

2013 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. Table 12 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 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. 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

Table 1. Temperature and rainfall at Lexington, Kentucky in 2007, 2008, 2009, 2010, 2011, 2012, and 2013.

	2007			2008			2009			2010			2011			2012			2013 ²									
	Temp °F	DEP ¹	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN							
JAN	37	+6	2.93	+0.07	32	+2	3.91	+1.05	28	-3	2.45	-0.41	29	-2	2.40	-0.46	29	-2	2.10	-0.76	38	+7	4.80	+1.94	38	+7	4.50	+1.64
FEB	27	-8	1.83	-1.38	36	+1	6.11	+2.90	38	+3	2.86	-0.35	29	-6	1.38	-1.83	39	+4	6.34	+3.13	40	+5	5.39	+2.18	36	+1	1.78	-1.43
MAR	52	+8	1.97	-2.43	44	+1	6.51	+1.91	48	+4	2.19	-2.21	47	+3	1.05	-3.35	47	+3	4.76	+0.36	56	+12	5.64	+1.24	39	-5	5.47	+1.07
APR	53	-2	3.87	-0.01	55	0	5.89	+2.01	55	+4	4.48	+0.60	59	+4	2.74	-1.14	58	+3	12.36	+8.48	56	+1	3.26	-0.62	55	0	4.46	+0.58
MAY	68	+4	1.45	-3.02	62	-2	4.33	+0.14	64	0	5.05	+0.58	67	+3	7.84	+3.37	64	0	6.72	+2.25	69	+5	4.02	-0.45	65	+1	5.23	+0.76
JUN	74	+2	1.77	-1.89	74	+2	3.59	-0.07	74	+2	5.41	-1.75	76	+4	4.61	+0.95	74	+2	2.61	-1.05	73	+1	2.42	-1.24	72	0	7.32	+3.66
JUL	74	-2	6.90	+1.90	76	0	3.41	-1.59	71	-5	5.89	+0.89	78	+2	5.49	+0.49	80	+4	6.29	1.29	81	+5	2.50	-2.50	72	-4	9.33	+4.33
AUG	80	+5	2.56	-1.37	75	0	2.18	-1.75	73	-2	5.38	+1.45	78	+3	1.54	-2.39	75	0	2.89	-1.04	75	0	1.68	-2.25	72	-3	3.68	-0.25
SEP	72	+4	1.15	-2.05	72	+4	1.42	-1.78	68	0	5.37	+2.17	71	+3	1.14	-2.06	66	-2	5.52	+2.32	67	-1	6.40	+3.20	67	-1	2.21	-0.99
OCT	63	+6	5.28	+2.71	57	0	1.53	-1.04	54	-3	4.83	+2.26	59	+2	1.22	-1.35	55	-2	4.10	+1.53	55	-2	2.00	-0.57	55	-2	8.10	+5.53
NOV	46	+1	2.86	-0.53	43	-2	2.53	-0.86	49	+4	0.94	-2.45	47	+2	4.58	+1.19	50	+5	9.53	+6.14	43	-2	1.81	-0.65				
DEC	40	+4	5.29	+1.31	35	-1	6.03	+2.05	36	0	3.86	-0.12	28	-8	2.15	-1.93	41	+5	5.58	+1.60	42	+6	9.57	+4.94				
Total			37.86	-6.69			47.24	+2.69			48.71	+4.16			36.14	-8.41			68.80	+24.25			49.49	+4.94			52.08	+14.90

¹ DEP is departure from the long-term average.
² 2013 data is for ten months through October.

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 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 (2006, 2008, 2011 and 2012) and Princeton (2009, 2011 and 2013) as part of the forage variety testing program. A conventional alfalfa trial was sown at Princeton in the spring of 2013 but did not establish well so was replanted in the fall of 2013. 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. 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 and Princeton are presented in tables 1 and 2.

Yield data (on a dry-matter basis) for all tests are reported in tables 3 through 10, and Table 13. 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 2013 and as total annual production.

Table 2. Temperature and rainfall at Princeton, Kentucky in 2008, 2009, 2010, 2011, 2012, and 2013.

