



The 1999 Alfalfa Report

Robert Spitaleri, J.C. Henning, L.G. Brown, G.D. Lacefield, W.J. Peterson, and P.C. Vincelli

Introduction

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

This report provides current yield data on alfalfa varieties included in yield trials in Kentucky as well as guidelines for selecting alfalfa varieties.

Considerations in Selecting an Alfalfa Variety

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

Winter hardiness. Each variety has a fall dormancy rating ranging from 1 (very dormant) to 9 (non-dormant). In general, varieties with lower dormancy ratings take more warm weather in spring to initiate growth, and they stop growing sooner in the fall. This growth habit can, but does not necessarily, reduce annual yields compared to less dormant varieties. Generally, alfalfa should have a fall dormancy rating of 2-5 to yield well in Kentucky and have good winter survival. Ratings of 6 and above are not winter hardy under Kentucky conditions.

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

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

Anthracnose, also caused by a fungus, attacks the stems of alfalfa, preventing water flow to the rest of the shoot and causing sudden wilting. These wilted shoots have a characteristic

"shepherd's crook" appearance. Anthracnose can also cause a bluish-black crown rot.

Bacterial wilt and fusarium wilt are infections of the water-conducting tissues of alfalfa roots and do not cause any noticeable root rot. These diseases prevent water flow to leaves, resulting in wilting of shoots and the eventual death of infected plants. Roots infected with bacterial wilt often have a yellowish-brown discoloration of the inner woody cylinder of the taproot. Fusarium infection can be recognized by brown to red streaks in the inner woody cylinder of the taproot.

Aphanomyces root rot is another fungal disease associated with poorly drained soils or excessive rainfall. Affected seedlings will be stunted but remain upright, unlike seedlings 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, with it may form a root disease complex. Aphanomyces root rot is known to affect new seedlings in Kentucky, but it is still unclear how it affects established alfalfa.

In years with overly cool and wet spring weather, alfalfa stands have suffered great damage to aphanomyces when planted to varieties that are susceptible to this disease.

Although certain alfalfa varieties are reported to have some resistance to sclerotinia crown and stem rot, UK research has shown that these varieties often perform poorly against the disease under Kentucky conditions.

Seed quality. Buy high 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 are reported in this or similar publications. Other information on the label will include the test date, which must be within the previous nine months; the level of germination; and other crop and weed seed. Order seed well in advance of planting time to assure that it will be available when needed.

Description of the Tests

Alfalfa variety tests were established at Lexington (1995, 1997, 1998, and 1999), Bowling Green (1996 and 1998), Princeton (1997 and 1999), and Eden Shale (1998) as part of the Forage Variety Testing Program. The soils at most locations are well suited to alfalfa, in that they are generally well-drained silt loams (Maury, Pembroke, and Crider at Lexington, Bowling Green, and Princeton, respectively). Eden Shale has a

Nicholson type soil. The Bowling Green tests are on soils that are naturally infested with both phytophthora and aphanomyces root rot pathogens, and the 1997 seeding in Princeton was found to be infested with the aphanomyces pathogen.

Plots were 5 x 15 feet in a randomized complete block design with four replications. 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 are delayed to allow the alfalfa to completely reach maturity as 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 percent dry matter production. Management of all tests for establishment, fertility, pest control, and harvest management was according to University of Kentucky Cooperative Extension Service recommendations. Pests (weeds and insects) are controlled so that they would not limit yield or persistence.

Results and Discussion

Weather data for Lexington, Bowling Green, Eden Shale, and Princeton are presented in Table 1. The 1999 growing season was hotter and drier than in any recent year. During the growing season, temperature was 6° to 10° higher and rainfall was 1 inch to 4 inches below normal each month. Lack of rainfall severely affected production from June through the end of the season.

Yield data (on a dry matter basis) for all tests are reported in Tables 2-12. 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 for 1999 and by year for each prior year of production.

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

each column of means. Low variability is desirable, and increased variability within a study results in higher CVs and larger LSDs.

Table 13 summarizes information about proprietors, distributors, fall dormancy, disease resistance, and yield performance across years and locations for all the varieties currently included in the tests discussed in this report. Varieties are listed in alphabetical order with the experimental varieties at the bottom. Experimental varieties are not available for farm use, but commercial varieties can be purchased through dealerships. In Table 13, shaded areas indicate that the variety was not in that particular test (labeled at the top of the column), and white or unshaded blocks mean that the variety was in the test. A single asterisk (*) means that the variety was not significantly different from the top yielding variety based on the 5% LSD. It is best to choose a variety that has performed well over several years and locations, as indicated by the asterisks. Make sure seed of the variety is properly labeled and will be available when needed.

