RELATIVE ADVANTAGES OF DIFFERENT DORMANCIES OF ALFALFA GROWN IN CENTRAL AND NORTHERN CALIFORNIA

Vern L. Marble
Extension Agronomist
University of California, Davis

This paper represents the eighth compilation I have made of winter dormancy and fall growth characteristics (Table 1) and resistance characteristics to major alfalfa pests in California (Table 2). This is not a complete compilation of all available varieties, but has been deliberately restricted to those that are marketed in California. The first compilation occurred in 1977 and was printed in the Seventh California Alfalfa Symposium Proceedings. In 1977 only 72 varieties and brands were characterized, while in 1986 a total of 115 are included. There has been a shifting over that period of time, in fact 14 were dropped from this version in one year, and a total of 46 varieties have been discontinued in this 10-year period. Still, today more are available. Most are dormant varieties (47), and only represent about one-third of the winter dormant (D) varieties available to farmers throughout the United States and Canada. There are also 21 semidormant (SD), 15 intermediate (ID) and moderately nondormant (MND), 21 nondormant (ND), and 11 very nondormant (VND) varieties and brands. In this compilation there are 13 new alfalfas that were not included in the 1985.

I must also add that a few varieties are not listed that are known to be utilized in California. These were not included because no information was received from the company which owns/markets the variety.

A New Dormancy Characterization

During 1986 I have communicated with the alfalfa breeding companies and also those marketing different alfalfas to gain their support for what appears to me to be a very necessary change in the winter dormancy classification. About 45 years ago, a USDA worker devised the terms to characterize dormancy of: northern, or winter dormant alfalfa; central, or semi winter dormant alfalfas; southern, or non winter dormant alfalfas. This system worked when there were only five to ten different alfalfas and regional ecotypes being grown throughout the United States and Canada. With modern alfalfa breeding being accelerated by many private companies, this original germ plasm and other introductions have mixed our dormancy classifications so much that a new more exact system needed to be devised. In 1977 I proposed a system of six classifications. This was a practical solution to our problems here in California but did not include the wide diversity of dormancy types available. Also in 1977 I attempted to categorize the fall growth characteristics of alfalfa with a scale from 1 to 8, which is still included in my system (the last page of Table 1). This, in most instances, is difficult to separate from the winter dormancy scale I am proposing (last page of Table 1). In most of California alfalfa growing areas, with the exception of our high elevation, northern mountain valleys, winter dormancy and fall growth characteristics should be fairly similar. In the northern areas, people are interested in knowing whether or not an alfalfa will live through severe winters. Here in the major alfalfa growing areas of California such as the Sacramento and San Joaquin Valleys, that issue is not important. All alfalfas, even very non winter dormant alfalfas or, in my new scale "extremely nondormant alfalfas" will live through our moderate winters. What we are interested in learning is whether or not alfalfas will grow during the warm days that frequently occur during our winter months. In my new scale, alfalfas classed as numbers 07 through 11 will all grow during the winter time if temperatures are normal. Alfalfas numbered 08 through 11 are very frost sensitive and foliage will be severely frosted and burned back at temperatures below 30°F (Table 3). Varieties 01 through 06 all have a distinct winter dormant period that is triggered by temperature and short day length. These alfalfas, in the Central Valley, will not grow and be frosted at temperatures slightly below freezing during the wintertime. However, in very cold areas, only those classed as 01-03 can be considered as not likely to suffer winter-spring damage (Table 4). Those classed as 06 or 07 are transitional between these two extremes, some showing the characteristics of the more dormant or the more nondormant types.

It is hoped that all alfalfa workers will review those classifications for winter dormancy and fall growth with the intent in refining the classes that are listed. Most of the classifications in the winter dormancy scale were made by the author since the distri-

butor/owner/originiator did not indicate what he wished to have in this classification. Variety descriptions as published by the National Certified Alfalfa Variety Review Board and data collected in University trials throughout California were used in this reclassification. Some companies did respond and all those responding agreed with the need for this new system. Undoubtedly in the next few years it will be refined.

Importance of Dormancy in Variety Selection

The most important considerations in variety selection involve:

Yield
2. Yield of ı quality hay
3. Yield of ı quality hay for desired stand fe.

Yield and Persistence. We have learned over the last 10 years that yield is strongly influenced by several prominent factors including dormancy and the ability to persist and remain productive throughout the entire rotational period devoted to alfalfa. In the Sacramento Valley this varies between four and five years, and is reduced as you go south into the San Joaquin Valley where many producers leave alfalfa only three years for maximum benefit tc their subsequent cotton crop. Even in Imperial Valley, persistence is important. A few weeks ago I talked to a grower from the Brawley area who told me he had been able to keep alfalfa in the Imperial Valley for seven fully productive years compared to three or four previously, simply by adopting the bed planting technique that we have been advocating through the alfalfa symposia for at least the last 12 years. The proper dormancy selection is important since it regulates the time period that harvests can be made. In the northern mountain area and Nevada, the so-called "Intermountain region", normally three or four cuttings are taken per season, and their stands last from five to eight years. At Tulelake and in the northeastern corner of California in Surprise Valley, Modoc County, we have had very productive plantings for 8 to 10 years. By the same token, in Imperial Valley where 9 to 10 cuttings are normally taken per season, it is not normal to have a stand maintain productivity past three or four years, for a total of 30 to 35 cuttings, about the same number as in the northern region with three and four cuttings per season. Likewise, in the Sacramento Valley with a normal six cutting program and stands lasting for five years, that is again about 30 cuttings. In the San Joaquin Valley with normally seven cuttings taken per season for a four year period, the total is about the same, around 30 cuttings maximum for a stand life. Note, however, in the data presented in Tables 4 and 5, a five year trial and a seven year trial (Table 6) from Tulelake, in northern California, respectively, that as long as stands of four to five plants per square foot were present, there was little decline in yield for the majority of varieties. In fact, some varieties with better stands are less productive than others with inferior stands, a fact noted in other environments (Tables 7 and 8).

Moapa 69 and Lahontan are good examples of the former statement. These are used as check varieties in all of our trials at UC Davis and in the San Joaquin Valley at the West Side Field Station (WSFS) and the Kearney Agricultural Center. Lahontan has always persisted as well as any other entry we have been able to identify (Table 8), but it's productivity is poor in the central San Joaquin Valley under the cutting schedules imposed of seven times per season frequently averaging 15% less than Moapa 69 and up to 30% less than the leading entries at the WSFS (Table 7).

When the relationship between yield and stand is plotted, as has been done in Figure 1 for the 1985 total seasonal yields and percent stand remaining at the end of the fifth year, this relationship becomes clear. You can see in the lower right hand corner of the graph, a number of points that show a high percent stand remaining with a low yield. These points are represented by Lahontan, and Nova, a variety developed in Australia from Lahontan. The higher yields and better stands, for the most part are highly correlated, with about two-thirds of a ton increase for each increase in 10% of stand, a highly significant relationship with less than 1 chance in 999 of being not a true relationship, even with the out-of-phase Lahontan values. I should point out however that we can't extrapolate beyond the limits of the data shown since the equation indicates that when there is 0% stand there will be a yield of 7.646 tons per acre, a value obviously not consistent with reality.

Increasing weed content of stands was highly related to stand loss (Figure 2). In fact, as this graph indicates, for most varieties, a weed rating could be predicted after five years, based on the percent stand remaining with a very high degree of accuracy (correlation coefficient -0.74, significant at odds of <999 to 1). Obviously, with this relationship, as weediness increases, yield will decline (Figure 3).

In summary, at the WSFS, with the exception of Lahontan, which has superior persistent characteristics, with seven cuttings per season, the varieties with the most weediness were varieties with poor persistence characteristics and/or semidormant and moderately nondormant in their fall growth and winter dormancy ratings. Productive stands were associated with nondormancy and persistence, with all of the leading entries being moderately resistant or resistant to Phytophthora root rot and/or other root rotting organisms.

Lower Sacramento and Upper San Joaquin Valley Area

This geographic area presents a different climate and soil environment that requires a reevaluation of the value of nondormant alfalfas. The heavier rainfall in the fall, winter and early spring in this area compared to the central and southern San Joaquin Valley, combined with lower, more optimum temperatures, means less time for growing a harvestable crop. The important issues for selecting a variety in this area would include the same three factors listed earlier--yield, quality and persistence--but modified by several environmental conditions peculiar to this area. These would include the difficulty in harvesting due to wet soil and/or poor drying conditions in early April and after the first of October. Thus the season in this area is effectively reduced, almost one full month, with the first cutting harvested around April 15 to 20 and the last cutting taken no later than the first week in October.

Persistence has also been a problem on heavy clay soils due to the soils being saturated in the late winter and often in the early spring when plants want to grow. This results in less to little oxyben in the root zone, giving lower yields for nondormant alfalfas, and frequently in a rapid stand decline, sometimes in the matter of a few weeks. This situation has been discussed in previous symposia from results of variety and cutting frequency trials conducted at UC Davis, and also by observational trials conducted on heavy clay soils in Yolo County by Carl Schoner, and in San Joaquin County by Mick Canevari. Table 9 summarizes stand persistence readings, weed cover, and vigor of 29 entries in a San Joaquin County trial, and 50 entries in a Yolo County trial, by dormancy groups. It is quite obvious that the greatest persistence was found in varieties that had some to a great deal of winter dormancy, and which were classed as intermediate to winter dormant.

Many producers north of Woodland are now planting winter dormant alfalfas, or varieties that are strongly semidormant. South of Davis, particularly around Stockton and south to the Modesto/Escalon area, growers are planting intermediate or varieties that have moderate nondormant characteristics. There are good reasons for not planting nondormant alfalfa in this area. As you can see from the weediness readings in Table 9, green foxtail was very severe the fourth year, particularly in stands that had less than a 45% stand remaining. Nearly all of these were nondormant or very nondormant varieties. In general, they are clearly not adapted to this area, although there are some few exceptions that have the persistence characteristics (mainly Phytophthora root rot resistance) that allow them to survive.

Most of the newer varieties that are in the semidormant/intermediate dormancy groups of 06 and 07 are multiple pest resistant varieties with strong Phytophthora root rot resistance and also with some degree of resistance to stand depleting diseases such as southern anthracnose, bacterial wilt, and Fusarium wilt. Many of these newer alfalfas were planted in three trials at UC Davis, each containing 33 entries in: (1) a dormant alfalfa trial; (2) a semidormant trial; and (3) a nondormant trial. 1986 was the third production year for these three trials. The dormant trial (Table 10) has been cut five times per season while the semidormant (Table 11) and nondormant trial (Table 12) have been cut each six times per season. The second production year they yielded very similarly when the 33 entries were averaged, and in 1986 the dormant and semidormant trials averaged identically (11.7 vs 11.11 tons/acre). The yield of the nondormant trial began to slip (10.46 tons/acre) because of stand reduction and lower first and second cutting yields due to the wet spring. For example, the first and second cuttings of the nondormant trial averaged 1.07 and 1.59 tons/acre respectively, compared to 1.39 and 1.93 for

the semidormant trial, and 1.44 and 2.38 of the dormant trial. The second cutting of the dormant trial was only delayed seven days but averaged 0.8 tons/acre more than the nondormant trial. The three-year summaries for all three trials are presented in Tables 10, 11, and 12 (note that the semidormant trial was planted in the spring of 1984 while the other two were planted in the fall of 1983).

New Varieties Outstanding

The productivity of some of the new varieties is truly outstanding! While the full stand life has not been completed, after three full production years, many are maintaining stands that are nearly equal to or in some cases equal or superior to the standard persistent variety of Lahontan. This is especially noticeable in the nondormant and semidormant trials where some entries are spectacularly persistent and high yielding. If these superior entries are able to maintain their stands for four to five years, they will represent a remarkable improvement and addition to our variety selection. The persistence rankings, represented as percent of stand taken at the end of the third production year, are given in Table 13 for the dormant, Table 14 for the semidormant, and Table 15 for the nondormant entries.

Just as at the West Side Field Station in Fresno County, there is a strong, very highly significant relationship between total 1986 yield and stand persistence at the end of the third production year in all of the three trials at UC Davis. The relationship between yield of nondormant varieties and stand persistence is given in Figure 4 as an example of all three trials. This relationship between total seasonal yield and stand persistence at the end of the third year is even stronger in this trial than at the WSFS. This is shown in the linear equation of: y (yield) = 3.709 + 0.098x (percent stand). The correlation coefficient of 0.648 is very highly significant at a probability of not being a true difference at less than 999 to 1. The equation tells us that within the range of stands encountered, for each percent increase in stand there will be a corresponding increase in yield of 0.098 tons/acre, or about 1 ton per 10 percentage units of stand increase.

