

## **AGRONOMY PROGRESS REPORT**

# **2016 CALIFORNIA ALFALFA VARIETY TRIAL RESULTS**

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### **ABSTRACT**

This publication details alfalfa yield trial data for multiple-year, single harvest, and single year summaries for the year 2016. Both conventional and Roundup-Ready (RR) lines have been tested. Yield trials were conducted in 5 regions in California: the Intermountain area (Tulelake), the Sacramento Valley (Davis), the San Joaquin Valley (Modesto, Parlier, and Five Points) and the Imperial Valley (El Centro). The alfalfa variety trial data from the University of California is placed online; often well in advance of this published report (<http://alfalfa.ucdavis.edu/>).

### **INTRODUCTION**

Choosing superior varieties of alfalfa is a significant economic factor for alfalfa growers. A large number of commercial varieties are currently available, enabling wide range of options. 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 Great 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 (dormant, semi-dormant, or non-dormant 90% varieties) in the **Northern Central Valley**, 7-8 cut systems (semi-dormant to non-dormant varieties) in the **Southern Central Valley** and 8-11 cut systems (non-dormant varieties) in the **Low Desert Environment** in the south.

**California Alfalfa Acreages by Section**

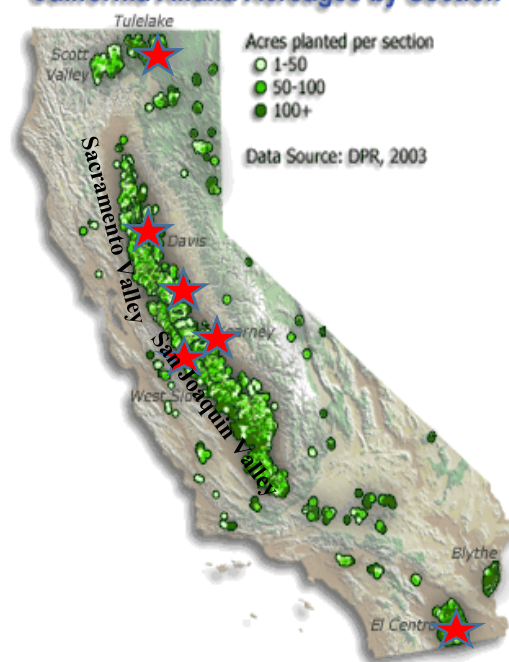
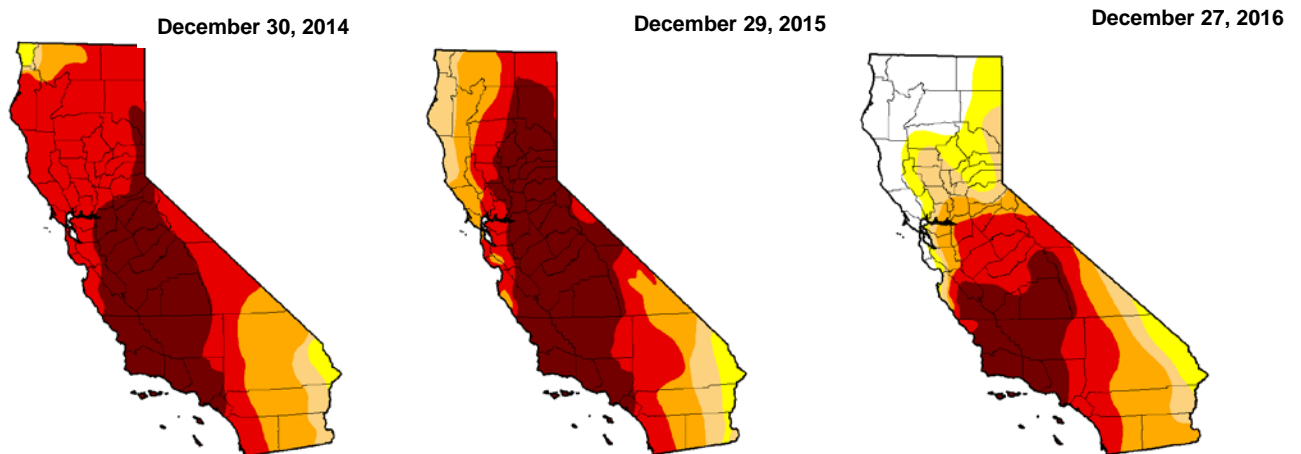


Figure 1. California alfalfa acreage. The Intermountain region is represented by Tulelake and Scott Valley, Sacramento Valley by Davis, San Joaquin Valley by Modesto, Parlier and Five Points Locations, and Low Desert by the El Centro trial.

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Both private and public varieties and experimental lines are tested. These data are frequently used by growers to choose varieties, and by breeders to help guide further selection. We test both private and public varieties, and experimental lines destined for release within the next few years. This report provides single year and over-the-year summary from alfalfa trials harvested in California in 2016.



**Figure 2.** Progression of California drought, 2014-2016. Darkest red = ‘Exceptional Drought’, red = ‘Extreme Drought’, Orange = ‘Severe Drought’ and lighter yellows are ‘Moderate Drought to Abnormally Dry’. Source: US Drought Monitor: USDGS, National Drought Mitigation Center, Lincoln, NE. USDA, NOAA.

## 2016 ALFALFA PRODUCTION YEAR

With California’s continuing drought conditions, there are increased water limitations in most regions due to low water supplies for irrigation. Figure 2 shows the drought conditions which prevailed during most of this testing period, and have been mitigated to some degree in late 2016, but still continue at this writing. Many alfalfa growers stopped watering their crops mid-season in 2014, 2015 and 2016. Since all of the CA alfalfa sites are conducted with irrigation, this did not largely affect the yields reported here (we have conducted deficit irrigation trials which are reported elsewhere). While temperatures remained relatively seasonal during the production season, early rained-on hay was experienced by many in the Central Valley in 2016.

The price of alfalfa hay plummeted in 2015-16 compared with the previous two years, and remained low for much of 2016. Lower quality hays were especially affected. Exports, however, increased substantially in 2016 compared with previous years. NASS reports an increase in alfalfa production in 2016 compared to the previous year. A weak domestic dairy profitability combined with oversupply of lower-quality hays and low commodity prices were important. These factors resulted in lower prices in hay than was experienced in previous years. Other than the ongoing drought conditions, seasonal temperatures were relatively normal.

## TESTING ALFALFA VARIETIES - 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 in these trials. Experimental cultivars with a high likelihood of release within the next few years are tested as space permits. In the fall of 2016 two new trials were established: a new El Centro trial was planted on 10/19/16, and Tulelake trial was planted on 9/23/16. There was an unseasonable cold spell in early September which destroyed the new stand of alfalfa at Tulelake. A replant is scheduled for spring 2017 in Tulelake. Also, planned for early 2017 is a drip-irrigated salinity trial at Westside Field Station.

Six alfalfa variety yield trials were harvested at Tulelake, Davis, Modesto, Parlier, Five Points and El Centro, CA in 2016. Specific planting dates for each trial are given on the results table for each trial. The plantings were at approximately 25 lbs/acre live seed. Plots were 3' to 4' wide and 13 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 up to nine cuttings were taken in the Imperial Valley. Cutting schedules were determined by 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:** Since 2006, 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%. 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 than is commonly used. 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 but yet represents good mean separation. Such decisions are always a compromise between practical factors and statistical vigor.

## 2016 YIELD RESULTS

### *Intermountain Region*

**2013 UC Tulelake Yield Trial --** -- This trial was planted with 42 entries on August 21, 2013. Four cuttings were taken during the 2016 season with the first cutting taking place on June 8, 2016. Single year results from the 2016 harvests are provided in Table 1. The average yield across all varieties was 6.9 tons/acre. The yearly yield averages between high and low varieties varied by approximately one ton or about 15% of the lowest yielding line. Yields averaged over the three-year trial were a little over 8.2 tons/acre (Table 2). The across-the-years yield average

between high and low varieties varied 1.4 tons/acre. The CVs were relatively low, indicating control of varieties was stable over each cut in this trial. Also, included in this trial were plots inoculated with 4 seed treatment combinations using alfalfa variety Integra8420. These treatments include: Optimize Gold Plus (OGP), Rhizobia with an LCO promoter; an isoflavinoid (EM-09009); and Quick Roots (QR), a microbial seed inoculant.

### ***Sacramento Valley Region***

***2014 UC Davis Yield Trial***– This trial was planted with 36 entries September 9, 2014 in the U.C. Davis research fields. This trial was conducted with subsurface drip irrigation. Six cuttings were taken during the 2016 season with the first cutting of the season on April 6, 2016 (Table 3). The yield average for all varieties was 7.3 tons/acre over 6 cuttings. The October cutting was not recorded, and is estimated to be approximately 1.0 tons/acre average yield. The yearly yield average between high and low varieties had a 1.6 tons/acre spread. The CVs were moderate, indicating control of varieties was stable over each cut in this trial. The two-year summary is provided in Table 4.