Summary

Consistent production of high yields of alfalfa is the result of good variety selection along with the implementation of good management techniques. Soil fertility should be maintained at recommended levels based on soil tests, and pests such as weeds, alfalfa weevil, and potato leafhopper should be controlled using the appropriate cultural and/or chemical methods. Harvesting established stands at the appropriate stage of maturity will produce four to five cuttings annually in Kentucky before mid-September. For further information about alfalfa management, refer to these College of Agriculture publications, available at your local county Extension office:

- AGR-1 *Lime and Fertilizer Recommendations*
- AGR-18 *Grain and Forage Crop Guide for Kentucky*
- AGR-64 *Establishing Forage Crops*
- AGR-76 *Alfalfa: The Queen of the Forage Crops*
- AGR-90 *Inoculation of Forage Legumes*
- AGR-107 *Alfalfa: Quality Means Profits*
- AGR-137 *Alfalfa Hay: Quality Makes the Difference*
- AGR-148 *Weed Control Strategies for Alfalfa and Other Forage Legume Crops*
- ENT-17 *Insect Management Recommendations for Field Crops and Livestock*
- PPA-10d *Kentucky Plant Disease Management Guide for Forage Legumes*
- PPA-28 *Alfalfa Varieties: Relative Disease Resistance and Winter Hardiness*

Table 1. Temperature and rainfall at Bowling Green, Eden Shale, Lexington, and Princeton in 1999.

	Bowling Green				Eden Shale				Lexington				Princeton			
	Temp		Rainfall		Temp		Rainfall		Temp		Rainfall		Temp		Rainfall	
MON	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP	°F	DEP	IN	DEP
JAN	40	+6	8.27	+4.45	36	+6	5.10	+2.56	36	+5	5.64	+2.78	40	+6	8.82	+5.02
FEB	44	+6	2.69	-1.44	41	+8	4.02	+1.27	40	+5	2.32	-0.89	46	+8	2.22	-2.21
MAR	44	-2	3.56	-1.54	41	-2	1.79	-2.93	40	-4	3.27	-1.13	46	-1	4.07	-0.87
APR	61	+4	1.78	-2.54	57	+3	2.03	-2.12	56	+1	1.87	-2.01	63	+4	5.85	+1.05
MAY	67	+1	3.35	-1.59	66	+3	1.19	-3.22	65	+1	1.35	-3.12	68	+1	3.34	-1.62
JUN	76	+1	3.98	-0.19	74	+3	3.13	-0.64	74	+2	3.89	+0.23	76	+1	4.52	+0.67
JUL	82	+4	1.18	-3.56	81	+6	2.40	-2.13	80	+4	1.00	-4.00	82	+4	4.61	+0.32
AUG	79	+2	0.99	-2.52	76	+2	1.93	-1.80	75	0	1.31	-2.62	79	+2	1.00	-3.01
SEP	71	+1	2.29	-1.43	71	+3	0.79	-2.40	69	+1	1.03	-2.17	73	+2	0.72	-2.61
OCT	58	0	2.82	-0.20	59	+2	2.39	-0.60	57	0	1.91	-0.66	62	+3	3.45	+0.40
NOV	52	+6	1.64	-2.79	52	+7	1.92	-1.63	51	+6	1.70	-1.69	57	+10	3.22	-1.41

Dep is departure from the long-term average for that location.

Table 2. Dry matter yields (tons/acre) of alfalfa varieties sown 6 September 1995 at Lexington, Kentucky.