None of these trials have varieties that were contaminated with weeds except several of the poorer persisting varieties in the nondormant trial.

Stand persistence problems at UC Davis have been diagnosed as involving Stagonospora root rot (Stagonospora meliloti), southern anthracnose (Colletotrichum trifolii) and Phytophthora root rot (Phytophthora megasperma). However, the stand differences account for only about 42% of the variability between varieties, leaving a large amount of the variability undefined. Undoubtedly some of this is due to the pure yielding ability differences among varieties. Other diseases and the previously mentioned ability of certain varieties to yield more in the first and second cuttings are probably also involved. Since the first cutting date for all three trials was the same day, April 11, 1986, it is interesting to note that the dormant alfalfas had a number of varieties that yielded in the range of 1.5 to 1.6 tons/acre for the first cutting, the better semidormants yielded in the range of 1.4 to 1.5 tons/acre, while the best nondormants yielded 1.2 to 1.3 tons/acre, somewhat different than what one might expect.

Quality. While we don't have a great deal of quality information on these variety trial comparisons, we did sample some common entries in all three trials for several cuttings in 1985. Table 16 summarizes some quality factors comparing three different varieties that were entered in both the dormant and semidormant trials, and hence represent a four and a five week cutting schedule. Three entries from the nondormant trial cut at the same four week schedule as the semidormant trial are also included. As one would expect, all quality factors measured (percent crude protein, TDN, calcium and phosphorus) were superior for the four weeks when alfalfa was harvested in a younger, more vegetative stage. It is also interesting to note that with the exception of WL 316, which was slightly higher in quality for all parameters measured among the three entries, as dormancy lessened and recovery was quicker, quality decreased. A lower calcium and higher phosphorus percentage indicate a higher quality since the calcium-phosphorus ratio is smaller. This is in keeping with other observations that as maturity increases calcium increases and phosphorus decreases. Table 16 also lists the TDN percent, calculated by the California MCF method. The average TDN for the four week (six seasonal cuttings per year) schedule was 54% TDN and for the five week (five cut schedule) was 52%.

This 2% reduction is substantial when one takes into account the price premium that high quality hay has been able to command through the 1986 season. The 1.7 tons advantage for the less frequently cut plot translates into a reduction of income of $297.00 or roughly $100.00 per season when the $15.00 reduction in price for the lower quality hay is taken into account. Harvesting for quality pays off even to a greater extent when one makes the same three-year total yield comparison between the highest yielding variety in each of the two trials. This comparison indicates that the best variety in the five cut schedule actually yielded 2.9 tons less compared to the six cut schedule which when projected for the same price structure for low and high quality hay, the results are even more spectacularly in favor of the more frequent cutting of high quality hay by $812.00 or $271.00 per year!

I realize that these figures are speculation with a lot of assumptions, but in today's marketing situation, high quality hay produced from more frequent cuttings is more important than a higher yield from the lower quality five cut treatment. The key is the availability of high yielding, persistent varieties that can be managed according to the demands of the market. The question that comes to my mind is what would be the performance of the leading varieties from each of the dormancy groups over a four year period when they were each cut at different intervals? Perhaps we need to reevaluate our concepts about the advantages of dormant and fully semidormant alfalfas in the Sacramento and upper San Joaquin Valleys when compared to the intermediates and nondormant alfalfas. The leading two varieties in the six cut semidormant trial (Table 11) have more nondormancy than a true semidormant alfalfa such as Lahontan. They have a much quicker regrowth, grow more vigorously into the fall months, and are highly persistent so far. In fact they have the appearance of being more like nondormant alfalfas than semidormant alfalfas when viewing them in comparison with other semidormant alfalfas in the field. All of the leading entries in the semidormant trial are more like the old Caliverde alfalfa which was so highly adapted to this area before the spotted alfalfa aphid arrived in 1954.

Caution

Does this optimism about intermediate alfalfas sound familiar? Many growers in the area remember new varieties with a lot of publicity that yielded well for three years, but which in the final analysis in a four or five year stand life, didn't persist and stands became thin and weedy prematurely compared to the old standbys of Lahontan and Washoe. I can't foresee the future, but I looked at these plots just a few days ago and some of these newer alfalfas look tremendous with very thick, vigorous stands, some better at this date than even Lahontan (see Tables 13, 14, and 15).

There are even several, new, high yielding varieties in the nondormant classification that appear to persist equal to Lahontan after three years. At the West Side Field Station, the same situation exists even after five years (Tables 7 and 8). A few of the leaders in the Davis trials after two years, have already begun to fade in the third year.

Summary

In the past, growers have benefited by switching from nondormant alfalfas to the semidormant types, and many have now switched again to the dormant alfalfas, especially in the Sacramento Valley where rain and saturated soils in the wintertime have posed a serious problem to maintaining productive, vigorous, weed-free stands over the four to five years which are preferred. We need additional yield comparisons on these poorer types of soils where conditions are not as ideal as they are at the UC Davis farm. Because of this, growers should move cautiously from successful established varieties into the newer apparently more productive varieties.

Two other speakers on the symposium program will present a very strong point of view for dormant alfalfas in the Sacramento Valley, especially on heavier clay soils. I agree with their points of view, since it is a well-known fact that the more dormancy alfalfa varieties have the greater will be their quality and survival under saturated soil conditions. However, on more well-drained soils I believe I would take the risk of planting some of these newer, high yielding, multiple pest resistant, vigorous, persistent, semidormant or intermediate/moderately nondormant varieties, and cut them for the demands of the high quality alfalfa hay market.

Table 1. Alfalfa variety and brand growth characteristics, principal areas of use, and distributor/owner/originator. December 1986.

Variety or brand	Winter[1] dormancy scale	Fall[2] growth	Principal[3] areas of use	Distributor or owner or orignator	Information supplied by:
			WINTER DORMANT		
Action	04	4	8	Land O'Lakes	R. R. Kalton
Apollo	04	3	6,8	Agripro	Jim Moutray
Apollo	04	3	6,7,8	" "	" "
Armor	04	2	6,7,8	" "	" "
Arrow	03	3	6,7,8	" "	" "
Atra 55	03	2	8	Arnold-Thomas Seed Service	Jack McGillis
Blazer	04	2	8	Union Seed Co.	Jess Bice/Don Brown
DeKalb Brand 120	04	2	8	DeKalb-Pfizer Genetics	
Drummor	04	3	6,7,8	Northrup King	Bill Knipe
Duchess	04	3	7,8	Plant Genetics	Ike Kawaguchi
Edge	04	4	8	Land O'Lakes	R. R. Kalton
Elevation	03	3	8	" "	" " "
Epic	05	3	8	Union Seed Co.	" " "
Flint	04	3	7,8	Plant Genetics	Ike Kawaguchi
Gladiator	04	2	8	Northrup King	Bill Knipe
GT-58	05	4	6,8	AgriPro	Jim Moutray
Husky	03	2	6,7,8	Lovelock Seed	Lloyd Stockton
Iroquois	02		8	New York College of Ag., Cornell Univ.	R. P. Murphy/C. C. Lowe
Max 85 Brand	03	2	8	SeedTec	Craig Sharp
Milkmaker	03	3	6,7,8	Lovelock Seed	Lloyd Stockton
Misson 305 Brand	05	4	6,7,8	Mission Seed Distributors	Mike Fraley
NK 83632	04	2	8	Northrup King	Fred Autio
Oneida	02	1	8	New York College of Ag., Cornell Univ.	R. P. Murphy/C. C. Lowe
Pacer	03	2	8	Union Seed Co.	Jess Bice/Don Brown
Peak	03	2	8	Union Seed Co.	R. R. Kalton
Phytor	02	2	8	Northrup King	Bill Knipe
Pioneer Brand 524	03	2	8	Pioneer Hi-Bred International Inc.	Boyd Hartman
Pioneer Brand 526	02	2	8	" "	" "
Pioneer Brand 532	04	3	7,8	" "	" "
Pioneer Brand 545	04	2	8	" "	" "
Pro 96 Brand	04	3	2,6,8	Garner Seed/ Ramsey Seed	Bob Garner
Raidor	04	3	8	Northrup King	Bill Knipe
Ranger	03		8	USDA/Univ. of Nebraska	Vern Marble
Sparta	02	3	8	Land O'Lakes	R. R. Kalton
Spredor 2	01		8	Northrup King	Bill Knipe
Sunrise	05		6,8	NC+ Hybrids	Jim Loe
Thor	04	2	8	Northrup King	Bill Knipe
Trumpetor	04	2	8	" "	" "
WL 220	02	2	8	Germain's/W-L Research	Doug Elkins/Frank Bedard
WL 221	02	2	8	" "	" " "
Valor	02		8	Union Seed Co.	Jess Bice/Don Brown
Vancor	03	2	8	Northrup King	Bill Knipe
Vernal	02	1	8	University of Wisconsin	Vern Marble

Table 1. (Continued)

Variety or brand	Winter[1] dormancy scale	Fall[2] growth	Principal[3] areas of use	Distributor or owner or orignlator	Information supplied by:
Verta	05	4	2,6,7,8	NC+ Hybrids	Jim Loe
Vortex	03	3	7,8	Plant Genetics	Ike Kawaguchi
Vernema	04	2	8	USDA/Washington State University	R. Peaden
Wrangler	03	3	6,8	USDA/University of Nevada	Bill Kehr
York	04	3	7,8	Plant Genetics	Ike Kawaguchi
			SEMI WINTER DORMANT		
Alpha I	05	4	2,3,5,6,8	NC+ Hybrids	Jim Loe
Brute Brand	06	4	2,3,5,6	SeedTec	Craig Sharp
Cimarron	06	4	2,5,6,8	Great Plains Research Co., Inc.	Thad Busbice
DeKalb Brand 167	06	4	2,3,5,6	DeKalb-Pfizer Genetics	J. Andrews
Eagle	06	3	2,6,7,8	O's Gold	Jerrold Ocheltree
NPI 455 Brand	07	3	2,3,5,6,8	NPI Lohse Mill	Chuck Lohse
Lahontan	06	3	2,3,5,6	USDA/Univ. of Nevada	Boyd Hartman
L-720 Brand	06	4	2,4,5,6,8	Lovelock Seed	Lloyd Stockton
Meteor	06	4	2,3,4,5,6, 7,8	Northrup King	Fred Autio
Mission 123 Brand	06	3	2,3,5,6	Mission Seed Distributors	Mike Fraley
Pike	07	4	2,3,4,5, 6,7	Northrup King	Bil Knipe
Pioneer Brand 555	06	4	6,8	Pioneer Hi-Bred International, Inc.	Boyd Hartman
Pro 86 Brand	06	4	2,5,6	Garner Seed/ Ramsey Seed	Bob Garner
SD 76 Brand	06	4	2,5,6,8	Tri-Cal Dist.	Bob Shotwell
Sutter	06	4	2,5,6	Plant Genetics	Ike Kawaguchi
WL 312	06	3	2,6,7,8	Germain's/W-L Research	Doug Elkins/Frank Bedard
WL 314	06	3	2,6,7,8	" "	" " " "
WL 316	06	4	2,6,7,8	" "	" " " "
WL 318	05	4	2,5,6,8	" "	" " " "
WL 320	06	4	2,5,6,8	" "	" " " "
1019 Brand	06	4	2,3,4,5,6, 7,8	Northrup King	Bil Knipe
Washoe	05	3	2,4,5,6,8	USDA/Univ. of Nevada	Boyd Hartman
			INTERMEDIATE WINTER DORMANT TO MODERATELY NON WINTER DORMANT		
Amador	07	5	2,3,4,5,6, 7	Northrup King	Bil Knipe
Baron	07	4	2,3,4,5,6	AgriPro	Jim Moutray
Caliverde 65	07	4	2,3,5,6	Univ. of Calif.	Vern Marble
Condura 73 Brand	07	4	2,3,5,6	Continental Grain	Eldon Hoffman
DeKalb Brand 185	07	5	4,5,6	Ramsey Seed/ DeKalb-Pfizer Genetics	J. Andrews
Diamond	07	5	2,3,4,5,6	AgriPro	Jim Moutray
Joaquin	07	5	2,3,4,5,6	Security Ag Research	Steve Rusconi

Table 1. (Continued)