### ***San Joaquin Valley Region***

***2014 UC Modesto Yield Trial***-- Trial was planted with 36 entries October 9, 2014 at the Stanislaus Farm Supply research fields in Modesto, CA. Reported here is the second year for the Stanislaus Yield Trial (Table 5). Harvests were taken by Stan Farm Supply staff, but yields were coded so that only UC personnel were able to access. Eight cuttings were taken during the 2016 season with the first cutting on March 29, 2015. The average yield across all varieties was 14 tons/acre. The yearly yield averages between high and low varieties showed a 6 tons/acre difference, or 42% of the mean. The fall dormancy ranges were from 5-10 in this trial. The two-year summary is provided in Table 6.

***2013 UC Kearney Yield Trial*** – This is the final year of yield data for the Kearney Trial located at Parlier, CA. Eight cuttings were conducted during the 2016 season with the first cutting taking place on April 13. Single year results from the 2016 harvests are provided in Table 7. The average yield across all varieties was slightly over 12 tons/acre. The yearly yield averages between high and low varieties were 3.3 tons/acre difference. The fall dormancy ranges were from 7-10. The yield summary of 3 years of production (Table 8) show differences from highest to lowest yielding variety were 3.0 tons/acre. The average yield across all varieties was 12.2 tons/acre. Also, included in this trial were plots inoculated with 4 seed treatment combinations using alfalfa variety Catalina. These treatments include: Optimize Gold Plus (OGP), Rhizobia with an LCO promoter; an isoflavinoid (EM-09009); and Quick Roots (QR), a microbial seed inoculant.

***2014 UC Westside Salinity Yield Trial*** – This variety trial was established October 9, 2014 with 36 varieties in 5 replications at the West Side Research and Extension Center, Five Points, CA. This includes proper controls (salt tolerant and salt susceptible lines developed for greenhouse screening by seed companies). Tables 9-10 present the yields per cut, and season total of low and high-salinity treatments. Table 11 shows the relative yield of varieties grown under low-

salinity conditions compared to high-salinity (EC 9-11). Data show a quite low yield penalty, around 1.0 t/A, suggesting alfalfa as a crop is tolerant of high-saline conditions. Very high CV% must be taken into consideration. We have less confidence in differences with varieties, and hypothesize these differences had more to do with the inability to provide sufficient water uniformity across a small trial. A future salinity tolerance trial is planned for early 2017, with plans to use subsurface drip irrigation (SDI) to supply water more uniformly.

### ***Low Desert Region***

**2016 New Planting** – A new alfalfa yield trial was established on October 19, 2016 at the Desert Research and Extension Center in Holtville, CA. The trial includes 30 entries with 6 replications.

### **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 over-the year's 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 (see #3).
3. **Consider the Fall Dormancy and Pest resistance Ratings** of individual varieties – available at the Alfalfa Alliance Website ([www.alfalfa.org](http://www.alfalfa.org)).
4. **Choose those 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).
6. **Consider Biotech Traits** such as the Glyphosate-Resistance. This should be compared as a comprehensive weed control strategy, not just a variety.
7. **Test a variety on portions of your farm** to see how it does under your soil conditions.
8. **Consider the price of seed, availability and Service.**

### **ACKNOWLEDGMENTS**

The authors are grateful for the help of Dale Pattigan and staff for help with the field plots at UC Kearney Ag Center, Rafael Solorio and crew for help with the field plots at Westside Research and Extension Center, Rob Wilson's crew at the Intermountain Research and Extension Center, Paul McCormick at the Stanislaus Farms facility, Francisco Maciel's crew at the Desert Research and Extension Center, and Jim Jackson for help on the U.C. Davis plots.

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**Table. 1. 2016 YIELDS, TULELAKE ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 8/21/13**

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
	FD	8-Jun	12-Jul	9-Aug	28-Sep	TOTAL		VERNAL
		Dry t/a						
<b>Released Varieties</b>								
Integra 8401RR	4	2.43 ( 1)	2.13 ( 2)	1.42 ( 5)	1.48 ( 9)	7.46 ( 1)	A	108.4
Integra 8420 (EM)	4	2.36 ( 3)	2.01 (16)	1.42 ( 4)	1.56 ( 2)	7.36 ( 2)	A B	106.8
Integra 8420 (OGP)	4	2.35 ( 4)	1.97 (25)	1.41 ( 6)	1.56 ( 1)	7.29 ( 3)	A B C	105.9
Archer III	5	2.33 ( 7)	2.09 ( 3)	1.28 (33)	1.48 (10)	7.17 ( 6)	A B C D E	104.2
Trophy	4	2.35 ( 5)	1.99 (21)	1.23 (37)	1.52 ( 5)	7.09 ( 7)	A B C D E F	103.0
RR NemaStar	4	2.12 (31)	2.05 ( 9)	1.44 ( 3)	1.45 (17)	7.06 ( 8)	A B C D E F G	102.6
Integra 8420 (OGP+EM)	4	2.25 (12)	1.93 (34)	1.40 ( 9)	1.46 (16)	7.04 ( 9)	B C D E F G H	102.3
AmeriStand 455TQ RR	4	2.15 (27)	2.15 ( 1)	1.46 ( 1)	1.27 (40)	7.03 (10)	B C D E F G H	102.0
Integra 8400	4	2.09 (34)	2.06 ( 6)	1.32 (25)	1.56 ( 3)	7.02 (11)	B C D E F G H	102.0
Nimbus	5	2.13 (28)	2.03 (11)	1.36 (16)	1.47 (13)	6.99 (12)	B C D E F G H I	101.6
6516R	5	2.22 (16)	2.05 ( 7)	1.40 ( 7)	1.31 (33)	6.98 (14)	B C D E F G H I	101.4
Integra 8444RR	4	2.21 (18)	2.01 (18)	1.36 (19)	1.40 (24)	6.98 (15)	B C D E F G H I	101.3
DG 4210	4	2.15 (25)	2.03 (12)	1.44 ( 2)	1.33 (29)	6.95 (16)	B C D E F G H I	101.0
Mutiny	4	2.18 (21)	1.96 (27)	1.40 ( 8)	1.41 (21)	6.95 (17)	B C D E F G H I	101.0
WL 363HQ	5	2.17 (22)	2.02 (15)	1.33 (22)	1.44 (18)	6.95 (18)	B C D E F G H I	100.9
6401N	4	2.16 (23)	1.94 (30)	1.36 (17)	1.47 (12)	6.94 (20)	C D E F G H I	100.8
Integra 8420	4	2.21 (17)	1.88 (40)	1.38 (12)	1.47 (14)	6.94 (21)	C D E F G H I	100.8
Integra 8420 (QR)	4	2.16 (24)	1.90 (39)	1.37 (13)	1.48 (11)	6.91 (22)	C D E F G H I J	100.4
Vernal	2	2.25 (13)	1.98 (23)	1.24 (36)	1.41 (22)	6.89 (23)	C D E F G H I J	100.0
DKA43-22RR	4	2.20 (20)	2.04 (10)	1.32 (24)	1.32 (32)	6.87 (24)	D E F G H I J	99.8
Rhino	4	2.32 ( 9)	1.93 (33)	1.20 (41)	1.42 (20)	6.87 (25)	D E F G H I J K	99.7
WL 354HQ	4	2.25 (14)	1.95 (29)	1.31 (27)	1.35 (28)	6.86 (26)	D E F G H I J K	99.6
AmeriStand 415NT RR	4	2.10 (33)	2.02 (14)	1.32 (23)	1.40 (23)	6.85 (27)	D E F G H I J K	99.5
Camas	4	2.13 (29)	1.92 (36)	1.39 (10)	1.40 (25)	6.85 (28)	D E F G H I J K	99.4
6547R	4	2.12 (30)	2.02 (13)	1.37 (14)	1.33 (30)	6.84 (30)	D E F G H I J K	99.3
DKA 44-16RR	4	2.21 (19)	2.01 (19)	1.29 (30)	1.30 (35)	6.81 (31)	D E F G H I J K	98.9
AmeriStand 427	4	2.24 (15)	1.97 (24)	1.28 (32)	1.29 (36)	6.79 (32)	E F G H I J K	98.6
6585Q	5	1.98 (41)	1.92 (38)	1.35 (20)	1.46 (15)	6.71 (33)	F G H I J K	97.5
6422Q	4	2.08 (35)	1.98 (22)	1.30 (29)	1.32 (31)	6.68 (35)	F G H I J K	97.0
AmeriStand 445NT	4	2.10 (32)	1.95 (28)	1.23 (38)	1.40 (26)	6.68 (36)	F G H I J K	97.0
RR Tonnica	5	2.03 (40)	1.99 (20)	1.36 (18)	1.29 (37)	6.67 (37)	G H I J K	96.8
6497R	4	2.15 (26)	1.87 (42)	1.32 (26)	1.31 (34)	6.65 (38)	H I J K	96.6
WL 372HQ.RR	4	2.04 (39)	1.96 (26)	1.36 (15)	1.27 (41)	6.64 (39)	H I J K	96.4
Masterpiece II	4	2.05 (36)	1.92 (37)	1.21 (39)	1.43 (19)	6.61 (40)	I J K	96.0
<b>Experimental Varieties</b>								
FG 49W201	5	2.27 (11)	2.07 ( 4)	1.39 (11)	1.49 ( 8)	7.22 ( 4)	A B C D	104.8
SW4332	4	2.33 ( 8)	2.07 ( 5)	1.29 (31)	1.53 ( 4)	7.21 ( 5)	A B C D	104.8
SW4351	4	2.36 ( 2)	1.93 (35)	1.20 (40)	1.51 ( 6)	6.99 (13)	B C D E F G H I	101.6
FG R49W215	4	2.34 ( 6)	2.05 ( 8)	1.28 (34)	1.28 (39)	6.95 (19)	B C D E F G H I	100.9
SW4328	4	2.04 (38)	2.01 (17)	1.31 (28)	1.49 ( 7)	6.85 (29)	D E F G H I J K	99.4
FG 49W202	5	2.04 (37)	1.94 (31)	1.33 (21)	1.39 (27)	6.70 (34)	F G H I J K	97.2
SW3304	3	2.31 (10)	1.87 (41)	1.19 (42)	1.13 (42)	6.51 (41)	J K	94.5
FG R57OK217	5	1.97 (42)	1.94 (32)	1.27 (35)	1.28 (38)	6.46 (42)	K	93.8
MEAN		2.19	1.99	1.33	1.40	6.91		
CV		8.06	6.25	6.85	8.38	5.00		
LSD (0.1)		0.21	NS	0.11	0.14	0.41		

