



AGRONOMY PROGRESS REPORT

2023 CALIFORNIA ALFALFA VARIETY TRIAL RESULTS

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SUMMARY

This publication details alfalfa yield trial data conducted in California for the year 2023. Yield trials were conducted in the Intermountain area (Tulelake), the San Joaquin Valley (Parlier) the Imperial Valley (El Centro) and the Sacramento Valley (Davis). A total of 169 varieties were tested, from 4 to 7 cuts/year, with a total of 3,260 yield observations. Trials were conducted on UC field research facilities around the state. The alfalfa variety trial data from the University of California is placed online well in advance of this published report, see (<https://alfalfa.ucdavis.edu> –click on variety).

INTRODUCTION

Choosing superior varieties of alfalfa is a significant economic factor for alfalfa growers. A number of commercial varieties are currently available, enabling a wide range of options in the different fall dormancy (FD) groups. These UC trials provide unbiased data from a wide range of environments related to variety performance of alfalfa. In California, alfalfa is grown from the Oregon border to the Mexican border, and throughout the Central Valley, which consists of the Sacramento and San Joaquin Valleys (Figure 1). These sites represent 3-4 cut systems (dormant varieties) in the **Intermountain Region**, 6-8 cut systems (semi-dormant, or non-dormant varieties) in the **Northern Central Valley (Sacramento Valley)**, 7-8 cut systems (semi-

California Alfalfa Acreages by Section

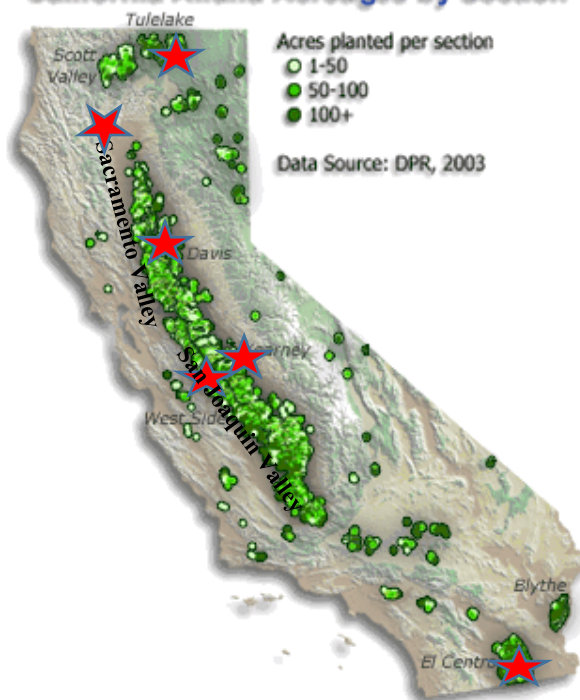


Figure 1. California alfalfa acreage. The Intermountain region is represented by Tulelake and Scott Valley, Sacramento Valley by Davis, San Joaquin Valley by Parlier and Five Points locations.

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dormant to non-dormant varieties) in the **Southern Central Valley (San Joaquin Valley)** and 8-11 cut systems (non-dormant varieties) in the **Low Desert**. These data are frequently used by growers to choose varieties, and by breeders to help guide further selection. Both private and public varieties are tested, and experimental lines as space allows. This report provides single year and over-the-year summary from alfalfa trials harvested in California in 2023.

VARIETY TESTING METHODS

Yield Trials. The California Alfalfa Cultivar Yield, Fall Dormancy, and Forage Quality Trials are open to any certified alfalfa cultivar, which is sold or is likely to be sold in California. Blends or brands (unless they are certified blends) are not included. Two alfalfa-variety yield trials were harvested in 2023 at Tulelake and Parlier. Two trials were planted at El Centro and Davis, CA. Specific planting dates for each trial are given on the results table for each trial. Seed was planted at approximately 25 lbs./acre live seed in 3' to 4' wide plots x 18 to 20 feet long, depending upon location and specific layout. Four to six replicates of each cultivar were planted at each location, depending upon the expected variation at that site. Experimental design was a randomized complete block design. Harvests for yield estimation were obtained from approximately a 3' x 18' area per plot using a flail-type or cutter-bar type forage harvester, and dry matter yield determined by oven-drying subsamples to a constant weight. A representative group of 5-6 varieties were taken at each harvest, and the average dry matter used for yield determination. Three to four harvests were taken in the Intermountain Region, while seven to eight cuttings taken in the Sacramento and San Joaquin valleys. Cutting schedules followed the most common practice in that region and are the same for all varieties within a trial. The data is obtained from each of the locations and analyzed and summarized at the UC Davis campus.