Variety or brand	Winter[1] dormancy scale	Fall[2] growth	Principal[3] areas of use	Distributor or owner or orignator	Information supplied by:
L-1920	07	4	2,3,4,5, 6,8	Lovelock Seed	Lloyd Stockton
Mesilla	07	5	2,4	New Mexico State Univ.	Bil Melton
NC+ 8800 Brand	07	5	4,5,6	NC+ Hybrids	Jim Loe
Pioneer Brand 581	07	4	2,3,5,6	Pioneer Hi-Bred International	Boyd Hartman
WL 450	07	5	3,5,6	Germain's/W-L Research	Doug Elkins/Frank Bedard
WL Southern Special	07	5	2,3,5,6	" "	" "
919 Brand	07	5	3,4,5,6	Northrup King	Bill Knipe
Yolo	07	5	2,3,5,6	Plant Genetics	Ike Kawaguchi
			NON WINTER DORMANT		
Ardiente	08	6	1,3,4,5	AgriPro	Jim Moutray
Armona	08	6	3,4,5,6	Plant Genetics	Ike Kawaguchi
Condor	08	7	1,4,5,6	Northrup King	Fred Autio
Galaxy Brand	08	6	1,3,4,5,6	NC+ Calif. Seed	Jim Loe
GT-13R Plus	08	6	3,4,5,6	AgriPro	Jim Moutray
Madera	08	6	3,4,5,6	Plant Genetics	Ike Kawaguchi
Maricopa	08	6	3,4,5,6	" "	" "
Mission 421	08	6	4,5	Mission Seed Distributors	Mike Fraley
Mission 477 Brand	08	6	4,5,6	" "	" "
Moapa 69	08	6	1,3,4,5,6	USDA/Univ. of Nevada	Boyd Hartman
ND 80 Brand	08	6	1,3,4,5,6	Tri-Cal Dist.	Bob Shotwell
Pierce	08	7	1,4,5	Northrup King	Bill Knipe
Pioneer Brand 572	08	7	1,3,4,5	Pioneer Hi-Bred International	Boyd Hartman
Rincon	07	6	2	New Mexico State University	Bill Melton
Sapphire	08	6	1,3,4,5,6	AgriPro	Jim Moutray
WL 512	07	6	1,3,4,5,6	Germain's/W-L Research	Doug Elkins/Frank Bedard
WL 514	08	6	1,3,4,5,6	" "	" " " "
WL 515	08	6	1,2,3,4,5,6	" "	" " " "
WL 516	08	6	1,3,4,5,6	" "	"
819 Brand	08	6	1,4,5	Northrup King	Bil Knipe
Valador	08	6	1.4.5	" "	" "
			VERY NON WINTER DORMANT		
CUF 101	09	8	1,4,5	Univ. of Calif.	Bill Lehman
Hayden	09	7	1,4	Univ. of Arizona	Mel Schonhorst
Lew	09	7	1,3	" " "	" "
Maxidor	09	8	1,4,5	Northrup King	Bill Knipe
Mecca	09	8	1,4,5	Plant Genetics	Ike Kawaguchi
Mesa Sirsa	09	7	1	Univ. of Arizona	Mel Schonhorst
Pioneer Brand 5929	09	8	1,3,4,5	Pioneer Hi-Bred International	Boyd Hartman
Sundor	09	8	1,3,4	Northrup King	Fred Autio
UC Cibola	09	7	1,4	Univ. of Calif.	Bill Lehman
UC Salton	09	7	1,4	" " "	" "
WL 605	09	8	1,4	Germain's/W-L Research	Doug Elkins/Frank Bedard

[1]Winter Dormancy and Example Variety

01 = VD = very dormant (Norseman)
02 = DI = dormant I (Vernal)
03 = DII = dormant II (Ranger)
04 = MDI = moderately dormant I (Saranac)
05 = MDII = moderately dormant II (DuPuits)
06 = SD = semidormant (Lahontan)
07 = MND = moderately nondormant (Mesilla)
08 = ND = nondormant (Moapa 69)
09 = VNDI = very nondormant (CUF 101)
10 = VNDII = very nondormant (Hasawi I)
11 = END = extremely nondormant (Wadi Quriyat)

[2]Fall Growth Similarities **

1 = Vernal
2 = Thor
3 = Lahontan
4 = Caliverde 65
5 = DeKalb Brand 185
6 = Moapa 69
7 = UC Salton
8 = CUF 101
9 = Hasawi I

[3]Principal Areas of Use

1 = Low desert valleys of southern California, southern Arizona, and southern Nevada.
2 = Intermediate and high desert valleys of southern California, southern Arizona, southern Nevada, southern New Mexico and west Texas.
3 = Coastal valleys of central and southern California.
4 = Southern San Joaquin Valley.
5 = Northern San Joaquin Valley.
6 = Sacramento Valley.
7 = North coastal valleys.
8 = High elevation mountain valleys of northern California, Nevada, northern Arizona, and northern New Mexico.

** New proposed fall growth scores not in effect in 1985.

Table 2. Alfalfa variety and brand ratings for pest resistance.[1] December 1986.

Variety or brand	SAA	PA	BAA	PRR	Sc	Rz	BW	FW	S An	CLS	DM	SN	RKN	VW
WINTER DORMANT														
Action	R	R	--	R	--	--	R	--	R	--	--	--	--	MR
Apollo	MR	MR	S	R	S	S	R	R	LR	LR	LR	MR	S	--
Apollo II	MR	MR	S	HR	--	--	R	R	MR	--	--	MR	--	MR
Armor	S	MR	S	R	--	--	R	R	MR	--	--	--	--	--
Arrow	S	--	S	HR	--	--	MR	HR	MR	MR	MR	MR	--	R
Atra 55	S	MR	S	MR	--	--	R	MR	S	HR	HR	--	--	--
Blazer	S	HR	S	MR	S	S	HR	R	LR	--	--	R	--	S
DeKalb Brand 120	S	R	--	R	--	--	HR	R	S	--	--	R	--	S
Drummor	R	--	--	R	--	--	R	--	MR	R	R	MR	--	--
Duchess	MR	R	S	R	--	--	R	MR	R	--	--	R	--	MR
Edge	MR	R	--	R	--	--	R	--	R	--	--	--	--	MR
Elevation	S	R	--	MR	--	--	R	R	S	--	--	HR	--	MR
Epic	S	HR	--	R	--	--	R	MR	S	MR	--	HR	--	S
Flint	R	R	S	R	--	--	R	--	HR	--	--	R	--	LR
Gladiator	S	R	S	S	--	--	R	MR	LR	MR	R	MR	--	--
GT-58	HR	R	LR	R	--	LR	R	HR	MR	MR	MR	MR	MR	--
*Iroquois	S	S	S	S	S	S	R	--	S	LR	--	S	--	--
Max 85 Brand	LR	HR	S	R	S	S	HR	R	LR	MR	--	R	--	--
Milkmaker	S	R	--	MR	--	--	R	R	MR	--	--	--	--	S
Mission 305 Brand	HR	HR	R	MR	--	--	LR	HR	LR	--	--	MR	--	--
NK 83632	R	--	S	HR	--	--	R	R	R	--	--	HR	--	R
*Oneida	S	S	S	R	--	--	HR	--	S	R	MR	S	--	--
Pacer	S	R	S	LR	--	--	R	MR	S	--	--	LR	LR	S
Peak	S	HR	S	MR	S	S	HR	R	S	--	--	R	--	LR
Phytor	S	S	S	R	--	--	R	--	S	MR	MR	S	--	--
Pioneer Brand 524	R	LR	--	--	--	--	MR	R	--	--	MR	--	--	--
Pioneer Brand 526	R	MR	--	--	--	--	R	--	--	--	MR	--	--	--
Pioneer Brand 532	R	MR	--	MR	--	--	R	R	MR	--	--	--	LR	--
Pioneer Brand 545	R	LR	--	R	--	--	R	R	--	--	--	LR	--	--
Pro 96 Brand	MR	R	--	R	--	--	R	R	MR	--	--	R	--	R
Raidor	S	S	S	S	--	--	R	MR	R	R	R	MR	--	--
*Ranger	S	S	S	S	--	--	MR	--	S	MR	MR	S	--	--
Sparta	S	R	--	MR	--	--	R	MR	S	--	--	HR	--	R
Spredor 2	S	S	S	S	--	--	HR	--	S	R	R	--	--	--
*Sunrise	R	LR	S	LR	--	--	R	MR	LR	LR	MR	LR	--	--
Thor	S	S	S	S	--	--	HR	--	S	R	R	MR	--	--
Trumpetor	S	R	S	S	--	--	MR	R	R	R	R	MR	--	MR
WL 220	MR	HR	MR	MR	--	--	R	MR	S	LR	LR	LR	S	--
WL 221	R	R	--	LR	--	--	R	MR	MR	LR	--	MR	--	--
Valor	S	R	S	S	S	S	R	MR	LR	MR	--	MR	LR	S
Vancor	S	R	S	R	--	--	R	MR	R	R	R	R	--	--
*Vernal	S	S	S	S	--	--	R	--	S	LR	MR	S	MR	--
Vernema	MR	--	S	LR	--	--	MR	--	LR	--	R	R	--	MR
Verta	LR	R	--	R	--	--	HR	R	HR	--	--	MR	--	R
Vortex	MR	HR	MR	R	--	--	HR	--	LR	--	--	MR	--	LR
Wrangler	R	R	--	R	--	--	R	R	R	--	R	--	--	--
York	MR	R	S	MR	--	--	R	--	HR	--	--	MR	--	LR
SEMI WINTER DORMANT														
*Alpha I	R	HR	LR	R	--	LR	R	MR	R	LR	MR	MR	--	
Brute Brand	HR	R	S	R	--	--	MR	R	MR	MR	MR	MR	S	S
*Cimarron	MR	R	S	MR	--	--	R	R	R	MR	LR	--	--	--
*Condura 74 Brand	R	R	LR	R	--	LR	R	MR	R	LR	MR	MR	--	--
*DeKalb Brand 167	R	LR	S	MR	--	--	LR	--	S	LR	LR	LR	--	--
Eagle	R	R	LR	R	--	--	R	R	R	--	--	R	--	--
Husky	S	R	--	MR	--	--	R	R	MR	--	--	MR	--	S
*Lahontan	R	S	S	R	S	S	R	S	S	S	S	R	S	

Table 2. (Continued)

