at Lexington, Kentucky.**

Variety	FD <sup>1</sup>	Percent Stand			Yield (tons/acre)								2-year Total
		2017		2018	2017		2018						
		Sep 26	Mar 14	Sep 25	Total	May 10	Jun 13	Jul 10	Aug 13	Sep 13	Total		
<b>Commercial Varieties-Available for Farm Use</b>													
Evermore	5	93	93	94	1.96	1.03	1.56	0.91	1.10	0.64	5.24	7.21*	
Ameristand 403TPlus	4	96	97	96	2.27	0.80	1.41	0.86	1.02	0.65	4.75	7.02*	
Contender	5	94	94	93	2.10	0.73	1.51	0.78	1.05	0.60	4.67	6.78*	
Caliber	4	95	95	94	2.00	0.92	1.41	0.64	1.09	0.59	4.65	6.64*	
Fierce	4	96	96	95	1.89	0.66	1.37	0.91	1.16	0.57	4.67	6.57*	
Saranac AR (certified)	4	87	87	86	1.83	0.82	1.61	0.73	0.96	0.54	4.65	6.48*	
Bulldog 505	5	92	90	90	1.66	0.75	1.33	0.68	1.02	0.55	4.33	5.99	
<b>Experimental Varieties</b>													
NF11ALF006	6	93	90	90	1.65	0.75	1.51	0.77	0.99	0.63	4.64	6.29*	
Mean		93	9	92	1.92	0.81	1.46	0.79	1.05	0.60	4.70	6.62	
CV,%		5	6	6	24.18	27.80	14.43	18.73	14.53	22.00	10.87	12.23	
LSD,0.05		7	8	8	0.68	0.33	0.31	0.72	0.22	0.19	0.75	1.19	

<sup>1</sup> FD=Fall Dormancy

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

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

**Table 9. Dry matter yields, seedling vigor and stand persistence of alfalfa varieties sown April 12, 2018, at Lexington, Kentucky.**

Variety	FD <sup>1</sup>	Seedling Vigor <sup>2</sup> May 22, 2018	Percent Stand		Yield (tons/acre)		
			2018		2018		
			May 22	Sep 25	Jul 10	Aug 20	Total
<b>Commercial Varieties-Available for Farm Use</b>							
Saranac AR (certified)	4	4.0	99	98	0.66	0.87	1.53*
Ameristand 403T Plus	4	4.8	100	98	0.60	0.70	1.30*
<b>Experimental Varieties</b>							
NF11ALF006	6	4.8	99	98	0.64	0.80	1.45*
BYS5028		5.0	100	98	0.60	0.83	1.43*
Mean		4.6	99	98	0.63	0.80	1.43
CV,%		6.7	1	2	16.72	19.24	16.18
LSD,0.05		0.5	2	4	0.17	0.25	0.37

<sup>1</sup> FD=Fall Dormancy

<sup>2</sup> Vigor score based on a scale of 1 to 5 with 5 being the most vigorous growth.

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

## About the Authors

G.L. Olson is a research specialist, S.R. Smith and J.C. Henning are Extension professors and forage specialists, and C.D. Teutsch is an associate Extension professor and forage specialist.

