2010 Annual Field Day

Welcome to the
2010 Annual Field Day

University of California
Intermountain Research and Extension Center

Welcome to our Annual Field Day. This event is a collaborative effort involving all of the Center staff, visiting researchers and many growers and grower groups in the region. The general purpose of the tour is to allow participants a chance to see research being conducted on our Center and interact with Center researchers. We sincerely appreciate the opportunity to share some of our research programs with members of the community, many of whom have helped sponsor the research and this event.

During the tour, please ask questions freely. If you would like additional information on any project, please seek out a side conversation with the researcher during breaks or over lunch. Of course, additional information on all our research projects is available at the office.

Please enjoy the tour, the lunch and the conversation.

Thanks for coming,
The IREC Staff

MEET THE STAFF

Rob Wilson	Center Director/Farm Advisor
Jennifer Engel	Office Manager
Don Kirby	Center Superintendent
Brooke Kliewer	Staff Research Associate I
Greg McCulley	Senior Farm Machinery Mechanic
Kevin Nicholson	Staff Research Associate I
Leopoldo Reyes	Farm Laborer
Seferino Salazar	Senior Agricultural Technician
Cristina SanJuan	Farm Laborer
Curtis Staunton	Farm Laborer
Tom Tappan	Farm Machinery Mechanic
Josefina Vallejo	Farm Laborer

Tools Available on IREC's Website

There are numerous resources located on IREC's website http://groups.ucanr.org/intermountain/ . Some of the tools available are links to the research process, including research progress reports on alfalfa, cereal, forage, onions, peppermint, and potatoes. Many of these progress reports have valuable information about variety yield data, and research on weed and pest control in the different crops. Another great tool is the crop water use report which can be helpful for scheduling irrigation. Updated daily, the crop water use report provides information on acre inches of water used by the primary crops grown in the Klamath Basin. The website also offers many helpful links to cost studies, events on the calendar, newsletters, contact information for the staff, links for the cooperative extension offices, campus resources, research & extension centers, statewide programs, and the ANR home page.

2010 Research Projects
Intermountain Research and Extension Center

Project:	**132 Potato Variety Selection; Evaluation and Development**
Project Leader:	*Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Don Kirby*, Superintendent, Intermountain Research & Extension Center, Tulelake *David Holm*, Professor of Horticulture, Colorado State University *Julian Creighton Miller*, Professor of Horticulture, Texas A & M University *Brian Charlton*, Cropping Systems Specialist, Oregon State University, Klamath Basin Research and Experiment Center
Objective:	1) to evaluate new russet cultivars developed by public and private breeding programs for adaptation and suitability to Tulelake's unique soil, climate and marketing conditions; 2) to evaluate specialty crop cultivars for marketable characteristics and adaptation to Tulelake production conditions; 3) to develop cultivar specific cultural management practices appropriate for the successful introduction of new cultivars into commercial production.

Project:	**133 Management of Potato Early-die in the Tulelake Basin**
Project Leader:	*Rob Wilson,*Center Director, UC Intermountain Research & Extension Center, Tulelake *Don Kirby*, Superintendent, Intermountain Research & Extension Center, Tulelake *R. Michael Davis*, Cooperative Ext. Specialist, Department of Plant Pathology, UC Davis
Objective:	1) Compare the efficacy and cost-effectiveness of different fumigant application rates in fields with a high incidence of early-dying on Tulelake soils; 2) Determine the effectiveness of stem residue management at harvest on the incidence of early-dying in subsequent potato crops; 3) Determine if irrigation scheduling can influence the incidence of early-dying disease

Project:	**146 Cultural Management of New Potato Varieties**
Project Leader:	*Rob Wilson,*Center Director, UC Intermountain Research & Extension Center, Tulelake *Don Kirby*, Superintendent, Intermountain Research & Extension Center, Tulelake *David Holm*, Professor of Horticulture, Colorado State University *Julian Creighton Miller*, Professor of Horticulture, Texas A & M University *Brian Charlton*, Cropping Systems Specialist, Oregon State University, Klamath Basin Research and Experiment Center
Objective:	1) to further evaluate newly released potato cultivars and experimental lines, which have demonstrated adaptation and suitability to Tulelake's unique soil, climate and marketing conditions; 2) to develop cultivar specific cultural management practices appropriate for the successful introduction of new cultivars into commercial production.

Project:	**239 Improving Spring Barley for Northern Intermountain Areas**
Project Leader:	*Lynn Gallagher*, Researcher, Department of Plant Sciences, UC Davis *Dr. Pat Hayes*, Barley Breeder, Dept. of Crop & Soil Science, OSU Corvallis, Oregon
Objective:	The project objective is to increase grain yield and disease resistance in spring barley adapted to the Klamath Basin.

Project:	**242 Evaluation of Wheat and Barley in the Intermountain Area**
Project Leader:	*Lee Jackson*, Extension Agronomist, Department of Plant Sciences, UC Davis *Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka *Don Kirby*, Superintendent, Intermountain Research & Extension Center, Tulelake *Rob Wilson*, UC Farm Advisor, Lassen County, Susanville
Objective:	The overall goal is to produce new varieties and improved germplasm and distribute them to growers, breeders and other researchers. To achieve this goal a multi-objective project is conducted which (1) introduces new germplasm for evaluation and breeding, (2) develops breeding populations through hybridization, selection and evaluation, (3) develops information on the inheritance of characters important to quality and yield in California production environments and finds molecular markers to assist the introgression of these characters into adapted breeding lines, and finally (4) produces Breeders Seed for multiplication as new varieties and germplasm for distribution to breeders and researchers. Most of the effort is placed in breeding new varieties and developing improved germplasm. Specific goals are to introduce and maintain disease resistance, maintain or increase grain yield potential and improve end-use characteristics.

Project:	**260 Development of Wheat Varieties for California**
Project Leader:	*Dr. Jorge Dubcovsky*, Assistant Professor, Department of Plant Sciences, UC Davis *Oswaldo Chicaiza*, Research Assistant, Department of Plant Sciences, UC Davis *John Heaton*, Department of Plant Sciences, UC Davis *Lee Jackson*, Extension Agronomist, Department of Plant Sciences, UC Davis
Objective:	The overall goal is to produce new varieties and improved germplasm and distribute them to growers, breeders and other researchers. To achieve this goal a multi-objective project is conducted which (1) introduces new germplasm for evaluation and breeding, (2) develops breeding populations through hybridization, selection and evaluation, (3) develops information on the inheritance of characters important to quality and yield in California production environments and finds molecular markers to assist the introgression of these characters into adapted breeding lines, and finally (4) produces Breeders Seed for multiplication as new varieties and germplasm for distribution to breeders and researchers. Most of the effort is placed in breeding new varieties and developing improved germplasm. Specific goals are to introduce and maintain disease resistance, maintain or increase grain yield potential and improve end-use characteristics.

Project:	**288 Effect of Postemergence Herbicides and Application Time on Small Grain Injury and Yield**
Project Leader:	*Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka *Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Steve Wright*, County Director/Farm Advisor, Tulare County, Visalia
Objective:	1) Evaluate the effectiveness of several broadleaf and grass herbicides applied alone and in combination. 2) Determine the crop injury and any effect on yield from commonly used and new herbicides. 3) Assess whether two wheat varieties and a barley variety differ in terms of susceptibility to injury from different herbicides. 4) Evaluate the effect of herbicide timing on crop safety and weed control.

Project:	**299 Small Grain Variety Evaluation under Dryland Conditions**
Project Leader:	*Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Don Kirby*, Superintendent, Intermountain Research & Extension Center, Tulelake *Brian Charlton*, Cropping Systems Specialist, Oregon State University, Klamath Basin Research and Experiment Center
Objective:	Evaluate the effects of dryland management strategies on cereal grain varieties for forage and grain.

Project:	**340 Alfalfa Experimental Germplasm and Cultivar Adaptation and Evaluation**
Project Leader:	*Dan Putnam,* Extension Agronomist, Dept. of Plant Science, UC Davis *Harry L. Carlson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka *Don Kirby*, Superintendent, Intermountain Research & Extension Center, Tulelake *Craig Giannini*, UC SRA, UC Davis
Objective:	1) to evaluate certified cultivar differences in alfalfa forage yield, quality, and persistence, and to communicate these results to clientele; 2) to develop and provide forage yield and performance data on alfalfa experimental germplasm to public and private alfalfa scientists.

Project:	**341 Effect of Small Grains Rotation on Alfalfa Stand Establishment and Yield**
Project Leader:	*Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka *Dan Putnam,* Extension Agronomist, Department of Plant Sciences, UC Davis
Objective:	1) Evaluate the effect of a small grain rotation crop on alfalfa stand establishment and yield the first year; 2) Determine whether there are differences between small grain species and varieties in regards to their effect on alfalfa establishment; 3) Evaluate the effectiveness of different production practices at mitigating any negative effect of a small grain rotation crop on alfalfa stand and vigor.

Project:	**349 Fall Harvest Management Strategies for Alfalfa**
Project Leader:	*Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka *Dan Putnam,* Extension Agronomist, Department of Plant Sciences, UC Davis
Objective:	Fall harvest management is a critical aspect of alfalfa production in the intermountian area. If the alfalfa plants enter the winter with insufficient root reserves, reduced alfalfa vigor or even winter kill may result. In recent years growers have started harvesting later and later into the fall. The effect of this strategy on alfalfa yield and stand life in the Intermountain environment is not well understood and deserves further research.

Project:	**397 Alfalfa Germplasm Evaluation - Fall Dormancy**
Project Leader:	*Larry Teuber*, Professor, Department of Plant Sciences, UC Davis *Carla E. Rivera*, SRA, Department of Plant Sciences UC Davis *Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka
Objective:	1) to determine fall dormancy reaction of cultivars and experimental cultivars that have potential for marketing in California; 2) to determine stability of fall dormancy reactions of check cultivars across years and locations; 3) to assess the interregional stability of cultivars and a recently adopted set of standard check cultivars; 4) to evaluate winter injury and follow the relationship between winter injury and fall dormancy.

Project:	**451 Application of Diallyl Disulfide (DADS) for the Control of White Rot on Garlic and Onions**
Project Leader:	*R. Michael Davis*, Cooperative Ext. Specialist, Department of Plant Pathology, UC Davis *Shannon Mueller*, University of California Cooperative Extension, Fresno County *Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake
Objective:	1) Demonstrate the effectiveness of DADS in lowering soil levels of white rot sclerotia; 2) Demonstrate fungicidal control of white rot in onions and garlic in plots with reduced soil sclerotia levels.

Project:	**456 Onion Weed Control**
Project Leader:	*Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Don Kirby*, Superintendent, UC Intermountain Research & Extension Center, Tulelake
Objective:	1) Evaluate crop and weed response to varied rates and timings of post emergence water-run onion herbicide applications; 2) Use the data collected to form UC recommendations and possible herbicide label changes for post emergence water run herbicides in onions.

Project:	**458 Evaluation of Insecticide Seed Treatments for Seed Corn Maggot Control**
Project Leader:	*Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Larry Godfrey*, Cooperative Ext. Specialist, Entomology CAES, UC Davis
Objective:	1) Determine if reduced rates of Poncho applied as a seed treatment can provide effective control of seed corn maggot. 2) Compare the efficacy of reduced rates of Poncho to in-furrow liquid and granular Lorsban treatments.

Project:	**459 Management Practices for Improved Thrips Control in Klamath Basin Onions**
Project Leader:	*Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka *Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Larry Godfrey*, Cooperative Ext. Specialist, Entomology CAES, UC Davis
Objective:	1) Compare the effectiveness of a range of insecticides for thrips control including standard conventional treatments, organic or low risk insecticides, and experimental insecticides. 2) Evaluate the two most popular insecticides for thrips control applied via chemigation and a foliar-applied spray application to determine the relative efficacy of the different application methods. 3) Develop methods to improve the efficacy of chemigation applications. 4) Evaluate different strategies for thrips management over the season to compare single insecticides, tank mixes, alternating chemistries and application timing.

Project:	**561 Development of Cultural Management Recommendations for the Production of Peppermint in the Klamath Basin**
Project Leader:	*Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Richard Roseberg*, Assoc. Professor, Oregon State University, Klamath Experiment Station *Don Kirby*, Superintendent, Intermountain Research & Extension Center, Tulelake *Brooke Kliewer*, Research Assistant, Intermountain Research & Extension Center, Tulelake
Objective:	Determine the effects of irrigation scheduling, nitrogen fertilizer management and harvest timing on peppermint biomass yield, oil yield and oil quality under Klamath Basin soil and climatic conditions.

Project:	**566 Integrated Pest Management of Insect and Mite Pests of Mint**
Project Leader:	*Larry Godfrey*, Cooperative Ext. Specialist, Entomology CAES, UC Davis *Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Dan Marcum,* Farm Advisor, Shasta Lassen County, McArthur *Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka
Objective:	1) To investigate the relationship between spider mite numbers and mint yield and quality Hypothesis: spider mites do cause loss in mint yields and a level can be identified where the value of the crop lost equals the cost of approved control measures. 2) To determine and compare the cost-effectiveness of registered miticides against spider mites in mint Hypothesis: There is a range of effectiveness among the registered miticides in mint and based on control efficacy, product cost, and mint yields this cost-effectiveness can be estimated. 3) To study the use of releases of predatory mites for spider mite management in mint in California. Hypothesis: If properly conducted, in terms of species, timing, and rate, predatory mites can provide acceptable control of spider mites in mint. 4) Investigate the use of reduced risk insecticides for management of mint root borer larvae. Hypothesis: Several reduced risk insecticides can provide equal or better control of mint root borer than the standard chlorpyrifos.

Project:	**569 Weed Control in Peppermint**
Project Leader:	*Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake *Don Kirby*, Superintendent, Intermountain Research & Extension Center, Tulelake
Objective:	1) Investigate winter dormant herbicides for control of groundsel in peppermint; 2) Investigate winter dormant herbicides efficacy for providing pre-emergent control of summer annual weeds; 3) Investigate spring post-emergent herbicides for control of emerged summer annual

Project:	**701 Seedling Perennial Grass Tolerance to DPX-MAT28**
Project Leader:	*Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake
Objective:	Test crop safety of DPX-MAT28 applied on seedling and established perennial grasses.

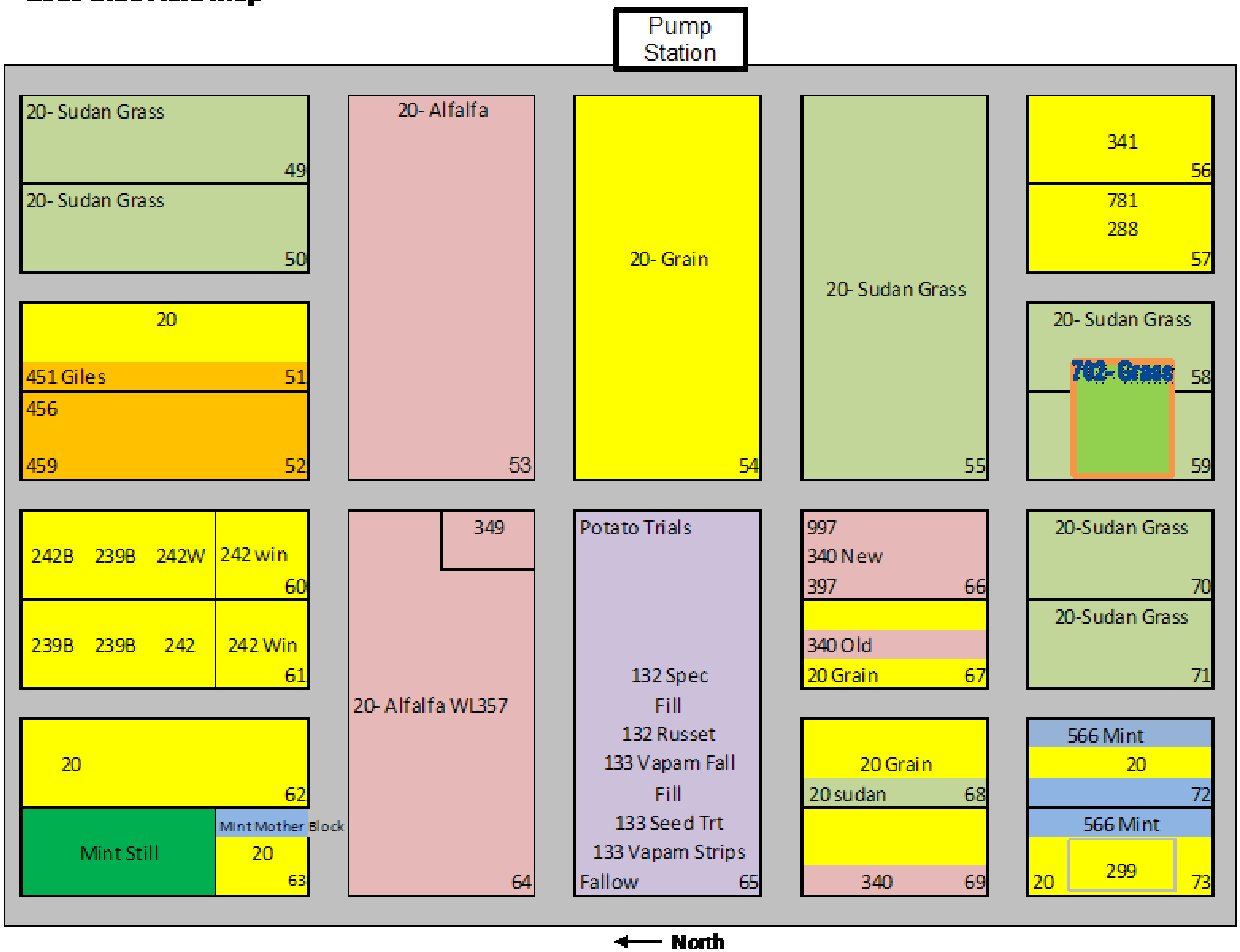
Project:	**702 Established Perennial Grass Tolerance to DPX-MAT28**
Project Leader:	*Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake
Objective:	1) Test crop safety of DPX-MAT28 applied on seedling and established perennial grasses. 2) Test crop safety and compatibility of tank-mixing other herbicides with DPX-MAT28 on seedling and established grasses.