Variety or brand	SAA	PA	BAA	PRR	Sc	Rz	BW	FW	S An	CLS	DM	SN	RKN	VW
L-720	R	R	--	MR	--	--	R	S	MR	--	--	--	--	S
LS-1920	MR	R	MR	MR	--	--	MR	LR	LR	--	--	LR	LR	S
Meteor	HR	HR	HR	R	--	--	R	R	--	--	--	R	--	--
Mission 123 Brand	R	HR	LR	MR	--	--	R	HR	LR	--	--	MR	--	--
NPI 455 Brand	R	R	LR	HR	--	LR	MR	HR	MR	MR	MR	MR	MR	--
Pike	MR	R	S	R	--	--	MR	MR	S	R	R	R	MR	--
Pioneer Brand 555	R	MR	--	LR	--	--	R	R	LR	--	--	--	LR	--
Pro 86 Brand	HR	R	S	R	--	--	LR	--	S	LR	LR	LR	--	S
*SD 76 Brand	R	R	LR	MR	--	LR	R	MR	MR	LR	LR	MR	--	--
Sutter	R	R	R	HR	--	--	R	R	LR	--	--	R	--	LR
WL 312	R	R	LR	R	--	--	R	MR	LR	MR	LR	MR	--	--
WL 314	R	HR	LR	LR	--	--	R	R	LR	--	--	HR	--	--
WL 316	R	R	LR	MR	--	--	MR	R	R	--	--	MR	--	R
WL 318	R	HR	LR	MR	--	--	R	MR	MR	MR	MR	LR	S	--
WL 320	R	MR	MR	R	--	--	R	R	MR	--	--	MR	--	MR
1019 Brand	MR	LR	--	R	--	--	MR	--	--	R	R	R	--	--
*Washoe	R	MR	S	R	--	--	R	S	S	S	S	R	S	--
INTERMEDIATE WINTER DORMANT TO MODERATELY NON WINTER DORMANT														
Amador	MR	S	S	R	--	--	--	R	--	MR	MR	MR	S	--
Baron	HR	HR	HR	R	--	--	MR	R	MR	--	--	--	--	--
*Caliverde 65	HR	S	S	MR	--	--	R	--	S	LR	LR	MR	--	--
*Condura 73 Brand	R	LR	S	R	S	S	R	--	S	LR	LR	R	--	--
*DeKalb Brand 185	R	LR	S	LR	--	--	S	--	S	LR	LR	S	--	--
Diamond	HR	HR	HR	R	--	--	LR	HR	R	--	--	--	--	--
*Joaquin 11	R	S	S	LR	--	--	--	--	S	S	S	LR	LR	
*Mesilla	R	R	S	LR	--	--	--	R	--	--	--	LR	--	--
*NC+ 8800 Brand	R	MR	S	R	--	--	S	--	S	LR	LR	S	--	--
Pioneer Brand 581	R	LR	S	MR	LR	S	R	--	S	LR	LR	R	S	--
WL 450	R	MR	MR	MR	--	--	MR	--	LR	LR	MR	R	LR	--
WL Southern Special	R	R	MR	MR	--	--	R	R	MR	--	--	MR	--	--
919 Brand	MR	LR	--	R	--	--	MR	--	--	MR	MR	MR	--	--
Yolo	HR	HR	R	MR	--	--	MR	HR	LR	--	--	MR	--	--
NON WINTER DORMANT														
Ardiente	R	LR	LR	MR	--	--	MR	R	LR	MR	MR	LR	LR	--
Armona	HR	HR	R	MR	--	--	MR	R	LR	--	--	R	--	--
Condor	HR	HR	HR	HR	--	--	--	HR	--	--	--	--	R	--
*Galaxy Brand	MR	R	LR	MR	--	--	MR	MR	LR	--	MR	LR	--	--
GT 13R Plus	R	LR	LR	R	--	MR	R	HR	LR	MR	MR	R	MR	--
Madera	HR	HR	LR	MR	--	--	MR	R	LR	--	--	MR	--	--
Maricopa	HR	HR	MR	R	--	--	MR	R	LR	--	--	R	--	--
Mission 421 Brand	R	R	MR	MR	--	--	LR	R	--	--	--	R	--	--
Mission 477 Brand	HR	HR	R	R	--	--	MR	R	LR	--	--	R	--	--
*Moapa 69	R	S	S	S	S	S	S	R	S	S	S	S	LR	--
*ND 80 Brand	HR	MR	MR	--	--	MR	HR	S	--	--	--	--	--	--
Pierce	HR	R	HR	R	--	--	LR	HR	S	MR	MR	R	--	--
Pioneer Brand 572	R	R	S	LR	LR	S	S	R	S	S	R	S	R	--
*Rincon	R	R	S	S	S	--	LR	LR	--	--	LR	--	--	--
Sapphire	R	R	R	R	--	--	LR	R	MR	--	--	--	--	--
WL 512	HR	R	LR	MR	LR	LR	MR	R	MR	LR	MR	LR	LR	
WL 514	R	R	MR	LR	--	--	MR	MR	S	--	--	LR	--	--
WL 515	R	R	MR	R	--	--	LR	R	S	--	--	R	--	--
WL 516	HR	R	R	HR	--	T	MR	R	LR	T	--	MR	--	--
819 Brand	R	MR	LR	MR	LR	--	--	R	LR	--	--	--	LR	--
Valador	R	--	S	R	LR	--	--	R	MR	LR	LR	--	MR	--

Table 2. (Continued)

Variety or brand	SAA	PA	BAA	PRR	Sc	Rz	BW	FW	S An	CLS	DM	SN	RKN	VW
VERY NON WINTER DORMANT														
CUF 101	HR	HR	HR	MR	LR	--	S	HR	S	S	LR	--	MR	--
Granada	HR	HR	HR	R	--	--	S	HR	S	--	MR	S	LR	--
*Hayden	HR	S	S	S	S	S	--	--	--	S	LR	S	LR	--
*Lew	HR	S	S	S	S	S	--	--	--	S	LR	R	S	--
Maxidor	HR	HR	R	MR	--	--	--	HR	--	--	--	R	LR	--
Mecca	HR	HR	MR	MR	--	--	LR	R	LR	--	--	MR	--	
*Mesa Sirsa	HR	S	S	S	S	S	--	--	--	S	LR	LR	LR	--
Pioneer Brand 5929	R	MR	R	MR	--	--	S	R	S	--	--	--	R	--
Sundor	HR	HR	HR	MR	--	--	--	HR	--	--	--	HR	--	--
UC Cibola	HR	R	LR	MR	LR	--	S	HR	--	--	LR	--	R	--
UC Salton	HR	LR	S	LR	LR	S	S	HR	S	S	LR	S	--	--
WL 605	HR	HR	HR	HR	--	T	LR	R	S	T	--	MR	--	--

[1]According to the system used by the National Certified Alfalfa Variety Review Board. Information supplied by companies or individuals indicated in Table 1. The author assumes no responsibility for accuracy of the data supplied by the different contributors. Those entries marked with an asterisk (*) have had 1982 ratings which involved "Tolerance" changed to the new system by Vern Marble. This was done since no information on this change was received from the originator/owner/distributor as requested.

Pests and Diseases

SAA = Spotted alfalfa aphid
PA = Pea aphid
BAA = Blue alfalfa aphid
PRR = Phytophthora root rot
Sc = Scald
Rz = Rhizoctonia stem and root canker
BW = Bacterial wilt
FW = Fusarium wilt
S An = Southern anthracnose
CLS = Common leaf spot
DM = Downy mildew
SN = Stem nematode
RKN = Root-knot nematode species
VW = Verticillium wilt

Resistance Symbols

HR = High resistance >51%
R = Resistance 31-50%
MR = Moderate resistance 15-30%
LR = Low resistance 6-14%
T = Tolerance (see definition below)
S = Susceptible <5%
-- = No data available

Definitions

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

R = Resistance. Ability of plants to restrict the activities of a specified pest.

T = Tolerance. Ability of plants to endure a specified pest or an adverse environmental condition, performing and producing in spite of the disorder. Not synonymous with low resistance. Used where the resistance mechanism is concerned with the plant's ability to repair, recover, or withstand infestation.

S = Susceptible. Inability of plants to restrict the activities of a specified pest, or to withstand an adverse environmental condition.

Table 3. Frost damage ratings for 1984 San Joaquin Valley regional 48 alfalfa variety and experimental selection trial. West Side Field Station, Five Points, Fresno County. Planted October 31, 1984 at 32 lbs/acre with four replications on Panoche clay loam soil. 1985. (Marble and Peterson) <WS184R5.9>

Entry	Frost damage ratings 11/20/85	DMRT 5%
NE NAF-3	7.50	A
NE NAF-4	2.75	B
NE NAF-1	2.50	BC
Wadi Qurlyat-1984	2.25	BCD
Moapa 69	2.25	BCD
NE NAF-2	2.00	CDE
Madera (83C61)	2.00	CDE
Yolo (83C64)	2.00	CDE
DK 187	2.00	CDE
UC 304	2.00	CDE
FSRC ND-143	2.00	CDE
Salinera INTA	2.00	CDE
Hasawi I (FSI-6)	2.00	CDE
Armona (83C65)	2.00	CDE
CUF 101	1.75	DEF
Pioneer Brand 83CN712	1.75	DEF
Pierce	1.75	DEF
NK 83587	1.75	DEF
UC 268	1.75	DEF
UC 143	1.75	DEF
Pioneer Brand 5929	1.75	DEF
C/W 448	1.75	DEF
Mission 421	1.75	DEF
UC 194	1.63	DEFG
Sequel	1.60	DEFG
UC 193	1.50	EFG
UC 302	1.50	EFG
VAIlant	1.50	EFG
C/W 303	1.50	EFG
WL 516 (83T57)	1.50	EFG
WL 605 (83T51)	1.50	EFG
GT 13R Plus	1.50	EFG
UC Cibola	1.50	EFG
NK 83585	1.50	EFG
Sapphire (NAPB 29)	1.27	FG
NK 83586	1.25	FG
Maricopa (83C62)	1.25	FG
FSRC ND-147	1.25	FG
UC 295	1.00	G
Lahontan	1.00	G
Fortinera INTA	1.00	G
UC 297	1.00	G
Cordobasa INTA	1.00	G
Pioneer Brand 83CN742	1.00	G
South African Standard	1.00	G
WL 515	1.00	G
UC 303	1.00	G
Trifecta	0.94	G
GRAND MEAN	1.72	
LSD (.05)	0.57	
(.01)	0.76	
% C.V.	23.77	

Entries that are followed by the same letter are not significantly different from each other at odds of 19 to 1.
Entries that differ from each other by more than the LSD are significantly or highly significantly different from each other at odds of 19 to 1 (.05) and/or 99 to 1 (.01), respectively.
Frost damage rating: 0 = no damage; 10 = all stems and leaves damaged.

4. Plant stands, winter kill, and spring frost injury for Tulelake alfalfa variety trial planted May 4, 1981. (Carlson and Marble) <TU181R5.1>

Entry	Crowns per square foot				5/2/85		
	9/11/82	9/25/84	4/12/85	9/11/85	Winter* kill rating	Stand** rating	Spring* frost rating
Vernal	9.50	5.25	6.13	6.44	2.0	5.5	2.3
Atra 55	10.00	7.00	5.38	5.94	4.0	5.3	2.8
Iroquois	9.25	5.88	5.75	5.50	2.0	6.0	2.5
WL 311	9.00	6.25	5.00	4.63	3.3	4.5	3.5
Oneida	10.00	6.19	4.69	4.69	2.0	5.0	2.3
Strain 201	8.75	4.19	4.75	4.81	1.0	5.3	1.5
UC 1030	9.75	5.56	3.94	4.13	3.0	4.3	3.3
LS 79-1920 SYN 2	9.25	5.81	3.44	3.94	4.5	3.3	4.8
Cimarron	7.50	5.37	3.94	4.88	4.3	3.8	4.3
Pacer	9.25	5.75	5.50	6.25	2.0	5.5	3.0
Blazer	10.00	6.69	5.75	6.19	2.0	6.3	2.8
Valor	8.50	6.31	5.13	6.63	2.3	5.5	2.8
FSR H-117	8.50	6.94	5.19	5.19	3.8	4.0	4.0
FSR H-103	8.50	5.17	5.63	5.31	2.5	5.0	3.3
AS-67	9.25	6.94	4.75	4.56	4.0	4.3	4.3
AS-60F	10.25	5.75	4.19	4.44	4.0	3.0	4.0
WL 221	10.50	6.50	6.25	6.31	2.5	5.5	2.5
WL 316	9.00	5.88	5.55	6.00	2.3	5.3	3.0
WL 312	9.75	5.94	4.25	4.44	3.5	4.0	3.8
WL 315	9.25	6.75	5.13	5.94	2.3	5.5	2.5
DeKalb Brand 130	11.25	6.44	4.38	5.94	3.8	3.8	4.0
RS 209	8.00	6.81	5.13	5.31	2.8	5.0	3.3
DeKalb Brand 120	10.50	6.56	5.75	6.13	2.0	6.3	2.3
Armor	10.25	6.25	5.44	6.19	2.8	5.3	2.5
Thunder	9.50	6.81	5.56	6.13	2.0	5.8	2.3
Apollo II	10.00	5.88	4.44	5.94	3.5	4.0	3.8
Vangard	9.25	5.88	4.31	5.50	3.5	4.3	4.0
G-2815	10.00	5.94	4.19	5.00	3.5	4.3	3.8
C/W 61	10.75	6.25	5.38	5.88	3.5	4.5	3.5
Jubilee	8.75	5.25	4.38	4.31	3.8	3.5	3.8
Futura	11.25	6.75	4.81	5.44	3.3	4.5	2.8
Magnum	9.25	6.25	5.13	5.31	3.0	4.8	3.3
Trumpetor	9.50	6.00	4.94	5.50	3.3	4.5	2.8
Vancor	9.75	6.56	4.19	5.69	3.3	4.5	3.8
Preserve	9.25	6.88	5.88	6.31	3.5	4.5	4.0
Drumor	8.50	5.62	5.50	4.69	3.3	4.8	3.5
Pioneer Brand 545	10.25	6.19	5.44	6.25	2.5	5.5	3.3
Pioneer Brand 532	9.75	6.13	5.38	6.56	2.0	6.0	2.5
Pioneer Brand 526	10.25	6.13	6.19	5.88	2.0	6.3	3.0
Pioneer Brand 524	9.75	6.69	5.44	6.00	2.5	5.3	2.8
FSR IH-119	8.75	5.44	2.69	4.25	5.8	2.5	6.0
DeKalb Brand 167	11.00	6.44	2.31	5.38	6.0	2.8	7.3
Perry	11.00	7.06	6.38	6.38	2.3	6.0	2.5
Anchor	8.75	5.00	4.31	3.56	2.0	5.0	2.5
Raidor	9.25	5.56	4.63	4.44	4.0	3.5	3.3
Sverre	7.75	6.13	4.81	5.56	3.5	3.8	3.5
GRAND MEAN	9.52	6.11	6.03	5.43	3.1	4.7	3.3
		16.2	20.	20.1	26.4	15.6	19.7
LSD (.05)		1.38	1.37	1.52	1.1	1.0	0.9

* 0-10 Scale, 0 equals no injury, 10 equals 100% kill.
** 0-10 Scale, 0 equals no stand, 10 equals 100% stand.
Entries that differ from each other by more than the LSD are significantly or highly significantly different from each other at odds of 19 to 1 (.05) and/or 99 to 1 (.01), respectively.