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. Also, included in this trial were plots inoculated with 4 seed treatment combinations using alfalfa variety Integra8420. These treatments include: Optimize Gold Plus (OGP), Rhizobia with an LCO promoter; An isoflavinoid (EM-09009); and

Quick Roots (QR), a microbial seed inoculant.

**Table 2. 2014-2016 YIELDS, TULELAKE ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 8/21/13**

		2014	2015	2016		
		Yield	Yield	Yield	Average	
	FD			Dry t/a		
<b>Released Varieties</b>						
Integra 8420 (EM)	4	10.06 ( 4)	8.55 ( 6)	7.36 ( 2)	8.65 ( 1)	A
AmeriStand 455TQ RR	4	9.99 ( 8)	8.69 ( 2)	7.03 (10)	8.57 ( 3)	A B C
Archer III	5	10.04 ( 5)	8.48 ( 7)	7.17 ( 6)	8.56 ( 4)	A B C
Integra 8400	4	9.93 (10)	8.55 ( 5)	7.02 (11)	8.50 ( 7)	A B C D E F
WL 363HQ	5	10.03 ( 6)	8.47 ( 8)	6.95 (18)	8.48 ( 8)	A B C D E F G
Masterpiece II	4	10.33 ( 1)	8.45 (10)	6.61 (40)	8.46 ( 9)	A B C D E F G H
Integra 8420 (OGP)	4	9.93 ( 9)	8.14 (24)	7.29 ( 3)	8.45 (10)	A B C D E F G H
Integra 8401RR	4	9.62 (24)	8.22 (18)	7.46 ( 1)	8.43 (11)	A B C D E F G H I
RR NemaStar	4	10.01 ( 7)	8.21 (20)	7.06 ( 8)	8.43 (12)	A B C D E F G H I J
DG 4210	4	9.67 (22)	8.65 ( 3)	6.95 (16)	8.42 (13)	A B C D E F G H I J
Mutiny	4	9.55 (30)	8.60 ( 4)	6.95 (17)	8.37 (14)	B C D E F G H I J K
6401N	4	9.79 (15)	8.21 (19)	6.94 (20)	8.31 (16)	B C D E F G H I J K L
6547R	4	9.68 (21)	8.36 (11)	6.84 (30)	8.29 (17)	C D E F G H I J K L M
Trophy	4	9.68 (20)	8.04 (32)	7.09 ( 7)	8.27 (18)	D E F G H I J K L M N
WL 354HQ	4	9.61 (25)	8.32 (13)	6.86 (26)	8.26 (20)	D E F G H I J K L M N
6422Q	4	9.90 (11)	8.20 (21)	6.68 (35)	8.26 (21)	E F G H I J K L M N
DKA44-16RR	4	9.71 (19)	8.26 (16)	6.81 (31)	8.26 (22)	E F G H I J K L M N
6516R	5	9.59 (26)	8.16 (23)	6.98 (14)	8.24 (23)	E F G H I J K L M N
6585Q	5	9.73 (18)	8.28 (14)	6.71 (33)	8.24 (24)	F G H I J K L M N
Nimbus	5	9.66 (23)	8.05 (31)	6.99 (12)	8.23 (25)	F G H I J K L M N
Integra 8444RR	4	9.57 (28)	8.08 (29)	6.98 (15)	8.21 (26)	G H I J K L M N O
WL 372HQ.RR	4	9.74 (17)	8.12 (26)	6.64 (39)	8.17 (28)	I J K L M N O
Integra 8420 (OGP+EM)	4	9.47 (33)	7.99 (36)	7.04 ( 9)	8.17 (29)	I J K L M N O
RR Tonnica	5	9.58 (27)	8.23 (17)	6.67 (37)	8.16 (30)	I J K L M N O
Camas	4	9.35 (38)	8.26 (15)	6.85 (28)	8.15 (31)	J K L M N O
AmeriStand 415NT RR	4	9.45 (34)	8.14 (25)	6.85 (27)	8.15 (32)	K L M N O
Rhino	4	9.43 (36)	8.10 (27)	6.87 (25)	8.13 (33)	K L M N O
Integra 8420 (QR)	4	9.56 (29)	7.86 (39)	6.91 (22)	8.11 (34)	K L M N O
AmeriStand 445NT	4	9.55 (31)	8.08 (28)	6.68 (36)	8.10 (35)	K L M N O
Integra 8420	4	9.43 (35)	7.89 (38)	6.94 (21)	8.09 (36)	L M N O
6497R	4	9.50 (32)	8.03 (34)	6.65 (38)	8.06 (37)	L M N O
DKA43-22RR	4	9.18 (41)	8.03 (33)	6.87 (24)	8.03 (38)	M N O
Vernal	2	9.27 (39)	7.85 (40)	6.89 (23)	8.00 (39)	N O
AmeriStand 427	4	9.25 (40)	7.82 (41)	6.79 (32)	7.95 (40)	O
<b>Experimental Varieties</b>						
FG 49W202	5	10.28 ( 2)	8.73 ( 1)	6.70 (34)	8.57 ( 2)	A B
SW4332	4	10.07 ( 3)	8.33 (12)	7.21 ( 5)	8.54 ( 5)	A B C D
FG 49W201	5	9.88 (12)	8.45 ( 9)	7.22 ( 4)	8.52 ( 6)	A B C D E
SW4351	4	9.80 (14)	8.19 (22)	6.99 (13)	8.33 (15)	B C D E F G H I J K L
SW4328	4	9.88 (13)	8.08 (30)	6.85 (29)	8.27 (19)	D E F G H I J K L M N
FG R49W215	4	9.75 (16)	7.90 (37)	6.95 (19)	8.20 (27)	H I J K L M N O
FG R57OK217	5	9.36 (37)	8.02 (35)	6.46 (42)	7.94 (41)	O
SW3304	3	7.97 (42)	7.29 (42)	6.51 (41)	7.26 (42)	
MEAN		9.66	8.20	6.91	8.26	
CV		4.44	4.47	5.00	2.82	
LSD (0.1)		0.51	0.44	0.41	0.28	

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. Also, included in this trial were plots inoculated with 4 seed treatment combinations using alfalfa variety Integra8420. These treatments include: Optimize Gold Plus (OGP), Rhizobia with an LCO promoter; An isoflavinoid (EM-09009); and Quick Roots (QR), a microbial seed inoculant.

**Table 3. 2016 Yields, UC Davis Alfalfa Cultivar Trial (Trial planted Sept. 30, 2014)**

Note: Single year data should not be used to evaluate alfalfa varieties or choose alfalfa cultivars. OCTOBER CUTTING NOT RECORDED (Historical Oct. yield averages approximately 1 t/A).

		Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Cut 6	YEAR		% of
	FD	6-Apr	29-Apr	27-May	30-Jun	3-Aug	8-Sep	TOTAL		CUF 101
		Dry t/a								
<b>Released Varieties</b>										
UC Impalo	8	0.59 ( 3)	1.26 ( 1)	1.22 (14)	1.60 ( 4)	1.50 ( 3)	1.82 ( 4)	7.99 ( 1)	A	114.6
DG9212	9	0.50 (28)	1.08 (10)	1.29 ( 4)	1.52 (10)	1.47 ( 5)	1.83 ( 1)	7.69 ( 2)	A B	110.2
Desert Sun 8.10 RR	8	0.53 (14)	1.02 (21)	1.19 (23)	1.60 ( 4)	1.51 ( 1)	1.83 ( 1)	7.68 ( 3)	A B	110.1
Camas	4	0.51 (24)	1.08 ( 9)	1.29 ( 4)	1.69 ( 1)	1.46 ( 7)	1.59 (26)	7.62 ( 5)	A B C	109.2
AmeriStand 715NT RI	7	0.48 (33)	1.08 (10)	1.25 (11)	1.62 ( 3)	1.46 ( 7)	1.72 (13)	7.60 ( 6)	A B C D	109.0
SW9215	9	0.58 ( 5)	1.10 ( 7)	1.22 (14)	1.52 (10)	1.34 (23)	1.82 ( 3)	7.57 ( 9)	A B C D E F	108.5
AmeriStand 803T	8	0.57 ( 7)	1.10 ( 7)	1.28 ( 8)	1.45 (20)	1.38 (18)	1.73 (10)	7.50 (11)	A B C D E F G	107.5
Integra 8420	4	0.53 (14)	1.11 ( 4)	1.28 ( 8)	1.60 ( 4)	1.35 (21)	1.62 (22)	7.50 (12)	A B C D E F G	107.5
Pacifico	8	0.51 (24)	1.00 (26)	1.32 ( 2)	1.48 (15)	1.35 (22)	1.73 (12)	7.39 (13)	A B C D E F G H	105.9
8R100	8	0.52 (20)	1.03 (17)	1.11 (31)	1.43 (23)	1.48 ( 4)	1.82 ( 4)	7.39 (14)	A B C D E F G H	105.9
Arriba II	6	0.53 (14)	1.11 ( 4)	1.26 (10)	1.46 (17)	1.42 (11)	1.59 (26)	7.38 (16)	B C D E F G H	105.8
6R200	6	0.49 (32)	1.00 (26)	1.16 (25)	1.45 (20)	1.51 ( 1)	1.75 ( 8)	7.35 (17)	B C D E F G H I	105.4
9R100	9	0.50 (28)	1.03 (17)	1.22 (14)	1.46 (18)	1.31 (28)	1.75 ( 8)	7.28 (18)	B C D E F G H I J	104.3
ICON	6	0.52 (20)	1.02 (21)	1.29 ( 4)	1.50 (12)	1.34 (23)	1.61 (25)	7.27 (19)	B C D E F G H I J	104.2
Integra 8600	6	0.57 ( 7)	1.00 (26)	1.24 (13)	1.59 ( 7)	1.39 (16)	1.48 (32)	7.25 (21)	B C D E F G H I J	104.0
Integra 8800	8	0.62 ( 1)	1.15 ( 2)	1.25 (11)	1.32 (32)	1.28 (31)	1.62 (22)	7.25 (22)	B C D E F G H I J	103.9
UC415	9	0.59 ( 3)	1.03 (17)	1.17 (24)	1.36 (29)	1.36 (20)	1.69 (16)	7.20 (24)	B C D E F G H I J	103.2
SW8421 S	8	0.50 (28)	1.02 (21)	1.16 (28)	1.29 (35)	1.42 ( 9)	1.62 (22)	7.00 (27)	D E F G H I J K L	100.4
Cuf 101	9	0.52 (20)	1.05 (15)	1.09 (35)	1.29 (34)	1.32 (25)	1.70 (15)	6.98 (28)	E F G H I J K L	100.0
Integra 8444 RR	4	0.45 (36)	0.85 (35)	1.11 (31)	1.65 ( 2)	1.36 (19)	1.49 (31)	6.92 (30)	G H I J K L	99.2
NuMex Bill Melton	7	0.57 (10)	0.95 (32)	1.11 (33)	1.25 (36)	1.29 (29)	1.59 (26)	6.76 (33)	I J K L	96.9
4R200	4	0.47 (35)	0.85 (35)	1.12 (30)	1.48 (15)	1.24 (33)	1.41 (35)	6.57 (35)	K L	94.1
<b>Experimental Varieties</b>										
SW 8357	8	0.56 (11)	1.06 (12)	1.36 ( 1)	1.50 (12)	1.42 ( 9)	1.73 (10)	7.63 ( 4)	A B C	109.3
R89M935	9	0.54 (12)	1.13 ( 3)	1.21 (21)	1.50 (12)	1.40 (13)	1.80 ( 6)	7.59 ( 7)	A B C D	108.8
SW 8421 RRS	8	0.52 (20)	1.11 ( 4)	1.22 (14)	1.57 ( 8)	1.47 ( 5)	1.69 (17)	7.59 ( 8)	A B C D E	108.7
SW 8208	8	0.54 (12)	1.03 (17)	1.22 (14)	1.55 ( 9)	1.42 (11)	1.78 ( 7)	7.55 (10)	A B C D E F	108.3
R88T829	9	0.62 ( 1)	1.05 (15)	1.16 (25)	1.46 (18)	1.39 (16)	1.70 (14)	7.39 (15)	A B C D E F G H	105.9
CW058071	8	0.53 (14)	1.02 (21)	1.29 ( 4)	1.45 (22)	1.32 (25)	1.65 (20)	7.26 (20)	B C D E F G H I J	104.1
UC 2671	9	0.58 ( 6)	1.06 (12)	1.22 (20)	1.36 (30)	1.32 (25)	1.67 (18)	7.22 (23)	B C D E F G H I J	103.5
SW 6334	6	0.57 ( 7)	1.06 (12)	1.21 (21)	1.41 (24)	1.40 (13)	1.48 (32)	7.13 (25)	B C D E F G H I J K	102.3
CW096043	6	0.51 (24)	1.00 (26)	1.32 ( 2)	1.41 (25)	1.24 (33)	1.57 (29)	7.05 (26)	C D E F G H I J K	101.1
Artesian Sunrise	7	0.50 (28)	0.88 (34)	1.22 (14)	1.41 (25)	1.40 (15)	1.54 (30)	6.96 (29)	F G H I J K L	99.8
SW 9215 RRS	9	0.48 (33)	0.98 (31)	1.12 (29)	1.41 (25)	1.28 (30)	1.64 (21)	6.91 (31)	G H I J K L	99.0
R99T939	8	0.50 (27)	0.92 (33)	1.09 (34)	1.36 (30)	1.28 (31)	1.67 (19)	6.82 (32)	H I J K L	97.7
UC2693	9	0.53 (19)	0.98 (30)	1.16 (25)	1.39 (28)	1.17 (35)	1.46 (34)	6.70 (34)	J K L	96.0
UC 410	9	0.53 (14)	1.02 (21)	1.00 (36)	1.31 (33)	1.17 (35)	1.38 (36)	6.41 (36)	L	91.8
MEAN		0.53	1.03	1.21	1.46	1.37	1.65	7.26		
CV		15.45	12.13	7.40	10.90	10.45	10.76	7.04		
LSD (0.1)		NS	0.15	0.11	0.19	0.17	0.21	0.61		

Trial seeded at 25 lb/acre viable seed on Yolo clay loam soil at the Univ. of California Agronomy Farm, Davis, CA.

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

FD = Fall Dormancy reported by seed companies.