Project:	**703 EBIPM Medusahead Management Project**
Project Leader:	*Joseph DiTomaso,* Cooperative Ext. Specialist, Weed Science Program, UC Davis *Rob Wilson*, Center Director, UC Intermountain Research & Extension Center, Tulelake
Objective:	The overall objectives are two-fold. First, to demonstrate the effectiveness of Plateau and Matrix for large scale control of downy brome and medusahead, and to determine the herbicides' utility in sage grouse habitat restoration of desirable native species without the need for expensive re-seeding efforts. Second, to consider alternative methods of control with and without re-seeding efforts, and to determine the best seeding method when active restoration practices are necessary. We hypothesize that multiple methods will be shown to be successful in selecting for desirable species and improving the habitat for sage grouse.

Project:	**781 Effect of Variety and Maturity at Harvest on Yield and Quality of Small Grain Forages**
Project Leader:	*Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka *Dan Putnam,* Extension Agronomist, Department of Plant Sciences, UC Davis
Objective:	1) Evaluate the forage yield of different spring cereal forage varieties under intermountain growing conditions. 2) Determine the effect of two harvest timings on forage yield. 3) Document the yield/quality tradeoff for different forage varieties

Project:	**997 Evaluation of Potential Cellulosic biofuels for the Intermountain Region**
Project Leader:	*Dan Putnam,* Extension Agronomist, Department of Plant Sciences, UC Davis *Steve Orloff*, County Director/Farm Advisor, Siskiyou County, Yreka *Don Lancaster*, County Director/Farm Advisor, Modoc County, Alturas
Objective:	While the core of this proposal is focused on switchgrass for cellulosic biofuels, since we have little data on this crop, we will compare this with several perennial and annual species to assess the potential of a range of crops for energy applications. It is important to continually ask the question as to the appropriateness of different feedstocks and their adaptation. Objectives: 1) To assess the adaptation, dry matter yield, and potential energy yield of a range of proposed cellulosic energy crops including switchgrass. 2) To describe differences among switchgrass varieties and their adaptation to the Intermountain region.

2010 IREC Field Map



University of California
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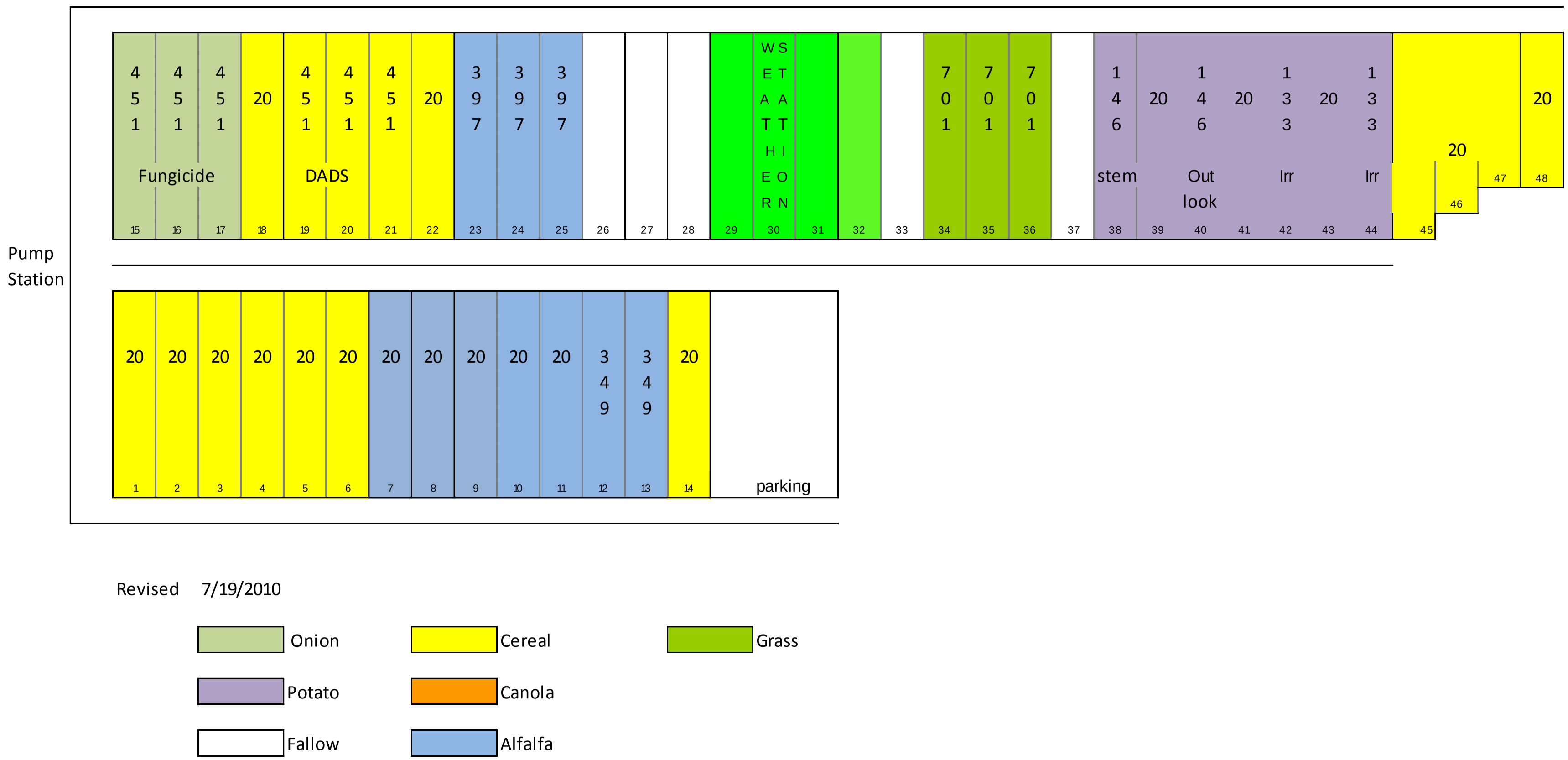
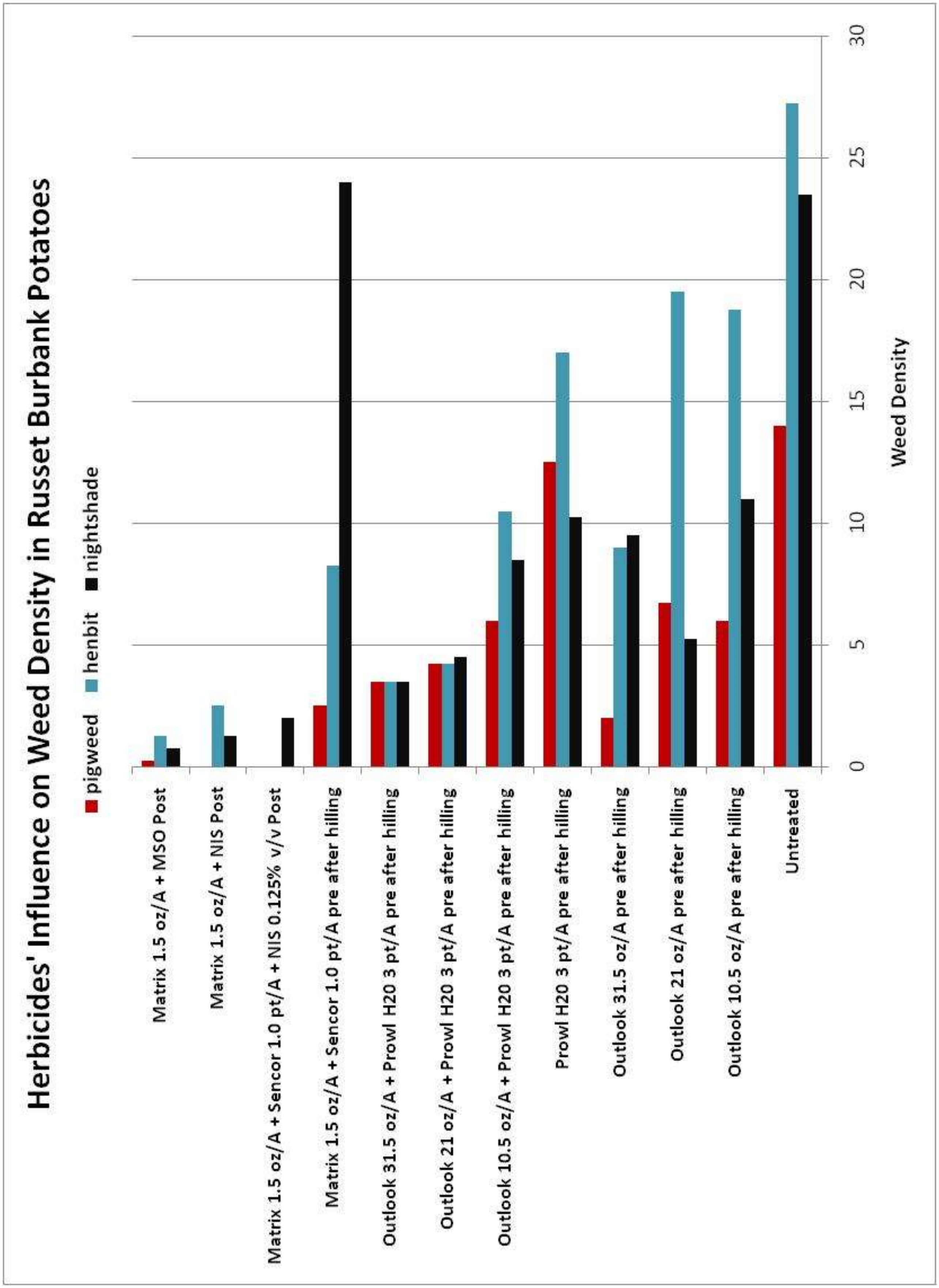
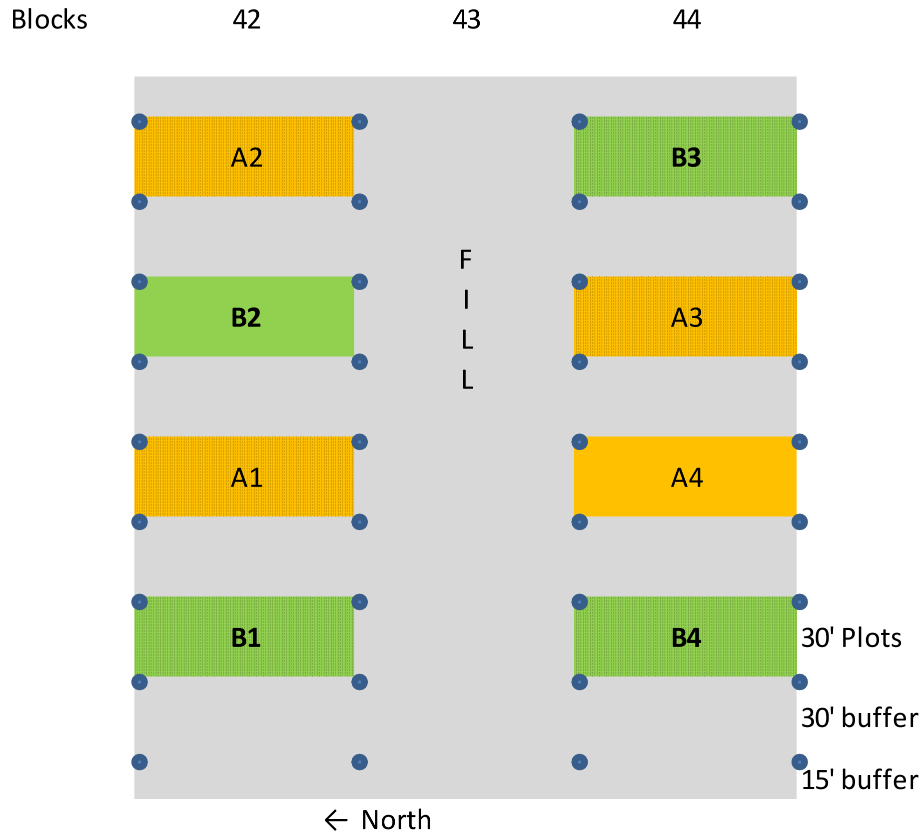
Station Map





Herbicides' Influence on Weed Density in Russet Burbank Potatoes
pigweed
henbit
nightshade
Matrix 1.5 oz/A + MSO Post
Matrix 1.5 oz/A + NIS Post
Matrix 1.5 oz/A + Sencor 1.0 pt/A + NIS 0.125% v/v Post
Matrix 1.5 oz/A + Sencor 1.0 pt/A pre after hilling
Outlook 31.5 oz/A + Prowl H20 3 pt/A pre after hilling
Outlook 21 oz/A + Prowl H20 3 pt/A pre after hilling
Outlook 10.5 oz/A + Prowl H20 3 pt/A pre after hilling
Prowl H20 3 pt/A pre after hilling
Outlook 31.5 oz/A pre after hilling
Outlook 21 oz/A pre after hilling
Outlook 10.5 oz/A pre after hilling
Untreated
0
5
10
15
20
25
30
Weed Density

1330 Irrigation Trial **Planted 5/14/10**



A = 40% Depletion Irrigation
B = 20% Depletion Irrigation

Tensiometers
= Sprinkler

In this trial, we will compare two irrigation schedules.

One schedule (A) will let soils reach 40% depletion before each irrigation (less frequent irrigation with more water applied per irrigation).

The second schedule (B) will let soils reach 20% depletion before each irrigation (more frequent irrigation with less water applied per irrigation).

Data will include measuring % disease infection, disease severity, tuber yield, size, and grade.

Fall Harvest Management Strategies for Alfalfa

Steve Orloff, UCCE Siskiyou County and Dan Putnam, Forage Specialist, UC Davis

Alfalfa is the largest acreage crop in the intermountain area and alfalfa has become increasingly important in the Klamath Basin including the Tulelake area. Growers often harvest four cuttings per year because of the price premium for high quality alfalfa hay (low ADF, high TDN and protein). With favorable weather conditions in recent years for hay making, growers are harvesting alfalfa later and later into the fall. While most growers traditionally completed the cutting of their last field by the middle of the September at the latest, it has recently become common for fields to be cut into late October. At the same time growers in neighboring valleys have observed increased winter injury. Research is needed to examine the effect of fall harvest management on alfalfa stand persistence and vigor the following season.

Accurate information about the effects of fall harvest management can improve alfalfa vigor, yield, and ultimately stand life.

The objectives of this research are to:

1. Evaluate the effect of the date of the last harvest in the fall on alfalfa yield.

2. Determine the profitability of different fall harvest management strategies.

3. Determine whether alternating the number of cuttings from one year to the next can help overcome the negative effects of improper fall harvest management.

Trials are arranged in a split plot design. The main plot is the first year harvest schedule. There will be four different first year cutting schedules with the emphasis being on the timing of the last cutting. The first year harvest schedules will be as follows:

Treatment	1st cutting	2nd cutting	3rd cutting	4th cutting	2010 Harvest Schedule
1	6/18/2009	7/22/2009	9/2/2009		3- Cut
2	6/18/2009	7/22/2009	9/2/2009		4-Cut
3	6/9/2009	7/9/2009	8/17/2009	9/16/2009	3- Cut
4	6/9/2009	7/9/2009	8/17/2009	9/16/2009	4-Cut
5	6/9/2009	7/9/2009	8/17/2009	9/30/2009	3- Cut
6	6/9/2009	7/9/2009	8/17/2009	9/30/2009	4-Cut
7	6/9/2009	7/9/2009	8/17/2009	10/16/2009	3- Cut
8	6/9/2009	7/9/2009	8/17/2009	10/16/2009	4-Cut

The sub plots will be the second year harvest schedules. Each plot will be harvested either 3 or 4 times the following year. The intent is to determine if alternating a 3 cut schedule with a four cut schedule can help overcome the effects of fall harvest management the previous year. The third year a single uniform first cutting harvest will be done for all plots to determine any carry-over effects of the previous harvest management.

The trial will be duplicated with this same regime in 2010 (with slightly different harvest dates due to the cool spring growing conditions) to help minimize the effects of year-to-year variation.