Note on Statistical Inference: We have elected to analyze and report significance of variety testing data (calculation of F-test and LSD Values) based upon a probability value of 10% vs. the traditional 5% level of uncertainty. In doing so, we are accepting a 90% confidence level vs. a 95% confidence level. This is due to the fact that growers routinely base decisions based upon degrees of confidence that are far lower than 95% confidence levels. A 10% probability level (the probability that the declared difference is based solely upon chance) is sufficiently conservative to prevent choosing varieties based upon false differences, yet represents good mean separation. Such decisions are always a compromise between practical factors and statistical vigor.

2023 YIELD RESULTS

Intermountain Region

2021 UC Tulelake Variety Trial- This 24 entry trial was planted 8/19/21. Four harvests were taken in 2023, the second year of harvest. The average yield for this trial was 7.8 t/A with a spread of 7.1-8.4 t/A among varieties (Table 1). Multi-year yield averaged 7.7 t/A, with both years being very similar in production (Table 2)

Sacramento Valley Region

2023 UC Davis Variety Drought Trial. This trial was planted Sept.28, 2023 and includes 42 entries. The purpose of this trial is to address water limitations in the state, and test the performance of commercial and experimental non-dormant varieties grown under full and deficit irrigation regimes. The trial is a split-plot arrangement with 5 reps. The main plot is irrigation strategy (Full irrigation- 100% of ET requirement, and deficit summer irrigation cut-off from July1-Sept30) with variety as subplots. Harvest yield will be measured beginning in the spring of 2024.

Low Desert Region

2023 El Centro Variety Drought Trial. Planted Nov 1, 2023 at the Desert Research and Extension Center. This trial includes 40 entries, and will be grown under the full and deficit irrigation as in Davis. 24 entries are duplicated between Davis and El Centro to assess variety performance under very different production environments. Data collection for yield will begin spring of 2024.

San Joaquin Valley Region

2021 UC Kearney Yield Trial- Trial was planted Oct. 19, 2021 and includes 26 entries. This was the second year of harvest. Six harvests were taken during the 2023 season with the first cut on June 7. The trial had heavy weed pressure, and was trimmed in May without taking yields. The average yield across varieties was 7.3tons/acre, with a spread of 5.6-9.2 tons/acre between the lowest and highest yielding varieties (Table 3). The two-year average yield was 9.0 t/A, with 2022 average 3.4 t/A higher than 2023, which is not surprising due to an extra cutting in May (Table 4).

INTERPRETING YIELD TRIAL RESULTS

We suggest the following procedure for selecting varieties:

1. **Select a group of high-yielding varieties** for your region (generally the top ¼ to 1/3 of a trial which is closest to your area) from Tables 1-9 in the multiple-year summaries (or from our website). Since this report contains single-year summaries, we recommend that you see the over-the years summaries from the relevant locations which is on our website: <http://alfalfa.ucdavis.edu>
2. **Determine the Pest Resistance and Fall Dormancy needs** for your region. The FD scores are provided on these tables and in the Alfalfa Alliance Website. Please see <https://www.alfalfa.org/varietyLeaflet.php> for a current (2022) listing of available alfalfa varieties marketed in the US along with pest resistance ratings.
3. **Consider the Fall Dormancy (FD) and pest resistance Ratings** of individual varieties – available at the National Alfalfa and Forage Alliance Website (www.alfalfa.org).