	2008			2009			2010			2011			2012			2013 ²						
	Temp °F	DEP ¹	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN	Temp °F	DEP	Rainfall IN				
JAN	37	+3	2.40	-1	0.94	-2.86	31	-3	3.06	-0.74	32	-2	2.35	-1.45	40	+6	3.01	-0.79	38	+4	6.31	+2.51
FEB	39	+1	6.76	+2.33	4.2	3.28	42	+4	3.28	-1.15	33	-5	1.54	-2.89	54	+6	1.73	-2.70	39	+1	3.09	-1.34
MAR	48	+1	7.55	+2.61	5.3	2.89	53	+6	2.89	-2.05	48	+1	3.24	+0.60	60	+13	3.27	-1.67	42	-5	4.34	-0.60
APR	58	-1	6.56	+1.76	5.8	5.35	58	-1	5.35	+0.55	62	3	3.3	-1.54	61	+2	16.15	+11.35	60	+1	0.62	-4.18
MAY	65	-2	6.19	+1.23	6.7	6.14	69	0	6.14	+1.18	69	+2	10.41	+5.45	71	+4	1.36	-3.60	66	-1	4.26	-0.70
JUN	78	+3	1.24	-2.61	7.7	7.97	77	+2	7.97	+4.12	79	4	4.82	0.97	74	-5	2.38	-1.47	74	-1	7.55	+3.70
JUL	79	+1	5.12	+0.83	7.4	7.45	80	-4	7.45	+3.16	80	2	2.73	-1.56	81	+3	2.98	-1.31	83	+5	1.40	-2.89
AUG	77	0	0.69	-3.32	7.5	2.44	81	4	2.46	-1.60	81	4	2.46	-1.55	77	0	3.95	-0.06	77	0	4.27	+0.26
SEP	74	+3	0.61	-2.72	7.1	4.61	71	0	0.94	-2.39	68	-3	3.86	+0.53	69	-2	5.45	+1.82	71	0	5.37	+2.04
OCT	60	+1	2.21	-0.84	5.5	9.08	60	+1	0.97	-2.08	57	-2	1.35	-1.70	57	-2	2.94	-0.11	59	0	4.04	+0.99
NOV	46	-1	2.59	-2.04	5.2	1.50	49	+2	3.98	-1.65	51	+4	9.12	+4.49	45	-2	2.11	-2.52				
DEC	39	0	6.49	+1.95	3.6	2.73	32	-3	1.57	-3.47	42	+3	6.13	+1.09	45	+6	4.77	-0.27				
Total			48.95	-2.18		54.31			39.02	-12.11			68.96	+17.83			33.01	-18.12			50.71	+9.25

¹ DEP is departure from the long-term average.

² 2013 data is for ten months through October.

Statistical analyses were performed on all alfalfa yield data (including experimentals) 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 variability within a study results in higher CVs and larger LSDs.

Table 11 summarizes 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 Table 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.

Table 12 is a summary of yield data from 2000 to 2013 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 12, 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. These details may influence variety choice, and the information can be found in the yearly reports. See the Table 12 footnote to determine to which yearly report to refer.