Fall Harvest Management Strategies

3490 Field 10-13
Plot size: 8.5 x 25 ft.

N

2	**6**	**3**	**7**	**1**	**4**	**8**	**5**	**8**	**6**	**4**	**2**	**1**	**3**	**5**	**7**
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

2	**7**	**4**	**1**	**6**	**5**	**8**	**3**	**4**	**8**	**1**	**6**	**5**	**2**	**3**	**7**
17	18	19	20	21	22	23	24	25	26	28	28	29	30	31	32

Treat.	**Year 1**	**Year 2**
1	3-cut: 1st mid June, 2nd late July, 3rd very early Sept.	3-Cut
2	Same as above	4-Cut
3	4-cut early: 1st June 11, 2nd early July, 3rd cut mid Aug, 4th cut early Sept.	3-Cut
4	Same as above	4-Cut
5	4-cut mid: 1st June 11, 2nd cut early July, 3rd cut mid Aug, 4th cut late Sept to very early Oct..	3-Cut
6	Same as above	4-Cut
7	4-cut late: 1st June 11, 2nd cut early July, 3rd cut mid Aug, 4th cut late October after killing frost.	3-Cut
8	Same as above	4-Cut

Practical Applications of the Fall Dormancy Rating system to Alfalfa Production

Larry R. Teuber
Department of Plant Sciences
University of California, Davis 95616

Abstract

Fall Dormancy is characterized by a reduction in growth during the fall. This reduction in growth is associated with reducing photoperiod (day length) and temperature. Arguably, fall dormancy is the most important single factor in determining the area of adaptation for an alfalfa cultivar. Certainly, fall dormancy must be accurately determined if it is to be of major value. Between about 1985 and 1995 it became clear that there were problems with the existing methodologies used for determining fall dormancy. Among the problems were check cultivars that were not behaving in a manner consistent with the dormancy class they represented, differentials in the response of cultivars to changes in day length and temperature probably were not accounted for in the measurement procedures, related to this issue is that there are differences (usually minor) in fall dormancy estimates (determinations) among locations and years. Finally, alfalfa breeders recognized there were substantial differences in the fall growth of cultivars within a dormancy class, but these differences were not recognized by the standard methods of determining/reporting fall dormancy class and consequently these differences were/are obscured when fall dormancy is reported. Potentially, these misclassifications can lead to serious winter kill and/or failure to realize the climatic potential for hay production. From a more positive perspective, more precise and accurate knowledge the fall dormancy of a cultivar should provide growers with one of the tools needed to fine tune their cultivar choices and subsequent management decisions.

Determining Fall Dormancy Class

University of California Fall Dormancy trials are established annually at up to four locations in California ((1) the Intermountain Research and Extension Center [Tulelake, CA - 41o 53' N, mean annual temp. 49.0o F]; (2) the Agronomy and Range Science Field Research Facility [Davis, CA - 38 o 32' N, mean annual temp. 60.3 o F], (3) Kearney Research and Extension Center [Parlier, CA - 36o 35' N, mean annual temp. 62.1o F); and the Desert Research and Extension Center [El Centro, CA) Alfalfa plants are established in single row plots on 30” centers. Each plot is 25’ in length separated by a 5’ alley. Individual plants within a plot are 18” apart. Seeding occurs on approximately May 1, except at Imperial where seeding occurs about March 20. When plants reach the second or third trifoliolate leaf stage the plot is thinned to the spacing above. Watering is adequate for a forage production field. The first clipping, if taken, should occur between July 1 and July 15 (no data are to be taken at this time). Clipping does not occur after this date because the reduction in day length after the summer solstice (June 21) has a strong impact on the regrowth of dormant cultivars. This can result in problems when they are grown for fall dormancy evaluation in trials containing non-dormant cultivars. The plot will remain well watered and weed and rodent free until: September. 7, Tulelake; October 3, Davis and Parlier; and October 23, Imperial. On these respective dates, the study is uniformly clipped to 2 inches (5 cm). Irrigation continues in amounts appropriate for forage production. Three and one-half weeks after clipping individual plants are evaluated for fall growth on a 1 to “n” scale. Each increment in the scale is equal to 2 inches of growth. These scores take into account both the length of the stem and the angle at which it is growing. Average scores for each plot are square root transformed to remove variance heterogeneity in the data. Transformed values are reported as natural plant height (NPH).

Assigning Fall Dormancy Ratings

Historically fall dormancy has been determined from a single trial often located in the upper Midwest. Included in these trials were materials to be classified for fall dormancy and a group of materials known fall dormancy (standard check cultivars). Fall dormancy was usually assigned based on a somewhat subjective determination of what check cultivar was most similar in growth. As the number of cultivars assigned to a dormancy class increased, alfalfa scientists recognized that there was substantial variation among cultivars assigned to a given dormancy class (e.g. FD = 5). Knowledge of these differences was not widely known among growers and was not available in written from. Furthermore, between 1985 and 1995 it became clear that all cultivars do not respond to daylength and temperature changes in the same manner (Table 1). For example, data obtained at Davis, CA show that the average cultivar scores an average of two scoring classes shorter when evaluated in October than when evaluated in September. However, among the check cultivars used prior to 1998 (see below), CUF101 and Lahontan change much more than the average, and Mesilla and Ranger respond much less than the average cultivar during this period.

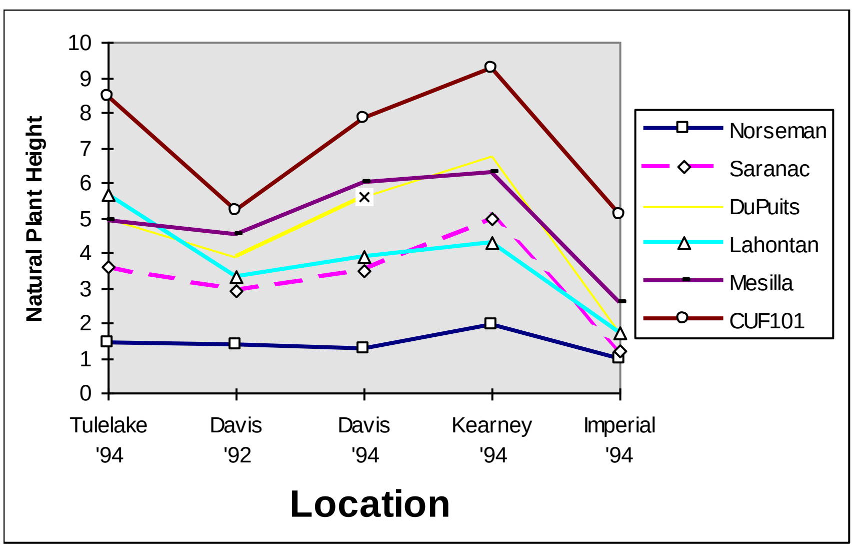
Table 1. Fall dormancy scores of old standard check cultivars on two different dates when evaluated at the University of California, Davis.

Check Cultivar	Time of evaluation September	October	Difference
	-------------------	Score	------------------
Norseman (1)[2]	2.3	1.1	1.2
Vernal (2)	5.1	4.0	1.1
Ranger (3)	5.5	4.8	0.7
Saranac (4)	6.2	4.4	1.8
Lahontan (6)	8.1	5.0	3.1
Mesilla (7)	8.3	7.8	0.5
Moapa 69 (8)	9.9	7.7	2.2
CUF101 (9)	12.4	8.9	3.5
$LSD_{0.05}$	1.74	0.48	
CV(%)	15.5	11.0	

[2] values in parentheses indicated the dormancy class of the check cultivar

This reduces the difference between cultivars and can change the ranking of cultivars. That is, the fall dormancy group that a cultivar is assigned could be highly dependent on the time of year that the trial is evaluated (Figure 1).

Figure 1. Relative fall dormancy ranking of selected check cultivars when evaluated at different locations in California.



These differences in fall dormancy response can lead to classifications that are appropriate in one environment that are not appropriate in another environment. Evaluation of fall dormancy in a single year and/or a single location has led to misclassification of some cultivars. These misclassifications are rarely major errors. The problems usually arise in trying to distinguish among similar cultivars and cultivars in similar dormancy groups. However, under the right set of circumstances these differences can have undesirable consequences such as winter kill or lack of production when growers purchase a cultivar that is supposed to be in a dormancy group that later turns out to be incorrect - at least for that location.

To alleviate this problem, we utilized multiple year and location data from our California trials to define a new set of check cultivars. These cultivars were selected to: 1) preserve the dormancy classes represented by the original fall dormancy checks and 2) to minimize the deviations from these relationships due to years and locations. That is, we choose the check cultivars to make the relationship among these as stable as possible across environments. Having done this, we can now define the relationship between fall growth score and fall dormancy class sufficiently well to permit cultivars to be assigned a fall dormancy rating that is accurate to approximately 0.2 classes. This is accomplished by regressing the transformed fall growth score on the Fall Dormancy Rating (FDR) of the check cultivars and utilizing the resulting regression equation to assign the FDR of unknown cultivars (Figure 2).

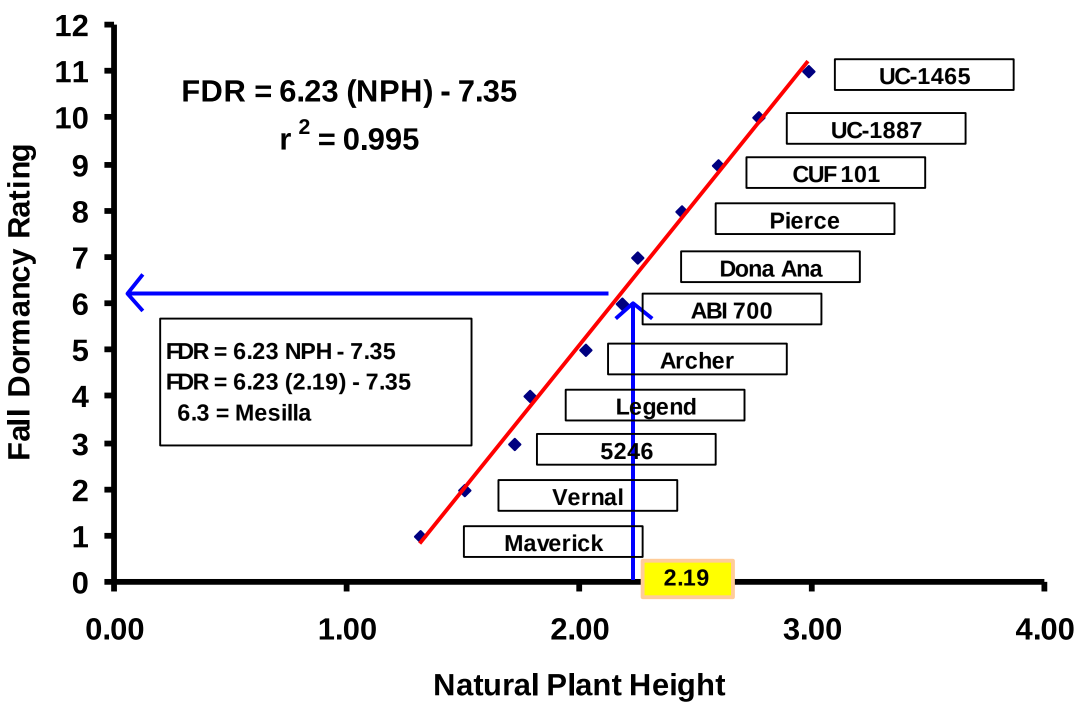


Figure 2. Check cultivars use to assess fall dormancy and an example of how to use regression to determine the fall dormancy class of a cultivar.

Implications of Improved Fall Dormancy Classification

Once we started applying this approach, we noticed there are substantial differences in dormancy among cultivars within a dormancy class, as previously defined (Table 1). Among a group of eight cultivars tested in University of California trials, five were misclassified in information that is widely available to growers. While these misclassifications are undesirable, none are grossly incorrect.

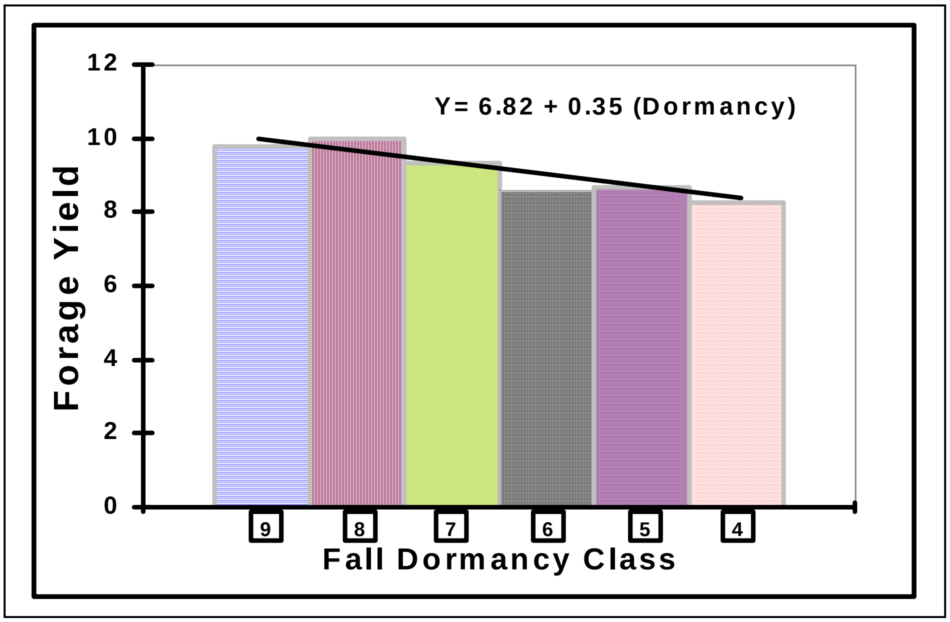
Table 2. Fall dormancy class as reported by the certified Alfalfa Seed Council and revised Fall Dormancy Rating under the new classification system of some dormant cultivars marked in California (cultivar names not reported), and forage yield of these cultivars in trials conducted at the Intermountain Research and Extension Center.

	Dormancy Rating				Forage Yield			
Cultivar[1]	Seed Council	UCD Trials	New Rating					Rank
	-- FDC --	-- FDC --	-- FDR --		-- T / A --			
"G"	4	4	4.2		6.61	a		1
"I"	5	4	4.5		6.49	a	b	2
"F"	4	4	4.0		6.45	a	b	3
"H"	4	4	4.3		6.39	a	b	4
"B"	3	4	3.6		6.32		b	5
"C"	3	4	3.8		6.30		b	6
"E"	3	4	3.9		6.30		b	6
"D"	3	4	3.8		6.25		b	8

[1] Cultivar names coded to avoid unfairly identifying only a few of the many certified cultivars marketed in the Intermountain Region.

Data serve well to illustrate some important principals. First, with the ability to more precisely identify fall dormancy cultivars that might not be considered because they were either too dormant (3) or too non-dormant (5) come into consideration. Second, within a dormancy class (FDR) there is variation in fall growth. Third, differences in fall dormancy are associated with differences in forage yield ($r_{(df=7)}$ = 0.697). Thus, when the fall dormancy rating is precisely defined the potential exists to both make choices among cultivars for planting to meet very well defined dormancy criteria and with the set of cultivars meeting that criterion select the cultivar(s) that meet criteria for yield and disease and pest resistance (Table 2). An important consideration in choosing cultivars is the relationship between Fall Dormancy Class and forage yield. As we have pointed out above, there are clearly differences in yield among cultivars within a fall dormancy class. Additionally, there is also a relationship between fall dormancy class and forage yield. We recently examined this relationship using long term production records from University of California forage yield trials conducted on the Agronomy Field Facility at Davis. At Davis, we have routinely tested cultivars ranging in fall dormancy between 4 and 9. We identified several cultivars (approximately 6) in each of these fall dormancy classes that had been in at least 3 trials and harvested for 3 years. Yield data from these cultivars were converted to a percentage of the check cultivar and then converted to a standard forage yield based on the check cultivar. Based on those data, average forage yield decreases with increasing fall dormancy (Figure 3). On average, annual forage yield increases by slightly more than one-third of a ton per acre for each change (increase) in dormancy class.

Figure 3. Long term relationship between fall dormancy class and average forage yield in trials conducted UC Davis.

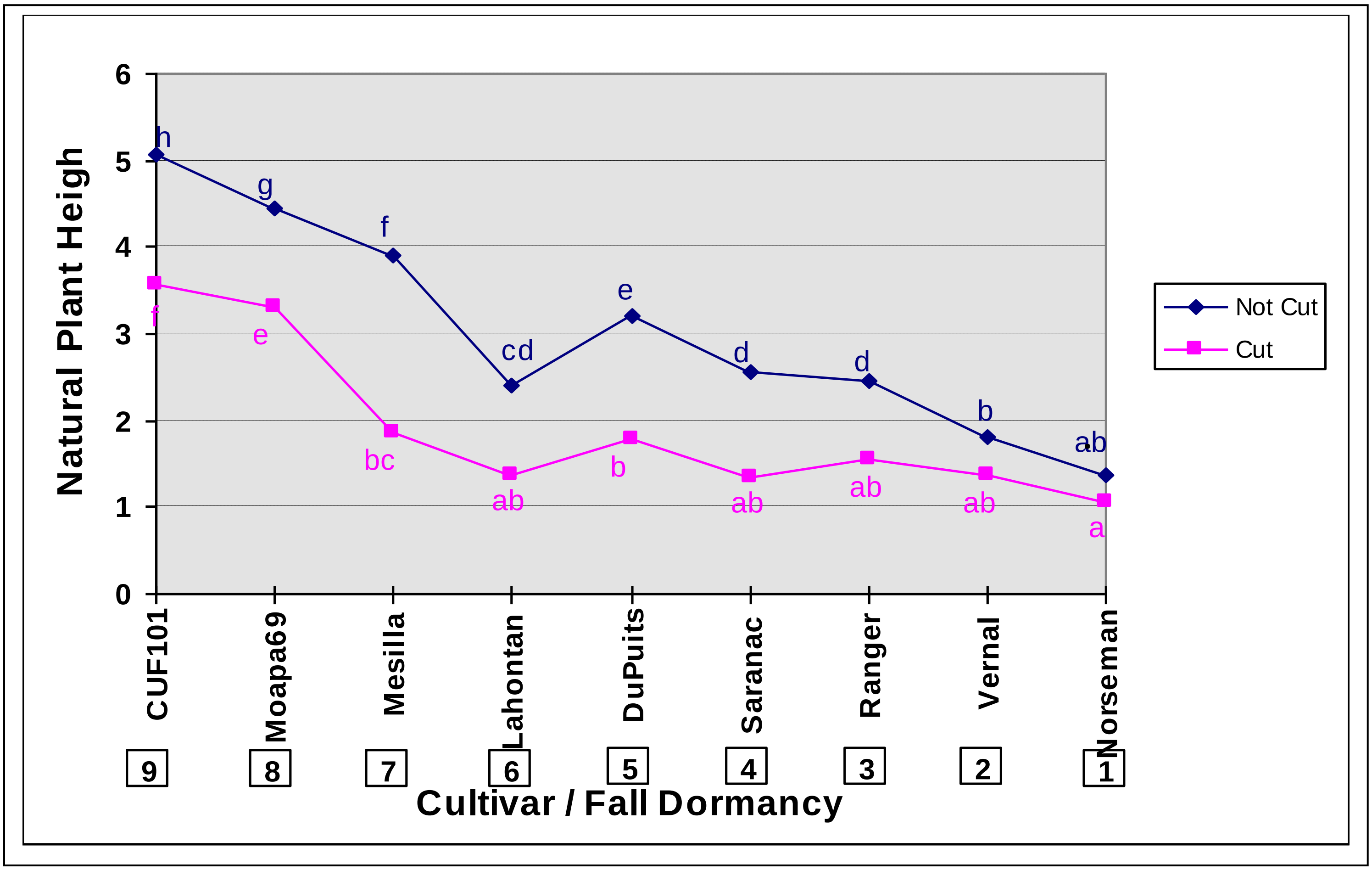


Having made this statement, it is appropriate to also provide some guidance in its interpretation and use. First one must always remember that there are cultivars in any fall dormancy class that are either relatively high or low yielding. Thus this is a generalization, but the relative yield of dormancy classes applies to the extremes of the within class distribution as well as to the average. Second fall dormancy is important to survival and productivity so there is little to be gained from growing cultivars that are substantially more or less dormant than the adapted type for the production area. Thirdly, maturity and the associated management are associated with fall dormancy.