4. **Choose a group of high yielding varieties** with the best Pest Resistance package for your region.
5. **Consider evidence for high quality** if available (such information is not always widely available, but generally more dormant varieties tend to be higher in quality). HarvXtra is a trait that confers higher quality, and yields normally when combined with later cutting schedules.
6. **Consider biotech traits** such as glyphosate-resistance and the HarvXtra trait. RR should be compared as a comprehensive weed control strategy, not just a variety.
7. **Test a variety in strips on your farm** to see how it does under your soil conditions.
8. **Consider the price of seed, availability and service.**

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Table 1. 2023 YIELDS, TULELAKE ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 8/19/21

Note: Single year data should not be used to evaluate alfalfa varieties or choose alfalfa cultivars

		Cut 1	Cut 2	Cut 3	Cut 4	YEAR		% of
		14-Jun	19-Jul	25-Aug	28-Sep	TOTAL		VERNAL
	FD	Dry t/a						
Released Varieties								
AWS 418RL	4	2.70 (6)	2.25 (6)	1.96 (1)	1.45 (6)	8.37 (1)	A	117.2
54VQ52	4	2.63 (7)	2.29 (5)	1.80 (11)	1.33 (12)	8.05 (2)	A B	112.7
AFX 439	4	2.47 (10)	2.39 (2)	1.86 (4)	1.32 (14)	8.04 (3)	A B	112.6
Ameristand 446NT	4	2.13 (24)	2.12 (17)	1.86 (5)	1.91 (1)	8.02 (4)	A B C	112.3
Ameristand 428TQ	4	2.40 (16)	2.42 (1)	1.69 (19)	1.47 (5)	7.98 (5)	A B C D	111.7
6453Q	4	2.47 (11)	2.30 (4)	1.85 (6)	1.36 (10)	7.98 (6)	A B C D	111.7
Ameristand 518NT	5	2.42 (14)	2.17 (10)	1.85 (7)	1.51 (4)	7.94 (7)	B C D	111.1
6585Q	5	2.41 (15)	2.12 (18)	1.86 (3)	1.54 (3)	7.94 (8)	B C D	111.1
HybriForce-4420/Wet	4	2.73 (4)	2.06 (20)	1.77 (15)	1.32 (13)	7.88 (9)	B C D E	110.4
Nexgrow 6516R	4.5	2.35 (19)	2.14 (14)	1.93 (2)	1.43 (9)	7.84 (10)	B C D E F	109.8
WL377 HQ	5	2.72 (5)	2.05 (23)	1.83 (9)	1.16 (19)	7.77 (12)	B C D E F	108.7
Ameristand 416NT RR	4	2.28 (22)	2.15 (12)	1.77 (16)	1.55 (2)	7.75 (13)	B C D E F	108.5
WL341 HVXRR	4	2.44 (12)	2.35 (3)	1.69 (20)	1.28 (16)	7.75 (14)	B C D E F	108.5
AWS 455 salt	4	2.75 (2)	2.15 (11)	1.79 (13)	1.05 (22)	7.74 (15)	B C D E F	108.4
LG5R300	5	2.43 (13)	2.13 (16)	1.80 (10)	1.35 (11)	7.71 (16)	B C D E F	107.9
LG4R300	4	2.32 (21)	2.18 (9)	1.70 (18)	1.44 (7)	7.64 (17)	C D E F	107.0
WL375 HVXRR	4.6	2.27 (23)	2.20 (7)	1.85 (8)	1.32 (15)	7.63 (18)	C D E F	106.9
WL3441 RR	4	2.33 (20)	2.13 (15)	1.72 (17)	1.44 (8)	7.62 (19)	D E F	106.6
54Q29	4	2.63 (8)	2.06 (21)	1.69 (22)	1.16 (20)	7.53 (20)	E F G	105.4
Bison Alfalfa	3.5	2.37 (18)	2.15 (13)	1.77 (14)	1.19 (18)	7.49 (21)	F G H	104.8
AWS 390	3.9	2.38 (17)	2.07 (19)	1.79 (12)	1.21 (17)	7.45 (22)	F G H	104.3
Vernal	2	2.79 (1)	2.06 (22)	1.45 (24)	0.85 (24)	7.14 (23)	G H	100.0
Magna150RR	4	2.48 (9)	1.93 (24)	1.67 (23)	1.03 (23)	7.12 (24)	H	99.7
Experimental Varieties								
SW4615	5	2.74 (3)	2.19 (8)	1.69 (21)	1.15 (21)	7.77 (11)	B C D E F	108.8
MEAN		2.49	2.17	1.78	1.33	7.76		
CV		5.51	9.00	7.03	12.14	4.21		
LSD (0.1)		0.17	NS	0.15	0.20	0.40		