**Table 4. 2015-2016 YIELDS, UC DAVIS ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 9/30/2014**

		2015	2016		
		Yield	Yield	Average	
	FD		Dry t/a		
<b>Released Varieties</b>					
UC Impalo	8	10.78 ( 3)	7.99 ( 1)	9.39 ( 1)	A
Desert Sun 8.10 RR	8	10.79 ( 2)	7.68 ( 3)	9.23 ( 2)	A B
AmeriStand 803T	8	10.52 ( 8)	7.50 (11)	9.01 ( 6)	A B C D E
8R100	8	10.60 ( 6)	7.39 (14)	8.99 ( 7)	A B C D E F
DG9212	9	10.29 (14)	7.69 ( 2)	8.99 ( 8)	A B C D E F
SW9215	9	10.35 (12)	7.57 ( 9)	8.96 ( 9)	A B C D E F G
UC415	9	10.68 ( 4)	7.20 (24)	8.94 (11)	A B C D E F G
AmeriStand 715NT RR	7	10.27 (15)	7.60 ( 6)	8.94 (12)	A B C D E F G
6R200	6	10.12 (19)	7.35 (17)	8.74 (16)	A B C D E F G H I
9R100	9	10.10 (20)	7.28 (18)	8.69 (17)	B C D E F G H I J
Integra 8800	8	10.02 (21)	7.25 (22)	8.63 (19)	B C D E F G H I J
Cuf 101	9	10.15 (17)	6.98 (28)	8.56 (20)	B C D E F G H I J
SW8421 S	8	10.13 (18)	7.00 (27)	8.56 (21)	B C D E F G H I J
Pacifico	8	9.65 (25)	7.39 (13)	8.52 (22)	C D E F G H I J
Camas	4	9.40 (30)	7.62 ( 5)	8.51 (23)	C D E F G H I J
ICON	6	9.70 (24)	7.27 (19)	8.48 (24)	D E F G H I J
Arriba II	6	9.54 (28)	7.38 (16)	8.46 (25)	D E F G H I J
Integra 8420	4	9.14 (34)	7.50 (12)	8.32 (28)	F G H I J K
Integra 8600	6	9.15 (33)	7.25 (21)	8.20 (30)	H I J K L
NuMex Bill Melton	7	9.60 (27)	6.76 (33)	8.18 (31)	I J K L
4R200	4	8.75 (35)	6.57 (35)	7.66 (35)	K L
Integra 8444 RR	4	8.28 (36)	6.92 (30)	7.60 (36)	L
<b>Experimental Varieties</b>					
SW 8208	8	10.81 ( 1)	7.55 (10)	9.18 ( 3)	A B C
R89M935	9	10.58 ( 7)	7.59 ( 7)	9.08 ( 4)	A B C D
SW 8357	8	10.51 ( 9)	7.63 ( 4)	9.07 ( 5)	A B C D
SW 8421 RRS	8	10.33 (13)	7.59 ( 8)	8.96 (10)	A B C D E F G
UC 2671	9	10.61 ( 5)	7.22 (23)	8.91 (13)	A B C D E F G
CW058071	8	10.50 (10)	7.26 (20)	8.88 (14)	A B C D E F G H
R88T829	9	10.17 (16)	7.39 (15)	8.78 (15)	A B C D E F G H I
R99T939	8	10.50 (11)	6.82 (32)	8.66 (18)	B C D E F G H I J
SW 9215 RRS	9	9.84 (23)	6.91 (31)	8.37 (26)	E F G H I J
UC2693	9	9.97 (22)	6.70 (34)	8.34 (27)	E F G H I J K
SW 6334	6	9.48 (29)	7.13 (25)	8.31 (29)	G H I J K
CW096043	6	9.29 (31)	7.05 (26)	8.17 (32)	I J K L
Artesian Sunrise	7	9.26 (32)	6.96 (29)	8.11 (33)	I J K L
UC 410	9	9.62 (26)	6.41 (36)	8.01 (34)	J K L
MEAN		9.99	7.26	8.62	
CV		7.23	7.71	6.63	
LSD (0.1)		0.86	0.67	0.68	

Trial seeded at 25 lb/acre viable seed on Yolo clay loam at the Univ. of California Agronomy Farm, Davis, 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. OCTOBER CUTTING NOT RECORDED (Historical Oct. yield averages approximately 1 t/A)

**Table 5. 2016 YIELDS, MODESTO ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 10/9/2014)**

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	Cut 7	Cut 8	YEAR	% of		
	29-Mar	25-Apr	23-May	20-Jun	13-Jul	2-Aug	29-Aug	29-Sep	TOTAL	CUF 101		
FD	Dry t/a											
<b>Released Varieties</b>												
AmeriStand 901TS	9	2.23 ( 1)	2.16 ( 1)	2.56 ( 2)	2.39 ( 2)	2.28 ( 2)	2.08 ( 1)	2.30 ( 1)	1.40 ( 1)	17.40 ( 1)	A	114.9
Grandslam	8	2.11 ( 4)	1.98 ( 6)	2.82 ( 1)	2.40 ( 1)	2.10 ( 5)	1.83 ( 5)	1.98 ( 8)	1.23 ( 4)	16.44 ( 2)	A B	108.5
AmeriStand 803T	8	2.13 ( 3)	1.97 ( 7)	2.24 ( 7)	2.27 ( 6)	2.22 ( 3)	1.96 ( 2)	2.21 ( 2)	1.31 ( 3)	16.30 ( 3)	A B C	107.6
DG9212	9	2.08 ( 5)	2.02 ( 2)	2.33 ( 4)	2.30 ( 4)	2.16 ( 4)	1.81 ( 8)	1.89 ( 18)	1.35 ( 2)	15.94 ( 5)	A B C D	105.2
Cuf 101	9	1.98 ( 11)	1.76 ( 18)	2.14 ( 13)	2.22 ( 7)	2.04 ( 6)	1.93 ( 3)	1.98 ( 9)	1.10 ( 13)	15.15 ( 8)	B C D E F	100.0
Integra 8600	6	1.86 ( 17)	1.86 ( 10)	2.24 ( 8)	2.19 ( 9)	2.02 ( 7)	1.77 ( 13)	1.73 ( 30)	1.13 ( 11)	14.80 ( 11)	B C D E F	97.7
SuperSonic	9	2.01 ( 7)	1.98 ( 5)	2.31 ( 6)	2.07 ( 15)	1.72 ( 22)	1.67 ( 29)	1.86 ( 21)	0.83 ( 28)	14.44 ( 14)	D E F G H	95.3
Integra 8800	8	1.91 ( 13)	1.78 ( 15)	1.93 ( 24)	2.06 ( 16)	1.95 ( 13)	1.77 ( 15)	1.96 ( 11)	1.06 ( 17)	14.43 ( 15)	D E F G H	95.2
SW 9106	9	1.84 ( 18)	1.68 ( 22)	1.96 ( 23)	1.93 ( 27)	1.93 ( 17)	1.79 ( 11)	1.99 ( 7)	1.04 ( 18)	14.15 ( 18)	E F G H I J	93.4
Farm Valley 6	6	1.87 ( 15)	1.73 ( 20)	2.12 ( 17)	2.03 ( 21)	1.77 ( 20)	1.83 ( 7)	1.89 ( 18)	0.86 ( 24)	14.10 ( 19)	E F G H I J	93.1
Farm Valley 7	7	1.72 ( 25)	1.78 ( 16)	2.17 ( 10)	2.09 ( 14)	1.96 ( 11)	1.65 ( 31)	1.57 ( 34)	1.10 ( 13)	14.03 ( 20)	E F G H I J	92.6
Pacifico	8	1.77 ( 24)	1.66 ( 24)	2.10 ( 19)	2.02 ( 23)	1.96 ( 11)	1.79 ( 12)	1.60 ( 33)	1.07 ( 16)	13.97 ( 21)	E F G H I J K	92.2
RR Tonnica	5	1.89 ( 14)	1.80 ( 14)	2.12 ( 18)	2.06 ( 16)	1.57 ( 23)	1.77 ( 13)	1.83 ( 22)	0.87 ( 23)	13.91 ( 22)	E F G H I J K L	91.9
RR NemaStar	5	1.84 ( 18)	1.67 ( 23)	2.17 ( 10)	2.06 ( 16)	1.55 ( 24)	1.81 ( 8)	1.95 ( 13)	0.80 ( 29)	13.85 ( 23)	E F G H I J K L	91.5
9R100	9	1.87 ( 16)	1.47 ( 30)	1.82 ( 29)	2.03 ( 21)	1.24 ( 34)	1.68 ( 28)	1.90 ( 15)	0.73 ( 35)	12.75 ( 26)	H I J K L M N	84.2
8R100	8	1.65 ( 26)	1.55 ( 27)	1.84 ( 26)	1.90 ( 29)	1.42 ( 26)	1.60 ( 33)	1.74 ( 26)	0.93 ( 20)	12.64 ( 27)	I J K L M N	83.4
Desert Sun 8.10RF	8	1.48 ( 34)	1.61 ( 26)	1.84 ( 26)	1.88 ( 31)	1.34 ( 30)	1.67 ( 29)	1.90 ( 14)	0.85 ( 25)	12.56 ( 28)	J K L M N	82.9
Nimbus	5	1.41 ( 36)	1.74 ( 19)	1.93 ( 24)	1.90 ( 29)	1.73 ( 21)	1.53 ( 35)	1.44 ( 36)	0.78 ( 32)	12.47 ( 29)	J K L M N	82.3
AmeriStand 715NT	7	1.63 ( 28)	1.37 ( 35)	1.70 ( 34)	1.92 ( 28)	1.31 ( 31)	1.72 ( 20)	1.82 ( 23)	0.80 ( 29)	12.27 ( 30)	K L M N	81.0
6R200	6	1.56 ( 29)	1.40 ( 33)	1.75 ( 32)	1.74 ( 36)	1.45 ( 25)	1.71 ( 23)	1.74 ( 26)	0.92 ( 21)	12.27 ( 31)	K L M N	81.0
6829R	8	1.55 ( 31)	1.44 ( 31)	1.79 ( 30)	1.78 ( 33)	1.31 ( 31)	1.72 ( 20)	1.88 ( 20)	0.78 ( 33)	12.25 ( 32)	K L M N	80.9
Transition 6.1	6	1.56 ( 30)	1.44 ( 31)	1.77 ( 31)	1.94 ( 26)	1.39 ( 28)	1.53 ( 35)	1.74 ( 26)	0.84 ( 26)	12.22 ( 33)	L M N	80.7
AmeriStand 915TS	9	1.55 ( 32)	1.33 ( 36)	1.72 ( 33)	1.76 ( 35)	1.37 ( 29)	1.69 ( 26)	1.77 ( 24)	0.79 ( 31)	11.98 ( 34)	M N	79.1
RR Six Shooter	6	1.43 ( 35)	1.53 ( 28)	1.70 ( 36)	1.76 ( 34)	1.10 ( 35)	1.61 ( 32)	1.63 ( 31)	0.84 ( 26)	11.58 ( 35)	N	76.5
WL662HQ RR	9	1.49 ( 33)	1.37 ( 34)	1.70 ( 34)	1.88 ( 31)	1.08 ( 36)	1.57 ( 34)	1.63 ( 31)	0.71 ( 36)	11.43 ( 36)	N	75.5
<b>Experimental Varieties</b>												
RD 71	8	2.16 ( 2)	1.95 ( 8)	2.54 ( 3)	2.38 ( 3)	2.34 ( 1)	1.71 ( 24)	2.01 ( 6)	1.18 ( 8)	16.27 ( 4)	A B C	107.4
SW 1037	10	1.99 ( 9)	2.00 ( 3)	2.17 ( 10)	2.13 ( 13)	2.02 ( 7)	1.80 ( 10)	2.08 ( 5)	1.19 ( 7)	15.38 ( 6)	B C D E	101.6
CW050085	10	1.94 ( 12)	1.84 ( 12)	2.14 ( 13)	2.18 ( 10)	1.99 ( 9)	1.85 ( 4)	2.11 ( 4)	1.13 ( 11)	15.18 ( 7)	B C D E F	100.2
CW058071	8	1.84 ( 18)	1.81 ( 13)	2.21 ( 9)	2.21 ( 8)	1.95 ( 13)	1.73 ( 18)	1.96 ( 11)	1.22 ( 5)	14.93 ( 9)	B C D E F	98.6
RD 121	9	1.99 ( 9)	1.89 ( 9)	2.33 ( 4)	2.29 ( 5)	1.99 ( 9)	1.68 ( 27)	1.57 ( 35)	1.17 ( 10)	14.90 ( 10)	B C D E F	98.4
SW 8357	8	1.79 ( 23)	1.85 ( 11)	2.14 ( 13)	2.06 ( 16)	1.95 ( 13)	1.83 ( 5)	1.98 ( 9)	1.10 ( 15)	14.69 ( 12)	C D E F	97.0
RD 132	8	1.99 ( 8)	1.99 ( 4)	2.14 ( 13)	2.15 ( 12)	1.79 ( 19)	1.73 ( 19)	1.74 ( 26)	0.94 ( 19)	14.49 ( 13)	D E F G	95.7
UC 2671	9	2.03 ( 6)	1.78 ( 16)	1.98 ( 22)	1.96 ( 25)	1.83 ( 18)	1.72 ( 20)	1.90 ( 15)	1.20 ( 6)	14.40 ( 16)	D E F G H	95.0
UC 2693	9	1.84 ( 21)	1.72 ( 21)	2.00 ( 21)	2.02 ( 23)	1.94 ( 16)	1.69 ( 25)	1.90 ( 15)	1.18 ( 8)	14.30 ( 17)	D E F G H I	94.4
SW 8421 RRS	8	1.80 ( 22)	1.49 ( 29)	2.05 ( 20)	2.18 ( 10)	1.30 ( 33)	1.76 ( 16)	2.12 ( 3)	0.88 ( 22)	13.60 ( 24)	F G H I J K L M	89.8
SW 9215-RRS	9	1.65 ( 26)	1.66 ( 24)	1.84 ( 26)	2.05 ( 20)	1.42 ( 27)	1.76 ( 17)	1.77 ( 25)	0.78 ( 33)	12.93 ( 25)	G H I J K L M N	85.3
MEAN		1.82	1.72	2.07	2.06	1.74	1.74	1.86	1.00	14.01		
CV		16.90	13.66	19.49	14.95	14.41	12.78	15.47	27.35	11.44		
LSD (0.1)		0.33	0.25	0.43	0.33	0.27	NS	0.31	0.29	1.71		