Implications of Fall Dormancy to harvest management and stand persistence

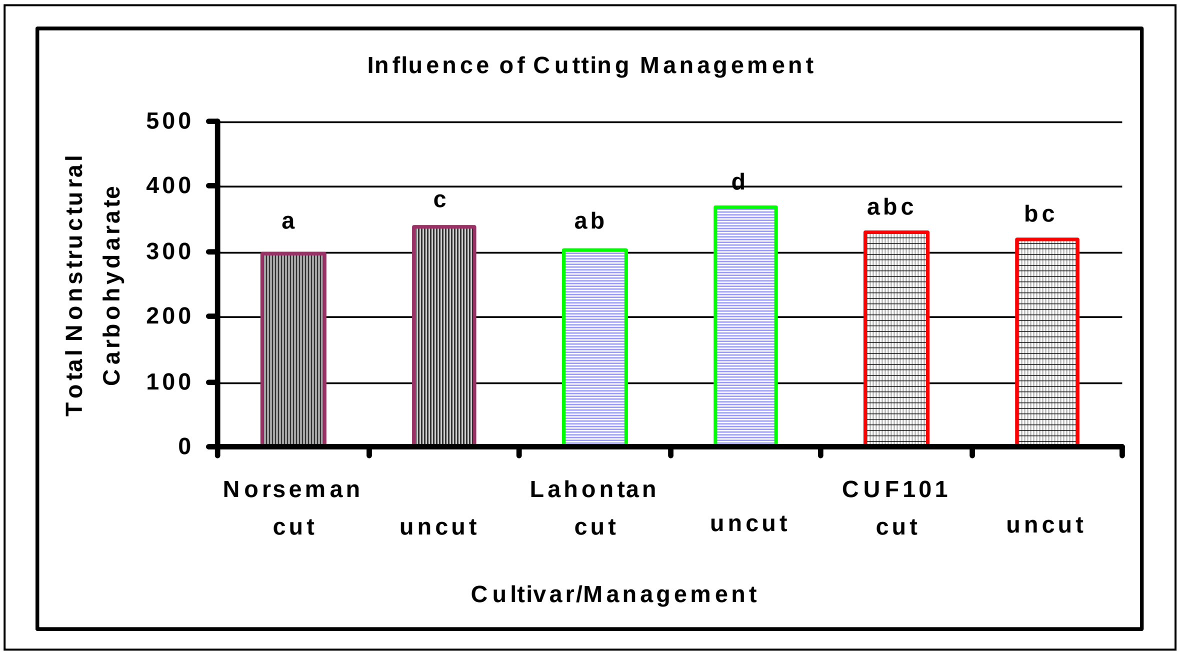
Several years ago we conducted a cutting management study on the Agronomy Field Facility at Davis to assess the impact of harvest frequency on the evaluation of fall dormancy. While this study was conducted using plants that were individually spaced down beds on thirty inch centers, the results from the study have relevance to harvest management in commercial hay production. These plots were established in early May. A harvest occurred the middle of July in both the harvested and unharvested plots. The harvest plots were subsequently harvested every 28 days through the beginning of October (three additional harvests). The unharvested plots were allowed to grow without harvest during this period. The latter protocol is standard for assessing fall dormancy. Three and one-half weeks after the October harvest regrowth was measured on both the harvested and unharvested plots differences in regrowth (fall dormancy) could be detected among check cultivars in the unharvested plots (Figure 4).

Figure 4. Differences in fall regrowth among alfalfa cultivars grown at Davis, California and harvested every 28 days (Cut) and not harvested between mid July and the 7th of October.



It is important to remember that cultivar with a fall dormancy rating of less than 7 would normally be considered too dormant for production in the southern Sacramento Valley. Or conversely, a cultivar with a fall dormancy rating greater than 4 or 5 may be too non-dormant for production in the intermountain area of California. A partial explanation of the reason that differences in regrowth could not be detected among the intermediate and dormant cultivars can be derived by examining the root carbohydrate (storage) in cultivars that were harvested frequently and those that were not harvested (Figure 5) and in the amount of winter injury that occurs. Root carbohydrate levels were significantly higher in plots of both Norseman (very dormant) and Lahontan (intermediate dormancy) that had not been harvested than in plots that were harvested at a frequency approximating the harvest frequency in commercial hay production. In contrast, there was no difference in root carbohydrate concentration between harvested and unharvested plots of the non-dormant cultivar CUF 101. The most likely explanation of this is that the

Figure 5. Root non-structural carbohydrate concentration in harvested (cut) and unharvested (uncut) plots of dormant, semi-dormant, and non-dormant cultivars grown at Davis, California.



more dormant cultivars took longer to mature than the 28 day cutting cycle permitted. Therefore less storage had occurred at the time of harvest. Repeatedly, harvesting prior to maturity probably weakened the plants in these cultivars adversely affecting regrowth potential -- and subsequent yield. This is known to also be related to the ability to withstand winter injury. Further illustrating the importance of accurate determination of fall dormancy, proper choice of cultivar within the adapted dormancy class, and finally proper harvest management. Each year fall dormancy trials at Tulelake are evaluated for winter injury on approximately May 1. The general appearance of each plant is determined on a 1 to 5 scale as depicted in Figure 6. At Tulelake cultivars classified with a fall dormancy rating of 4 or less typically show little sign of winter injury (sores of 1 or 2) Cultivars with a fall dormancy of 5 will show some injury in severe winters. Cultivar with a fall dormancy of 6 or greater experience significant injury, and cultivars classified in dormancy classes 9 and 10 normally are completely winterkilled.

Figure 6. Appearance (Phenotype) of one-year old alfalfa plants in the Spring following exposure to winter conditions.

Summary

Fall dormancy is a very useful trait to determine the potential area of adaptation of an alfalfa cultivar. Recently, the check cultivars and the protocol used to establish fall dormancy have been changed and additional non-dormant classes defined. We have shown that precise and proper determination of fall dormancy provides better distinction among cultivars and likely choices of cultivars that previously would not be considered because of their dormancy class. Data were also provided to show that higher yield potential is associated with more non-dormant cultivars. These facts suggest the need for careful examination of the wisdom of growing cultivars that are too dormant for the production area, because of the lower yield potential and the associated need to lengthen cutting cycle (likely further reducing annual yield) to maintain stand vigor (replenish root carbohydrate).

4510 Tulelake- Onions Experiment 1, fungicides

Treatments

Planted 4/16/10 N ←

Field 15-16

1 **Control (pink)**
N/A

2 **Folicur rate 1 (gold)**
0.5x standard- 10.3 oz/A (banded)

3 **Folicur rate 2 (yellow)**
standard - 20.5 oz/A (banded)

4 **Luna Priv. (green)**
6.84 fl. oz/A

5 **Switch 62.5 WG (light blue)**
14 oz/A

6 **LEM17- 20 SC (turquoise)**
24 fl. oz/A

7 **Endura (plum)**
6.8 oz/A

	Fill	Fill	Fill	Fill	Fill	Fill	25 ft
	Rep 1 7	Rep 2 3	Rep 3 4	Rep 4 2	Rep 5 3	Rep 6 5	25 ft
	Rep 1 2	Rep 2 2	Rep 3 3	Rep 4 7	Rep 5 2	Rep 6 7	25 ft
	Rep 1 6	Rep 2 5	Rep 3 1	Rep 4 6	Rep 5 1	Rep 6 3	25 ft
200 ft	Rep 1 3	Rep 2 1	Rep 3 2	Rep 4 5	Rep 5 4	Rep 6 6	25 ft
	Rep 1 5	Rep 2 7	Rep 3 6	Rep 4 4	Rep 5 5	Rep 6 4	25 ft
	Rep 1 4	Rep 2 4	Rep 3 7	Rep 4 1	Rep 5 7	Rep 6 1	25 ft
	Rep 1 1	Rep 2 6	Rep 3 5	Rep 4 3	Rep 5 6	Rep 6 2	25 ft
	4 rows	4 rows	4 rows	4 rows	4 rows	4 rows	

Developing Integrated Pest Management Strategies for California Mint

Project researchers: Kris Tollerup, Rob Wilson, Dan Marcum, Steve Orloff, and Larry Godfrey

Presenter: Larry Godfrey

Feeding damage on mint from the twospotted spider mite, *Tetranychus urticae* Koch, has a considerable negative impact on oil yield and quality. This mite commonly attacks mint and effectively managing it requires a monitoring method that efficiently and accurately determines when and if a treatment is necessary. The spider mite monitoring protocol developed at Oregon State University the mid 1990s indicates to examine 630 leaves per 30 acres for adults, nymphs and eggs. This calls for inspecting 9 leaves (three leaves at each of the lower, mid, and upper, portion of the stem) on five randomly selected stems in 14 different locations within an individual mint field. Leaves are classified as infested when they have five or more adults and or nymphs. Also important is the presence of predatory mites. These predators play an important role in naturally regulating spider mite populations and keeping them below economic levels. The suggested treatment threshold is reached when 40% of the leaves sampled at each site have five or more spider mites and no predators are present.

This sampling protocol is extremely useful; however, it is time intensive and has not been validated for California conditions. Therefore we aim to validate and improve this plan using six area mint fields.

At the Intermountain Research and Extension Center, we have two ongoing studies. The objectives of these studies are to 1) Investigate effectiveness of several reduced risk miticides against twospotted spider mite and 2) Study the use of releases of predatory mites for spider mite management on mint in California.

The miticide, Omite, is commonly used against spider mites in mint but this material is under regulatory scrutiny. Several new miticides have recently been registered and we are trying to develop some efficacy data on these to allow growers to make the most cost effective choice. In addition, developing data on mite populations effects on mint oil yield will be another outcome of this study. Predatory mites are another option for spider mite control. Guidelines for their use have been developed in Pacific NW mint and growers in CA have tried releases of predatory mites with mixed success. We are re-examining this biological control tool in small plot studies. Predatory mite release timing is the primary factor we are studying in 2010.

Developing Integrated Pest Management Strategies for California Mint

Project researchers: Kris Tollerup, Rob Wilson, Dan Marcum, Steve Orloff, and Larry Godfrey

Presenter: Kris Tollerup

In California, mint production occurs in the northeast counties of Shasta, Lassen, Modoc, and Siskiyou. For optimum yield, mint requires long warm days and cool nights and until the mid 1990s, production has occurred primarily in the states of Idaho, Oregon, and Washington. The Lepidoptera pest, mint root borer (MRB), *Fumibotys fumalis* Hodges, commonly attacks mint and has a negative impact on oil yield and quality. This pest poses a significant management challenge and is the target of considerable pesticide use. Mint root borer has a single generation per year. Adults emerge from the soil beginning in mid June through September. Newly emerged females mate and lay disc-shaped eggs on the upper or lower leaf surface and eggs hatch in approximately 3-5 days. Larvae feed on the foliage for a short time then drop to the soil surface, burrow in and begin feeding on the plant roots.

The pesticide Lorsban (chlorpyrifos) is used extensively against MRB. The watersheds and environment of the Intermountain area, including the Fall River Valley and Klamath Basin, are extremely sensitive and the use of Lorsban is problematic. This organophosphate insecticide is under regulatory scrutiny and could be removed from the market by 2015. Lorsban applied to mint has a 90-day pre-harvest interval and thus must be applied postharvest, although at this stage considerable feeding damage has occurred. In recent years, several reduced risk (RR) insecticides have been registered for use against MRB in California. The effectiveness of these RR chemistries is not fully understood and treatment protocols have not been developed. The objectives of our study is to 1) Investigate the seasonal life history of MRB in California and the applicability of the population model developed in the Pacific Northwest to California conditions, and 2) Study the effectiveness of RR insecticides for management of MRB in California.

To investigate MRB flight, we have set up a series of large delta sticky traps baited with MRB sex pheromone that are checked weekly.

In the McArthur and Tulelake areas we have set up experimental sites to collect data on the efficacy of five recently-registered RR insecticides: Avaunt (DuPont), Coragen (DuPont), Intrepid (Dow AgroSciences), Radiant (Dow AgroSciences), and Voliam flexi (Syngenta). Theses RR insecticides will be compared against the industry standards, Lorsban (Gowan) and

Mocap (Bayer CropSciences). We will assess MRB populations in the soil prior to harvest using Berlese funnels.

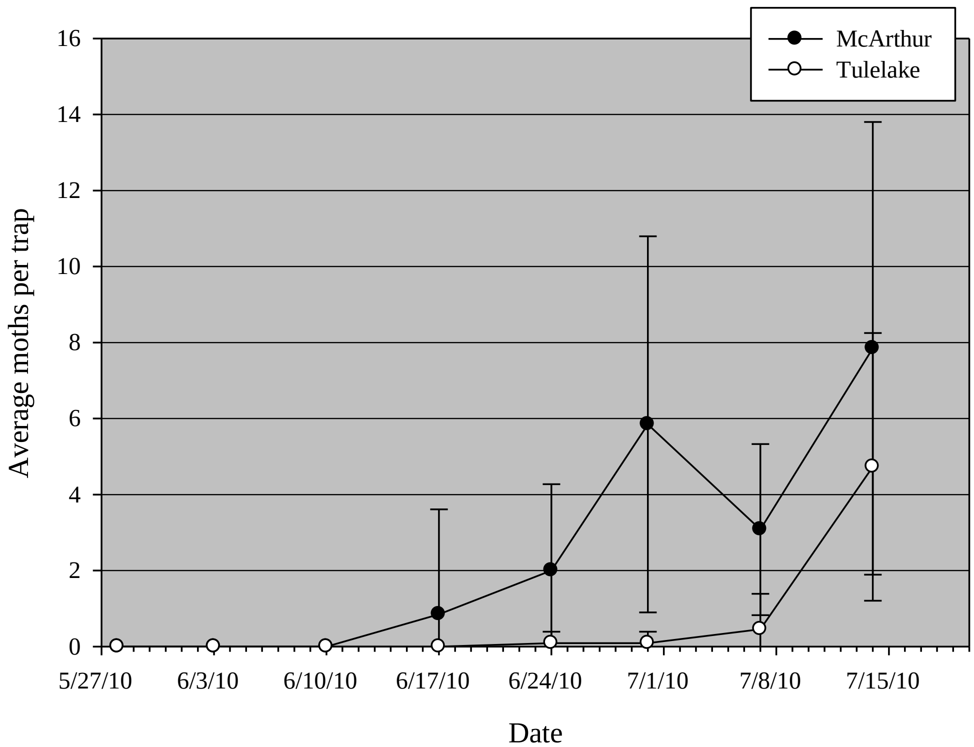


Fig. 1. Average number of mint root borer captured in the McArthur and Tulelake areas from late May thru mid July 2010.

Field Day Handout

UC Tulelake Research and Information Center, July 22, 2010

UC ALFALFA VARIETY RESEARCH

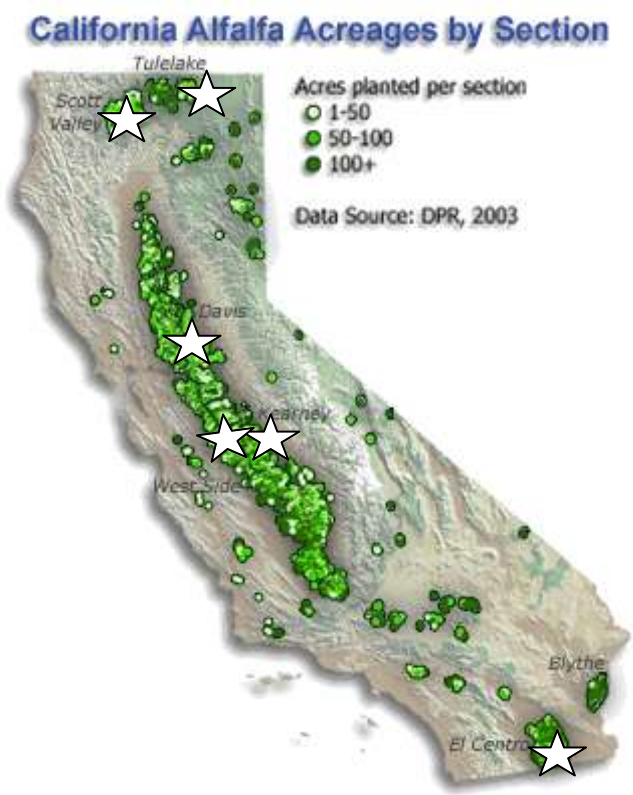
Dan Putnam, Steve Orloff UCCE, UC Davis

See: http://alfalfa.ucdavis.edu for current variety information

Growers often choose cultivars based upon promotion, price or habit. However, the choice of a variety can make a large long-term difference in profitability. Spending just a few minutes to carefully consider choice of variety may be beneficial, since1) cultivars can have a large impact upon yield, 2) Varieties can help cope with diseases or insects, and 3) Growers are 'stuck' with their choice for many years.