Trial seeded at 25 lb/acre viable seed at Intermountain Research and Extension Center, Tulelake, CA.

Entries followed by the same letter are not significantly different at the 10% probability level according to Fisher's (protected) LSD.

FD = Fall Dormancy reported by seed companies.

Table 2. 2022-2023 YIELDS, TULELAKE ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 8/19/21

		2022	2023			% of
		Yield	Yield	Average		Vernal
	FD		Dry t/a			
Released Varieties						
AWS 418RL	4	7.87 (7)	8.37 (1)	8.12 (1)	A	110.5
HybriForce-4420/Wet	4	8.11 (3)	7.88 (9)	8.00 (2)	A B	108.9
54VQ52	4	7.90 (4)	8.05 (2)	7.97 (3)	A B C	108.5
54Q29	4	8.26 (2)	7.53 (20)	7.89 (4)	A B C D	107.4
6453Q	4	7.70 (9)	7.98 (6)	7.84 (5)	A B C D E	106.7
Ameristand 428TQ	4	7.66 (10)	7.98 (5)	7.82 (7)	A B C D E	106.4
AWS 455 salt	4	7.87 (6)	7.74 (15)	7.81 (8)	A B C D E	106.2
AFX 439	4	7.56 (12)	8.04 (3)	7.80 (9)	A B C D E F	106.2
WL377 HQ	5	7.71 (8)	7.77 (12)	7.74 (10)	B C D E F G	105.3
Magna150RR	4	8.33 (1)	7.12 (24)	7.73 (11)	B C D E F G	105.2
6585Q	5	7.48 (14)	7.94 (8)	7.71 (12)	B C D E F G	104.9
Nexgrow 6516R	4.5	7.46 (15)	7.84 (10)	7.65 (13)	B C D E F G H	104.2
Ameristand 446NT	4	7.25 (22)	8.02 (4)	7.64 (14)	C D E F G H	103.9
WL341 HVXRR	4	7.42 (16)	7.75 (14)	7.59 (15)	D E F G H	103.2
LG5R300	5	7.41 (17)	7.71 (16)	7.56 (16)	D E F G H	102.9
Bison Alfalfa	3.5	7.64 (11)	7.49 (21)	7.56 (17)	D E F G H	102.9
Ameristand 518NT	5	7.16 (23)	7.94 (7)	7.55 (18)	D E F G H	102.8
Ameristand 416NT RR	4	7.32 (20)	7.75 (13)	7.53 (19)	E F G H	102.6
WL375 HVXRR	4.6	7.37 (18)	7.63 (18)	7.50 (20)	E F G H	102.1
LG4R300	4	7.25 (21)	7.64 (17)	7.45 (21)	F G H	101.4
AWS 390	3.9	7.35 (19)	7.45 (22)	7.40 (22)	G H	100.7
WL3441 RR	4	7.08 (24)	7.62 (19)	7.35 (23)	H	100.0
Vernal	2	7.55 (13)	7.14 (23)	7.35 (24)	H	100.0
Experimental Varieties						
SW4615	5	7.87 (5)	7.77 (11)	7.82 (6)	A B C D E	106.5
MEAN		7.61	7.76	7.68		
CV		5.11	4.21	3.79		
LSD (0.1)		0.47	0.40	0.35		

Trial seeded at 25 lb/acre viable seed at Intermountain Research and Extension Center, Tulelake, CA.