Trial seeded at 25 lb/acre viable seed on sandy soil at Stanislaus Farm Supply, Modesto CA.

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

FD = Fall Dormancy reported by seed companies.

**Table 6. 2015-2016 YIELDS, MODESTO ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 10/9/2014**

		2015	2016		
		Yield	Yield	Average	
	FD		Dry t/a		
<b>Released Varieties</b>					
AmeriStand 901TS	9	15.54 ( 2)	17.40 ( 1)	16.47 ( 1)	A
Grandslam	8	14.42 (12)	16.44 ( 2)	15.43 ( 2)	A B
Pacifico	8	16.71 ( 1)	13.97 (21)	15.34 ( 3)	A B C
AmeriStand 803T	8	14.14 (17)	16.30 ( 3)	15.22 ( 5)	A B C D E
Integra 8600	6	15.13 ( 5)	14.80 (11)	14.97 ( 6)	B C D E F
DG9212	9	13.99 (21)	15.94 ( 5)	14.96 ( 7)	B C D E F
SuperSonic	9	14.95 ( 6)	14.44 (14)	14.70 (11)	B C D E F G H
Farm Valley 7	7	15.21 ( 4)	14.03 (20)	14.62 (13)	B C D E F G H I
Cuf 101	9	14.05 (20)	15.15 ( 8)	14.60 (14)	B C D E F G H I J
Integra 8800	8	14.22 (14)	14.43 (15)	14.32 (16)	B C D E F G H I J K
SW 9106	9	13.80 (23)	14.15 (18)	13.98 (18)	C D E F G H I J K L M
Farm Valley 6	6	13.46 (27)	14.10 (19)	13.78 (21)	F G H I J K L M N
8R100	8	14.62 (10)	12.64 (27)	13.63 (23)	F G H I J K L M N O
Transition 6.1	6	14.85 ( 8)	12.22 (33)	13.54 (25)	H I J K L M N O
9R100	9	14.12 (18)	12.75 (26)	13.44 (26)	H I J K L M N O
RR NemaStar	5	12.67 (34)	13.85 (23)	13.26 (27)	I J K L M N O
RR Tonnica	5	12.56 (35)	13.91 (22)	13.24 (28)	J K L M N O
Desert Sun 8.10RR	8	13.68 (26)	12.56 (28)	13.12 (29)	K L M N O
AmeriStand 715NT RI	7	13.97 (22)	12.27 (30)	13.12 (30)	K L M N O
Nimbus	5	13.41 (28)	12.47 (29)	12.94 (31)	L M N O
6R200	6	13.13 (32)	12.27 (31)	12.70 (32)	L M N O
RR Six Shooter	6	13.71 (25)	11.58 (35)	12.65 (33)	L M N O
AmeriStand 915TS RI	9	13.24 (29)	11.98 (34)	12.61 (34)	M N O
6829R	8	12.92 (33)	12.25 (32)	12.59 (35)	N O
WL662HQ RR	9	13.22 (31)	11.43 (36)	12.33 (36)	O
<b>Experimental Varieties</b>					
RD 71	8	14.20 (15)	16.27 ( 4)	15.23 ( 4)	A B C D
SW 8357	8	15.22 ( 3)	14.69 (12)	14.96 ( 8)	B C D E F G
SW 1037	10	14.51 (11)	15.38 ( 6)	14.95 ( 9)	B C D E F G
CW058071	8	14.92 ( 7)	14.93 ( 9)	14.92 (10)	B C D E F G
CW050085	10	14.06 (19)	15.18 ( 7)	14.62 (12)	B C D E F G H I
UC 2671	9	14.78 ( 9)	14.40 (16)	14.59 (15)	B C D E F G H I J
UC 2693	9	13.72 (24)	14.30 (17)	14.01 (17)	C D E F G H I J K L
SW 8421 RRS	8	14.16 (16)	13.60 (24)	13.88 (19)	D E F G H I J K L M N
RD 132	8	13.22 (30)	14.49 (13)	13.86 (20)	E F G H I J K L M N
RD 121	9	12.55 (36)	14.90 (10)	13.73 (22)	F G H I J K L M N
SW 9215-RRS	9	14.24 (13)	12.93 (25)	13.59 (24)	G H I J K L M N O
MEAN		14.09	14.01	14.05	
CV		12.15	11.30	9.15	
LSD (0.1)		1.83	1.69	1.37	

Trial seeded at 25 lb/acre viable seed on sandy soil at Stanislaus Farm Supply, 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 7. 2016 YIELDS, UC KEARNEY ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 9/18/13

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

Table with columns: Variety, Cut 1 (13-Apr), Cut 2 (12-May), Cut 3 (10-Jun), Cut 4 (7-Jul), Cut 5 (3-Aug), Cut 6 (30-Aug), Cut 7 (28-Sep), Cut 8 (26-Oct), YEAR TOTAL, % of CUF 101. Rows include Released Varieties (e.g., Saltana, 6906N, 6015R) and Experimental Varieties (e.g., CW060046, 108T813, 98T811). A summary row at the bottom shows MEAN, CV, and LSD (0.1) values.