UC Variety Testing Program

The University of California provides an independent source of variety information that can be used to judge performance of alfalfa varieties. We have plots ranging from Tulelake and Scott Valley (Intermountain), to Davis and Kearney (Central Valley), and El Centro (Desert). It takes less than 1 tenths of 1 ton to justify even a $2 increase in the price of seed, and several varieties produce yield differences 10 times this amount. Choosing alfalfa varieties carefully only takes a short time and is worth it!



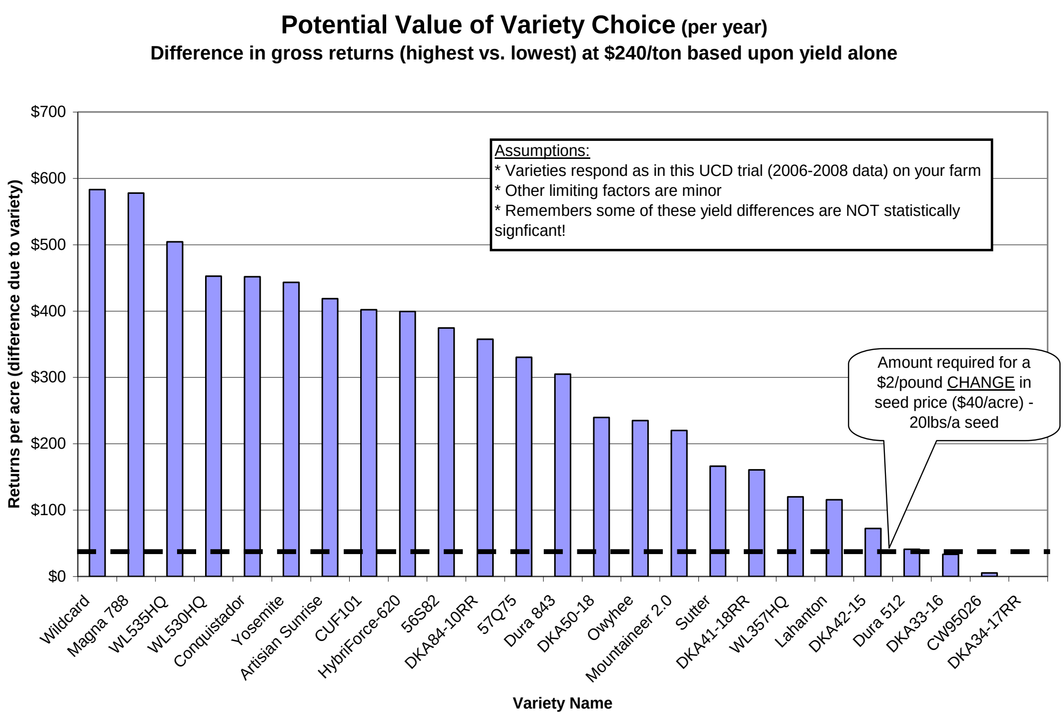
Yields are important, but are not the only criteria for variety selection. Take a look at the fall dormancy, disease resistance, and the quality characteristics, too. Research is continually underway to improve the performance of alfalfa varieties.

Many thanks to California Crop Improvement Association and alfalfa seed companies for funding the UC alfalfa variety work

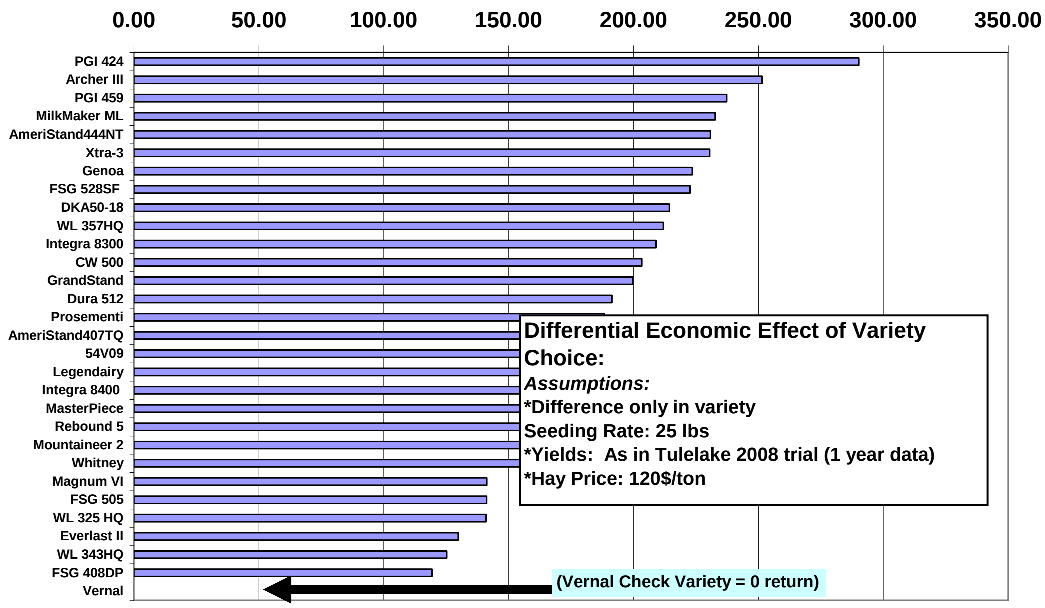
Steps for Choosing Alfalfa Varieties:

- **1) Choose group of high yielding certified varieties from relevant trials. Look at multi-year trial results.**
- **2) Determine Fall Dormancy requirements and preference.**
- **3) Determine pest resistance requirements for your area (emphasize those you expect).**
- **4) Consider Biotech Traits (e.g. RR)**
- **5) Look for evidence of better persistence**
- **6) Consider Forage quality**
- **7) Price/availability, and of course, hats**

Variety Choice – Does it pay?



VALUE OF VARIETY CHOICE
(Tulelake Data 2008)
Net Returns ($/a) over 1 year (difference due to variety only)



Suggested minimum alfalfa cultivar pest resistance and fall dormancy ratings[1] for alfalfa pests found in six California climate zones[2].

Zone[2]	FD	SAA	PA	BAA	PRR	BW	FW	San	Stn	RKN	VW
Intermountain	2--4	S	R	MR	R	R	HR	R	HR	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

[1] Pest Resistance abbreviations described below.

NOTE: These pest Resistance Ratings were originally developed by Dr. Vern Marble, Extension Agronomist, UC Davis, based upon decades of experience with alfalfa variety response in various locations in California.

[2] Zones correspond to the principle regions of alfalfa Production in California.

Resistance Abbreviations		Percent resistance[1]
HR	Highly Resistant	>51%
R	Resistant	31-50%
MR	Moderately Resistant	15-30%
LR	Low Resistant	6-14%
S	Susceptible	<5%
T	Tolerance	(see definition)

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

TABLE 1. 2009 YIELDS, TULELAKE ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 7/27/07

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
		17-Jun	16-Jul	11-Aug	24-Sep	TOTAL		VERNAL
	FD			Dry t/a				%
Released Varieties								
DKA50-18	5	3.3 (2)	2.0 (5)	1.6 (4)	1.6 (2)	8.5 (1)	A	130.5
Archer III	5	3.0 (22)	2.0 (1)	1.6 (1)	1.6 (6)	8.3 (2)	A B	127.4
Integra 8400	4	3.4 (1)	1.9 (12)	1.4 (30)	1.6 (13)	8.3 (3)	A B	127.3
PGI 459	4	3.1 (15)	2.0 (2)	1.6 (3)	1.6 (14)	8.3 (4)	A B	126.7
Legendairy	3	3.1 (13)	2.0 (4)	1.5 (15)	1.5 (29)	8.1 (5)	B C	124.1
WL 357HQ	5	3.2 (6)	1.8 (24)	1.5 (21)	1.6 (16)	8.1 (6)	B C	124.0
Integra 8300	3	3.2 (5)	1.8 (29)	1.5 (7)	1.5 (35)	8.1 (7)	B C D	123.8
Rebound 5	4	3.3 (3)	1.8 (32)	1.5 (25)	1.5 (36)	8.0 (8)	B C D E	123.2
AmeriStand407TQ	4	3.1 (17)	1.9 (15)	1.5 (10)	1.5 (23)	8.0 (9)	B C D E	123.0
GrandStand	4	3.1 (14)	1.9 (17)	1.5 (18)	1.5 (25)	8.0 (10)	B C D E F	122.5
PGI 424	4	3.1 (10)	1.8 (31)	1.4 (36)	1.5 (26)	7.9 (13)	C D E F G H	120.8
CW 500	5	2.9 (34)	1.8 (30)	1.5 (16)	1.6 (5)	7.9 (14)	C D E F G H I	120.6
Magnum VI	4	3.1 (16)	1.8 (21)	1.4 (46)	1.5 (27)	7.8 (18)	C D E F G H I	120.0
Dura 512	5	2.9 (32)	1.8 (33)	1.4 (34)	1.6 (8)	7.8 (21)	C D E F G H I J K L	119.1
FSG 505	5	3.0 (29)	1.8 (27)	1.5 (27)	1.5 (24)	7.7 (25)	C D E F G H I J K L	119.0
FSG 528SF	5	2.8 (43)	1.8 (39)	1.5 (14)	1.6 (4)	7.7 (26)	C D E F G H I J K L	118.8
Genoa	4	3.0 (21)	1.8 (28)	1.4 (35)	1.5 (40)	7.7 (27)	C D E F G H I J K L	118.7
AmeriStand444NT	4	3.1 (18)	1.7 (50)	1.4 (31)	1.5 (22)	7.7 (31)	C D E F G H I J K L	118.6
WL 325 HQ	4	3.2 (9)	1.7 (44)	1.4 (40)	1.4 (48)	7.7 (32)	C D E F G H I J K L	118.5
WL 343HQ	4	3.1 (20)	1.8 (34)	1.4 (37)	1.4 (50)	7.7 (34)	E F G H I J K L M	117.8
MilkMaker ML	5	2.5 (52)	1.9 (10)	1.6 (2)	1.5 (30)	7.6 (37)	H I J K L M N	116.0
54V09	4	3.1 (11)	1.8 (35)	1.3 (49)	1.3 (55)	7.6 (39)	H I J K L M N	116.0
Everlast II	4	3.0 (24)	1.7 (52)	1.4 (48)	1.5 (39)	7.5 (43)	H I J K L M N O	115.4
Xtra-3	4	2.8 (46)	1.7 (42)	1.4 (42)	1.6 (18)	7.5 (45)	J K L M N O	114.4
MasterPiece	4	2.9 (37)	1.7 (53)	1.3 (50)	1.5 (38)	7.4 (49)	L M N O	113.5
Mountaineer 2	5	2.9 (42)	1.7 (43)	1.3 (54)	1.4 (43)	7.3 (50)	M N O	112.6
FSG 408DP	4	2.8 (44)	1.7 (54)	1.4 (38)	1.4 (49)	7.3 (52)	N O	111.9
Prosementi	ND	2.4 (55)	1.8 (36)	1.4 (29)	1.5 (19)	7.2 (53)	O P	109.8
Whitney	4	2.7 (48)	1.6 (55)	1.2 (55)	1.4 (54)	6.9 (54)	P Q	105.6
Vernal	2	2.9 (40)	1.3 (56)	1.1 (56)	1.2 (56)	6.5 (56)	R	100.0
Experimental Varieties								
R46Bx164	6	2.9 (35)	1.9 (6)	1.6 (6)	1.6 (12)	8.0 (11)	B C D E F	122.5
R56BD188	ND	3.1 (12)	1.9 (11)	1.4 (28)	1.5 (31)	8.0 (12)	B C D E F G	122.3
R46Bx218	6	3.0 (23)	1.8 (20)	1.4 (43)	1.6 (11)	7.8 (15)	C D E F G H I	120.3
R56BD191	ND	3.2 (7)	1.8 (25)	1.4 (41)	1.4 (52)	7.8 (16)	C D E F G H I	120.2
R46Bx197	8	2.9 (38)	1.9 (9)	1.6 (5)	1.4 (44)	7.8 (17)	C D E F G H I	120.0
R46BD201	ND	2.9 (33)	1.9 (19)	1.5 (9)	1.5 (32)	7.8 (19)	C D E F G H I J	119.8
R46Bx165	8.5	2.9 (39)	1.9 (7)	1.5 (19)	1.5 (37)	7.8 (20)	C D E F G H I J K	119.5
R46Bx160	5	3.0 (27)	1.9 (18)	1.5 (13)	1.4 (46)	7.8 (22)	C D E F G H I J K L	119.1
R46Bx777	ND	3.2 (4)	1.7 (45)	1.3 (51)	1.4 (42)	7.8 (23)	C D E F G H I J K L	119.0
R56BD190	ND	2.9 (41)	1.8 (26)	1.5 (8)	1.5 (20)	7.8 (24)	C D E F G H I J K L	119.0
R46Bx162	8	3.0 (26)	1.9 (13)	1.4 (33)	1.5 (41)	7.7 (28)	C D E F G H I J K L	118.7
R46Bx167	4	2.9 (31)	2.0 (3)	1.4 (45)	1.4 (53)	7.7 (29)	C D E F G H I J K L	118.6
R46Bx775	ND	3.2 (8)	1.7 (48)	1.4 (47)	1.5 (33)	7.7 (30)	C D E F G H I J K L	118.6
R46Bx161	6	3.0 (30)	1.8 (22)	1.5 (17)	1.4 (51)	7.7 (33)	D E F G H I J K L	118.2
R56BD202	ND	2.8 (45)	1.9 (16)	1.4 (32)	1.6 (15)	7.6 (35)	F G H I J K L M N	117.3
R46Bx776	ND	3.1 (19)	1.7 (51)	1.3 (53)	1.5 (21)	7.6 (36)	G H I J K L M N	116.8
R56Bx214	4	2.6 (50)	1.9 (14)	1.5 (11)	1.6 (9)	7.6 (38)	H I J K L M N	116.0
TS 4028	4	3.0 (28)	1.8 (38)	1.4 (44)	1.4 (45)	7.5 (40)	H I J K L M N	115.8
R46Bx778	ND	3.0 (25)	1.7 (47)	1.3 (52)	1.5 (28)	7.5 (41)	H I J K L M N	115.7
R56Bx212	6	2.6 (49)	1.9 (8)	1.5 (22)	1.6 (17)	7.5 (42)	H I J K L M N	115.5
R46Bx173	5	2.9 (36)	1.8 (37)	1.4 (39)	1.4 (47)	7.5 (44)	I J K L M N O	115.1
R46Bx217	8	2.5 (53)	1.7 (40)	1.5 (12)	1.7 (1)	7.4 (46)	K L M N O	114.1
R46BD203	ND	2.6 (51)	1.7 (41)	1.5 (23)	1.6 (3)	7.4 (47)	L M N O	113.7
R46Bx163	4	2.7 (47)	1.7 (46)	1.5 (24)	1.5 (34)	7.4 (48)	L M N O	113.7
R46Bx211	4.1	2.4 (54)	1.8 (23)	1.5 (20)	1.6 (10)	7.3 (51)	M N O	112.3
R66BD108	ND	2.0 (56)	1.7 (49)	1.5 (26)	1.6 (7)	6.8 (55)	Q R	104.1
MEAN		2.93	1.81	1.44	1.50	7.69		
CV		8.6	6.5	6.7	7.8	4.5		
LSD (0.1)		0.27	0.13	0.10	0.12	0.37		

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

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

FD = Fall Dormancy reported by seed companies.