Table 3. 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)																	
	2006 Oct 17	2006 Oct 17	2007		2008		2009		2010		2011		2012		2013		2013		7-year Total													
			Mar 26	Oct 27	Mar 27	Oct 13	Mar 24	Oct 7	Mar 29	Oct 15	Mar 21	Oct 10	Mar 21	Oct 11	Mar 22	Oct 20	2007 Total	2008 Total		2009 Total	2010 Total	2011 Total	2012 Total	2013 Jul 12	2013 Aug 12	2013 Sep 16						
Commercial Varieties—Available for Farm Use																																
Expedition	5.0	99	98	98	99	99	99	100	100	99	99	97	97	97	90	96	94	81	53	3.98	4.28	6.32	5.66	4.74	3.40	1.46	1.29	1.04	0.73	0.75	5.27	33.66*
DKA41-18RR	4.3	99	98	98	99	98	99	98	100	97	96	95	95	90	91	92	80	49	4.06	3.95	5.62	5.17	4.47	3.37	3.40	1.43	1.35	1.03	0.72	0.77	5.30	31.92*
PerForm	5.0	100	98	98	97	98	98	97	97	97	96	96	96	90	89	88	79	56	4.12	3.99	5.62	5.33	4.60	3.32	3.40	1.45	1.09	0.95	0.67	0.66	4.83	31.83*
L447HD	4.8	76	96	95	95	97	95	95	95	92	87	88	86	65	40	426	4.19	5.69	5.33	4.28	3.18	1.44	1.11	0.78	3.18	1.44	1.11	0.78	0.65	0.67	4.66	31.59*
WL355RR	4.8	98	96	96	95	95	95	99	96	94	91	88	91	90	63	48	3.90	3.90	3.90	4.34	2.98	1.32	1.18	0.95	2.98	1.32	1.18	0.95	0.68	0.73	4.86	31.01*
WL343HQ	4.3	99	100	100	100	100	100	100	99	98	97	92	94	91	75	51	3.69	3.92	5.34	4.96	4.45	3.18	1.34	1.24	3.18	1.34	1.24	0.96	0.68	0.70	4.91	30.45
Withstand	4.8	100	97	98	97	99	99	99	98	95	90	86	89	87	66	41	3.50	3.72	5.87	4.97	4.31	2.97	1.33	1.16	2.97	1.33	1.16	0.87	0.58	0.67	4.60	29.94
Ameristand 403T	5.0	100	98	98	99	99	99	98	96	95	93	89	91	78	61	3.69	3.74	5.57	4.91	4.44	3.02	1.32	0.92	0.89	3.02	1.32	0.92	0.89	0.69	0.65	4.48	29.85
LegenDairy 5.0	5.0	100	95	95	94	96	96	96	99	95	87	83	88	88	71	55	3.53	3.79	5.75	5.21	4.15	2.75	1.29	1.21	2.75	1.29	1.21	0.92	0.61	0.60	4.63	29.80
Phoenix	4.8	99	98	98	98	100	98	97	97	95	92	91	87	86	70	46	3.64	3.89	5.66	4.97	4.55	2.79	1.25	1.01	2.79	1.25	1.01	0.80	0.56	0.54	4.16	29.66
Radiant-AM	5.0	100	97	96	97	98	96	96	96	95	92	91	88	85	63	41	3.79	3.73	5.48	4.85	4.16	2.91	1.18	1.04	2.91	1.18	1.04	0.86	0.63	0.64	4.36	29.27
Buffalo	5.0	99	99	98	99	99	99	99	99	94	93	88	85	63	48	40	3.67	3.63	4.69	4.07	3.75	2.39	1.19	1.19	2.39	1.19	1.03	0.74	0.44	0.42	3.82	26.01
Saranac AR (certified)	4.8	100	96	96	95	94	92	93	93	89	80	78	78	49	39	3.46	3.48	4.95	4.40	3.79	2.26	1.06	0.88	2.26	1.06	0.88	0.65	0.49	0.50	3.59	25.94	
Experimental Varieties																																
DS617	5.0	99	97	97	96	98	98	99	98	97	96	86	86	86	70	48	3.82	4.03	5.84	5.21	4.59	3.10	1.48	1.12	3.10	1.48	1.12	0.84	0.60	0.56	4.60	31.21
Mean	4.8	98	97	97	97	98	98	98	97	95	93	88	87	87	69	48	3.79	3.87	5.59	5.02	4.33	2.97	1.32	1.12	2.97	1.32	1.12	0.88	0.62	0.63	4.58	30.15
CV,%	7.6	12	3	3	4	3	3	3	3	4	7	7	6	6	16	16	9.36	10.68	7.87	9.3	9.48	11.41	11.22	14.42	11.41	11.22	14.42	15.96	15.09	15.06	11.96	7.07
LSD,0.05	0.5	17	4	4	6	4	4	4	4	5	9	9	8	8	16	11	0.51	0.59	0.63	0.67	0.59	0.49	0.21	0.23	0.49	0.21	0.23	0.2	0.13	0.16	0.78	3.05