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. Also, included in this trial were plots inoculated with 4 seed treatment combinations using alfalfa variety Integra8420. These treatments include: Optimize Gold Plus (OGP), Rhizobia with an LCO promoter; An isoflavonoid (EM-09009); and Quick Roots (QR), a microbial seed inoculant.

**Table 8. 2014-2016 YIELDS. UC KEARNEY ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 9/18/2013**

		2014	2015	2016			
	FD	Yield	Yield	Yield	Average		
		Dry t/a					
<b>Released Varieties</b>							
DG 9212	9	14.40 ( 1)	12.32 ( 5)	13.00 ( 9)	13.24 ( 3)	A B C	
6906N	9	14.18 ( 2)	12.05 (10)	13.39 ( 6)	13.21 ( 4)	A B C D	
6015R	10	14.06 ( 5)	11.91 (15)	13.23 ( 7)	13.06 ( 6)	A B C D E	
Sun Quest	9	13.24 (27)	12.71 ( 3)	12.98 (10)	12.98 ( 7)	A B C D E F	
Catalina (OGP)	9	13.93 ( 8)	11.96 (13)	12.66 (17)	12.85 ( 8)	A B C D E F G	
Saltana	9	13.36 (22)	11.68 (22)	13.44 ( 4)	12.83 (10)	A B C D E F G	
RRALF 9R100	9	12.94 (39)	12.40 ( 4)	13.00 ( 8)	12.78 (12)	A B C D E F G H	
RRALF 9R100	9	13.37 (21)	12.01 (12)	12.83 (15)	12.73 (13)	A B C D E F G H	
WL 662HQ.RR	9	14.04 ( 6)	11.28 (30)	12.65 (18)	12.65 (14)	A B C D E F G H	
WL552HQ.RR	10	13.78 ( 9)	10.97 (35)	12.89 (13)	12.55 (15)	A B C D E F G H I	
Ameristand 901TS	9	13.71 (11)	11.67 (23)	12.16 (26)	12.51 (17)	A B C D E F G H I J	
WL 662HQ.RR	9	13.16 (30)	12.27 ( 6)	12.01 (28)	12.48 (18)	A B C D E F G H I J K	
SW9628	9	13.19 (29)	11.42 (27)	12.72 (16)	12.44 (19)	A B C D E F G H I J K	
6015R	10	13.35 (24)	11.68 (21)	12.29 (23)	12.44 (20)	A B C D E F G H I J K	
Catalina (EM)	9	13.36 (23)	10.89 (37)	12.93 (12)	12.39 (22)	A B C D E F G H I J K L	
Ameristand 915TS RR	9	13.13 (32)	11.73 (18)	12.28 (24)	12.38 (23)	A B C D E F G H I J K L	
Integra 8800	8	13.42 (19)	11.16 (31)	12.55 (19)	12.38 (24)	A B C D E F G H I J K L	
AR-370	10	13.63 (15)	11.71 (19)	11.63 (37)	12.32 (25)	A B C D E F G H I J K L	
WL 550 RR	8	12.76 (46)	12.18 ( 8)	11.56 (41)	12.17 (28)	B C D E F G H I J K L M	
Catalina (QR)	9	13.27 (25)	11.44 (26)	11.78 (32)	12.16 (29)	B C D E F G H I J K L M	
WL 550 RR	8	13.73 (10)	11.28 (29)	11.38 (47)	12.13 (32)	D E F G H I J K L M	
Ameristand 915TS RR	9	13.61 (16)	10.78 (40)	11.99 (30)	12.13 (33)	D E F G H I J K L M	
SW8421-S	8	12.94 (38)	11.02 (33)	12.21 (25)	12.06 (37)	E F G H I J K L M	
Supersonic	9	12.61 (49)	11.94 (14)	11.43 (43)	11.99 (38)	E F G H I J K L M	
Catalina (OGP+QR)	9	13.97 ( 7)	9.77 (49)	12.15 (27)	11.96 (39)	F G H I J K L M	
WL656HQ	9	12.79 (45)	11.00 (34)	12.01 (29)	11.93 (40)	F G H I J K L M	
WL552HQ.RR	10	13.05 (36)	9.97 (48)	11.53 (42)	11.52 (45)	I J K L M N	
Catalina	9	12.24 (53)	10.48 (44)	11.63 (38)	11.45 (47)	J K L M N O	
PGI 908s	9	13.11 (34)	9.02 (51)	11.20 (49)	11.11 (51)	M N O P	
Cuf 101	9	13.12 (33)	8.60 (53)	10.25 (52)	10.66 (52)	N O P	
Ameristand 445NT	4	11.71 (54)	8.85 (52)	10.11 (54)	10.22 (54)	P	
<b>Experimental Varieties</b>							
108T813	9	12.88 (43)	13.54 ( 1)	13.56 ( 2)	13.33 ( 1)	A	
SW9108	9	14.08 ( 4)	12.25 ( 7)	13.40 ( 5)	13.24 ( 2)	A B	
CW060046	10	13.02 (37)	12.09 ( 9)	14.09 ( 1)	13.07 ( 5)	A B C D E	
FG 98T812	10	13.49 (18)	12.03 (11)	12.97 (11)	12.83 ( 9)	A B C D E F G	
SW9106	9	13.15 (31)	12.74 ( 2)	12.52 (20)	12.81 (11)	A B C D E F G	
98T811	9	13.24 (28)	10.85 (39)	13.49 ( 3)	12.53 (16)	A B C D E F G H I J	
FG 106T701	10	14.11 ( 3)	11.52 (25)	11.59 (40)	12.41 (21)	A B C D E F G H I J K L	
UC 417	9	13.41 (20)	11.86 (17)	11.40 (46)	12.23 (26)	B C D E F G H I J K L	
UC 416	9	12.45 (51)	11.37 (28)	12.85 (14)	12.22 (27)	B C D E F G H I J K L	
UC 419	9	12.90 (40)	11.90 (16)	11.67 (36)	12.16 (30)	C D E F G H I J K L M	
SW1037	10	13.09 (35)	10.94 (36)	12.36 (22)	12.13 (31)	D E F G H I J K L M	
SW9107	9	12.31 (52)	11.58 (24)	12.43 (21)	12.11 (34)	E F G H I J K L M	
AR-380	9	12.90 (41)	11.70 (20)	11.71 (33)	12.10 (35)	E F G H I J K L M	
SW8341	8	13.69 (12)	10.87 (38)	11.68 (35)	12.08 (36)	E F G H I J K L M	
UC 101	9	12.89 (42)	11.15 (32)	11.62 (39)	11.89 (41)	G H I J K L M	
AR-12	9	13.25 (26)	10.68 (42)	11.71 (34)	11.88 (42)	G H I J K L M	
RD121	10	13.69 (13)	10.26 (45)	11.43 (44)	11.79 (43)	G H I J K L M	
UC 418	9	12.62 (48)	10.60 (43)	11.92 (31)	11.71 (44)	H I J K L M N	
Vulcan	9	13.56 (17)	10.18 (46)	10.68 (51)	11.47 (46)	I J K L M N	
SW7339	7	12.79 (44)	10.03 (47)	11.41 (45)	11.41 (48)	K L M N O	
CW058071	8	13.68 (14)	9.17 (50)	11.21 (48)	11.35 (49)	L M N O	
RD132	8	12.63 (47)	10.68 (41)	10.71 (50)	11.34 (50)	L M N O	
NeMex Melton	7	12.60 (50)	8.44 (54)	10.11 (53)	10.38 (53)	O P	
<b>MEAN</b>		13.25	11.20	12.12	12.19		
<b>CV</b>		8.28	15.19	9.17	7.53		
<b>LSD (0.1)</b>		NS	2.01	1.32	1.09		

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. Also, included in this trial were plots inoculated with 4 seed treatment combinations using alfalfa variety Integra8420. These treatments include: Optimize Gold Plus (OGP), Rhizobia with an LCO promoter; An isoflavinoid (EM-09009); and Quick Roots (QR), a microbial seed inoculant.