Variety	Total 1996	Total 1997	Total 1998	1999 Harvests			Total 1999	4-yr Total
				May 12	Jun 15	Jul 16		
Commercial Varieties—Available for Farm Use								
DK127	5.05 *	4.41 *	5.09 *	1.90 *	1.07 *	0.89 *	3.86 *	18.41 *
Choice	4.54 *	4.10 *	5.01 *	2.03 *	1.12 *	1.02 *	4.17 *	17.82 *
Rushmore	5.25 *	4.33 *	4.69 *	1.59 *	1.05 *	0.81 *	3.46 *	17.72 *
Excalibur II	4.54 *	3.84 *	4.93 *	1.78 *	1.28 *	0.98 *	4.04 *	17.34 *
WL323	4.45 *	4.09 *	4.78 *	1.85 *	0.96 *	0.85 *	3.67 *	16.99 *
DK133	4.33	3.82 *	5.07 *	1.65 *	1.14 *	0.97 *	3.77 *	16.98 *
Supercuts	4.35	3.66	4.93 *	1.87 *	1.09 *	0.86 *	3.81 *	16.76 *
Saranac-AR	4.12	3.84 *	4.88 *	1.81 *	1.01 *	0.93 *	3.75 *	16.60 *
Multiqueen	4.50 *	4.12 *	4.70 *	1.65 *	0.84 *	0.77 *	3.26 *	16.58 *
Dominator	4.03	3.68	4.94 *	1.82 *	0.88 *	0.79 *	3.49 *	16.14 *
5454	4.36	3.55	4.43	1.49	0.90 *	0.72	3.11	15.44
ARC	4.35	3.35	4.24	1.56	1.10 *	0.80 *	3.46 *	15.41
329	4.16	3.62	4.55	1.55	0.70	0.59	2.85	15.17
ICI630	3.31	3.15	4.35	1.63 *	0.68	0.66	2.96	13.78
Legacy	4.13	3.01	4.03	1.28	0.69	0.58	2.55	13.73
Apollo	3.55	2.79	3.77	0.86	0.92 *	0.69	2.46	12.57
Experimental Varieties—Not Available for Farm Use								
ABI9231	4.72 *	3.80 *	5.01 *	1.77 *	1.02 *	1.00 *	3.79 *	17.32 *
GA-APGC	4.49 *	4.42 *	4.91 *	1.86 *	0.83 *	0.72	3.40 *	17.23 *
ZC9346	3.96	4.15 *	5.14 *	1.79 *	0.41	0.71	2.91	16.16 *
93116	4.35	3.49	4.35	1.67 *	0.87 *	0.73 *	3.27 *	15.46
GA-MX	3.73	2.74	3.90	1.30	0.96 *	0.60	2.85	13.22
Mean	4.3	3.71	4.65	1.65	0.93	0.79	3.38	16.04
CV,%	13.7	13.93	8.69	19.92	37.75	25.52	21.22	11.05
LSD, 0.05	0.83	0.73	0.57	0.47	0.5	0.29	1.01	2.51

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

Table 3. Dry matter yields (tons/acre) of alfalfa varieties sown 19 April 1996 at Bowling Green, Kentucky.