Table 5. Five year yield summary of 1981 Tulelake 46 alfalfa variety and experimental selection trial. Tulelake Field Station, Tulelake, Siskiyou County. Planted May 4, 1981 with four replications on a silty clay loam soil with 11% organic matter. (Carlson and Marble) <TU181Y5>

Entry	Yield in tons per acre, rank in parenthesis						
	1981 2 cuts	1982 2 cuts	1983 3 cuts	1984 4 cuts	1985 3 cuts	5-year average	% of Vernal
DeKalb Brand 120	4.25 (3)	5.36 (2)	8.42 (1)	6.83 (6)	5.97 (8)	6.17	110.8
Pioneer Brand 526	4.11 (10)	5.47 (1)	7.82 (21)	6.92 (3)	6.42 (1)	6.15	110.5
Perry	3.94 (23)	5.19 (7)	7.87 (14)	6.63 (20)	6.28 (2)	5.98	107.5
Drummor	4.01 (19)	5.15 (9)	8.02 (4)	6.72 (11)	6.00 (7)	5.98	107.5
WL 315	3.86 (30)	4.93 (25)	7.96 (7)	7.00 (1)	6.02 (5)	5.95	107.0
Thunder	3.82 (33)	5.31 (3)	7.90 (9)	6.60 (25)	6.12 (3)	5.95	107.0
Apollo II	4.28 (1)	5.20 (5)	7.87 (15)	6.86 (5)	5.46 (31)	5.93	106.7
Blazer	3.91 (25)	5.11 (12)	7.83 (20)	6.72 (12)	6.08 (4)	5.93	106.6
Atra 55	4.07 (14)	5.28 (4)	7.89 (11)	6.72 (13)	5.65 (20)	5.92	106.5
Valor	4.10 (11)	5.07 (14)	7.97 (6)	6.63 (22)	5.64 (21)	5.88	105.8
WL 316	3.99 (21)	5.02 (20)	7.89 (10)	6.99 (2)	5.40 (32)	5.86	105.3
Pioneer Brand 532	3.90 (28)	5.04 (19)	8.00 (5)	6.52 (29)	5.80 (14)	5.85	105.2
WL 312	4.26 (2)	5.04 (19)	7.84 (19)	6.71 (15)	5.34 (34)	5.84	105.0
Armor	4.20 (7)	5.08 (13)	7.69 (27)	6.63 (21)	5.57 (27)	5.83	104.9
Pacer	3.68 (42)	5.07 (15)	7.81 (22)	6.59 (26)	6.01 (6)	5.83	104.9
Iroquois	4.00 (20)	4.84 (35)	7.85 (18)	6.56 (28)	5.91 (9)	5.83	104.8
WL 221	3.79 (35)	5.20 (6)	8.05 (2)	6.48 (34)	5.64 (22)	5.83	104.8
UC 1030	4.21 (6)	4.87 (33)	7.62 (32)	6.70 (17)	5.67 (19)	5.81	104.5
Vangard	4.03 (17)	5.18 (8)	7.96 (8)	6.51 (31)	5.34 (33)	5.80	104.3
G-2815	4.04 (16)	5.01 (22)	7.85 (17)	6.70 (16)	5.29 (37)	5.78	103.9
Oneida	3.84 (32)	5.07 (16)	7.54 (37)	6.62 (24)	5.79 (15)	5.77	103.8
DeKalb Brand 130	4.09 (13)	4.90 (29)	7.80 (23)	6.76 (9)	5.30 (36)	5.77	103.7
Magnum	4.04 (15)	4.88 (33)	7.67 (29)	6.56 (27)	5.64 (23)	5.76	103.5
RS 209	3.54 (45)	5.06 (17)	7.48 (40)	6.77 (8)	5.90 (10)	5.75	103.4
Futura	3.91 (27)	4.89 (30)	7.74 (24)	6.67 (18)	5.50 (30)	5.74	103.2
Anchor	3.51 (46)	4.97 (23)	7.52 (39)	6.82 (7)	5.87 (13)	5.74	103.2
FSR H-117	3.79 (22)	4.79 (37)	7.69 (26)	6.76 (10)	5.60 (25)	5.73	102.9
Pioneer Brand 545	3.89 (29)	4.63 (38)	7.36 (43)	6.87 (4)	5.87 (12)	5.72	102.9
C/W 61	3.79 (36)	5.13 (11)	8.03 (3)	6.36 (39)	5.25 (39)	5.71	102.7
WL 311	3.74 (38)	4.88 (31)	7.60 (33)	6.63 (23)	5.61 (24)	5.69	102.3
Trumpetor	3.92 (24)	4.93 (26)	7.52 (38)	6.52 (30)	5.55 (28)	5.69	102.3
Preserve	4.11 (9)	5.02 (21)	7.86 (16)	6.17 (44)	5.28 (38)	5.69	102.3
Vancor	3.86 (31)	4.90 (28)	7.56 (36)	6.39 (38)	5.68 (18)	5.68	102.1
FSR H-103	4.03 (18)	4.62 (39)	7.46 (42)	6.43 (37)	5.74 (17)	5.66	101.7
Cimarron	4.21 (5)	4.94 (24)	7.88 (12)	6.27 (41)	4.97 (44)	5.65	101.6
AS-60F	4.14 (8)	5.13 (10)	7.67 (30)	6.43 (36)	4.90 (45)	5.65	101.6
Jubilee	3.75 (37)	4.86 (34)	7.58 (35)	6.50 (32)	5.58 (26)	5.65	101.6
Raidor	4.10 (12)	5.06 (18)	7.59 (34)	6.49 (33)	4.98 (43)	5.64	101.5
AS-67	3.70 (41)	4.91 (27)	7.70 (25)	6.34 (40)	5.51 (29)	5.63	101.2
Pioneer Brand 524	3.81 (34)	4.88 (32)	7.64 (31)	5.93 (45)	5.77 (16)	5.61	100.8
LS 79-1920 SYN 2	3.56 (44)	4.79 (37)	7.88 (13)	6.64 (19)	5.12 (41)	5.60	100.6
Sverre	3.91 (26)	4.83 (36)	7.69 (28)	6.27 (42)	5.12 (40)	5.56	100.0
Vernal	3.74 (39)	4.63 (38)	7.29 (44)	6.26 (43)	5.89 (11)	5.56	100.0
DeKalb Brand 167	3.59 (43)	4.25 (41)	7.47 (41)	6.72 (14)	4.78 (46)	5.36	96.4
FSR IH-119	3.72 (40)	4.24 (42)	7.16 (45)	6.44 (35)	5.08 (42)	5.33	95.8
Strain 201	4.25 (4)	4.51 (40)	7.07 (46)	5.20 (46)	5.30 (35)	5.27	94.7
GRAND MEAN	3.94	4.96	7.73	6.56	5.59	5.76	103.5
% CV	8.4			5.8	7.7	4.2	
LSD (.05)	0.46	0.30	0.34	0.53	0.60	0.30	

To convert dry tons per acre to hay at 12% moisture, multiply by 1.136.
Entries that differ from each other by more than the LSD are significantly or highly significantly different from each other at odds of 19 to 1 (.05) and/or 99 to 1 (.01), respectively.

Table 6. Seven year average seasonal yields and an average, high, and low plants per square foot for 34 varieties planted at Tulelake Field Station, Siskiyou County, on May 4, 1974 at 24 lbs/acre.

Years	Tons/acre	Plants/square foot-autumn		
		Average	High	Low
1974 (2 cuts)	5.13	16.1	19.5	13.6
1975	8.48	12.8	13.9	9.1
1976 (2 cuts)	4.81	9.6	11.5	8.2
1977	7.79	9.0	10.5	7.2
1978	6.77	7.0	9.0	5.3
1979	7.03	6.2	7.5	4.5
1980	6.38	4.9	5.5	4.0

7. Five year yield summary of 1980 San Joaquin Valley regional 36 variety, brand and experimental selection trial. West Side Field Station, Five Points, Fresno County. Planted November 18, 1980 at 43 lbs/acre with four replications on Panoche clay loam soil. 1985. (Marble and Peterson) <WS180Y5>

Entry	Yield in dry tons per acre, rank in parenthesis							
	1981	1982	1983	1984	1985	Average over years		% of Moapa 69
UC 186	9.39(6)	11.49(1)	11.75(2)	11.02(4)	2.21(2)	11.17(1)	A	116.2
UC 193	9.84(3)	11.28(3)	11.56(5)	11.12(2)	1.53(7)	11.07(2)	AB	115.2
NK C-80-628	9.85(2)	11.32(2)	11.02(10)	10.93(6)	2.12(3)	11.05(3)	AB	114.9
AS-13R	9.48(5)	10.41(15)	11.31(7)	11.58(1)	2.44(1)	11.04(4)	AB	114.9
Pioneer Brand 5929	9.68(4)	10.83(6)	12.12(1)	10.98(5)	1.32(10)	10.99(5)	AB	114.3
FSRC ND-107	8.95(12)	10.63(11)	11.59(4)	11.07(3)	1.63(5)	10.77(6)	ABC	112.1
UC 196	9.86(1)	10.90(5)	11.74(3)	10.75(7)	0.52(16)	10.75(7)	ABC	111.9
Pioneer Brand SM	9.04(10)	10.70(10)	11.51(6)	10.51(8)	1.53(6)	10.66(8)	ABCD	110.9
Pierce	8.86(14)	10.58(12)	11.00(11)	10.48(9)	1.42(8)	10.47(9)	ABCDE	108.9
UC 195	9.34(8)	11.20(4)	10.98(12)	10.03(15)	0.44(18)	10.40(10)	ABCDE	108.2
WL 75 CA A-W	8.36(20)	10.47(14)	10.75(15)	9.79(17)	1.70(4)	10.21(11)	ABCDEF	106.3
Megluc I (MeA 00)	9.39(7)	10.78(7)	10.82(13)	9.68(19)	0.14(22)	10.16(12)	ABCDEF	105.7
CUF 101	8.74(16)	10.72(9)	10.60(18)	10.24(10)	0.43(19)	10.14(13)	ABCDEF	105.6
WL 515	8.76(15)	10.17(20)	10.79(14)	[illegible]	0.98(12)	10.10(14)	ABCDEF	105.1
DK 187	8.37(19)	10.52(13)	10.64(17)	[illegible]	0.47(17)	10.04(15)	ABCDEF	104.5
NC+ 8000 Brand	8.87(13)	9.76(27)	11.11(9)	[illegible]	0.27(20)	10.01(16)	ABCDEFG	104.1
NK C-79-616	9.01(11)	10.09(22)	11.13(8)	10.22(23)	0.07(24)	9.91(17)	ABCDEFG	103.1
NK C-80-631	7.90(25)	9.41(30)	10.71(16)	10.04(13)	1.35(9)	9.89(18)	BCDEFG	102.9
WL 514	8.04(24)	9.91(24)	10.08(25)	9.26(12)	1.16(11)	9.87(19)	BCDEFG	102.7
Galaxy Brand	7.17(33)	10.26(19)	10.18(23)	10.09(20)	0.97(13)	9.65(20)	CDEFGH	100.4
C/W 8035	8.47(18)	10.38(16)	10.23(20)	10.15(27)	9.96(26)	9.62(21)	CDEFGH	100.0
Moapa 69	7.33(30)	9.78(26)	10.09(24)	9.65(16)	0.85(15)	9.61(22)	CDEFGH	100.0
WL 76 CA K	7.47(29)	9.70(28)	10.03(26)	9.03(21)	0.92(14)	9.55(23)	CDEFGH	99.4
Ardiente	7.83(27)	9.97(23)	10.21(21)	10.01(26)	0.10(23)	9.43(24)	DEFGH	98.2
Rere	8.58(17)	10.15(21)	10.19(22)	9.62(29)	9.47(30)	9.42(25)	DEFGH	98.0
CUF 101A	8.17(22)	10.34(18)	9.46(33)	9.06(28)	0.06(25)	9.36(26)	EFGHI	97.4
Baron	8.23(21)	10.75(8)	9.99(27)	8.71(31)	9.49(29)	9.35(27)	EFGHI	97.3
NC+ 6600 Brand	7.84(26)	8.28(35)	10.27(19)	8.79(22)	9.81(27)	9.11(28)	FGHIJ	94.8
Granada	9.13(9)	10.34(17)	9.58(30)	8.30(35)	8.60(36)	9.10(29)	FGHIJ	94.7
Pioneer Brand 572	8.09(23)	8.77(32)	9.53(31)	9.35(25)	9.70(28)	9.03(30)	FGHIJ	93.9
Megluc II (MeA MM)	7.76(28)	9.81(25)	9.71(28)	7.87(30)	9.23(32)	8.98(31)	FGHIJ	93.4
FSRC A 21-R	7.06(34)	8.88(31)	9.53(32)	9.06(24)	0.15(21)	8.94(32)	FGHIJ	93.1
Sirlver	7.30(32)	9.65(29)	9.65(29)	8.38(32)	8.93(35)	8.76(33)	GHIJ	91.1
Florida 77	7.33(31)	8.70(33)	8.64(35)	9.10(34)	9.35(31)	8.41(34)	HIJ	87.5
Lahontan	6.21(36)	8.10(36)	9.22(34)	8.27(33)	9.10(34)	8.18(35)	IJ	85.1
Nova	6.80(35)	8.46(34)	8.44(36)	8.05(36)	9.16(33)	8.10(36)	J	84.3
GRAND MEAN	8.40	10.10	10.45	9.64	10.49	9.81		102.
% CV	12.2	9.6	9.4	10.4	8.0	16.9		
LSD (.05)	1.44	1.36	1.38	1.40	1.17	.04		
(.01)	1.91	1.80	1.82	1.86	1.55	.37		