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

Variety	Percent Stand												Yield (tons/acre)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	2008			2009			2010			2011			2012			2013			2014			2015			2016			2017			2018			2019			2020			2021			2022			2023			2024			2025			2026			2027			2028			2029			2030			2031			2032			2033			2034			2035			2036			2037			2038			2039			2040			2041			2042			2043			2044			2045			2046			2047			2048			2049			2050			2051			2052			2053			2054			2055			2056			2057			2058			2059			2060			2061			2062			2063			2064			2065			2066			2067			2068			2069			2070			2071			2072			2073			2074			2075			2076			2077			2078			2079			2080			2081			2082			2083			2084			2085			2086			2087			2088			2089			2090			2091			2092			2093			2094			2095			2096			2097			2098			2099			2100			2101			2102			2103			2104			2105			2106			2107			2108			2109			2110			2111			2112			2113			2114			2115			2116			2117			2118			2119			2120			2121			2122			2123			2124			2125			2126			2127			2128			2129			2130			2131			2132			2133			2134			2135			2136			2137			2138			2139			2140			2141			2142			2143			2144			2145			2146			2147			2148			2149			2150			2151			2152			2153			2154			2155			2156			2157			2158			2159			2160			2161			2162			2163			2164			2165			2166			2167			2168			2169			2170			2171			2172			2173			2174			2175			2176			2177			2178			2179			2180			2181			2182			2183			2184			2185			2186			2187			2188			2189			2190			2191			2192			2193			2194			2195			2196			2197			2198			2199			2200			2201			2202			2203			2204			2205			2206			2207			2208			2209			2210			2211			2212			2213			2214			2215			2216			2217			2218			2219			2220			2221			2222			2223			2224			2225			2226			2227			2228			2229			2230			2231			2232			2233			2234			2235			2236			2237			2238			2239			2240			2241			2242			2243			2244			2245			2246			2247			2248			2249			2250			2251			2252			2253			2254			2255			2256			2257			2258			2259			2260			2261			2262			2263			2264			2265			2266			2267			2268			2269			2270			2271			2272			2273			2274			2275			2276			2277			2278			2279			2280			2281			2282			2283			2284			2285			2286			2287			2288			2289			2290			2291			2292			2293			2294			2295			2296			2297			2298			2299			2300			2301			2302			2303			2304			2305			2306			2307			2308			2309			2310			2311			2312			2313			2314			2315			2316			2317			2318			2319			2320			2321			2322			2323			2324			2325			2326			2327			2328			2329			2330			2331			2332			2333			2334			2335			2336			2337			2338			2339			2340			2341			2342			2343			2344			2345			2346			2347			2348			2349			2350			2351			2352			2353			2354			2355			2356			2357			2358			2359			2360			2361			2362			2363			2364			2365			2366			2367			2368			2369			2370			2371			2372			2373			2374			2375			2376			2377			2378			2379			2380			2381			2382			2383			2384			2385			2386			2387			2388			2389			2390			2391			2392			2393			2394			2395			2396			2397			2398			2399			2400			2401			2402			2403			2404			2405			2406			2407			2408			2409			2410			2411			2412			2413			2414			2415			2416			2417			2418			2419			2420			2421			2422			2423			2424			2425			2426			2427			2428			2429			2430			2431			2432			2433			2434			2435			2436			2437			2438			2439			2440			2441			2442			2443			2444			2445			2446			2447			2448			2449			2450			2451			2452			2453			2454			2455			2456			2457			2458			2459			2460			2461			2462			2463			2464			2465			2466			2467			2468			2469			2470			2471			2472			2473			2474			2475			2476			2477			2478			2479			2480			2481			2482			2483			2484			2485			2486			2487			2488			2489			2490			2491			2492			2493			2494			2495			2496			2497			2498			2499			2500		