Variety	1996 Total	1997 Total	1998 Total	1999 Harvests				1999 Total	4-yr Total
				May 21	Jun 17	Jul 21	Nov 12		
Commercial Varieties—Available for Farm Use									
WL324	5.96 *	3.75 *	5.71 *	1.95 *	1.72 *	1.48 *	0.76 *	5.91 *	21.33 *
TMF-Generation	5.22 *	3.80 *	5.45 *	2.06 *	1.60 *	1.46 *	0.78 *	5.89 *	20.37 *
Affinity+Z	5.26 *	3.48 *	5.55 *	2.01 *	1.60 *	1.50 *	0.77 *	5.87 *	20.16 *
Imperial	5.33 *	3.63 *	5.28 *	2.01 *	1.67 *	1.51 *	0.72 *	5.91 *	20.15 *
WL252HQ	5.05	3.39 *	5.69 *	2.09 *	1.65 *	1.53 *	0.74 *	6.01 *	20.14 *
Depend+EV	5.15	3.59 *	5.48 *	1.93 *	1.59 *	1.53 *	0.74 *	5.78 *	20.01 *
Gem	5.17	3.52 *	5.56 *	2.05 *	1.52	1.41	0.71 *	5.69 *	19.93 *
645	5.46 *	3.54 *	5.34 *	1.88 *	1.56 *	1.46 *	0.66 *	5.56 *	19.89 *
Choice	4.91	3.75 *	5.49 *	2.00 *	1.58 *	1.40	0.71 *	5.70 *	19.85 *
631	4.96	3.88 *	5.24	1.89 *	1.62 *	1.42 *	0.76 *	5.69 *	19.77
ABT405	5.32 *	3.51 *	5.35 *	1.96 *	1.51	1.44 *	0.64 *	5.55 *	19.74
Supercuts	5.02	3.76 *	5.18	2.06 *	1.53	1.50 8	0.66 *	5.75 *	19.72
Demand	5.21 *	3.73 *	5.24	2.07 *	1.47	1.30	0.69 *	5.54 *	19.71
Dk133	4.95	3.38	5.64 *	1.88 *	1.60 *	1.46 *	0.75 *	5.69 *	19.65
Saranac-AR	5.27 *	3.50 *	5.22	1.93 *	1.53	1.28	0.74 *	5.49	19.49
WL325HQ	5.09	3.53 *	5.05	1.79	1.58 *	1.52 8	0.67 *	5.56 *	19.23
DK127	4.92	3.35	5.22	1.89 *	1.53	1.57 8	0.72 *	5.71 *	19.21
Innovator+Z	4.95	3.47 *	5.33 *	1.70	1.56 *	1.44 8	0.68 *	5.39	19.14
Fortress	5.30 *	3.56 *	4.84	1.95 *	1.45	1.38	0.62	5.40	19.10
Apollo	5.16	2.88	5.24	1.75	1.45	1.38	0.72 *	5.30	18.57
Rushmore	4.75	3.12	5.28 *	1.76	1.47	1.46 *	0.68 *	5.37	18.52
Legacy	4.70	3.07	5.19	1.96 *	1.47	1.44 *	0.66 *	5.53	18.49
Buffalo-B	5.27 *	2.89	4.68	1.68	1.38	1.41 *	0.78 *	5.25	18.10
Arc	5.00	2.93	4.57	1.74	1.28	1.24	0.56	4.82	17.32
Buffalo-A	4.85	2.34	4.48	1.73	1.15	1.25	0.48	4.61	16.28
Experimental Varieties—Not Available for Farm Use									
93116	5.57 *	3.49 *	5.21	1.92 *	1.33	1.32	0.70 *	5.27	19.55
ZG9533	5.39 *	3.34	5.18	2.01 *	1.56 *	1.41	0.65 *	5.63 *	19.54
ZG9543	4.88	3.46 *	5.37 *	1.91 *	1.58 *	1.57 *	0.71 *	5.76 *	19.47
ZG9530	5.09	3.42 *	5.42 *	1.88 *	1.52	1.43 *	0.50	5.32	19.26
ZG9430	4.79	3.42 *	5.28 *	1.90 *	1.58 *	1.51 *	0.71 *	5.70 *	19.19
A9107	4.99	3.66 *	5.15	1.98 *	1.50	1.33	0.53	5.33	19.14
C106	4.60	3.22	5.30 *	1.73	1.68 *	1.57 *	0.78 *	5.77 *	18.89
Mean	5.11	3.42	5.26	1.91	1.53	1.43	0.69	5.55	19.34
CV, %	10.63	10.45	6.22	9.75	7.44	7.94	15.92	6.22	5.54
LSD, 0.05	0.76	0.5	0.46	0.26	0.16	0.16	0.15	0.49	1.51

Variety	1997 Total	1998 Total	1999 Harvests			1999 Total	3-yr Total
			May 13	Jun 15	Jul 19		
Commercial Varieties—Available for Farm Use							
Apollo	2.45 *	5.77 *	3.77 *	0.99 *	0.84 *	5.61 *	13.83 *
Amerigraze 401Z	2.17 *	5.75 *	3.85 *	0.94 *	0.63 *	5.41 *	13.34 *
Arc	2.13 *	5.69 *	3.77 *	0.88 *	0.78 *	5.43 *	13.25 *
Haygrazer	2.19 *	5.79 *	3.68 *	0.83 *	0.72 *	5.23 *	13.21 *
ABT405	2.24 *	5.61 *	3.66 *	0.87 *	0.74 *	5.27 *	13.12 *
WL326GZ	2.12 *	5.72 *	3.68 *	0.82 *	0.57 *	5.07 *	12.92 *
Fortress	2.25 *	5.62 *	3.49 *	0.97 *	0.59 *	5.04 *	12.91 *
Alfagraze	2.14 *	5.46 *	3.63 *	0.79 *	0.87 *	5.29 *	12.89 *
Feast	2.09 *	5.47 *	3.52 *	0.91 *	0.86 *	5.29 *	12.85 *
Saranac-AR	1.97	5.73 *	3.54 *	0.86 *	0.68 *	5.08 *	12.79 *
Grazeking	2.02	5.57 *	3.57 *	0.83 *	0.78 *	5.19 *	12.78 *
Stampede	1.90	5.56 *	3.73 *	0.80 *	0.66 *	5.19 *	12.65 *
Spredor	2.02	5.60 *	3.34 *	0.76	0.72 *	4.82 *	12.44
Experimental Varieties—Not Available for Farm Use							
94IO5PL1	2.34 *	5.84 *	3.81 *	0.86 *	0.71 *	5.38 *	13.56 *
W116	2.13 *	5.89 *	3.83 *	0.93 *	0.62 *	5.37 *	13.40 *
GA-APGC	2.31 *	5.62 *	3.63 *	0.87 *	0.72 *	5.22 *	13.15 *
A9508	2.05	5.71 *	3.73 *	0.85 *	0.68 *	5.26 *	13.02 *
CAR9426	2.26 *	5.67 *	3.28 *	0.82 *	0.80 *	4.89 *	12.82 *
Mean	2.16	5.67	3.47	1.02	0.74	5.22	13.05
CV,%	11.79	6.26	11.73	16.35	33.13	10.77	7.04
LSD, 0.05	0.38	0.5	0.58	0.24	0.35	0.8	1.3