	.05	.01	% CV
Between varieties	1.04	1.37	16.9
Between years	0.16	0.21	6.9
Between different years for same variety	0.94	1.24	6.9
Between different years for different variety	1.34	1.76	6.9

To convert dry tons per acre to hay at 12% moisture, multiply by 1.136.

Entries that are followed by the same letter are not significantly different from each other at odds of 19 to 1.

Entries that differ from each other by more than the LSD are significantly or highly significantly different from each other at odds of 19 to 1 (.05) and/or 99 to 1 (.01), respectively.

Table 8. Third and fifth year stand persistence and weed ratings for 1980 UC regional 36 alfalfa variety brand and experimental selection trial. West Side Field Station, Five Points, Fresno County. Planted November 18, 1980 with four replications at 38 lbs/acre on Panoche clay loam soil. 1985. <WS180R5>

Entry	Dormancy	Percent stand remaining 2/22/84	Percent stand remaining 9/24/85	Weed rating 9/24/85
Lahontan	SD	67.5(3)	63.75	1.25
AS-13R	ND	68.8(2)	61.25	0.75
NK C-80-628	ND	68.8(1)	55.00	1.25
NK C-80-631	ND	60.0(12)	55.00	0.50
UC 193	VND	65.0(5)	52.50	1.25
WL 515	ND	61.3(11)	52.50	1.25
Pioneer Brand SM	ND	58.8(14)	52.50	1.25
WL 75 Ca A-W	ND	62.5(9)	51.25	1.00
WL 514	ND	65.6(4)	50.00	1.25
DK 187 (C/W 8037)	ND	60.0(13)	48.75	1.50
Moapa 69	ND	58.8(15)	48.75	0.75
UC 186	VND	62.4(8)	48.75	1.75
FSRC ND-107 (80A6)	ND	63.8(6)	48.75	1.25
WL 76 Ca K	ND	56.3(17)	46.25	1.50
Pierce (79176)	ND	57.6(16)	46.25	1.00
Nova	SD	42.5(33)	46.25	5.50
Galaxy Brand	ND	48.7(23)	46.25	3.00
UC 196	VND	63.8(7)	45.00	1.75
NC+ 6600 Brand	ND	47.5(24)	45.00	1.50
FSRC A-21R	ND	53.8(19)	42.50	2.25
Ardiente	ND	46.3(27)	42.50	2.00
Pioneer Brand 5929	VND	62.5(10)	42.50	2.50
CUF 101	VND	50.0(22)	40.00	2.50
NK C-79-616	VND	45.0(29)	40.00	2.75
NC+ 8000 Brand	ND	53.8(18)	40.00	1.75
UC 195	VND	53.8(20)	38.75	2.50
C/W 8035	ND	43.8(31)	37.50	2.25
Florida 77 (66a)	ND	52.5(21)	36.25	4.75
Pioneer Brand 572	ND	46.3(26)	33.75	2.50
Megluc I (MeA 00)	VND	47.5(25)	32.50	3.75
Rere	MND	43.8(30)	31.25	5.75
Baron	MND	46.3(28)	30.00	4.25
CUF 101A	VND	42.5(32)	28.75	4.75
Sirlver	ND	37.5(35)	26.25	4.25
Megluc II (MeA MM)	ND	41.2(34)	22.50	4.50
Granada	ND	37.5(36)	16.25	6.00
Mean		54.0	42.92	2.45
LSD (.05)		8.8	7.61	1.56
(.01)		11.7	10.07	2.07
% CV		1.7	12.64	45.38

Weed ratings: 0 = no weeds; 10 = completely covered by weeds.
Dominant weed: yellow foxtail (Sataria glauca).

Entries that differ by at least the least significant difference (LSD), are significantly (5%) or highly significantly (1%) different from each other.

SD = semidormant; MND = moderately nondormant; N = nondormant; VND = very nondormant.

Table 9. Stand persistence of alfalfas of different dormancy when grown on heavy clay soils in Yolo and San Joaquin counties. (Carl Schoner and Mick Canevari)

Dormancy	San Joaquin County* 4th year			Yolo County** 3rd year		
	No.	% Full stand	% Weed cover	No.	% Full stand	Vigor
Dormant	1	53.3	18.0	13	70.3	6.5
Semidormant	9	56.8	26.4	17	74.3	6.8
Intermediate dormant and moderately nondormant	5	53.7	20.0	8	64.0	5.4
Nondormant	7	46.4	26.0	10	54.2	4.8
Very nondormant	7	36.4	41.0	2	42.2	4.3

*Stockton adobe clay.
**Capay clay.

Table 10. Three year yield summary of 1983 UC 33 dormant alfalfa variety and brand trial. UC Davis, Yolo County. Planted October 31, 1983 at 43 lbs/acre with four replications on Yolo clay soil. 1986. (Schoner and Marble). <UC183Y6>

Entry	Yield in dry tons per acre, rank in parenthesis 1984 total	1985 total	1986 total	Average total		% of Lahontan
WL 320	8.29(1)	13.37(2)	12.23(1)	11.30(1)	A	116.8
NK 83582	7.64(6)	13.64(1)	11.96(4)	11.08(2)	AB	114.6
Pio. Br. 5444 (YAR21)	8.15(2)	13.28(3)	11.53(12)	10.98(3)	ABC	113.6
GT 58	7.64(7)	13.19(5)	11.95(5)	10.93(4)	ABC	113.0
DK 135	7.87(4)	13.15(7)	11.64(9)	10.89(5)	ABC	112.5
FSRC F-144	8.07(3)	12.95(9)	11.58(11)	10.87(6)	ABC	112.4
Jubilee	7.18(22)	13.25(4)	12.14(2)	10.85(7)	ABC	112.2
Sunrise	7.19(21)	13.11(8)	11.46(13)	10.59(8)	ABCD	109.5
Epic	7.40(12)	12.42(15)	11.71(8)	10.51(9)	ABCD	108.6
FSRC F-115R	7.20(20)	12.42(16)	11.59(10)	10.40(10)	BCD	107.5
Pioneer Brand 545	7.23(17)	12.07(22)	11.84(6)	10.38(11)	BCD	107.3
FFR SYN 7905	7.38(13)	11.71(27)	11.97(3)	10.35(12)	BCD	107.1
Preserve	7.70(5)	12.42(14)	10.93(19)	10.35(13)	BCD	107.0
Pioneer Brand YAR22	7.52(8)	12.81(10)	10.68(27)	10.34(14)	BCD	106.9
DeKalb Brand 120	6.95(26)	12.36(17)	11.41(14)	10.24(15)	BCDE	105.9
Pioneer Brand 532	7.14(23)	13.15(6)	10.40(32)	10.23(16)	BCDE	105.8
WL 316	6.86(29)	12.48(13)	11.35(15)	10.23(17)	BCDE	105.7
Eagle	7.50(9)	12.62(11)	10.51(30)	10.21(18)	BCDE	105.6
Hi-Phy	7.22(19)	12.13(20)	11.23(17)	10.19(19)	BCDE	105.4
Apollo II	7.29(15)	12.59(12)	10.61(28)	10.16(20)	BCDE	105.1
Drummor	7.40(11)	12.14(19)	10.78(23)	10.11(21)	CDE	104.5
Endure	7.23(18)	11.96(24)	11.05(18)	10.08(22)	CDE	104.2
Blazer	7.32(14)	12.12(21)	10.80(22)	10.08(23)	CDE	104.2
Peak	6.70(30)	11.75(26)	11.78(7)	10.08(24)	CDE	104.2
IC B-34	7.27(16)	12.34(18)	10.58(29)	10.06(25)	CDE	104.0
WL Ca 82-5	6.92(28)	12.00(23)	11.25(16)	10.06(26)	CDE	104.0
WL 312	7.09(24)	11.88(25)	10.76(25)	9.91(27)	DE	102.5
Garst Brand 629	7.42(10)	11.22(31)	10.72(26)	9.78(28)	DE	101.1
Apollo	6.62(31)	11.64(28)	10.84(20)	9.70(29)	DE	100.3
Lahontan	6.94(27)	11.31(30)	10.77(24)	9.67(30)	DE	100.0
IC B-31	7.07(25)	11.43(29)	10.47(31)	9.66(31)	DE	99.9
Armor	6.31(32)	10.93(32)	10.80(21)	9.35(32)	E	96.7
Vernal	6.18(33)	9.84(33)	9.21(33)	8.41(33)	F	86.9
GRAND MEAN	7.27	12.29	11.17	10.24		105.9
% CV	9.1	6.2	5.9	9.1		
LSD (.05)	0.93	1.07	0.92	0.76		
LSD (.01)	1.23	1.42	1.22	1.00		

LSD's	.05	.01	% CV
Between varieties	0.76	1.00	9.1
Between years	0.13	0.17	5.3
Between years for same variety	0.76	1.00	5.3
Between years for different varieties	0.98	1.29	5.3

To convert dry tons per acre to hay at 12% moisture, multiply by 1.136.
Entries that are followed by the same letter are not significantly different from each other at odds of 19 to 1.