	DKA50-18	84	74	89	88	84	84	78	70	73	75	75	29	20	0.87	5.55	5.84	4.59	2.90	1.22	1.12	0.74	0.54	0.56	4.17	23.92*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
WL 343HQ	91	93	94	95	91	87	83	86	81	86	81	40	30	0.68	5.51	5.33	4.77	3.06	1.18	1.19	0.83	0.65	0.66	4.52	23.88*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
FSG 5285F	89	93	93	93	89	86	79	83	80	83	80	36	29	0.72	5.54	5.81	4.52	2.82	1.11	0.94	0.65	0.48	0.59	3.77	23.19*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
6552	85	84	84	87	86	83	76	79	76	76	76	33	23	0.77	5.17	5.66	4.62	2.88	1.08	1.00	0.74	0.48	0.55	3.85	22.95*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
6417	90	88	89	89	84	83	73	80	78	80	78	34	24	0.73	5.30	5.65	4.76	2.85	0.94	0.98	0.73	0.45	0.46	3.56	22.86*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
WL 363HQ	90	89	90	91	89	83	74	78	78	78	78	30	18	0.52	5.12	5.67	4.61	3.02	0.99	1.02	0.75	0.47	0.56	3.79	22.74*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
A5225	88	85	86	86	84	80	70	74	73	73	73	29	23	0.59	5.38	5.57	4.49	2.99	0.92	1.04	0.67	0.49	0.58	3.70	22.72*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Rebound 5.0	84	84	88	88	82	80	70	73	71	73	71	33	23	0.73	5.34	5.59	4.43	2.68	1.12	0.95	0.68	0.46	0.54	3.75	22.52*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
DKA43-13	84	83	89	88	87	81	73	78	78	78	78	33	24	0.58	5.39	5.29	4.69	2.85	0.90	0.92	0.62	0.46	0.55	3.45	22.24*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
PGI 459	93	90	93	94	89	89	74	81	78	81	78	36	21	0.53	5.18	5.47	4.47	2.84	1.03	0.92	0.76	0.42	0.50	3.63	22.11																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Phoenix	91	89	90	90	89	88	75	75	74	74	74	33	29	0.57	5.36	5.48	4.42	2.69	1.00	0.93	0.72	0.43	0.49	3.58	22.10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Anchormate	96	96	95	95	94	91	84	83	80	80	80	40	34	0.74	4.98	5.46	4.28	2.79	1.12	0.87	0.72	0.42	0.36	3.50	21.73																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
A4440	88	89	91	89	86	86	78	80	76	80	76	35	33	0.65	4.95	5.62	4.32	2.55	1.02	0.89	0.73	0.46	0.47	3.58	21.67																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Genoa	73	68	79	80	78	68	66	66	69	63	69	26	20	0.61	5.25	5.34	4.37	2.72	0.81	0.87	0.64	0.45	0.50	3.27	21.56																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Ameristand 403T	70	65	73	73	75	74	66	64	59	59	59	25	23	0.60	4.68	5.24	4.06	2.31	0.86	0.71	0.60	0.37	0.36	2.91	19.80																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Withstand	76	78	76	76	75	69	55	58	50	50	50	20	16	0.52	4.79	5.02	3.73	2.41	0.85	0.82	0.63	0.30	0.46	3.06	19.53																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Saranac AR (certified)	88	85	85	88	88	81	71	58	58	58	58	23	13	0.73	4.54	5.05	3.77	2.17	0.81	0.69	0.46	0.22	0.28	2.47	18.72																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Buffalo	89	90	90	89	84	80	60	59	50	50	50	18	6	0.68	4.77	4.91	3.41	1.77	0.65	0.57	0.33	0.17	0.23	1.95	17.50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
Mean	86	84	87	88	85	81	72	74	71	71	71	31	23	0.66	5.16	5.44	4.35	2.68	0.98	0.91	0.67	0.43	0.48	3.47	21.76																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
CV%	10	11	7	6	6	9	14	12	11	12	11	19	20	35.01	8.80	6.41	8.86	8.89	16.29	14.54	16.16	16.73	21.14	11.42	5.86																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
LSD,0.05	12	13	8	7	7	10	14	12	11	12	11	8	6	0.33	0.64	0.50	0.55	0.34	0.23	0.19	0.15	0.10	0.15	0.56	1.87																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