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

Variety	1997 Total	1998 Total	1999 Harvests			1999 Total	3-yr Total
			May 17	June 18	July 19		
Commercial Varieties—Available for Farm Use							
Garst 631	2.51 *	5.64 *	2.67	1.18 *	0.69	4.54 *	12.68 *
DK 140	2.24 *	5.76 *	2.62	1.08 *	0.91 *	4.61 *	12.61 *
Wintergreen	1.99	5.58 *	2.97 *	0.82	1.02 *	4.80 *	12.37 *
Cimarron 3i	2.26 *	5.34	2.82 *	1.06 *	0.75	4.63 *	12.23 *
Gem	1.85	5.41 *	2.93 *	1.05 *	0.83 *	4.82 *	12.08 *
ABT 405	1.88	5.53 *	2.76 *	0.99 *	0.90 *	4.64 *	12.05 *
Affinity+Z	2.13 *	5.55 *	2.78 *	0.74	0.86 *	4.37	12.05 *
DK 141	2.35 *	5.57 *	2.57	0.66	0.86 *	4.08	12.00 *
WL325HQ	2.19 *	5.46 *	2.43	0.99 *	0.93 *	4.35	11.99 *
ABT 205	1.88	5.45 *	2.71 *	1.03 *	0.86 *	4.60 *	11.93 *
Cimarron VR	2.58 *	5.37	2.38	0.79	0.73	3.90	11.86
Saranac-AR	1.95	5.29	2.56	1.03 *	0.83 *	4.42	11.66
Fortress	2.14 *	5.14	2.59	0.91 *	0.87 *	4.38	11.65
Arc	1.82	4.82	2.48	0.85	0.65	3.98	10.61
Experimental Varieties—Not Available for Farm Use							
C231	2.29 *	5.43 *	2.75 *	1.12 *	0.99 *	4.86 *	12.57 *
ZC9623S	1.73	5.72 *	2.88 *	1.08 *	0.97 *	4.93 *	12.39 *
ZB9546	1.89	5.48 *	2.76 8	1.18 *	1.07 *	5.00 *	12.38 *
ZC9630S	1.81	5.41 *	2.85 *	0.92 *	0.85 *	4.62 *	11.84
C106	1.71	5.02	2.46	0.79	0.82 *	4.07	10.79
Mean	2.09	5.43	2.69	0.96	0.86	4.52	12.03
CV, %	17.07	4.92	7.36	23.69	25.35	8.94	6.07
LSD, 0.05	0.51	0.38	0.28	0.32	0.31	0.57	1.03