Table 11. Three year summary of 1984 UC 33 semidormant alfalfa variety and brand trial. UC Davis, Yolo County. Planted March 12, 1984 at 43 lbs/acre with four replications on Yolo loam soil. 1986. (Schoner and Marble) <UC184Y6>

Entry	Yield in dry tons per acre, rank in parenthesis: 1984 total	1985 total	1986 total	Average total		% of Lahontan
Yolo	6.37(2)	14.11(2)	13.20(1)	11.22(1)	A	115.8
Sutter	6.08(9)	13.84(3)	13.19(2)	11.03(2)	AB	113.8
Diamond	6.89(1)	14.43(1)	11.10(16)	10.81(3)	AB	111.4
FSRC IH-135	6.15(5)	13.48(4)	12.12(4)	10.58(4)	ABC	109.1
SD 83 BR	6.05(11)	13.37(6)	12.32(3)	10.58(5)	ABC	109.1
Pioneer Brand WK-1	6.14(7)	13.45(5)	11.91(7)	10.50(6)	ABCD	108.3
Pioneer Brand SK-1	5.99(13)	[illegible]	11.89(8)	10.31(7)	BCDE	106.4
Moapa 69	5.94(17)	[illegible]	11.75(10)	10.30(8)	BCDE	106.2
Pioneer Brand 581	5.75(26)	13.20(8)	12.07(6)	10.28(9)	BCDE	106.0
Baron	6.04(12)	13.02(10)	11.48(11)	10.26(10)	BCDE	105.8
WL Southern Special	6.14(6)	13.26(7)	12.09(5)	10.24(11)	BCDE	105.6
Pioneer Brand WL-1	5.75(29)	12.49(11)	11.75(9)	9.91(12)	CDEF	102.2
NK 81416	6.27(3)	12.22(16)	11.30(13)	9.86(13)	CDEF	101.7
Pioneer Brand 555	5.93(18)	12.01(20)	11.44(12)	9.83(14)	CDEFG	101.4
NK 80338	5.86(22)	12.11(18)	11.24(14)	9.77(15)	CDEFGH	100.8
NPI 455 Brand	5.89(19)	12.22(15)	11.08(17)	9.77(16)	CDEFGH	100.7
Lahontan	5.67(30)	12.33(12)	11.15(15)	9.70(17)	DEFGH	100.0
Shenandoah	6.07(10)	12.27(14)	10.82(22)	9.69(18)	DEFGH	100.0
LS 1920	5.89(20)	12.19(17)	10.96(18)	9.62(19)	EFGH	99.3
WL 318	6.12(8)	12.02(19)	10.92(21)	9.60(20)	EFGH	99.0
WL 316	5.97(14)	11.75(22)	10.92(20)	9.54(21)	EFGH	98.4
Eagle	5.46(31)	11.74(23)	10.78(23)	9.51(22)	EFGH	98.1
SD 76 BR	5.75(28)	12.29(13)	10.53(24)	9.31(23)	FGH	96.0
Pioneer Brand WJ-1	5.42(32)	11.64(25)	10.93(19)	9.31(24)	FGH	96.0
WL 314	5.80(25)	11.57(26)	10.30(26)	9.27(25)	FGH	95.6
Meteor	6.16(4)	11.71(24)	10.29(28)	9.25(26)	FGH	95.5
Pike	5.97(15)	11.32(27)	9.85(32)	9.21(27)	FGH	94.9
DK 167R	5.88(21)	11.80(21)	10.35(25)	9.12(28)	FGH	94.0
LS ICO-24	5.80(23)	11.12(28)	10.05(31)	8.99(29)	GH	92.7
WL 312	5.80(24)	11.12(29)	10.29(27)	8.97(30)	H	92.5
LS ICO-10	5.75(27)	10.81(31)	10.12(30)	8.95(31)	H	92.4
Drummor	5.95(16)	10.99(30)	10.13(29)	8.93(32)	H	92.1
Fortin Pergamino	5.[illegible](33)	10.71(33)	8.39(33)	7.66(33)		79.0
GRAND MEAN	5.94	12.21	11.1	9.75		100.6
% CV	8.0	5.6	5.7	8.8		
LSD (.05)	0.66	0.96	0.89	0.70		
LSD (.01)	0.88	1.27	1.19	0.92		

LSD's	.05	.01	% CV
Between varieties	0.70	0.92	8.8
Between years	0.11	0.15	4.7
Between years for same variety	0.63	0.84	4.7
Between years for different varieties	0.87	1.15	4.7

To convert dry tons per acre to hay at 12% moisture, multiply by 1.136.
Entries that are followed by the same letter are not significantly different from each other at odds of 19 to 1.

Table 12. Three year yield summary of 1983 UC 33 nondormant alfalfa variety and brand trial. UC Davis, Yolo County. Planted October 19, 1983 at 43 lbs/acre with four replications on Yolo loam soil. 1986. (Schoner and Marble) <UC183Y6.1>

Entry	Yield in dry tons per acre, rank in parenthesis 1984 total	1985 total	1986 total	Average total		% of Lahontan
Madera	7.45(7)	13.28(2)	12.26(1)	10.99(1)	A	121.2
UC Cibola	7.31(14)	13.30(1)	11.72(4)	10.77(2)	AB	118.8
Condor	7.62(3)	12.84(8)	11.79(3)	10.75(3)	AB	118.5
GT 13R Plus	7.08(21)	12.73(10)	11.95(2)	10.59(4)	ABC	116.7
UC 284	7.32(13)	13.11(3)	10.87(13)	10.43(5)	ABC	115.0
Pierce	7.11(18)	12.92(6)	11.16(8)	10.40(6)	ABC	114.6
Moapa 69	7.65(2)	12.44(15)	11.02(9)	10.37(7)	ABCD	114.3
Armona	7.20(17)	12.66(11)	11.23(7)	10.36(8)	ABCD	114.2
Pioneer Brand 5929	7.07(22)	13.03(4)	10.88(12)	10.33(9)	ABCD	113.8
NK 80343	7.86(1)	12.85(7)	10.23(23)	10.31(10)	ABCD	113.7
WL 515	7.50(5)	12.76(9)	10.58(18)	10.28(11)	ABCD	113.3
UC 276	7.06(23)	12.98(5)	10.68(15)	10.24(12)	BCD	112.9
FSRC ND-143	7.57(4)	12.14(20)	10.97(11)	10.23(13)	BCD	112.7
Pioneer Brand WM-1	6.80(28)	12.40(16)	11.26(6)	10.15(14)	BCDE	111.9
DK 187	7.29(15)	12.49(14)	10.66(16)	10.15(15)	BCDE	111.9
Galaxy Brand	7.42(9)	12.39(17)	10.62(17)	10.14(16)	BCDE	111.8
NK 83586	7.42(10)	12.64(12)	10.28(21)	10.11(17)	BCDE	111.5
WL 514	7.35(12)	12.20(18)	10.78(14)	10.11(18)	BCDE	
CUF 101	7.41(11)	12.55(13)	10.29(20)	10.08(19)	BCDE	111.1
WL Southern Special	[illegible](26)	11.68(26)	11.55(5)	10.04(20)	BCDE	110.6
Maricopa	[illegible](27)	12.00(24)	10.99(10)	9.96(21)	CDE	109.7
WL 512	6.88(6)	12.07(21)	10.25(22)	9.94(22)	CDE	109.5
UC 273	7.49(19)	12.14(19)	10.46(19)	9.90(23)	CDE	109.1
NC+ 8800 Brand	7.10(29)	12.01(23)	10.20(24)	9.65(24)	DEF	106.3
UC 283	6.72(20)	12.05(22)	9.80(25)	9.64(25)	DEF	106.3
Sapphire	7.08(16)	11.94(25)	9.20(30)	9.45(26)	EF	104.1
UC 288	7.20(8)	11.60(27)	9.26(29)	9.43(27)	EF	103.9
Hunterfield	[illegible](30)	11.49(29)	9.41(28)	9.20(28)	F	101.4
NAPB 28	6.71(24)	11.56(28)	8.70(32)	9.10(29)	F	100.4
Lahontan	7.05(32)	11.12(30)	9.70(26)	9.07(30)	F	100.0
Wakefield	6.40(25)	11.06(31)	9.13(31)	9.04(31)	F	99.6
Sheffield	6.93(31)	11.04(32)	9.60(27)	9.03(32)	F	99.6
Granada	6.45(33)	10.71(33)	7.71(33)	8.26(33)	G	91.0
GRAND MEAN	7.16	12.25	10.46	9.95		109.7
% CV	6.9	5.1	5.7	7.4		
LSD (.05)	0.70	0.88	0.83	0.60		
LSD (.01)	0.92	1.16	1.10	0.79		

LSD's	.05	.01	% CV
Between varieties	0.60	0.80	7.4
Between years	0.14	0.19	5.8
Between years for same variety	0.81	1.07	5.8
Between years for different varieties	0.89	1.18	5.8

To convert dry tons per acre to hay at 12% moisture, multiply by 1.136.
Entries that are followed by the same letter are not significantly different from each other at odds of 19 to 1.

Table 13. Third year stand persistence for the 1983 UC 33 dormant alfalfa variety and brand trial. UC Davis, Yolo County. Planted October 31, 1983 at 43 lbs/acre with four replications on Yolo clay soil. 1986. (Schoner and Marble) <UC183R6.14>

Entry	Average % stand 9/30/86 & 10/18/86	DMRT 5%
Peak		
WL 320 (792132)	77.50	AB
Lahontan	77.50	AB
WL Ca 82-5	76.88	ABC
WL 316	75.63	ABCD
Garst Brand 629	74.38	BCDE
Sunrise	74.38	BCDE
FSRC F-115R	73.75	BCDEF
Pioneer Brand 545	73.75	BCDEF
GT 58	73.13	BCDEFG
Armor	72.50	BCDEFG
NK 83582	72.50	BCDEFG
Blazer	71.88	CDEFG
Enture	71.88	CDEFG
Epic	71.25	DEFG
Apollo	71.25	DEFG
Jubilee	71.25	DEFG
DK 135	70.63	DEFG
Eagle	70.63	DEFG
Pioneer Br. 5444 (YAR21)	70.00	EFGH
Pioneer Brand YAR 22	70.00	DEFGH
FFR SYN 7905	69.38	EFGHI
Apollo II	69.38	EFGHI
HI-Phy	68.75	EFGHI
IC B-31	68.13	FGHI
FSRC F-144	68.13	FGHI
Preserve	67.50	GHI
WL 312	67.50	GHI
DeKalb Brand 120	65.00	HI
Drummor	64.38	IJ
IC B-34	64.38	IJ
Vernal	64.38	IJ
Pioneer Brand 532	59.38	J
GRAND MEAN	70.81	
LSD (5%)	4.61	
LSD (1%)	6.10	
% C.V.	4.64	

Entries that are followed by the same letter are not significantly different from each other at odds of 19 to 1.

Table 14. Third year stand persistence of UC 33 semidormant alfalfa variety and brand trial. UC Davis, Yolo County. Planted March 12, 1984 at 43 lbs/acre with four replications on Yolo loam soil. 1986. (Schoner and Marble) <UC184R6.12>

Entry	% Stand 10/17/86	DMRT 5%
Yolo (83C64)	86.25	A
Lahontan	82.50	AB
WL Southern Special	81.25	ABC
Pioneer Brand SK-1	80.00	ABCD
SD 83 Brand	80.00	ABCD
Pioneer Brand 581	78.75	ABCDE
Sutter (83C63)	78.75	ABCDE
Pioneer Brand WK-1	78.75	ABCDE
NPI 455 Brand (GT 55)	73.75	CDEF
Moapa 69	73.75	CDEF
FSRC IH-135	73.75	CDEF
Shenandoah	72.50	DEFG
Pioneer Brand WL-1	72.50	DEFG
Pioneer Brand WJ-1	72.50	DEFG
DK 167R	72.50	DEFG
WL 316	72.50	DEFG
WL 318	71.25	EFG
LS 1920	71.25	EFG
Pioneer Brand 555	71.25	EFG
NK 80338	70.00	FGH
WL 312	70.00	FGH
LS ICO-10	70.00	FGH
NK 81416	70.00	FGH
Baron	70.00	FGH
WL 314	70.00	FGH
Diamond (NAPB 27)	68.75	FGH
Fortin Pergamino	68.75	FGH
SD 76 Brand	67.50	FGH
LS ICO-24	66.25	FGH
Pike	66.25	FGH
Meteor (NK 83580)	66.25	FGH
Eagle	65.00	GH
Drummor	62.50	H
GRAND MEAN	72.58	
LSD (5%)	6.50	
LSD (1%)	8.60	
% CV	6.38	

Entries that are followed by the same letter are not significantly different from each other at odds of 19 to 1.

Table 15. Third year stand persistence for 1983 UC 33 nondormant alfalfa variety and brand trial. UC Davis, Yolo County. Planted October 19, 1983 at 43 lbs/acre with four replications on Yolo loam soil. 1986. (Schoner and Marble) <UC283R6.12>

Entry	% Stand 10/18/86	DMRT 5%
Lahontan	82.50	A
GT 13R Plus	80.00	AB
UC Cibola	77.50	ABC
NC+ 8800 Brand	77.50	ABC
Madera (83C61)	76.25	BCD
Armona (83C65)	75.00	BCDE
FSRC ND-143	73.75	CDEF
Condor (NK 83585)	73.75	CDEF
Maricopa (83C62)	72.50	CDEFG
DK 187	71.25	DEFGH
UC 276	71.25	DEFGH
NK 80343	71.25	DEFGH
UC 273	70.00	EFGH
Moapa 69	70.00	EFGH
WL 514	70.00	EFGH
WL Southern Special	70.00	EFGH
NK 83586	70.00	EFGH
WL 515	70.00	EFGH
Pierce	68.75	FGH
Pioneer Brand WM-1	68.75	FGH
CUF 101	67.50	GHI
Galaxy Brand	67.50	GHI
WL 512	67.50	GHI
UC 284	67.50	GHI
Pioneer Brand 5929	66.25	HIJ
Sheffield	66.25	HIJ
Sapphire (NAPB 29)	62.50	IJK
Hunterfield	62.50	IJK
NAPB 28	62.50	IJK
UC 288	61.25	JK
UC 283	60.00	K
Wakefield	55.00	L
Granada	50.00	M
GRAND MEAN	68.98	
LSD (.05)	4.85	
LSD (.01)	6.43	
% CV	5.02	

Entries that are followed by the same letter are not significantly different from each other at odds of 19 to 1.