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

Variety	Proprietor	Variety Characteristics <sup>1</sup>						Lexington																	
		FD <sup>4</sup>	Disease Resistance <sup>2</sup>					2012 <sup>3</sup>						2015				2016			2017		2018		
			Bw	Fw	An	PRR	APH	13 <sup>5</sup>	14	15	16	17	18	15	16	17	18	16	17	18	17	18	18		
<b>Commercial Varieties-Available for Farm Use</b>																									
4030	Brett Young	4	HR	HR	HR	HR	HR	*	*	*	*	*	*												
55V50	Pioneer Hi-Bred	5	HR	R	HR	HR	HR	*	*	*	*	*	*												
Ameristand 403T	America's Alfalfa	4	HR	HR	HR	HR	HR	*	*	x <sup>6</sup>	x	*	*												
Ameristand 403TPlus	America's Alfalfa	4	HR	HR	HR	HR	HR							x	*	x	*	*	*	*	*	*			
Ameristand 427TQ	America's Alfalfa	4	HR	HR	HR	HR	HR							*	*	*	*								
Arc (certified)	Public	4	LR	MR	HR	-	-	x	x	x	x	*	*												
Buffalo	Public	-	-	-	-	-	-							x	*	x	x								
Bulldog-505	Univ. of Georgia	5	-	HR	-	R	-	*	*	x	*	*	*					x	*	*	*	x			
Caliber	Beck's Hybrids	4	HR	HR	HR	HR	HR	*	*	*	x	*	*	*	*	x	*	*	*	*	*	*			
Contender	Beck's Hybrids	5	HR	HR	HR	HR	HR							*	x	x	*	*	*	*	*	*			
Evermore	Allied Seed, L.L.C.	5	HR	HR	HR	HR	HR	*	*	x	*	*	*					*	*	*	*	*			
Fierce	Beck's Hybrids	4	HR	HR	HR	HR	HR							*	*	x	*				*	*			
FSG 415BR	Farm Science Genetics	4	HR	HR	HR	HR	HR											*	*	*					
FSG 426	Farm Science Genetics	4	HR	HR	HR	HR	HR							*	*	x	*								
GA-497HD	Preferred Alfalfa Genetics	5	HR	HR	HR	HR	HR											*	*	*					
PGI 529	Alforex Seeds	5	HR	HR	HR	HR	HR	*	*	*	*	*	*												
Phoenix	Southern States	5	HR	HR	HR	HR	HR	R	*	*	*	*	*	*											
RadiancHD	Ampac Seed/Cisco	4	HR	HR	HR	HR	HR	*	*	*	*	*	*												
Rebound 6XT	Croplan Genetics	4	HR	HR	HR	HR	HR											*	*	*					
Saranac AR (certified)	Public	4	MR	R	HR	LR	-	x	*	x	*	*	*	x	*	x	*	*	*	x	*	*			
Withstand	Southern States	4	HR	HR	HR	HR	HR	x	*	x	x	*	*												
WL 365HQ	W-L Research	5	HR	HR	HR	HR	HR											*	*	x					
<b>Experimental Varieties</b>																									
AM-09-600	Ampac Seed/Cisco	4	HR	HR	HR	HR	HR											x	*	*					
AM-14-900	Ampac Seed/Cisco	4	HR	HR	HR	HR	HR											*	*	x					
AFX095005	Alforex Seeds	5	HR	HR	HR	HR	HR											x	*	*					
AFX095026	Alforex Seeds	4	HR	HR	HR	HR	R											*	*	*					
BYS5028	Brett Young	5	HR	HR	HR	HR	HR															*			
CW 065030	Beck's Hybrids	5	HR	HR	HR	HR	HR	x	*	*	*	*	*												
GA-ALFG-1	Univ. of Georgia	-	-	-	-	-	-	x	x	x	*	x	*												
LS 905	Legacy Seeds, Inc.	4	HR	HR	HR	HR	HR											*	*	x					
NF11ALF0006	Noble Foundation	6	-	-	-	-	-											x	x	x	*	*			

<sup>1</sup> 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.  
<sup>2</sup> Disease resistance: S=susceptible, LR=low resistance, MR=moderate resistance, R=resistance, HR=high resistance.  
<sup>3</sup> Establishment year.  
<sup>4</sup> Fall dormancy-check varieties: 1=Spredor 3, 2=Vernal, 3=Ranger, 4=Saranac, 5=DuPuits.  
<sup>5</sup> Harvest year  
<sup>6</sup> 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 11. Characterization and performance of Roundup Ready alfalfa varieties across years and locations in Kentucky.**

Variety	Proprietor	Variety Characteristics <sup>1</sup>						Lexington														
		FD <sup>4</sup>	Disease Resistance <sup>2</sup>					2012 <sup>3</sup>						2015				2016				
			Bw	Fw	An	PRR	APH	13 <sup>5</sup>	14	15	16	17	18	15	16	17	18	16	17	18		
<b>Commercial Varieties-Available for Farm Use</b>																						
428 RR	Allied Seed, L.L.C.	4	HR	HR	HR	HR	HR								*	*	*	*	*	*	*	
54R02 RR	Pioneer Hi-Bred	4	HR	HR	HR	HR	HR	x <sup>6</sup>	*	*	*	x	x	*	*	*	*	*	*	*	*	
55VR06 RR	Dupont Pioneer	5	HR	HR	HR	HR	HR							x	x	*	*					
55VR08 RR	Dupont Pioneer	5	-	HR	HR	HR	HR							*	*	*	*	*	*	*	*	
6516R RR	NEXGROW	5	HR	-	HR	HR	HR	*	*	*	*	*	*									
Alfagraze 300 RR	America's Alfalfa	3	HR	R	HR	HR	HR	x	x	*	*	x	*	x	*	*	*	*	*	*	*	
Alfagraze 600 RR	America's Alfalfa	6	-	R	HR	R	R							*	*	*	*					
Ameristand 405T RR	America's Alfalfa	4	HR	HR	HR	HR	HR	*	x	*	*	*	*	*	*	*	*	*	*	*	x	x
Ameristand 433T RR	America's Alfalfa	3	HR	R	R	HR	HR	x	x	*	x	x	*	*	*	*	*	*	*	*	*	*
Ameristand 455TQ RR	America's Alfalfa	4	HR	HR	HR	HR	HR	*	x	*	*	*	*	*	*	*	*	*				
AphaTron RR	Croplan Genetics	4	HR	HR	HR	HR	HR	*	*	*	*	*	*	x								
Consistency 4.10 RR	Croplan Genetics	4	HR	HR	HR	HR	HR	*	x	*	*	*	*	*								
DKA 41-18 RR	Monsanto	4	HR	HR	HR	HR	HR	x	*	*	*	*	*	*								
DKA 44-16 RR	Monsanto	4	HR	HR	HR	HR	HR	*	*	*	*	*	*	*								
Stratica RR	Croplan Genetics	4	HR	HR	HR	HR	HR	*	*	*	*	x	x							*	*	*
Tonnica RR	Croplan Genetics	5	HR	HR	HR	HR	HR	*	*	*	*	*	*	x								
WL 355 RR	W-L Research	4	HR	HR	HR	HR	HR	x	*	*	*	*	*	x								
WL 356HQ RR	W-L Research	4	HR	HR	HR	HR	HR	*	x	*	*	*	*	*	*	*	*	*				
WL 372HQ RR	W-L Research	5	HR	HR	HR	HR	HR	*	*	*	*	*	*	*								