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

Table 6. Dry matter yields (tons/acre) of alfalfa varieties sown 15 April 1997 at Princeton, Kentucky.								
Variety	1997 Total	1998 Total	1999 Harvests				1999 Total	3-yr Total
			May 20	Jun 16	Jul 20	Nov 11		
Commercial Varieties—Available for Farm Use								
Choice	1.91 *	5.07 *	1.91 *	1.54 *	1.02 *	0.51 *	4.99 *	11.97 *
ABT 405	1.73 *	5.01 *	1.97 *	1.43 *	1.05 *	0.45	4.90 *	11.64 *
Rushmore	1.81 *	4.79 *	1.91 *	1.49 *	1.00 *	0.54 *	4.93 *	11.54 *
Wintergreen	1.62 *	4.88 *	2.05 *	1.43 *	1.01 *	0.52 *	5.01 *	11.51 *
631	1.65 *	4.69 *	1.94 *	1.50 *	1.07 *	0.48	4.98 *	11.32 *
Feast	1.82 *	4.63 *	1.87 *	1.44 *	1.05 *	0.36	4.72 *	11.17 *
Amerigraze 401+Z	1.50 *	4.82 *	1.84 *	1.46 *	1.03 *	0.45	4.79 *	11.10 *
Gem	1.37 *	4.84 *	1.89 *	1.38 *	0.98 *	0.44	4.68 *	10.89 *
WL332SR	1.64 *	4.64 *	1.88 *	1.37 *	0.89	0.42	4.55 *	10.83 *
Fortress	1.48 *	4.70 *	1.93 *	1.36 *	0.93	0.40	4.62 *	10.80 *
WL326GZ	1.67 *	4.69 *	1.77 *	1.28	0.95	0.39	4.39 *	10.75 *
ABT 205	1.50 *	4.64 *	1.78 *	1.39 *	0.97 *	0.42	4.56 *	10.69 *
Arc	1.19	4.56 *	1.86 *	1.32 *	0.94	0.39	4.52 *	10.26
Saranac-AR	1.22	4.37	2.01 *	1.33 *	0.93	0.39	4.66 *	10.26
Experimental Varieties—Not Available for Farm Use								
ZC9651	1.88 *	5.09 *	1.87 *	1.47 *	1.08 *	0.62 *	5.04 *	12.01 *
Mean	1.60	4.76	1.9	1.41	0.99	0.45	4.76	11.12
CV,%	26.01	9.12	10.32	12.22	8.65	21.48	9.63	9.76
LSD, 0.05	0.59	0.62	0.28	0.25	0.12	0.14	0.65	1.55

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

Table 7. Dry matter yields (tons/acre) of alfalfa varieties resistant and susceptible to potato leafhopper with insecticide applied. Sown 5 May 1998 at Lexington, Kentucky.

Variety	1998 ¹ Total	1999 Harvests			1999 ² Total	2-yr Total
		May 17	Jun 15	Jul 19		
Commercial Varieties—Available for Farm Use						
Cleansweep 1000	1.66	2.56	0.90	0.93	4.39	6.05
Saranac-AR	1.51	2.60	0.92	0.91	4.44	5.95
DK 131HG	1.42	2.61	0.93	0.95	4.49	5.91
Choice	1.35	2.44	0.90	0.94	4.27	5.62
Fortress	1.48	2.47	0.78	0.84	4.10	5.58
Arrest	1.54	2.40	0.74	0.85	3.99	5.53
Amerigraze 401+Z	1.50	2.35	0.82	0.86	4.03	5.53
LH3	1.28	2.36	0.81	0.84	4.00	5.28
Arc	1.36	2.22	0.70	0.73	3.66	5.02
Experimental Varieties—Not Available for Farm Use						
3R22	1.32	2.49	0.87	0.86	4.22	5.54
Mean	1.44	2.45	0.84	0.87	4.16	5.6
CV,%	14.11	15.95	33.79	22.9	20.16	17.87
LSD, 0.05	0.3	0.57	0.41	0.29	1.22	1.45

¹ Varieties treated with permethrin at 0.2 lb a.i./acre on July 24, 1998.
² Varieties treated with permethrin at 0.2 lb a.i./acre on June 3, 1999.

Table 8. Dry matter yields (tons/acre) of alfalfa varieties resistant and susceptible to potato leafhopper without insecticide applied. Sown 5 May 1998 at Lexington, Kentucky.

Variety	1998 Total	1999 Harvests			1999 Total	2-yr Total
		May 17	Jun 15	Jul 19		
Commercial Varieties—Available for Farm Use						
Cleansweep 1000	1.17	2.29	0.83	0.81	3.93	5.10
Fortress	1.11	2.26	0.86	0.79	3.91	5.02
Choice	0.92	2.35	0.80	0.73	3.88	4.79
Saranac-AR	1.00	2.26	0.80	0.70	3.77	4.77
DK 131HG	1.01	2.17	0.81	0.75	3.73	4.74
Arrest	1.08	2.22	0.73	0.70	3.64	4.72
Arc	1.02	2.24	0.75	0.67	3.67	4.69
Amerigraze 401+Z	1.14	2.13	0.69	0.71	3.53	4.67
LH3	1.01	2.01	0.73	0.55	3.29	4.29
Experimental Varieties—Not Available for Farm Use						
3R22	0.94	1.98	0.69	0.70	3.38	4.32
Mean	1.04	2.19	0.77	0.71	3.67	4.71
CV,%	15.47	8.31	19.89	23.36	10.16	10.51
LSD, 0.05	0.23	0.26	0.22	0.24	0.54	0.72

Table 9. Dry matter yields of alfalfa varieties sown 15 May 1998 at Eden Shale, Kentucky.