Table 16. Quality differences of three alfalfas cut on a 4-week vs 5-week schedule. Average of four replications. UC Davis, third cut, 1985. The third cut for the 5-week schedule was on July 9, 37 days after the second cut. The third cut for the 4-week schedule was on June 24, 31 days after the second cut.

Entry	Dormancy rating	Percent							
		Crude protein		TDN		Calcium		Phosphorus	
		4 wk	5 wk	4 wk	5 wk	4 wk	5 wk	4 wk	5 wk
Drummor	04	20.9	18.1	54	51	1.06	1.27	.28	.23
WL 316	05	21.5	18.6	54	53	0.88	1.10	.26	.20
Lahontan	06	20.9	17.8	55	53	1.26	1.51	.25	.21
Average of 3		21.1	18.1	54	52	1.07	1.29	.26	.21
Lahontan	06	20.6	--	55		1.27	--	.22	
Moapa 69	08	17.7	--	53		1.30	--	.24	
CUF 101	09	20.7	--	56		1.44	--	.23	

Figure 1. Relationship between fifth year yields and percent stand at the end of the fifth production year. West Side Field Station, Fresno County. Planted November 18, 1980 at 43 lbs/acre with four replications. 144 observations. <MAR483.C05>

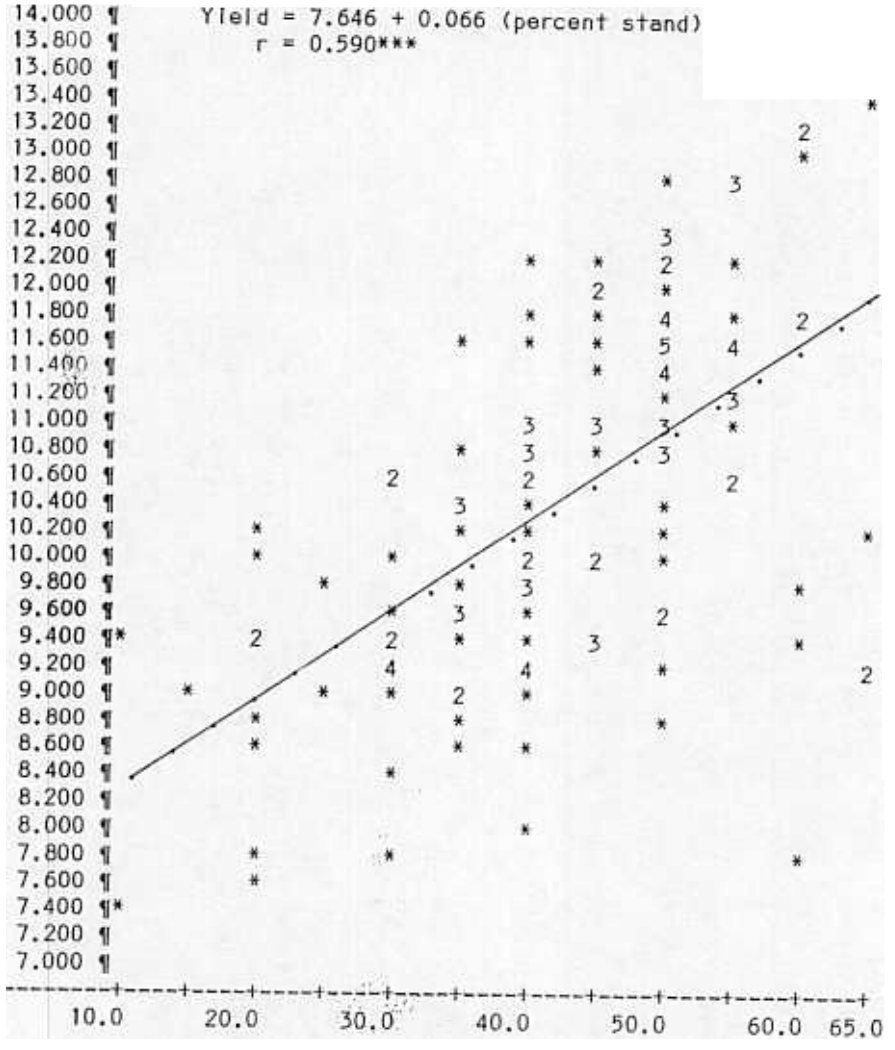


Figure 2. Relationship of weediness to stand persistence at the end of the fifth production year. West Side Field Station, Fresno County. Planted November 18, 1980 at 43 lbs/acre with four replications. 144 observations. <MAR483.C03>

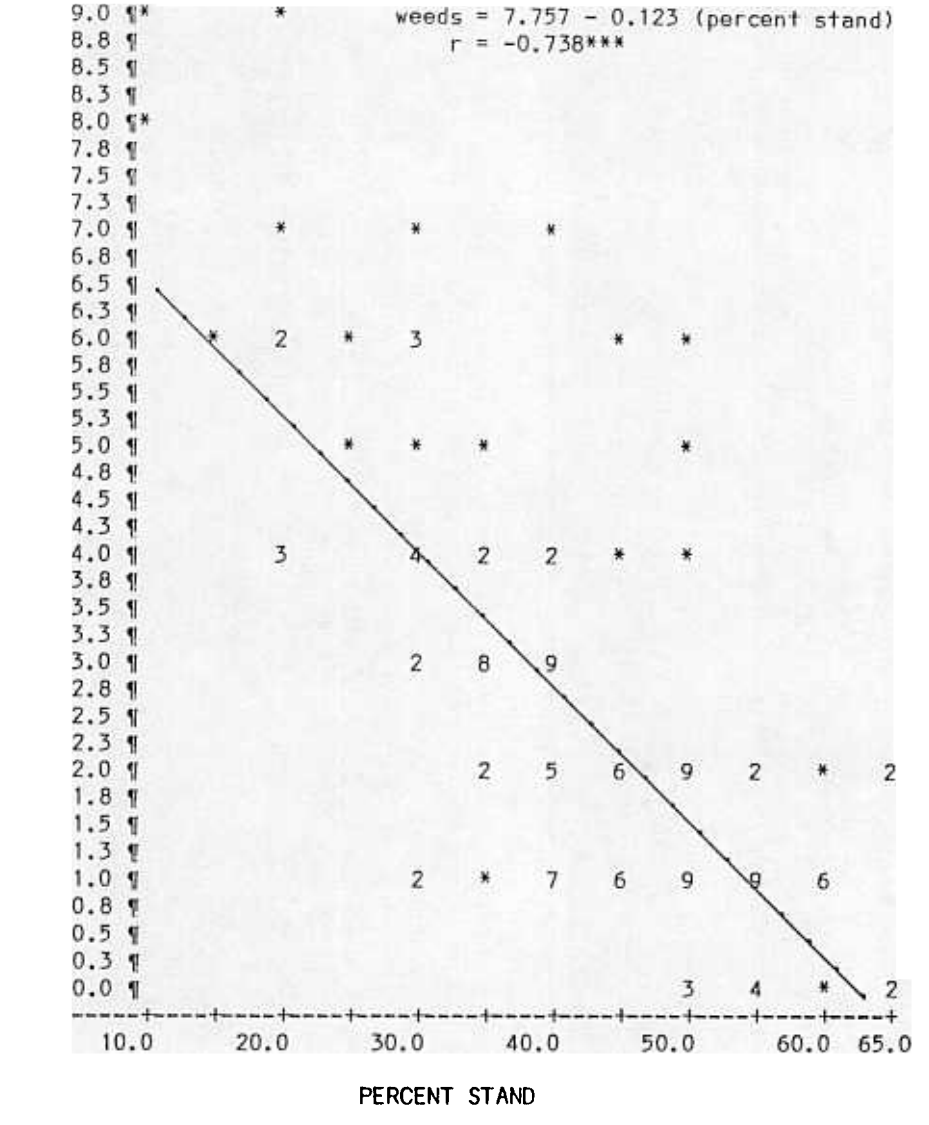
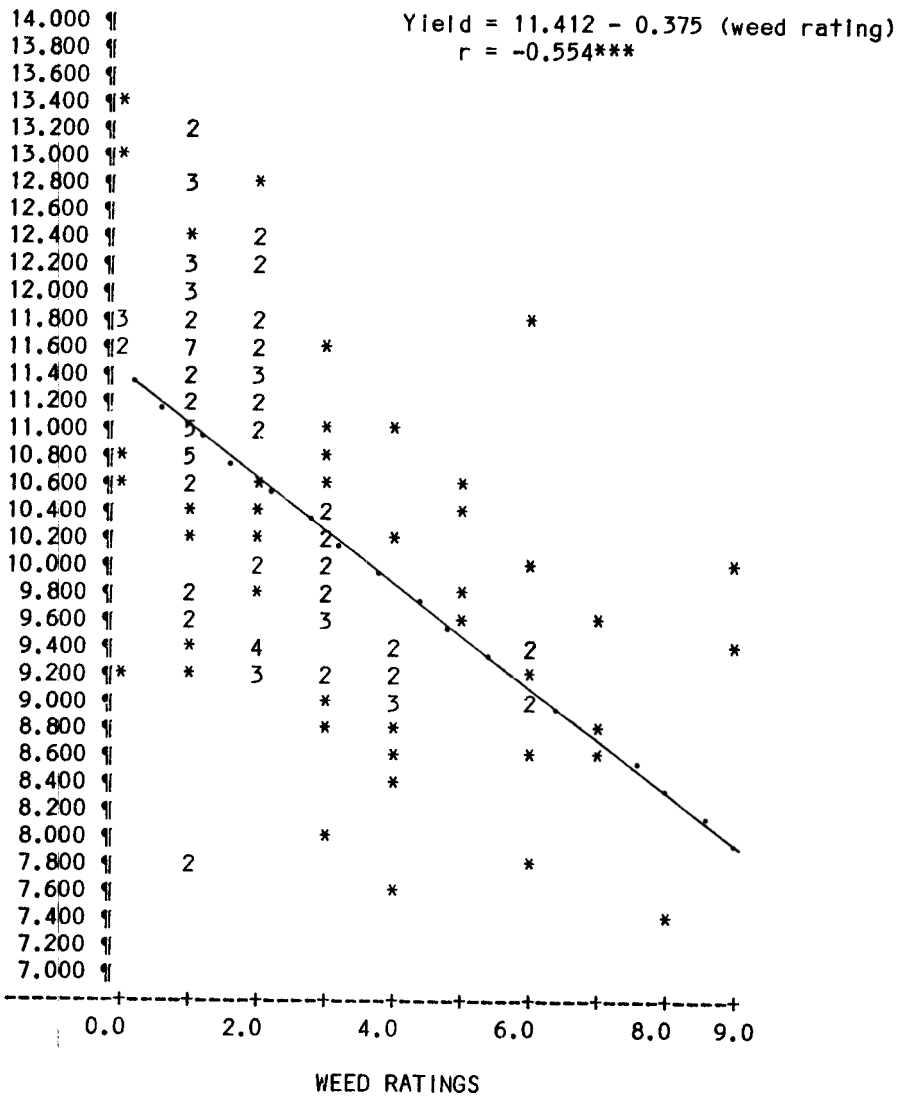


Figure 3. Relationship between yield and weed control content (yellow foxtail) at the end of the fifth year. West Side Field Station, Fresno County. Planted November 18, 1980 at 43 lbs/acre with four replications. 144 observations. <MAR483.C04>



0 = no weeds; 10 = completely covered with weeds.

Figure 4. Relationship between yield and stand persistence at the end of the third year for 1983 UC 33 non-dormant alfalfa variety and brand trial. UC Davis, Yolo County. Planted October 19, 1983 at 43 lbs/ acre with four replications. <MAR496R.C01>