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

Table 5. Dry matter yields, seedling vigor and stand persistence of alfalfa varieties sown September 14, 2011, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Oct. 11, 2011	Commercial Varieties—Available for Farm Use	Percent Stand												Yield (tons/acre)																																																																																																																																																																																																																	
			2011			2012			2013			2014			2015			2016			2017			2018			2019			2020			2021			2022			2023			2024			2025			2026			2027			2028			2029			2030			2031			2032			2033			2034			2035			2036			2037			2038			2039			2040			2041			2042			2043			2044			2045			2046			2047			2048			2049			2050			2051			2052			2053			2054			2055			2056			2057			2058			2059			2060			2061			2062			2063			2064			2065			2066			2067			2068			2069			2070			2071			2072			2073			2074			2075			2076			2077			2078			2079			2080			2081			2082			2083			2		

Table 6. Dry matter yields, seedling vigor and stand persistence of alfalfa varieties sown August 9, 2012, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Sept. 27, 2012	Percent Stand			Yield (tons/acre)							
		2012		2013	2012		2013					
		Sep 27	Mar 20	Sep 26	Nov 16	May 13	Jun 12	Jul 12	Aug 12	Sep 16	Total	Total ²
Commercial Varieties—Available for Farm Use												
55V50	5.0	100	100	100	1.15	2.01	1.57	1.21	1.07	1.05	6.91	8.06*
Phoenix	4.8	98	99	97	1.11	2.00	1.56	1.13	1.03	1.08	6.81	7.91*
Evermore	4.8	100	100	100	1.00	2.01	1.58	1.18	0.99	0.95	6.71	7.71*
4030	4.5	99	100	99	1.04	1.78	1.40	1.19	1.12	1.02	6.52	7.56*
Caliber	4.3	98	100	100	1.06	1.91	1.49	1.08	0.97	1.03	6.48	7.54*
Ameristand 403T	5.0	100	100	100	1.12	1.92	1.51	1.01	1.00	0.93	6.37	7.50*
Radiance HD	4.5	99	100	100	1.04	1.81	1.43	1.15	1.08	0.98	6.45	7.49*
GA-505	5.0	100	100	99	1.23	1.75	1.38	1.06	1.03	0.96	6.18	7.40*
Saranac AR (certified)	4.8	100	100	96	1.21	1.78	1.41	1.00	0.96	0.91	6.05	7.27
Withstand	4.8	100	100	100	0.93	1.79	1.39	1.05	1.00	1.04	6.27	7.20
Arc (certified)	4.9	100	100	96	1.25	1.73	1.35	0.83	0.89	0.82	5.62	6.87
Experimental Varieties												
CW 085028	5.0	100	100	100	1.00	1.77	1.40	1.29	1.01	0.92	6.39	7.39*
CW 065030	4.8	100	100	100	1.11	1.68	1.33	1.15	0.98	0.95	6.09	7.20
GA-ALFG-1	5.0	100	99	97	1.24	1.60	1.24	0.84	0.88	0.89	5.44	6.68
Mean	4.8	99	100	99	1.11	1.82	1.43	1.08	1.00	0.97	6.31	7.41
CV,%	6.2	1	1	2	14.82	8.12	8.19	7.41	9.43	10.84	6.93	7.28
LSD,0.05	0.4	2	1	3	0.23	0.21	0.17	0.11	0.14	0.15	0.63	0.77

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

² This total includes the late fall 2012 harvest plus the 2013 harvests.

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

Table 7. Dry matter yields, seedling vigor and stand persistence of Roundup Ready alfalfa varieties sown August 9, 2012, at Lexington, Kentucky.

Variety	Seedling Vigor ¹ Sep 27, 2012	Percent Stand			Yield (tons/acre)							
		2012		2013	2012		2013					
		Sep 27	Mar 20	Sep 26	Nov 16	May 13	Jun 12	Jul 12	Aug 12	Sep 16	Total	Total ²
Commercial Varieties—Available for Farm Use												
Tunica	4.6	100	100	100	0.56	1.33	1.12	1.05	0.79	0.93	5.23	5.79*
Stratica	3.6	94	95	95	0.45	1.10	0.93	1.27	0.82	0.95	5.08	5.53*
Ameristand 405T	4.5	100	100	78	0.56	1.21	1.02	1.12	0.78	0.83	4.97	5.52*
DKA46-16	4.5	99	100	100	0.43	1.14	0.96	1.11	0.91	0.86	4.97	5.39*
WL 372HQ	4.1	100	100	100	0.46	1.03	0.87	1.17	0.89	0.94	4.91	5.37*
6516R	4.8	99	99	99	0.48	1.18	1.00	1.07	0.75	0.88	4.88	5.36*
AphaTron	4.3	100	100	100	0.45	1.16	0.98	1.01	0.71	0.86	4.72	5.17*
Consistency 4.10	4.1	98	98	98	0.45	1.03	0.87	1.10	0.83	0.86	4.70	5.14*
Ameristand 455TQ	4.1	100	100	100	0.45	0.84	0.71	1.18	0.90	0.96	4.60	5.05*
WL 356HQ	4.1	100	100	100	0.51	1.08	0.92	0.93	0.72	0.88	4.53	5.04*
DKA41-18	4.1	98	99	99	0.44	0.89	0.75	1.12	0.88	0.87	4.51	4.96
WL 355	3.9	99	100	78	0.46	0.92	0.78	1.15	0.80	0.84	4.48	4.94
54R02	4.5	94	96	97	0.37	1.04	0.88	1.08	0.74	0.82	4.57	4.93
Ameristand 433T	3.4	92	94	93	0.38	0.93	0.79	1.11	0.78	0.81	4.42	4.80
Alfagrace 300	3.6	97	98	98	0.44	0.93	0.79	0.99	0.67	0.72	4.09	4.53
Mean	4.2	98	98	95	0.46	1.05	0.89	1.10	0.80	0.87	4.71	5.17
CV,%	14.9	2	2	18	24.94	21.02	21.09	9.54	14.87	10.94	16.23	10.56
LSD,0.05	0.9	3	2	24	0.16	0.32	0.27	0.15	0.17	0.14	0.69	0.78

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

² This total includes the late fall 2012 harvest plus the 2013 harvests.