Entries followed by the same letter are not significantly different at the 10% probability level according to Fisher's (protected) LSD.

FD = Fall Dormancy reported by seed companies.

Table 3. 2023 YIELDS, UC KEARNEY ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 10/19/21

Note: Single year data should not be used to evaluate alfalfa varieties or choose alfalfa cultivars

		Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Cut 6	YEAR		% of
		7-Jun	6-Jul	4-Aug	30-Aug	4-Oct	1-Nov	TOTAL		CUF101
	FD	Dry t/a								
WL 668HQ.RR	9	2.08 (1)	2.51 (2)	1.65 (1)	1.03 (1)	0.99 (1)	0.91 (1)	9.16 (1)	A	144.5
NM1705PAR	8	2.06 (3)	2.65 (1)	1.55 (3)	0.80 (6)	0.79 (6)	0.77 (2)	8.62 (2)	A B	135.9
NM1703PAR	8	2.06 (2)	2.48 (3)	1.42 (5)	0.86 (2)	0.89 (2)	0.73 (3)	8.45 (3)	A B C	133.2
Alphatec 921	9	2.05 (4)	2.46 (4)	1.57 (2)	0.75 (10)	0.73 (10)	0.66 (11)	8.24 (4)	A B C D	129.9
6829R	8	1.90 (6)	2.36 (7)	1.49 (4)	0.84 (4)	0.86 (4)	0.72 (5)	8.17 (5)	A B C D	128.8
Magna 995	9	1.79 (9)	2.37 (6)	1.33 (10)	0.85 (3)	0.89 (2)	0.70 (6)	7.94 (6)	A B C D E	125.1
Alphatec 821	8	2.04 (5)	2.39 (5)	1.42 (6)	0.66 (17)	0.70 (15)	0.64 (15)	7.85 (7)	A B C D E	123.7
NM170506PAR	7	1.79 (9)	2.33 (8)	1.17 (16)	0.79 (7)	0.80 (5)	0.69 (9)	7.57 (8)	A B C D E	119.4
AmeriStand 835NT RF	8	1.83 (8)	2.25 (11)	1.30 (11)	0.72 (13)	0.70 (14)	0.65 (13)	7.45 (9)	B C D E	117.5
Ameristand 901TS	9	1.73 (15)	2.26 (10)	1.34 (8)	0.64 (22)	0.75 (9)	0.69 (9)	7.42 (10)	B C D E	117.1
AmeriStand 803T	8	1.84 (7)	2.23 (13)	1.34 (9)	0.66 (18)	0.67 (19)	0.62 (17)	7.37 (11)	B C D E F	116.2
Highline	9	1.60 (17)	2.11 (18)	1.29 (12)	0.80 (5)	0.65 (22)	0.73 (4)	7.18 (12)	B C D E F G	113.3
SW 9813s	9	1.53 (18)	2.17 (15)	1.37 (7)	0.70 (15)	0.75 (8)	0.65 (12)	7.18 (13)	B C D E F G	113.2
NM1702PAR	7	1.62 (16)	2.25 (11)	1.21 (13)	0.71 (14)	0.71 (12)	0.65 (13)	7.16 (14)	B C D E F G	112.9
WL 656HQ	9	1.53 (18)	2.09 (19)	1.21 (13)	0.79 (8)	0.79 (6)	0.70 (7)	7.12 (15)	B C D E F G	112.3
HybriForce-4420/Wet	4	1.79 (9)	2.30 (9)	1.19 (15)	0.66 (19)	0.70 (13)	0.48 (25)	7.11 (16)	B C D E F G	112.1
SW 9812	9	1.75 (13)	2.08 (20)	1.17 (17)	0.70 (16)	0.69 (17)	0.64 (15)	7.02 (17)	B C D E F G	110.8
RRALF 9R100	9	1.50 (21)	2.13 (17)	1.16 (19)	0.76 (9)	0.73 (10)	0.60 (19)	6.88 (18)	C D E F G	108.4
RRL913T455	8	1.76 (12)	2.02 (22)	1.16 (19)	0.64 (22)	0.67 (21)	0.61 (18)	6.85 (19)	C D E F G	108.1
NM1704PAR	7	1.51 (20)	2.17 (14)	1.17 (17)	0.65 (20)	0.62 (23)	0.56 (22)	6.69 (20)	D E F G	105.5
6601N	6	1.73 (14)	2.16 (16)	1.16 (19)	0.55 (25)	0.53 (25)	0.52 (23)	6.64 (21)	D E F G	104.7
NM1701PAR	7	1.49 (22)	2.05 (21)	1.10 (22)	0.73 (11)	0.67 (19)	0.59 (21)	6.62 (22)	D E F G	104.3
Ameristand 715NT RF	7	1.44 (23)	2.02 (22)	1.09 (23)	0.65 (21)	0.69 (16)	0.51 (24)	6.40 (23)	E F G	100.9
CUF101	9	1.40 (24)	1.82 (26)	1.01 (24)	0.73 (11)	0.68 (18)	0.70 (7)	6.34 (24)	E F G	100.0
Magna 801FQ	8	1.13 (26)	1.88 (25)	0.92 (26)	0.61 (24)	0.62 (23)	0.60 (19)	5.76 (25)	F G	90.9
Ameristand 518 NT	5	1.36 (25)	1.89 (24)	1.00 (25)	0.48 (26)	0.47 (26)	0.37 (26)	5.58 (26)	G	88.0
MEAN		1.70	2.21	1.26	0.72	0.72	0.64	7.26		
CV		25.49	16.52	26.79	23.34	23.83	16.76	18.80		
LSD (0.1)		NS	NS	NS	0.20	0.21	0.13	1.65		