<sup>1</sup> 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.

<sup>2</sup> Disease resistance: S=susceptible, LR=low resistance, MR=moderate resistance, R=resistance, HR=high resistance.

<sup>3</sup> Establishment year.

<sup>4</sup> Fall dormancy-check varieties: 1=Spredor 3, 2=Vernal, 3=Ranger, 4=Saranac, 5=DuPuits.

<sup>5</sup> Harvest Year

<sup>6</sup> 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 13. Summary of Kentucky Roundup Ready alfalfa yield trials 2011-2018 (yield shown as a percentage of the mean of the commercial varieties in the test).**

Variety	Proprietor	Variety Characteristics <sup>1</sup>						Lexington		Princeton			Quicksand	Mean <sup>5</sup> (# trials)
		FD	Disease Resistance <sup>2</sup>					12 <sup>3,4</sup>	15	11	13	15	14	
			Bw	Fw	An	PRR	APH	6yr <sup>6</sup>	4yr	5yr	4yr	2yr	2yr	
Alfagraze 300 RR	America's Alfalfa	3	HR	R	HR	HR	HR	95	95	93	99	93		95(5)
Alfagraze 600 RR	America's Alfalfa	6		R	HR	R	R		100			85	93	93(3)
Ameristand 405T RR	America's Alfalfa	4	HR	HR	HR	HR	HR	100	102	97	100	98	93	98(6)
Ameristand 433T RR	America's Alfalfa	3	HR	R	R	HR	HR	92	99		95	96	107	98(5)
Ameristand 445TQ RR	America's Alfalfa	4	HR	HR	HR	HR	HR	105	103		100			103(3)
AphaTron RR	Croplan Genetics	4	HR	HR	HR	HR	HR	99			98			99(2)
Consistency 4.10 RR	Croplan Genetics	4	HR	HR	HR	HR	HR	101		102				102(2)
DKA-41-18 RR	Monsanto	4	HR	HR	HR	HR	HR	100		101		100		100(3)
DKA 44-16 RR	Monsanto	4	HR	HR	HR	HR	HR	104			100			102(2)
Stratica RR	Croplan Genetics	4	HR	HR	HR	HR	HR	97			96			97(2)
Tonnica RR	Crop Genetics	5	HR	HR	HR	HR	HR	105			101			103(2)
WL 355 RR	W-L Research	4	HR	HR	HR	HR	HR	99		102		110		104(3)
WL 356HQ RR	W-L Research	5	HR	HR	HR	HR	HR	100	98		96			98(3)
WL 372HQ RR	W-L Research	5	HR	HR	HR	HR	HR	102			106			104(2)
428 RR	Allied Seed	4	HR	HR	HR	HR	HR		96		104		111	104(3)
54R02 RR	Dupont Pioneer	4	HR	HR	HR	HR	HR	97	108	104		102	97	102(5)
55VR06 RR	Dupont Pioneer	5	HR	R	HR	HR	HR		92				99	96(2)
55VR08 RR	Dupont Pioneer	5	-	HR	HR	HR	HR		105			110		108(2)
6516R RR	NEXGROW	5	HR	-	HR	HR	HR	106			109			108(2)

<sup>1</sup> 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.

<sup>2</sup> Disease resistance: S=susceptible, LR=low resistance, MR=moderate resistance, R=resistance, HR=high resistance.

<sup>3</sup> Year trial was established

<sup>4</sup> 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 5 years, so the final yield report would be "2015 Alfalfa Report" archived in the KY Forage website at forages.ca.uky.edu.

<sup>5</sup> Mean only presented when respective variety was included in two or more trials.

<sup>6</sup> Number of years of data