TABLE 2. 2008-2009 YIELDS, TULELAKE ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 07/27/07

	FD	2008 Yield	2009 Yield	Average		% of VERNAL
			Dry t/a			%
Released Varieties						
Archer III	5	8.6 (1)	8.3 (2)	8.4 (1)	A	127.5
DKA50-18	5	8.3 (11)	8.5 (1)	8.4 (2)	A B	126.9
PGI 459	4	8.5 (2)	8.3 (4)	8.4 (3)	A B C	126.4
WL 357HQ	5	8.3 (12)	8.1 (6)	8.2 (4)	A B C D	123.6
Integra 8300	3	8.3 (15)	8.1 (7)	8.2 (5)	A B C D E	123.3
Integra 8400	4	8.0 (34)	8.3 (3)	8.2 (6)	A B C D E F	123.1
GrandStand	4	8.2 (20)	8.0 (10)	8.1 (7)	B C D E F G	122.2
PGI 424	4	8.3 (10)	7.9 (13)	8.1 (8)	B C D E F G	122.2
AmeriStand444NT	4	8.4 (4)	7.7 (31)	8.1 (10)	B C D E F G	122.0
Genoa	4	8.4 (6)	7.7 (27)	8.1 (12)	C D E F G H	121.8
AmeriStand407TQ	4	8.1 (30)	8.0 (9)	8.1 (14)	C D E F G H	121.7
FSG 528SF	5	8.4 (7)	7.7 (26)	8.1 (16)	C D E F G H	121.6
Legendairy	3	8.0 (33)	8.1 (5)	8.1 (17)	C D E F G H	121.6
CW 500	5	8.2 (18)	7.9 (14)	8.0 (18)	C D E F G H I	121.4
MilkMaker ML	5	8.4 (3)	7.6 (37)	8.0 (20)	D E F G H I J K	120.8
Rebound 5	4	7.9 (38)	8.0 (8)	8.0 (23)	D E F G H I J K L	120.5
Dura 512	5	8.1 (24)	7.8 (21)	8.0 (24)	D E F G H I J K L M	120.1
Xtra-3	4	8.4 (5)	7.5 (45)	7.9 (27)	D E F G H I J K L M N	119.9
54V09	4	8.1 (29)	7.6 (39)	7.8 (35)	F G H I J K L M N O	118.3
Magnum VI	4	7.8 (47)	7.8 (18)	7.8 (36)	G H I J K L M N O	117.7
FSG 505	5	7.8 (46)	7.7 (25)	7.8 (38)	G H I J K L M N O P	117.2
WL 325 HQ	4	7.8 (48)	7.7 (32)	7.7 (39)	H I J K L M N O P	116.9
MasterPiece	4	8.0 (37)	7.4 (49)	7.7 (44)	K L M N O P Q	115.9
WL 343HQ	4	7.6 (52)	7.7 (34)	7.7 (46)	L M N O P Q	115.7
Mountaineer 2	5	7.9 (39)	7.3 (50)	7.6 (47)	M N O P Q	115.2
Prosementi	ND	8.1 (28)	7.2 (53)	7.6 (48)	M N O P Q	115.2
Everlast II	4	7.7 (51)	7.5 (43)	7.6 (51)	O P Q	114.8
FSG 408DP	4	7.6 (53)	7.3 (52)	7.4 (53)	P Q R	112.5
Whitney	4	7.9 (41)	6.9 (54)	7.4 (54)	Q R	111.7
Vernal	2	6.7 (56)	6.5 (56)	6.6 (56)		100.0
Experimental Varieties						
R46Bx197	8	8.3 (8)	7.8 (17)	8.1 (9)	B C D E F G	122.1
R56BD188	ND	8.2 (22)	8.0 (12)	8.1 (11)	C D E F G	121.9
R56BD191	ND	8.3 (13)	7.8 (16)	8.1 (13)	C D E F G H	121.7
R46Bx164	6	8.1 (26)	8.0 (11)	8.1 (15)	C D E F G H	121.6
R46BD201	ND	8.2 (17)	7.8 (19)	8.0 (19)	D E F G H I J	121.1
R46Bx162	8	8.2 (16)	7.7 (28)	8.0 (21)	D E F G H I J K L	120.6
R56BD190	ND	8.2 (19)	7.8 (24)	8.0 (22)	D E F G H I J K L	120.5
R46Bx218	6	8.1 (31)	7.8 (15)	8.0 (25)	D E F G H I J K L M	120.1
R46Bx167	4	8.2 (23)	7.7 (29)	7.9 (26)	D E F G H I J K L M	120.0
R56Bx214	4	8.3 (9)	7.6 (38)	7.9 (28)	D E F G H I J K L M N	119.8
R46Bx775	ND	8.1 (27)	7.7 (30)	7.9 (29)	D E F G H I J K L M N O	119.5
R46Bx777	ND	8.1 (32)	7.8 (23)	7.9 (30)	D E F G H I J K L M N O	119.4
R46Bx165	8.5	8.0 (36)	7.8 (20)	7.9 (31)	D E F G H I J K L M N O	119.0
R46Bx778	ND	8.2 (21)	7.5 (41)	7.9 (32)	D E F G H I J K L M N O	118.7
R46Bx160	5	7.9 (40)	7.8 (22)	7.8 (33)	E F G H I J K L M N O	118.4
R46BD203	ND	8.3 (14)	7.4 (47)	7.8 (34)	E F G H I J K L M N O	118.4
R46Bx163	4	8.1 (25)	7.4 (48)	7.8 (37)	G H I J K L M N O P	117.3
R56Bx212	6	7.9 (42)	7.5 (42)	7.7 (40)	I J K L M N O P Q	116.6
TS 4028	4	7.9 (43)	7.5 (40)	7.7 (41)	I J K L M N O P Q	116.6
R56BD202	ND	7.8 (45)	7.6 (35)	7.7 (42)	I J K L M N O P Q	116.6
R46Bx217	8	8.0 (35)	7.4 (46)	7.7 (43)	J K L M N O P Q	116.4
R46Bx776	ND	7.7 (49)	7.6 (36)	7.7 (45)	K L M N O P Q	115.9
R46Bx161	6	7.5 (55)	7.7 (33)	7.6 (49)	N O P Q	115.0
R46Bx173	5	7.7 (50)	7.5 (44)	7.6 (50)	N O P Q	115.0
R46Bx211	4.1	7.9 (44)	7.3 (51)	7.6 (52)	O P Q	114.6
R66BD108	ND	7.6 (54)	6.8 (55)	7.2 (55)	R	108.4
MEAN		8.05	7.69	7.87		
CV		5.8	4.5	4.0		
LSD (0.1)		0.49	0.37	0.33		

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

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

FD = Fall Dormancy reported by seed companies.

TABLE 3. 2009 YIELDS, TULELAKE ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 05/21/04

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

	FD	Cut 1 17-Jun	Cut 2 16-Jul	Cut 3 11-Aug	Cut 4 24-Sep	YEAR TOTAL		% of VERNAL
				Dry t/a				%
Released Varieties								
Dura 512	5	2.9 (14)	2.2 (1)	1.5 (6)	1.5 (9)	8.1 (1)	A	102.7
Innovator +Z	3	3.2 (2)	2.1 (9)	1.5 (15)	1.3 (30)	8.0 (2)	A B	101.7
54Q25	4	3.1 (3)	2.1 (8)	1.5 (5)	1.3 (32)	8.0 (3)	A B	101.6
Hybriforce-420/Wet	4	3.0 (7)	2.1 (15)	1.5 (3)	1.4 (15)	8.0 (4)	A B	101.5
9429	4	3.1 (5)	2.2 (2)	1.5 (17)	1.3 (31)	8.0 (5)	A B	101.4
Blazer XL	3	3.1 (4)	2.2 (4)	1.4 (23)	1.4 (27)	8.0 (6)	A B C	101.2
Alfa Star II	4	3.0 (8)	2.1 (6)	1.5 (8)	1.4 (24)	8.0 (8)	A B C	101.1
Rebound 5.0	4	3.0 (10)	2.1 (7)	1.5 (12)	1.4 (22)	8.0 (9)	A B C	100.6
Vernal	2	3.3 (1)	2.0 (26)	1.4 (31)	1.2 (35)	7.9 (10)	A B C D	100.0
MasterPiece	4	2.9 (19)	2.1 (16)	1.4 (25)	1.5 (4)	7.9 (11)	A B C D E	99.3
Vitro	3	2.9 (15)	2.1 (5)	1.4 (30)	1.4 (17)	7.8 (12)	A B C D E F	99.2
Xtra-3	4	2.9 (13)	2.1 (13)	1.4 (19)	1.4 (23)	7.8 (13)	A B C D E F	99.1
Reward II	4	2.9 (20)	2.1 (23)	1.5 (16)	1.4 (14)	7.8 (14)	A B C D E F G	98.5
Mountaineer 2.0 (4M124)	5	3.0 (12)	1.9 (34)	1.5 (11)	1.5 (10)	7.8 (15)	A B C D E F G	98.4
DS309Hyb	4	2.8 (25)	2.0 (24)	1.5 (1)	1.4 (19)	7.8 (16)	A B C D E F G	98.3
Plumas	4	2.9 (17)	2.1 (17)	1.4 (29)	1.4 (16)	7.8 (17)	A B C D E F G	98.0
LegenDairy 5.0	3	3.0 (11)	1.9 (32)	1.5 (2)	1.3 (33)	7.7 (18)	B C D E F G	97.7
DS218	6	2.8 (24)	2.0 (31)	1.5 (4)	1.4 (13)	7.7 (19)	B C D E F G H	97.4
SW435(SW4A135)	4	2.8 (26)	2.1 (14)	1.4 (18)	1.4 (18)	7.7 (20)	B C D E F G H	97.2
C 316 Lot9078	4	2.8 (23)	2.0 (25)	1.5 (13)	1.4 (26)	7.7 (21)	B C D E F G H	97.1
WL325HQ	4	2.9 (16)	2.1 (10)	1.4 (24)	1.3 (34)	7.7 (22)	B C D E F G H	97.1
WL357HQ	5	2.9 (18)	2.0 (28)	1.4 (20)	1.4 (28)	7.7 (23)	B C D E F G H	97.0
Expedition	5	2.8 (22)	2.1 (22)	1.3 (33)	1.5 (11)	7.7 (24)	B C D E F G H	96.9
LM 459 WD	5	2.7 (28)	2.0 (27)	1.5 (14)	1.5 (7)	7.7 (25)	B C D E F G H	96.9
CW5440	4	2.8 (21)	2.1 (21)	1.4 (21)	1.4 (29)	7.7 (26)	B C D E F G H	96.8
Recover	5	2.7 (29)	2.0 (29)	1.4 (22)	1.5 (1)	7.7 (27)	B C D E F G H	96.8
WL319HQ	3	3.0 (9)	2.1 (11)	1.3 (32)	1.2 (36)	7.6 (28)	C D E F G H	96.4
Boulder (4M125)	5	2.6 (32)	2.1 (20)	1.4 (26)	1.5 (8)	7.5 (30)	E F G H	94.6
Magna601	6	2.4 (34)	2.1 (12)	1.5 (7)	1.4 (25)	7.3 (34)	H I	92.7
Experimental Varieties								
CW94023	4	3.1 (6)	2.2 (3)	1.4 (28)	1.4 (20)	8.0 (7)	A B C	101.1
SW5307	5	2.6 (30)	2.1 (19)	1.4 (27)	1.5 (5)	7.6 (29)	D E F G H	95.7
SW5329	5	2.7 (27)	2.1 (18)	1.3 (35)	1.4 (21)	7.5 (31)	E F G H	94.4
CW05009	5	2.6 (31)	1.9 (33)	1.5 (9)	1.5 (12)	7.5 (32)	F G H	94.4
SW4328	4	2.5 (33)	2.0 (30)	1.5 (10)	1.5 (6)	7.4 (33)	G H	94.0
SW4310	4	2.3 (35)	1.8 (35)	1.3 (34)	1.5 (3)	7.0 (35)	I J	88.3
SW6330	6	2.1 (36)	1.8 (36)	1.3 (36)	1.5 (2)	6.7 (36)	J	84.5
MEAN		2.83	2.05	1.43	1.40	7.72		
CV		6.8	7.7	7.5	8.9	4.7		
LSD (0.1)		0.21	0.17	0.11	0.13	0.39		

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

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

FD = Fall Dormancy reported by seed companies.

Table 4. 2004-2009 YIELDS. UC TULELAKE ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 5/21/04

	FD	2004 Yield		2005 Yield		2006 Yield		2007 Yield		2008 Yield		2009 Yield		Average			% of Vernal
								Dry t/a									%
Released Varieties																	
Alfa Star II	4	5.2	(18)	8.9	(8)	9.2	(4)	7.7	(9)	7.8	(1)	8.0	(8)	7.8	(1)	A	108.6
Rebound 5.0	4	5.2	(16)	8.9	(7)	9.3	(2)	7.5	(17)	7.7	(5)	8.0	(9)	7.8	(2)	A B	108.3
Xtra-3	4	5.1	(23)	9.2	(1)	9.4	(1)	7.4	(22)	7.8	(2)	7.8	(13)	7.8	(3)	A B	108.2
DS309Hyb	4	5.2	(10)	8.8	(16)	9.1	(9)	7.9	(3)	7.8	(3)	7.8	(16)	7.8	(4)	A B	107.9
WL357HQ	5	4.9	(30)	8.9	(6)	9.2	(3)	8.0	(1)	7.6	(10)	7.7	(23)	7.7	(5)	A B C	107.5
Dura 512	5	5.0	(29)	8.6	(19)	8.9	(19)	7.9	(4)	7.7	(4)	8.1	(1)	7.7	(7)	A B C D	107.1
MasterPiece	4	5.2	(12)	8.8	(15)	9.1	(8)	7.6	(13)	7.6	(8)	7.9	(11)	7.7	(8)	A B C D	107.0
Expedition	5	5.3	(6)	9.1	(2)	9.1	(10)	7.8	(5)	7.1	(31)	7.7	(24)	7.7	(9)	A B C D E	106.7
Recover	5	5.2	(9)	8.8	(12)	8.9	(20)	7.7	(8)	7.6	(7)	7.7	(27)	7.7	(10)	A B C D E F	106.4
WL325HQ	4	5.3	(7)	9.0	(5)	9.2	(5)	7.3	(26)	7.5	(12)	7.7	(22)	7.7	(11)	A B C D E F	106.4
Vitro	3	5.2	(13)	8.7	(17)	9.1	(7)	7.5	(15)	7.4	(17)	7.8	(12)	7.6	(12)	A B C D E F G	106.2
Mountaineer 2.0 (4M12	5	5.4	(1)	8.8	(13)	8.9	(17)	7.4	(23)	7.5	(13)	7.8	(15)	7.6	(13)	A B C D E F G	106.2
LegenDairy 5.0	3	4.9	(32)	8.9	(11)	9.0	(12)	7.7	(7)	7.5	(11)	7.7	(18)	7.6	(14)	A B C D E F G H	106.0
WL319HQ	3	5.1	(25)	8.9	(9)	9.0	(11)	7.8	(6)	7.2	(26)	7.6	(28)	7.6	(15)	A B C D E F G H	105.7
54Q25	4	5.1	(21)	8.5	(21)	9.0	(15)	7.5	(21)	7.4	(14)	8.0	(3)	7.6	(16)	A B C D E F G H	105.7
C 316 Lot9078	4	4.9	(31)	9.0	(4)	9.1	(6)	7.5	(18)	7.2	(23)	7.7	(21)	7.6	(17)	A B C D E F G H I	105.5
Hybriforce-420/Wet	4	5.2	(15)	8.6	(18)	8.8	(22)	7.5	(19)	7.3	(20)	8.0	(4)	7.6	(18)	A B C D E F G H I	105.5
Blazer XL	3	5.0	(28)	8.3	(28)	8.7	(26)	8.0	(2)	7.4	(15)	8.0	(6)	7.6	(19)	A B C D E F G H I	105.4
Boulder (4M125)	5	5.0	(27)	8.9	(10)	8.9	(18)	7.6	(10)	7.4	(16)	7.5	(30)	7.6	(20)	B C D E F G H I J	105.1
9429	4	4.8	(34)	8.3	(30)	8.9	(16)	7.5	(20)	7.6	(9)	8.0	(5)	7.5	(21)	C D E F G H I J K	104.4
SW435(SW4A135)	4	5.2	(17)	8.6	(20)	8.5	(32)	7.3	(27)	7.4	(18)	7.7	(20)	7.5	(23)	E F G H I J K	103.7
LM 459 WD	5	5.1	(20)	8.4	(24)	8.7	(27)	7.6	(11)	7.1	(28)	7.7	(25)	7.4	(24)	F G H I J K	103.5
CW5440	4	5.1	(24)	8.4	(25)	8.7	(24)	7.5	(16)	7.2	(24)	7.7	(26)	7.4	(25)	F G H I J K	103.4
Reward II	4	5.0	(26)	8.3	(27)	8.8	(21)	7.3	(29)	7.2	(25)	7.8	(14)	7.4	(26)	G H I J K L	103.1
DS218	6	5.2	(14)	8.5	(22)	8.7	(25)	7.4	(25)	6.9	(34)	7.7	(19)	7.4	(27)	H I J K L M	102.9
Plumas	4	4.8	(33)	8.1	(33)	8.6	(30)	7.6	(12)	7.3	(21)	7.8	(17)	7.4	(28)	I J K L M	102.4
Magna601	6	5.3	(5)	8.4	(26)	8.6	(29)	6.9	(35)	7.3	(22)	7.3	(34)	7.3	(32)	K L M	101.7
Innovator +Z	3	4.8	(35)	8.3	(29)	8.4	(35)	7.3	(28)	7.0	(32)	8.0	(2)	7.3	(33)	K L M	101.6
Vernal	2	4.7	(36)	8.0	(35)	8.4	(33)	7.3	(31)	6.9	(35)	7.9	(10)	7.2	(34)	L M	100.0
Experimental Varieties																	
CW94023	4	5.2	(19)	9.0	(3)	9.0	(13)	7.6	(14)	7.6	(6)	8.0	(7)	7.7	(6)	A B C	107.4
CW05009	5	5.1	(22)	8.8	(14)	9.0	(14)	7.4	(24)	7.1	(27)	7.5	(32)	7.5	(22)	D E F G H I J K	104.0
SW5307	5	5.4	(2)	8.2	(31)	8.8	(23)	7.0	(34)	7.1	(29)	7.6	(29)	7.3	(29)	J K L M	102.0
SW5329	5	5.2	(11)	8.4	(23)	8.5	(31)	7.3	(30)	7.0	(33)	7.5	(31)	7.3	(30)	J K L M	101.9
SW4328	4	5.2	(8)	8.0	(34)	8.7	(28)	7.1	(32)	7.4	(19)	7.4	(33)	7.3	(31)	J K L M	101.8
SW4310	4	5.4	(3)	8.1	(32)	8.4	(34)	7.1	(33)	7.1	(30)	7.0	(35)	7.2	(35)	M	99.8
SW6330	6	5.3	(4)	7.8	(36)	8.0	(36)	6.7	(36)	6.6	(36)	6.7	(36)	6.8	(36)		95.3
MEAN		5.12		8.59		8.85		7.47		7.35		7.72		7.52			
CV		5.4		4.9		4.6		5.8		6.3		4.7		2.9			
LSD (0.1)		0.29		0.45		0.44		0.46		0.49		0.39		0.23			

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

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

FD = Fall Dormancy reported by seed companies.