Trial seeded at 25 lb/acre viable seed on Hanford fine sandy loam soil at the Univ. of Calif. Kearney Agricultural Center, Parlier, CA.

Entries followed by the same letter are not significantly different at the 10% probability level according to Fisher's (protected) LSD.

FD = Fall Dormancy reported by seed companies.

*May harvest was weedy, and trimmed without harvesting for yield

Table 4. 2022-2023 YIELDS, UC KEARNEY ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 10/19/21

		2022	2023	Average	
		Yield	Yield		
	FD		Dry t/a		
WL 668HQ.RR	9	12.54 (1)	9.16 (1)	10.85 (1)	A
NM1705PAR	8	12.25 (2)	8.62 (2)	10.44 (2)	A B
NM1703PAR	8	11.49 (7)	8.45 (3)	9.97 (3)	A B C
Alphatec 921	9	11.63 (5)	8.24 (4)	9.94 (4)	A B C
6829R	8	11.49 (6)	8.17 (5)	9.83 (5)	A B C
AmeriStand 835NT RR	8	11.81 (3)	7.45 (9)	9.63 (6)	A B C D
Magna 995	9	10.91 (10)	7.94 (6)	9.42 (7)	A B C D E
SW 9813s	9	11.67 (4)	7.18 (13)	9.42 (8)	A B C D E
AmeriStand 803T	8	11.16 (8)	7.37 (11)	9.27 (9)	B C D E
NM170506PAR	7	10.95 (9)	7.57 (8)	9.26 (10)	B C D E
Alphatec 821	8	10.60 (17)	7.85 (7)	9.22 (11)	B C D E
Ameristand 901TS	9	10.75 (11)	7.42 (10)	9.09 (12)	B C D E
Highline	9	10.71 (13)	7.18 (12)	8.95 (13)	C D E F
NM1702PAR	7	10.60 (16)	7.16 (14)	8.88 (14)	C D E F
SW 9812	9	10.73 (12)	7.02 (17)	8.88 (15)	C D E F
WL 656HQ	9	10.51 (19)	7.12 (15)	8.81 (16)	C D E F
RRALF 9R100	9	10.63 (14)	6.88 (18)	8.75 (17)	C D E F G
NM1704PAR	7	10.59 (18)	6.69 (20)	8.64 (18)	C D E F G
NM1701PAR	7	10.61 (15)	6.62 (22)	8.61 (19)	C D E F G
RRL913T455	8	10.15 (21)	6.85 (19)	8.50 (20)	C D E F G
CUF101	9	10.31 (20)	6.34 (24)	8.33 (21)	D E F G
6601N	6	9.95 (22)	6.64 (21)	8.29 (22)	D E F G
Ameristand 715NT RR	7	9.59 (23)	6.40 (23)	8.00 (23)	E F G
HybriForce-4420/Wet	4	8.81 (26)	7.11 (16)	7.96 (24)	E F G
Magna 801FQ	8	9.38 (24)	5.76 (25)	7.57 (25)	F G
Ameristand 518 NT	5	9.06 (25)	5.58 (26)	7.32 (26)	G
MEAN		10.73	7.26	8.99	
CV		13.40	18.80	13.57	
LSD (0.1)		1.74	1.65	1.47	