*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 Roundup Ready alfalfa varieties sown April 7, 2011, at Princeton, Kentucky.¹

Variety	Percent Stand						Yield (tons/acre)								3-year Total
	2011		2012		2013		2011	2012	2013						
	Jun 14	Oct 24	Mar 21	Oct 29	Mar 19	Oct 8	Total	Total	May 14	Jun 19	Jul 16	Aug 14	Sep 17	Total	
Commercial Varieties—Available for Farm Use															
54R02 RR	94	94	96	97	94	91	1.72	4.58	2.24	2.09	1.08	0.96	0.80	7.17	13.48*
Ameristand 405T RR	96	96	97	96	96	94	1.47	3.95	2.01	2.13	1.04	0.95	0.85	6.99	12.41*
Consistency 4.10 RR	99	99	99	99	98	96	1.64	4.26	1.80	2.01	1.07	0.88	0.71	6.46	12.36*
DKA41-18 RR	98	97	96	97	96	94	1.48	4.16	1.89	2.15	1.06	0.89	0.71	6.70	12.34*
WL 355 RR	98	98	97	98	96	96	1.43	4.01	1.81	1.89	1.10	0.86	0.85	6.51	11.95
Alfagraze 300 RR	94	94	93	93	92	89	1.24	3.88	1.68	1.93	0.90	0.84	0.64	6.00	11.12
Experimental Varieties															
FG R47M120 RR	94	97	96	97	97	94	1.61	4.30	1.99	2.10	1.16	0.86	0.79	6.90	12.82*
FG R47M312 RR	92	94	94	95	93	93	1.41	4.04	1.80	1.95	1.18	0.92	0.79	6.65	12.10
FG R46M162 RR	98	98	98	94	93	92	1.53	3.92	1.86	1.93	1.04	0.93	0.83	6.60	12.04
FG R47M319 RR	98	98	99	98	95	93	1.59	4.05	1.60	1.82	1.03	0.86	0.79	6.10	11.74
Mean	96	96	96	96	95	93	1.51	4.11	1.87	2.00	1.07	0.90	0.78	6.61	12.24
CV,%	3	3	2	2	2	3	13.66	10.05	15.51	7.57	10.32	10.19	18.76	7.26	6.89
LSD,0.05	4	4	3	3	3	5	0.30	0.60	0.42	0.23	0.16	0.13	0.21	0.70	1.22

¹ This trial was sprayed with Roundup once in 2012 and twice in 2013.

*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 Web site 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)
- Kentucky Plant Disease Management Guide for Forage Legumes (PPA-10D)
- Alfalfa Hay: Quality Makes the Difference (AGR-137)
- “Emergency” Inoculation for Poorly Nodulated Legumes (PPFS-AG-F-04)

Table 9. Dry matter yields, seedling vigor and stand persistence of Roundup Ready alfalfa varieties sown April 9, 2013, at Princeton, Kentucky.¹

Variety	Seedling Vigor ² May 15, 2013	Percent Stand		Yield (tons/acre)			
		2013		2013			
		May 15	Oct 8	Jul 16	Aug 14	Sep 17	Total
Commercial Varieties—Available for Farm Use							
AphaTron RR	4.1	98	91	0.84	0.74	1.08	2.67*
428 RR	2.8	96	96	0.84	0.83	0.98	2.66*
Alfagraze 300 RR	2.6	76	86	0.82	0.75	1.08	2.66*
WL 356HQ RR	3.1	96	95	0.87	0.80	0.94	2.61*
Ameristand 405T RR	3.0	96	94	0.76	0.81	1.00	2.57*
Ameristand 455TQ RR	3.9	100	96	0.90	0.66	0.93	2.49*
Ameristand 433T RR	3.1	95	93	0.84	0.66	0.92	2.43*
Tunica RR	3.6	98	95	0.80	0.66	0.96	2.42*
WL 372HQ RR	3.5	98	83	0.82	0.68	0.87	2.38*
Stratica RR	3.0	96	97	0.77	0.71	0.88	2.36*
6516 RR	4.1	99	77	0.79	0.71	0.82	2.32*
DKA46-16 RR	3.8	97	85	0.74	0.70	0.78	2.22*
Mean	3.4	95	91	0.82	0.73	0.94	2.48
CV,%	24.2	12	13	16.18	18.20	23.57	13.40
LSD,0.05	1.0	16	16	0.19	0.19	0.32	0.48

¹ This trial was sprayed with Roundup twice in 2013.

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.

- 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

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Table 13. Dry matter yields and stand persistence of alfalfa varieties [including Roundup Ready (RR)] sown April 7, 2011, at Princeton, Kentucky.