Variety	1998 Total	1999 Harvest			1999 Total	2-yr Total
		May 24	Jun 25	Aug 2		
Commercial Varieties—Available for Farm Use						
Gem	0.36 *	3.11 *	1.42 *	0.41	4.95 *	5.31 *
Stampede	0.34 *	2.87 *	1.47 *	0.51 *	4.85 *	5.19 *
Baralfa	0.32	2.86 *	1.49 *	0.51 *	4.86 *	5.18 *
Geneva	0.43 *	2.94 *	1.43 *	0.35	4.72 *	5.15 *
Choice	0.38 *	2.86 *	1.45 *	0.41	4.71 *	5.09 *
ABT350	0.37 *	2.84 *	1.43 *	0.43	4.69 *	5.06 *
Amerigraze 401Z	0.41 *	2.81 *	1.41 *	0.42	4.64 *	5.05 *
Saranac-AR	0.35 *	2.88 *	1.44 *	0.38	4.69 *	5.04 *
DK 140	0.34 *	2.72 *	1.44 *	0.53 *	4.69 *	5.03 *
Wintergreen	0.37 *	2.76 *	1.41 *	0.46 *	4.64 *	5.00 *
Fortress	0.35 *	2.84 *	1.36 *	0.37	4.58 *	4.92 *
Spredor-3	0.35 *	2.82 *	1.34 *	0.39	4.56 *	4.91 *
Grazeking	0.39 *	2.73 *	1.36 *	0.36	4.45	4.85 *
Vernal	0.35 *	2.70	1.34 *	0.44 *	4.49 *	4.84 *
Emperor	0.42 *	2.67	1.36 *	0.37	4.40	4.82 *
WL326GZ	0.33 *	2.75 *	1.34 *	0.39	4.48 *	4.81 *
Alfagraze	0.34 *	2.57	1.40 *	0.46 *	4.43	4.77
Haygrazer	0.33	2.67	1.32 *	0.37	4.37	4.70
Arc	0.29	2.71 *	1.27	0.34	4.32	4.61
Cimarron-3i	0.30	2.54	1.33 *	0.38	4.24	4.55
Mean	0.36	2.78	1.39	0.41	4.59	4.94
CV, %	19.36	10.29	10.57	17.22	7.5	7.31
LSD, 0.05	0.1	0.41	0.21	0.1	0.49	0.51
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.						

Table 10. Dry matter yields (tons/acre) of alfalfa varieties sown 14 May 1998 at Bowling Green, Kentucky.							
Variety	1998 Total	1999 Harvests				1999 Total	2-yr Total
		May 21	Jun 17	Jul 21	Nov 12		
Commercial Varieties—Available for Farm Use							
DK 141	0.37 *	2.00 *	1.23 *	1.14 *	0.49 *	4.86 *	5.23 *
DK 140	0.39 *	2.02 *	1.42 *	0.92 *	0.41	4.77 *	5.16 *
Pasture+	0.29 *	2.03 *	1.32 *	1.07 *	0.42	4.83 *	5.12 *
Cimarron 3i	0.33 *	1.91 *	1.25 *	1.04 *	0.51 *	4.70 *	5.03 *
ABT350	0.32 *	1.76	1.22 *	1.05 *	0.50 *	4.54 *	4.86 *
Geneva	0.29 *	1.88 *	1.25 *	1.00 *	0.41	4.53 *	4.82 *
ABT 400SCL	0.30 *	1.77	1.23 *	1.00 *	0.52 *	4.52 *	4.82 *
Emperor	0.30 *	1.75	1.24 *	1.16 *	0.35	4.50 *	4.80 *
Choice	0.27 *	2.01 *	1.17 *	0.90 *	0.41	4.49 *	4.76 *
WL326GZ	0.28 *	1.78	1.20 *	1.02 *	0.41	4.42 *	4.69 *
Baralfa 54	0.25	1.63	1.18 *	1.00 *	0.47 *	4.28 *	4.53 *
GoldPlus	0.28 *	1.76	1.04	0.92 *	0.43	4.15	4.43
Stellar	0.21	1.71	1.05	0.92 *	0.42	4.10	4.31
ProGro	0.23	1.72	1.00	0.91 *	0.40	4.02	4.25
Saranac-AR	0.26	1.70	0.85	0.84	0.47 *	3.87	4.13
Certified Arc	0.19	1.88 *	0.79	0.79	0.45 *	3.91	4.09
Vernal	0.20	1.69	0.89	0.79	0.28	3.65	3.85
Experimental Varieties—Not Available for Farm Use							
C416	0.41 *	1.80 *	1.22 *	1.07 *	0.55 *	4.64 *	5.05 *
ZC9651	0.33 *	1.82 *	1.09 *	0.94 *	0.49 *	4.34 *	4.68 *
A9503	0.23	1.90 *	1.14 *	0.87	0.47 *	4.39 *	4.62 *
ZC9751A	0.23	1.82 *	1.10 *	0.99 *	0.48 *	4.39 *	4.62 *
ZC9750A	0.25	1.84 *	1.08 *	0.91 *	0.51 *	4.35 *	4.60 *
ZG9641	0.32	1.81 *	1.19 *	0.94 *	0.33	4.27 *	4.59 *
ZC9650	0.27	1.76	1.04	0.94 *	0.45 *	4.19 *	4.45
ZG9640	0.19	1.83	1.06	0.92 *	0.37	4.19 *	4.38
Mean	0.28	1.82	1.13	0.96	0.44	4.35	4.63
CV,%	36.17	9.4	23.22	18.8	19.47	11.09	11.53
LSD, 0.05	0.14	0.24	0.37	0.26	0.12	0.68	0.75