Trial seeded at 25 lb/acre viable seed at San Joaquin Valley Agricultural Sciences Center, Parlier, CA.

Entries followed by the same letter are not significantly different at the 10% probability level according to Fisher's (protected) LSD.

FD = Fall Dormancy reported by seed companies.

*1st cut of 2023 not harvested for yield

SUGGESTED FALL DORMANCY RANGE AND MINIMUM ALFALFA CULTIVAR PEST RESISTANCE RATINGS FOR SIX CALIFORNIA CLIMATE ZONES. Growers selecting varieties from different regions should emphasize the pests that are most important for their area.

Production Zone	Rating Factor										
	FD	SAA	PA	BAA	PRR	BW	FW	An	Stn	RKN	VW
Intermountain	2--4	S	R	MR	R	R	HR	R	R	R	R
Sacramento Valley	4--8	MR	HR	HR	HR	MR	HR	R	R	R	R
San Joaquin Valley	7--9	R	HR	HR	HR	MR	HR	R	HR	HR	R
Coastal	5--7	MR	HR	HR	HR	MR	HR	R	HR	HR	R
High Desert	4--7	R	R	R	R	MR	HR	MR	HR	HR	R
Low Desert	8--9	HR	HR	HR	HR	S	HR	HR	R	HR	S

NOTE: These pest resistance recommendations were originally developed by Dr. Vern Marble, Extension Agronomist, UC Davis, based upon decades of experience with alfalfa varieties in various locations in California. Zones correspond to the principle regions of alfalfa production in California.

EXPLANATION OF PEST RESISTANCE. Alfalfa varieties consist of a population of plants which have varying degrees of resistance to an insect or disease. Since alfalfa fields can sustain considerable loss of individual plants without reducing productivity, alfalfa varieties with 51% or over are considered to be highly resistant, since resistant plants will make up for losses from other plants.

Resistance Level	Abbreviation	Percent resistance ¹
Highly Resistant	HR	>51%
Resistant	R	31-50%
Moderately Resistant	MR	15-30%
Low Resistance	LOW	6-14%
Susceptible	S	<5%
Tolerant	T	(see definition)

¹ Percent of plants in a population resistant to a given pest

Definitions

I - Immune -- Not subject to attack for a specified pest. Immunity is absolute, and seldom occurs in alfalfa.

R - Resistant -- The ability of plants to withstand pest attack. Resistance is not absolute but varies by degree. Even highly resistant varieties will have some plants that are susceptible (see above percentages). NOTE: Very high insect populations or very severe disease conditions can overwhelm pest resistance in alfalfa.

S - Susceptible -- Damage commonly occurs when in the presence of a specified pest. Inability of a variety to withstand adverse disease or insect conditions.

T - Tolerant -- Ability of plants to sustain yields when confronted with a pest attack or environmental condition (e.g. salt or grazing). Tolerant varieties are affected by the condition, but still maintain yields at high levels relative to less tolerant varieties.