Variety	Percent Stand						Yield (tons/acre)									3-year Total
	2011		2012		2013		2011	2012	2013							
	Jun 14	Oct 24	Mar 21	Oct 29	Mar 19	Oct 8	Total	Total	May 14	Jun 19	Jul 16	Aug 14	Sep 17	Total		
Commercial Varieties—Available for Farm Use																
WL 354HQ	99	100	100	100	98	93	2.03	4.50	1.85	1.96	1.34	1.09	1.02	7.27	13.79*	
Gunner	96	97	98	98	96	69	1.80	4.77	1.77	2.02	1.23	1.06	0.97	7.05	13.62*	
Consistency 4.10 RR	99	97	98	97	98	83	1.61	4.77	1.75	2.03	1.30	1.08	0.97	7.12	13.50*	
Ameristand 403T	96	96	96	96	94	91	1.92	4.56	1.80	2.03	1.21	0.97	0.96	6.97	13.46*	
54R02 RR	92	95	97	96	94	85	1.57	4.69	2.06	1.92	1.24	1.07	0.89	7.18	13.44*	
Charger	95	97	97	98	97	84	1.79	4.76	1.63	1.88	1.24	1.03	0.99	6.76	13.32*	
Ameristand 407TQ	96	96	98	95	94	83	1.46	4.74	1.79	1.96	1.33	1.00	0.98	7.06	13.27*	
Lancer	91	95	95	96	95	80	1.57	4.84	1.80	1.97	1.15	1.03	0.90	6.83	13.24*	
Phoenix	93	94	94	97	93	76	1.82	4.56	1.67	1.87	1.24	1.06	0.85	6.69	13.06*	
Radiance HD	95	97	97	96	95	90	1.67	4.63	1.73	1.84	1.18	1.04	0.91	6.71	13.01*	
WL 355 RR	96	97	99	98	96	85	1.49	4.52	1.82	1.95	1.21	1.01	0.87	6.86	12.87*	
Caliber	96	97	97	97	93	79	1.69	4.44	1.66	1.90	1.21	0.95	0.96	6.68	12.81*	
DS4210	97	99	98	97	97	89	1.62	4.34	1.63	1.78	1.34	1.02	0.92	6.69	12.65*	
Alfagraze 300 RR	94	94	95	94	91	84	1.54	4.35	1.83	1.90	1.20	0.93	0.87	6.73	12.62*	
Rebound 6.0	98	99	99	99	98	86	1.60	4.20	1.72	1.77	1.17	1.05	0.97	6.67	12.47	
L-449Aph2	98	99	99	99	97	92	1.74	4.25	1.69	1.69	1.15	0.93	0.87	6.34	12.32	
DKA41-18 RR	96	97	97	97	94	86	1.55	4.21	1.72	1.76	1.13	0.96	0.94	6.52	12.28	
Saranac AR (certified)	98	97	96	94	90	43	1.48	4.55	1.79	1.90	1.03	0.83	0.64	6.19	12.21	
Withstand	95	93	93	93	92	61	1.50	4.14	1.60	1.96	1.15	0.90	0.76	6.37	12.01	
Ameristand 405T RR	99	98	100	99	98	94	1.47	3.99	1.59	1.44	1.21	1.01	0.87	6.12	11.58	
Experimental Varieties																
FG R47M120 RR	92	95	98	98	96	89	1.61	4.83	1.83	1.99	1.36	1.01	0.94	7.13	13.58*	
TS4013	99	98	98	98	97	86	1.88	4.67	1.97	1.91	1.18	1.03	0.87	6.95	13.50*	
FG R47M312 RR	95	97	97	97	97	93	1.47	4.32	1.77	1.89	1.32	1.05	0.99	7.03	12.81*	
FG R47M319 RR	97	98	99	98	97	93	1.54	4.44	1.57	1.85	1.24	1.03	0.94	6.64	12.62*	
FG R46M162 RR	98	95	96	96	96	89	1.41	4.24	1.80	1.88	1.29	1.05	0.82	6.84	12.49	
Mean	96	97	97	97	95	83	1.63	4.49	1.75	1.88	1.23	1.01	0.91	6.78	12.90	
CV,%	3	3	3	3	4	14	18.58	9.19	14.28	13.84	9.58	11.54	14.50	7.45	7.14	
LSD,0.05	5	5	4	4	5	17	0.43	0.58	0.35	0.37	0.17	0.16	0.19	0.71	1.30	

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



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