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

Table 11. Dry matter yields (tons/acre) of alfalfa varieties sown 3 May 1999 at Lexington, Kentucky.			
Variety	1999 Harvests		1999 Total
	Jun 30	Aug 18	
Commercial Varieties—Available for Farm Use			
DK131HG	0.83 *	0.34 *	1.17 *
Cimarron-SR	0.82 *	0.27	1.09 *
54H69	0.79 *	0.30 *	1.09 *
Saranac-AR	0.79 *	0.26	1.05 *
TMF4355LH	0.76 *	0.28 *	1.04 *
Arc	0.76 *	0.28 *	1.04 *
Ameriguard 302+Z	0.71	0.32 *	1.03
LH4	0.75 *	0.26	1.01
Experimental Varieties—Not Available for Farm Use			
3A30	0.73	0.29 *	1.02
ZH9841H	0.74	0.28 *	1.02
Mean	0.77	0.29	1.06
CV, %	10.74	24.31	12.66
LSD, 0.05	0.08	0.07	0.13
* Not significantly different from the highest value in the column, based on the 0.05 LSD.			

Table 12. Dry matter yields of alfalfa varieties sown 13 April 1999 at Princeton, Kentucky			
Variety	1999 Harvests		1999 Total
	Jul 20	Nov 11	
Commercial Varieties—Available for Farm Use			
Amerigraze 401+Z	1.34 *	0.64 *	1.98 *
Cimarron-SR	1.26 *	0.69 *	1.95 *
WL327	1.23 *	0.72 *	1.95 *
54V54	1.28 *	0.65 *	1.94 *
Arc	1.22 *	0.70 *	1.93 *
Reward	1.17 *	0.76 *	1.93 *
53Q60	1.19 *	0.72 *	1.90 *
W318	1.17 *	0.73 *	1.90 *
5246	1.18 *	0.71 *	1.89 *
TMF4464	1.21 *	0.66 *	1.88 *
DK 140	1.20 *	0.68 *	1.88 *
WL325HQ	1.27 *	0.57 *	1.85 *
Geneva	1.11	0.74 *	1.85 *
DK 141	1.18 *	0.67 *	1.85 *
Affinity+Z	1.10	0.75 *	1.85 *
W326	1.18 *	0.64 *	1.82 *
ABT 350	1.16 *	0.62 *	1.78 *
Abilene+Z	1.08	0.63 *	1.70 *
ABT 400SCL	1.09	0.62 *	1.70 *
Experimental Varieties—Not Available for Farm Use			
GA-AG-MPX	1.20 *	0.68 *	1.89 *
C416	1.12 *	0.71 *	1.83 *
A9503	1.02	0.69 *	1.72 *
Mean	1.18	0.68	1.86
CV,%	13.19	20.2	12.42
LSD, 0.05	0.22	0.19	0.33
* Not significantly different from the highest numerical value in the column, based on the 0.05 LSD.			



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