Table 5. 2009 YIELDS, UC SCOTT VALLEY ALFALFA CUTIVAR TRIAL. TRIAL PLANTED 5/04/2006

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

	FD	Cut 1 24-Jun		Cut 2 5-Aug		Cut 3 23-Sep		YEAR TOTAL			% of VERNAL
		Dry t/a									%
Integra 8400	4	3.6	(3)	2.5	(1)	2.8	(1)	8.9	(1)	A	135.7
GrandStand	4	3.9	(1)	2.3	(4)	2.6	(4)	8.8	(2)	A B	134.4
PGI 459	4	3.5	(5)	2.4	(2)	2.6	(2)	8.5	(3)	A B C	129.6
Xtra-3	4	3.7	(2)	2.2	(8)	2.5	(8)	8.4	(4)	A B C D	127.6
Rebound 5.0	4	3.5	(9)	2.3	(3)	2.6	(3)	8.4	(5)	A B C D E	127.3
Boulder	5	3.5	(8)	2.3	(5)	2.5	(5)	8.2	(6)	B C D E F	125.3
FSG 505	5	3.4	(10)	2.2	(7)	2.5	(7)	8.1	(7)	C D E F G	123.3
WL 357HQ	5	3.3	(15)	2.2	(9)	2.5	(9)	7.9	(8)	C D E F G H	120.4
DS417	4	3.5	(6)	2.1	(18)	2.3	(18)	7.9	(9)	C D E F G H I	120.3
Masterpiece	4	3.5	(4)	2.1	(20)	2.3	(20)	7.9	(10)	C D E F G H I	119.9
AmeriStand 407TQ	4	3.1	(25)	2.3	(6)	2.5	(6)	7.9	(11)	C D E F G H I	119.5
RRALF 4R200	4	3.3	(14)	2.2	(12)	2.4	(12)	7.8	(12)	C D E F G H I	119.4
MasterPiece	4	3.4	(11)	2.1	(16)	2.4	(16)	7.8	(13)	D E F G H I	119.0
WL 343HQ	4	3.3	(12)	2.1	(14)	2.4	(14)	7.8	(14)	D E F G H I J	118.9
DKA50-18	5	3.2	(18)	2.2	(11)	2.4	(11)	7.8	(15)	D E F G H I J	118.3
Expedition	5	3.1	(24)	2.2	(10)	2.4	(10)	7.7	(16)	D E F G H I J	117.7
Dura 512	5	3.2	(20)	2.1	(13)	2.4	(13)	7.7	(17)	D E F G H I J	117.4
WL 319HQ	3	3.5	(7)	2.0	(24)	2.2	(24)	7.7	(18)	E F G H I J K	116.9
Whitney	4	3.3	(13)	2.0	(21)	2.3	(21)	7.6	(19)	F G H I J K L	115.5
DKA41-18RR	4	3.2	(21)	2.1	(19)	2.3	(19)	7.6	(20)	F G H I J K L	114.9
Mountaineer 2.0	5	3.2	(16)	2.0	(22)	2.3	(22)	7.5	(21)	G H I J K L	114.5
Power 4.2 (PI + Alleg)	4	3.2	(17)	2.0	(23)	2.3	(23)	7.5	(22)	G H I J K L	113.8
Power 4.2 (Coated)	4	3.0	(30)	2.1	(15)	2.4	(15)	7.5	(23)	G H I J K L	113.4
WL 355RR	4	3.0	(29)	2.1	(17)	2.3	(17)	7.4	(24)	G H I J K L	113.2
PGI 424	4	3.2	(19)	2.0	(27)	2.2	(27)	7.3	(25)	H I J K L	111.5
WL 325HQ	4	3.2	(22)	2.0	(26)	2.2	(26)	7.3	(26)	H I J K L	111.4
HybriForce620	6	3.1	(23)	1.9	(28)	2.2	(28)	7.2	(27)	I J K L M	110.0
CW 500	5	3.0	(31)	2.0	(25)	2.2	(25)	7.1	(28)	J K L M	108.6
Mariner III	4	3.1	(28)	1.9	(29)	2.1	(29)	7.0	(29)	K L M	106.8
HybriForce420/wet	4	3.1	(26)	1.8	(30)	2.0	(30)	7.0	(30)	L M	105.9
Vernal	2	3.1	(27)	1.7	(31)	1.8	(31)	6.6	(31)	M N	100.0
FSG 408DP	4	2.8	(32)	1.6	(32)	1.8	(32)	6.2	(32)	N	94.4
MEAN		3.27		2.09		2.33		7.69			
CV		7.3		9.8		9.8		7.4			
LSD (0.1)		0.29		0.25		0.27		0.69			

Trial seeded at 25 lb/acre viable seed at Scott Valley, 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.

Note: Cut 1 was analyzed using a missing values technique, due to several missing plots.

TABLE 6. 2006-2009 YIELDS, UC SCOTT VALLEY ALFALFA CULTIVAR TRIAL. TRIAL PLANTED 5/04/06

	FD	2006 Yield	2007 Yield	2008 Yield	2009 Yield	Average		% of Vernal
				Dry t/a				%
Integra 8400	4	4.6 (21)	9.1 (1)	8.8 (1)	8.9 (1)	7.8 (1)	A	127.0
Xtra-3	4	5.5 (1)	8.7 (2)	8.0 (13)	8.4 (4)	7.7 (2)	A B	124.1
PGI 459	4	4.7 (15)	8.4 (6)	8.7 (2)	8.5 (3)	7.6 (3)	A B C	123.1
Rebound 5.0	4	4.8 (12)	8.4 (7)	8.7 (4)	8.4 (5)	7.6 (4)	A B C D	122.4
GrandStand	4	4.2 (30)	8.4 (9)	8.6 (5)	8.8 (2)	7.5 (5)	A B C D E	121.6
Dura 512	5	4.9 (6)	8.4 (11)	8.7 (3)	7.7 (17)	7.4 (6)	B C D E F	120.3
FSG 505	5	4.6 (19)	8.6 (3)	8.3 (7)	8.1 (7)	7.4 (7)	B C D E F G	120.1
DS417	4	5.3 (2)	8.4 (8)	8.0 (17)	7.9 (9)	7.4 (8)	B C D E F G	120.0
MasterPiece	4	4.8 (11)	8.6 (4)	8.0 (14)	7.8 (13)	7.3 (9)	C D E F G H	118.5
Masterpiece	4	4.7 (17)	8.3 (14)	8.3 (6)	7.9 (10)	7.3 (10)	C D E F G H	118.2
Boulder	5	4.6 (22)	8.4 (13)	7.9 (20)	8.2 (6)	7.3 (11)	C D E F G H I	117.8
WL 357HQ	5	4.9 (5)	8.2 (21)	7.8 (24)	7.9 (8)	7.2 (12)	D E F G H I J	117.0
AmeriStand 407TQ	4	4.4 (27)	8.3 (17)	8.2 (8)	7.9 (11)	7.2 (13)	E F G H I J K	116.3
Mountaineer 2.0	5	4.8 (10)	8.4 (12)	8.0 (16)	7.5 (21)	7.2 (14)	E F G H I J K	116.3
Power 4.2 (PI + Alleg)	4	4.6 (23)	8.6 (5)	8.0 (19)	7.5 (22)	7.2 (15)	F G H I J K L	115.9
DKA50-18	5	4.5 (25)	8.3 (16)	8.0 (15)	7.8 (15)	7.1 (16)	F G H I J K L	115.5
WL 319HQ	3	4.5 (26)	8.1 (25)	8.2 (9)	7.7 (18)	7.1 (17)	F G H I J K L	115.1
Whitney	4	4.6 (18)	8.3 (18)	7.9 (21)	7.6 (19)	7.1 (18)	F G H I J K L M	115.0
Power 4.2 (Coated)	4	4.7 (16)	8.3 (15)	7.8 (23)	7.5 (23)	7.1 (19)	G H I J K L M	114.7
WL 325HQ	4	4.6 (20)	8.3 (19)	8.1 (11)	7.3 (26)	7.1 (20)	G H I J K L M	114.7
Expedition	5	4.5 (24)	8.1 (26)	8.0 (18)	7.7 (16)	7.1 (21)	H I J K L M	114.4
CW 500	5	4.8 (8)	8.2 (23)	8.1 (12)	7.1 (28)	7.1 (22)	H I J K L M	114.2
PGI 424	4	4.9 (7)	8.4 (10)	7.5 (28)	7.3 (25)	7.0 (23)	H I J K L M N	113.8
HybriForce620	6	5.1 (4)	8.2 (22)	7.5 (26)	7.2 (27)	7.0 (24)	H I J K L M N	113.7
RRALF 4R200	4	4.0 (32)	7.8 (28)	8.1 (10)	7.8 (12)	7.0 (25)	I J K L M N	112.5
WL 343HQ	4	4.1 (31)	7.9 (27)	7.8 (22)	7.8 (14)	6.9 (26)	J K L M N	112.1
WL 355RR	4	4.8 (13)	7.8 (29)	7.5 (27)	7.4 (24)	6.9 (27)	K L M N	111.4
Mariner III	4	4.8 (9)	8.2 (20)	7.2 (29)	7.0 (29)	6.8 (28)	L M N	110.4
DKA41-18RR	4	4.3 (29)	7.5 (31)	7.7 (25)	7.6 (20)	6.8 (29)	M N	109.6
HybriForce420/wet	4	5.2 (3)	8.1 (24)	6.5 (31)	7.0 (30)	6.7 (30)	N O	108.4
FSG 408DP	4	4.7 (14)	7.8 (30)	6.8 (30)	6.2 (32)	6.4 (31)	O P	103.3
Vernal	2	4.4 (28)	7.5 (32)	6.2 (32)	6.6 (31)	6.2 (32)	P	100.0
MEAN		4.69	8.26	7.91	7.69	7.14		
CV		8.5	4.0	6.1	7.4	4.0		
LSD (0.1)		0.48	0.40	0.58	0.69	0.34		

Trial seeded at 25 lb/acre viable seed at Scott Valley, 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.

3400 New Alfalfa Variety Trial **Planted: July 24, 2007**

B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
B B	8 20	16 21	45 60	55 61	6 100	4 101	41 140	37 141	3 180	30 181	32 220	36 221	46 260	15 261	B B	
B B	24 19	13 22	47 59	35 62	42 99	7 102	29 139	25 142	27 179	1 182	23 219	11 222	18 259	28 262	B B	I
B B	39 18	17 23	12 58	43 63	52 98	22 103	49 138	48 143	26 178	21 183	38 218	20 223	51 258	44 263	B B	
B B	40 17	50 24	53 57	54 64	34 97	9 104	19 137	14 144	2 177	10 184	5 217	31 224	33 257	56 264	B B	
B B	20 16	28 25	5 56	52 65	25 96	51 105	2 136	41 145	22 176	16 185	53 216	13 225	35 256	9 265	B B	
B B	34 15	55 26	39 55	56 66	10 95	4 106	37 135	42 146	12 175	24 186	36 215	27 226	7 255	32 266	B B	II
B B	26 14	14 27	17 54	48 67	31 94	46 107	30 134	3 147	38 174	40 187	49 214	6 227	54 254	47 267	B B	
B B	15 13	21 28	29 53	8 68	45 93	33 108	43 133	50 148	44 173	19 188	18 213	23 228	11 253	1 268	B B	
B B	35 12	10 29	34 52	25 69	11 92	39 109	3 132	12 149	41 172	26 189	31 212	21 229	44 252	20 269	B B	
B B	49 11	18 30	54 51	38 70	40 91	32 110	36 131	14 150	15 171	9 190	46 211	50 230	51 251	48 270	B B	III
B B	16 10	22 31	23 50	6 71	2 90	28 111	17 130	19 151	47 170	13 191	33 210	5 231	45 250	37 271	B B	
B B	52 9	43 32	29 49	8 72	30 89	27 112	55 129	7 152	24 169	53 192	4 209	56 232	42 249	1 272	B B	
B B	14 8	21 33	55 48	45 73	19 88	3 113	25 128	20 153	11 168	17 193	29 208	46 233	51 248	44 273	B B	
B B	6 7	7 34	12 47	37 74	34 87	28 114	32 127	31 154	2 167	36 194	15 207	16 234	8 247	49 274	B B	IV
B B	26 6	50 35	24 46	54 75	42 86	5 115	22 126	39 155	33 166	43 195	4 206	13 235	48 246	27 275	B B	
B B	1 5	30 36	9 45	18 76	53 85	35 116	52 125	10 156	38 165	23 196	47 205	40 236	41 245	56 276	B B	
B B	35 4	3 37	42 44	34 77	14 84	9 117	37 124	20 157	47 164	8 197	2 204	25 237	43 244	48 277	B B	
B B	13 3	45 38	33 43	6 78	54 83	23 118	40 123	11 158	4 163	15 198	44 203	28 238	19 243	52 278	B B	V
B B	18 2	10 39	27 42	51 79	49 82	39 119	30 122	22 159	17 162	29 199	46 202	26 239	1 242	41 279	B B	
B B	5 1	38 40	7 41	53 80	12 81	31 120	36 121	21 160	24 161	50 200	55 201	56 240	32 241	16 280	B B	<-20'->
B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	

<-----400'----->

<-----48'----->

<3'>

No.	Name (Conv. Varieties)	No.	Name (Roundup re
1	Vernal	32	R46Bx160
2	Magnum VI	33	R46Bx161
3	54V09	34	R46Bx162
4	FSG 505	35	R46Bx163
5	FSG 528SF	36	R46Bx164
6	FSG 408DP	37	R46Bx165
7	AmeriStand444NT	38	R46Bx167
8	Archer III	39	R46Bx173
9	AmeriStand407TQ	40	R46Bx197
10	DKA50-18	41	R46Bx211
11	Integra 8400	42	R46Bx217
12	Integra 8300	43	R46Bx218
13	GrandStand	44	R56Bx212
14	MasterPiece	45	R56Bx214
15	MilkMaker ML	46	R46Bx775
16	Genoa	47	R46Bx776
17	WL 357HQ	48	R46Bx777
18	WL 343HQ	49	R46Bx778
19	Everlast II	50	R46BD201
20	TS 4028	51	R56BD202
21	CW 500	52	R46BD203
22	PGI 424	53	R56BD188
23	PGI 459	54	R56BD190
24	Whitney	55	R56BD191
25	Prosementi	56	R66BD108
26	Xtra-3		
27	Rebound 5		
28	WL 325 HQ		
29	Mountaineer 2		
30	Legendairy		
31	Dura 512		

North

3400- Old Planting **Alfalfa Variety Evaluation/2010**

Planted May 2004

N

Border

V	***M***	***9*** 20	***22*** 21	***15*** 60	***32*** 61	***6*** 100	***25*** 101	***18*** 140	***2*** 141	***24*** 180	***D***
	M	***34*** 19	***4*** 22	***31*** 59	***12*** 62	***26*** 99	***8*** 102	***21*** 139	***13*** 142	***30*** 179	***D***
	M	***27*** 18	***11*** 23	***19*** 58	***1*** 63	***17*** 98	***14*** 103	***5*** 138	***29*** 143	***36*** 178	***D***
	M	***16*** 17	***3*** 24	***35*** 57	***28*** 64	***7*** 97	***23*** 104	***10*** 137	***33*** 144	***20*** 177	***D***
IV	***M***	***5*** 16	***21*** 25	***15*** 56	***4*** 65	***28*** 96	***20*** 105	***16*** 136	***24*** 145	***12*** 176	***D***
	M	***27*** 15	***8*** 26	***18*** 55	***11*** 66	***34*** 95	***9*** 106	***32*** 135	***1*** 146	***33*** 175	***D***
	M	***7*** 14	***2*** 27	***36*** 54	***14*** 67	***23*** 94	***35*** 107	***13*** 134	***29*** 147	***19*** 174	***D***
	M	***26*** 13	***17*** 28	***22*** 53	***10*** 68	***3*** 93	***31*** 108	***25*** 133	***6*** 148	***30*** 173	***D***
III	***M***	***19*** 12	***17*** 29	***10*** 52	***29*** 69	***14*** 92	***22*** 109	***27*** 132	***8*** 149	***31*** 172	***D***
	M	***1*** 11	***26*** 30	***6*** 51	***24*** 70	***11*** 91	***32*** 110	***2*** 131	***18*** 150	***36*** 171	***D***
	M	***12*** 10	***7*** 31	***21*** 50	***15*** 71	***3*** 90	***28*** 111	***13*** 130	***5*** 151	***23*** 170	***D***
	M	***25*** 9	***30*** 32	***4*** 49	***34*** 72	***20*** 89	***9*** 112	***33*** 129	***16*** 152	***35*** 169	***D***
II	***M***	***18*** 8	***13*** 33	***4*** 48	***28*** 73	***22*** 88	***9*** 113	***20*** 128	***26*** 153	***7*** 168	***D***
	M	***35*** 7	***5*** 34	***32*** 47	***14*** 74	***6*** 87	***11*** 114	***33*** 127	***1*** 154	***36*** 167	***D***
	M	***30*** 6	***23*** 35	***2*** 46	***24*** 75	***19*** 86	***16*** 115	***21*** 126	***12*** 155	***27*** 166	***D***
	M	***25*** 5	***10*** 36	***34*** 45	***17*** 76	***8*** 85	***29*** 116	***3*** 125	***15*** 156	***31*** 165	***D***
I	***M***	***2*** 4	***12*** 37	***21*** 44	***3*** 77	***14*** 84	***26*** 117	***4*** 124	***24*** 157	***19*** 164	***D***
	M	***33*** 3	***15*** 38	***28*** 43	***1*** 78	***22*** 83	***17*** 118	***7*** 123	***35*** 158	***8*** 163	***D***
	M	***27*** 2	***9*** 39	***11*** 42	***34*** 79	***5*** 82	***36*** 119	***32*** 122	***13*** 159	***31*** 162	***D***
	M	***23*** 1	***6*** 40	***29*** 41	***10*** 80	***30*** 81	***16*** 120	***25*** 121	***18*** 160	***20*** 161	***D***

Border

No	NAME
1	Hybriforce-420/Wet
2	Magna601
3	DS218
4	DS309Hyb
5	SW435(SW4A135)
6	SW4328
7	SW4310
8	SW5307
9	SW5329
10	SW6330
11	WL319HQ
12	WL357HQ
13	Dura 512
14	54Q25
15	Alfa Star II
16	Plumas
17	Vitro
18	9429
19	Blazer XL
20	Recover
21	Boulder (4M125)
22	Rebound 5.0
23	Mountaineer 2.0 (4M124)
24	MasterPiece
25	Xtra-3
26	LegenDairy 5.0
27	Expedition
28	CW5440
29	CW94023
30	CW05009
31	LM 459 WD
32	C 316 Lot9078
33	Innovator +Z
34	Reward II
35	Reno
36	Vernal

Effect of Postemergence Herbicides and Application Time on Small Grain Injury and Yield

Steve Orloff, UCCE Siskiyou County, Rob Wilson, IREC Director and Farm Advisor, and Steve Wright, Farm Advisor Tulare County

Wheat and barley are important crops in Siskiyou County and the intermountain area as a whole. While cereals are grown throughout the region, most of the production for grain occurs in the Klamath Basin. Control of both broadleaf and grassy weeds is a significant problem for small grain producers and nearly all fields are treated for weeds each year.