**Table 9. Westside Salinity Trial 2016. Alfalfa Yield of 7 cuts. Low Salinity Treatments**

Entry	Variety	Yield t/A							Season Total
		1-Apr	4-May	6-Jun	6-Jul	7-Aug	15-Sep	25-Oct	
15	SW 9106	1.81	1.26	2.00	1.76	1.70	1.41	1.25	<b>11.18</b>
19	SW 8421- RRS	1.62	1.33	1.86	1.77	1.57	1.22	1.35	<b>10.73</b>
18	SW 9215-RRS	1.64	1.39	1.90	1.80	1.48	1.24	1.21	<b>10.66</b>
20	CW050085	1.50	1.46	1.84	1.86	1.26	1.19	1.43	<b>10.54</b>
5	FG R914W259S	1.65	1.32	1.96	1.72	1.42	1.22	1.21	<b>10.49</b>
12	Saltana	1.72	1.20	1.53	1.84	1.29	1.25	1.42	<b>10.26</b>
7	AZ-88NDC	1.62	1.25	1.67	1.56	1.54	1.21	1.33	<b>10.18</b>
6	AZ- 90NDC-ST	1.53	1.24	2.00	1.65	1.44	1.16	1.14	<b>10.17</b>
4	FG R814W258S	1.62	1.36	1.80	1.54	1.35	1.22	1.24	<b>10.13</b>
1	CUF101	1.78	1.32	1.91	1.49	1.33	1.13	1.15	<b>10.11</b>
2	9R100	1.74	1.25	1.90	1.66	1.33	1.02	1.19	<b>10.09</b>
9	AmeriStand 901TS	1.70	1.27	1.81	1.68	1.30	1.07	1.19	<b>10.01</b>
11	Sun Quest	1.72	1.17	1.88	1.68	1.34	1.12	1.10	<b>10.01</b>
14	SW 9813	1.46	1.47	2.00	1.40	1.30	1.14	1.19	<b>9.97</b>
8	AmeriStand 915TS RR	1.58	1.42	1.75	1.61	1.25	1.09	1.12	<b>9.81</b>
21	CW058071 (Impalo)	1.43	1.50	1.78	1.53	1.28	1.06	1.23	<b>9.81</b>
13	SW 8421-S	1.56	1.33	1.78	1.50	1.26	1.09	1.08	<b>9.61</b>
3	FG R814W257S	1.50	1.27	1.72	1.51	1.31	1.11	1.17	<b>9.58</b>
10	Desert Sun 8.10RR	1.54	1.28	1.58	1.54	1.23	1.06	1.22	<b>9.45</b>
17	SW9812	1.49	1.29	1.54	1.48	1.34	1.07	1.15	<b>9.36</b>
16	SW9215	1.38	1.10	1.44	1.31	1.22	0.98	1.24	<b>8.68</b>
	<b>Mean</b>	1.60	1.31	1.79	1.61	1.36	1.15	1.22	10.04
	<b>CV%</b>	16.9	17.2	22.3	20.8	27.2	21.4	18.0	16.9
	<b>LSD (p=0.05)</b>	0.38	0.32	0.57	0.48	0.52	0.35	0.31	2.40

**Table 10. Westside Salinity Trial 2016. Alfalfa Yield of 7 cuts. High Salinity Treatments**

Entry	Variety	Yield t/A							Season Total
		1-Apr	4-May	6-Jun	6-Jul	7-Aug	15-Sep	25-Oct	
17	SW9812	1.88	1.69	2.17	1.81	1.25	1.10	1.19	<b>11.08</b>
14	SW 9813	1.83	1.75	2.17	1.59	1.10	1.02	1.02	<b>10.49</b>
3	FG R814W257S	1.67	1.56	2.09	1.45	1.01	1.02	1.44	<b>10.24</b>
5	FG R914W259S	1.69	1.71	2.18	1.44	1.08	0.90	1.04	<b>10.03</b>
8	AmeriStand 915TS RR	1.63	1.59	2.17	1.57	0.96	0.97	0.85	<b>9.75</b>
1	CUF101	1.83	1.60	1.98	1.43	0.89	0.90	0.89	<b>9.51</b>
12	Saltana	1.73	1.48	1.93	1.46	0.90	0.87	0.83	<b>9.21</b>
19	SW 8421- RRS	1.73	1.52	1.83	1.39	0.98	0.79	0.87	<b>9.10</b>
9	AmeriStand 901TS	1.65	1.46	1.79	1.44	0.73	0.96	0.91	<b>8.95</b>
6	AZ- 90NDC-ST	1.57	1.54	1.92	1.27	0.93	0.86	0.83	<b>8.92</b>
4	FG R814W258S	1.69	1.54	1.88	1.33	0.78	0.76	0.89	<b>8.87</b>
16	SW9215	1.70	1.46	1.94	1.56	0.91	0.59	0.69	<b>8.85</b>
7	AZ-88NDC	1.69	1.46	1.77	1.20	0.68	0.84	0.91	<b>8.54</b>
2	9R100	1.54	1.49	1.88	1.33	0.67	0.76	0.84	<b>8.51</b>
11	Sun Quest	1.65	1.44	1.76	1.27	0.70	0.74	0.75	<b>8.31</b>
10	Desert Sun 8.10RR	1.59	1.39	1.78	1.18	0.55	0.71	0.99	<b>8.19</b>
20	CW050085	1.55	1.32	1.73	1.24	0.73	0.81	0.75	<b>8.12</b>
18	SW 9215-RRS	1.60	1.31	1.70	1.30	0.78	0.74	0.58	<b>8.02</b>
21	CW058071 (Impalo)	1.43	1.38	1.77	1.15	0.61	0.75	0.79	<b>7.89</b>
15	SW 9106	1.67	1.40	1.74	1.11	0.56	0.79	0.61	<b>7.87</b>
13	SW 8421-S	1.44	1.37	1.53	0.94	0.54	0.61	0.60	<b>7.03</b>

<b>Mean</b>	1.65	1.49	1.89	1.36	0.83	0.83	0.87	8.92
<b>CV%</b>	19.57	16.97	19.84	29.50	52.30	47.33	44.27	24.76
<b>LSD (p=0.05)</b>	0.46	0.36	0.53	0.57	0.61	0.56	0.54	3.13

**Table 11. Westside Salinity Trial 2016. Comparison on Low and High Salinity Total Alfalfa Yields.**

Entry	Variety	Yield t/A		Ave.	Relative Yield (HS/LS)
		Low Salinity (LS)	High Salinity (HS)		
15	SW 9106	11.18	7.87	<b>9.53</b>	70%
19	SW 8421- RRS	10.73	9.10	<b>9.92</b>	85%
18	SW 9215-RRS	10.66	8.02	<b>9.34</b>	75%
20	CW050085	10.54	8.12	<b>9.33</b>	77%
5	FG R914W259S	10.49	10.03	<b>10.26</b>	96%
12	Saltana	10.26	9.21	<b>9.73</b>	90%
7	AZ-88NDC	10.18	8.54	<b>9.36</b>	84%
6	AZ- 90NDC-ST	10.17	8.92	<b>9.55</b>	88%
4	FG R814W258S	10.13	8.87	<b>9.50</b>	88%
1	CUF101	10.11	9.51	<b>9.81</b>	94%
2	9R100	10.09	8.51	<b>9.30</b>	84%
9	AmeriStand 901TS	10.01	8.95	<b>9.48</b>	89%
11	Sun Quest	10.01	8.31	<b>9.16</b>	83%
14	SW 9813	9.97	10.49	<b>10.23</b>	105%
8	AmeriStand 915TS RR	9.81	9.75	<b>9.78</b>	99%
21	CW058071 (Impalo)	9.81	7.89	<b>8.85</b>	80%
13	SW 8421-S	9.61	7.03	<b>8.32</b>	73%
3	FG R814W257S	9.58	10.24	<b>9.91</b>	107%
10	Desert Sun 8.10RR	9.45	8.19	<b>8.82</b>	87%
17	SW9812	9.36	11.08	<b>10.22</b>	118%
16	SW9215	8.68	8.85	<b>8.76</b>	102%
		<b>10.04</b>	<b>8.93</b>		89%



**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 <i>Fall Dormancy</i>	SAA <i>Spotted Alfalfa Aphid</i>	PA <i>Pea Aphid</i>	BAA <i>Blue Alfalfa Aphid</i>	PRR <i>Phytophthora Root Rot</i>	BW <i>Bacterial Wilt</i>	FW <i>Fusarium Wilt</i>	An <i>Southern Anthracnose</i>	Stn <i>Stem Nematode</i>	RKN <i>Root Knot Nematode</i>	VW <i>Verticillium Wilt</i>
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 <sup>1</sup>
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)

<sup>1</sup> 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.