Several new small grain herbicides have been developed, some of which are commonly used in other areas. Some of these herbicides may have a fit in the intermountain area but have not been used commercially because producers and pest control advisors do not have experience with them or they are concerned about the possibility of crop injury. A broadleaf weed control trial has not been conducted in cereal crops in the Klamath Basin for decades. Research is needed to evaluate many of the newer herbicides that are used successfully in other production areas.

Most grain fields contain both broadleaf and grassy weeds. This usually necessitates the use of two different herbicides. Ordinarily the application timing for grass and broadleaf herbicides is different. This presents a problem for producers, who for cost reasons, would like to control all weeds in a single herbicide application. Usually the grass herbicide application timing is earlier because small grasses are easier to control. The broadleaf herbicide is often applied later due to crop safety concerns. So, if a grower wishes to combine grass and broadleaf herbicides and treat early, they run the risk of injuring the crop. Conversely, if the grower chooses to combine herbicides and treat at the later application timing, the grower runs the risk of poor weed control (the grass weeds may have become too large to be effectively controlled) or reducing crop yield from prolonged weed competition.

More information is needed regarding crop safety of different herbicides. This is especially the case when herbicide tank mixes are used. Therefore, research is needed to evaluate herbicides and herbicide tank mixes to determine their crop safety and effect on yield when applied at different growth stages.

The objectives of this research are as follow:

1. Determine the crop injury and effect on yield from commonly used and new herbicides.
2. Assess whether two wheat varieties and a barley variety differ in terms of susceptibility to injury from different herbicides.

A trial was planted at IREC on April 15, 2010. The experimental design is a three-way factorial with a split plot arrangement. The main plot is the herbicide treatment which will be sprayed across a block of small grain varieties. There are 14 different herbicide treatments. The herbicides evaluated are shown in the table below. The two treatment timings evaluated were the 3 leaf stage (treated on May 20) and the tillering stage before canopy closure (treated on June 7). The small grain varieties are the sub subplot. There are two wheat varieties Yecora Rojo (a spring red wheat variety) and Alpowa (a spring white wheat variety) and the spring barley variety Metcalfe. Visual evaluations of crop injury were made 7, 14 and 23 days after each treatment. Plant height was also measured. All plots will be harvested for yield to determine if the crop injury carries through to yield.

Table 1. The effect of herbicide treatment on small grain injury one week after treatment (averaged over two timings and three varieties)

No.	Treatment	Rate/A	Injury (%)
1	2,4-D	1.0 pt	12.5
2	2,4-D + Clarity	1.00 + 4 oz	12.5
3	Osprey	4.67 oz	15.8
4	Atlantis	7 oz	14.8
5	Axial	16.4 oz	15.6
6	ET	1 oz	24.2
7	Shark	1 oz	26.7
8	2,4-D + Shark	1.25 pt + 1 oz	25.6
9	Pyroxsulam	6.75 oz	15.2
10	Puma	10.6 oz	19.8
11	Shark + Puma	1 oz + 10.6	27.7
12	Shark + Axial	1 oz + 16.4 oz	25.2
13	MCPA + Axial	1 pt. plus 16.4 oz.	19.6
14	Untreated		9.6

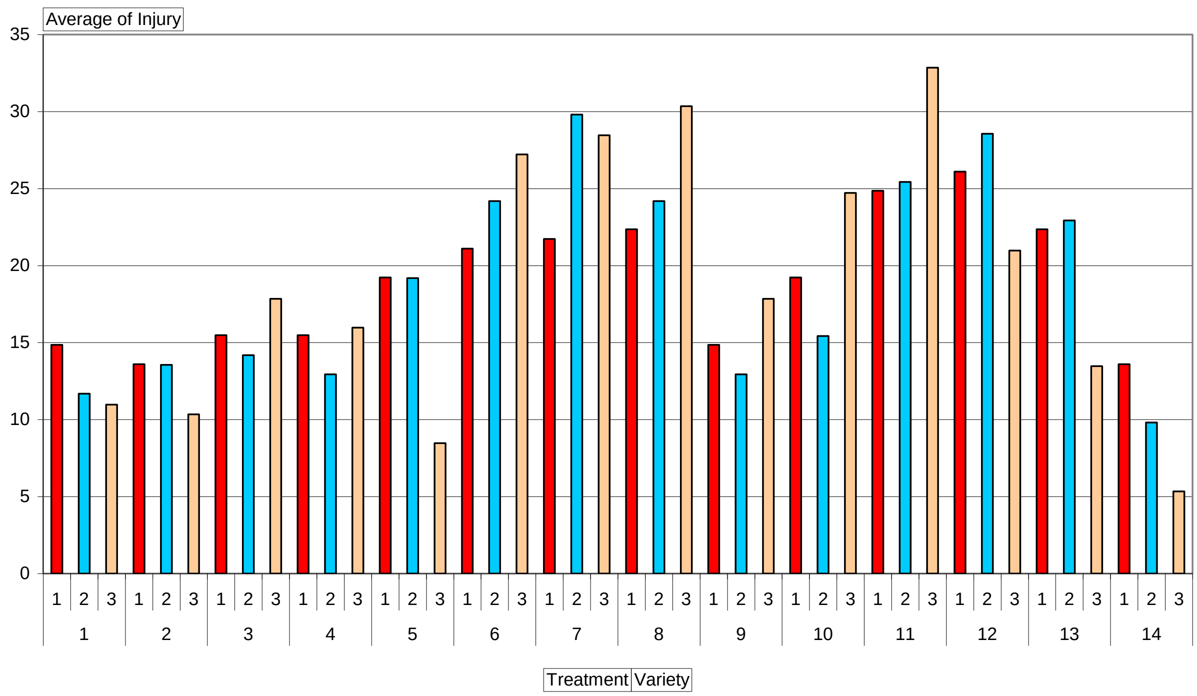
Table 2. The effect of herbicide treatment on small grain injury one week after treatment (averaged over 14 herbicide treatments and 3 varieties)

No.	Variety	Injury (%)
1	Yecora Rojo	20.3
2	Alpowa	10.4
3	Metcalfe	26.1

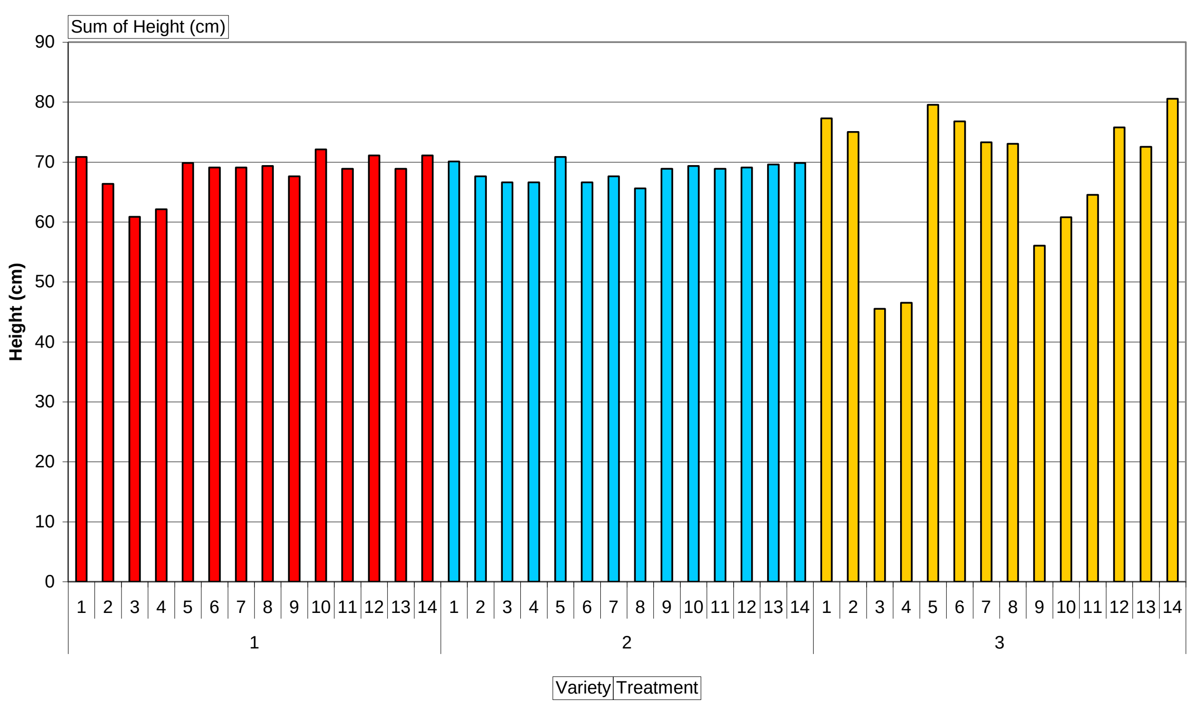
Table 3. The effect of herbicide treatment on small grain injury one week after treatment (averaged over 14 herbicide treatments and 2 timings)

Timing	Injury (%)
Early	23.9
Late	14.0

Effect of Herbicide Treatment on Injury of 3 Small Grain Varieties



Effect of Herbicide Treatment on Wheat and Barley Plant Height (23 DAT)



Orloff Project 2880 - Effect of PostEmergence Herbicides and Application Time on Small Grain Injury and Yield
Planted 4/15/10

16	**4**	3	1	2	**1**	3	2	1	**2**	1	2	3	**8**	2	3	1	**1**	2	1	3	**11**	1	2	3	**13**	3	1	2	
15	**8**	1	2	3	**4**	3	1	2	**14**	3	2	1	**2**	1	3	2	**6**	1	3	2	**3**	3	2	1	**5**	3	2	1	rep 1
14	**7**	2	3	1	**9**	3	2	1	**11**	3	1	2	**7**	3	2	1	**13**	3	2	1	**12**	1	3	2	**10**	2	1	3	
13	**3**	3	1	2	**6**	1	3	2	**12**	3	2	1	**9**	2	1	3	**5**	1	3	2	**14**	2	1	3	**10**	1	3	2	
12	**2**	2	3	1	**3**	3	2	1	**8**	1	2	3	**11**	3	1	2	**13**	2	1	3	**14**	1	3	2	**9**	1	3	2	
11	**12**	1	2	3	**7**	3	1	2	**14**	2	3	1	**13**	2	1	3	**4**	3	2	1	**7**	3	1	2	**4**	3	1	2	rep 2
10	**6**	3	2	1	**10**	2	1	3	**1**	1	3	2	**6**	1	3	2	**3**	1	3	2	**10**	2	1	3	**11**	1	2	3	
9	**5**	1	3	2	**5**	2	1	3	**9**	3	1	2	**1**	1	2	3	**12**	2	3	1	**2**	1	3	2	**8**	3	2	1	
8	**1**	2	1	3	**7**	3	2	1	**6**	3	2	1	**14**	3	2	1	**11**	1	3	2	**14**	2	3	1	**9**	2	1	3	
7	**13**	1	2	3	**4**	1	3	2	**6**	1	2	3	**11**	1	3	2	**7**	1	2	3	**3**	2	1	3	**1**	3	2	1	rep 3
6	**8**	3	2	1	**12**	2	1	3	**9**	2	1	3	**13**	2	3	1	**2**	3	2	1	**10**	3	1	2	**2**	1	2	3	
5	**5**	1	3	2	**3**	1	3	2	**12**	3	1	2	**5**	2	1	3	**4**	1	2	3	**10**	2	3	1	**8**	3	1	2	
4	**3**	3	2	1	**7**	3	2	1	**10**	3	2	1	**11**	3	2	1	**12**	3	2	1	**14**	1	2	3	**2**	1	2	3	
3	**11**	3	1	2	**1**	1	2	3	**12**	2	1	3	**9**	1	2	3	**8**	1	3	2	**8**	3	2	1	**13**	3	2	1	rep 4
2	**2**	3	1	2	**5**	2	3	1	**10**	1	2	3	**6**	2	3	1	**9**	2	1	3	**13**	1	3	2	**5**	1	3	2	
1	**14**	1	2	3	**6**	3	1	2	**3**	1	3	2	**7**	3	1	2	**1**	3	1	2	**4**	2	3	1	**4**	3	2	1	
			A				**B**				**C**				**D**				**E**				**F**				**G**		

Early 5/20/10 3 leaves

Late 6/7/10 9-12 leaves (early tillering)

Entry #	Variety
1	Yecora Rojo
2	Alpowa
3	Metcalfe

North ↓

Management Practices for Improved Thrips Control in Klamath Basin Onions

Thrips, both onion thrips (Thrips tabaci) and western flower thrips (Frankliniella occidentalis), are a serious problem in California onion fields. In fact, thrips are the most common and serious insect pest of onions. The predominant species in the Klamath Basin is not known at this time but will be assessed through this project. Thrips damage the onion plant by feeding under the folds of onion leaves and in the neck area above the bulb. Their feeding, characterized by rasping of the leaf surface and sucking the liberated juices, causes leaf scaring which can lower bulb size and reduce overall yield. Thrips also vector Iris Yellow Spot Virus (IYSV), which fortunately is not known to occur in the Klamath Basin yet. Thrips have a broad host range including grassy crops like cereals, broadleaf crops and several weed species. This broad host range makes control problematic, as thrips (both onion and western flower thrips) migrate from crop or non-crop areas to onion fields when the other crops/weeds senesce or are harvested. Thrips pressure has been severe in the Klamath Basin with the dominance of alfalfa, small grains and peppermint crops, all of which are hosts for thrips.

Thrips have always been difficult to control because they are somewhat protected due to where they feed on the plant. In addition, thrips have a history of developing resistance to insecticides when there is prolonged use of insecticides with a single mode of action. When growers identify an effective insecticide they often tend to rely on it until it loses its effectiveness, exacerbating resistance issues.

Thrips control studies have been conducted in other states but not in the Klamath Basin. Studies are needed in this area because of the unique environmental conditions that occur in terms of climate and cropping patterns. In addition, the thrips control studies conducted in other areas are done with broadcast-applied insecticides sprayed on the crop rather than chemigation applications. Due to the nature of chemigation (an extremely dilute application made over an extended time period), the results may be significantly different from the typical foliar-applied spray application. Research is needed to assess this potential difference and to identify improved chemigation techniques. In addition, most of the research to assess the efficacy of different insecticide treatments is done with a single treatment evaluated over a 20 to 30 day time period. Research is needed to determine the effectiveness of using a single insecticide repeatedly compared with rotating chemicals versus tank mixing. The longer term effect of thrips treatments from a season-long perspective is needed.

An effective thrips control program will help reduce yield and quality losses due to thrips feeding. Identification of a superior thrips control program can also potentially reduce the number of insecticide applications needed per season.

The objectives of this research are the following:

- Compare the effectiveness of a range of insecticides for thrips control including standard conventional treatments and organic or low risk insecticides,
- Evaluate some of the most popular insecticides for thrips control applied via chemigation and a foliar-applied spray application to determine the relative efficacy of the different application methods.
- Determine the effect of adding an adjuvant and the duration of the application on the efficacy of chemigation applications
- Evaluate different strategies for thrips management over the season to compare single insecticides, tank mixes, alternating chemistries and application timing.

Comparison and Chemigation and Spray Applications

The insecticides Warrior and Lannate will be applied as a spay application and chemigated with a hose-reel chemigation system. The level of thrips control with the two application methods will be compared by assessing the thrips populations 7 and 14 days after treatment.

Evaluation of Different Insecticides

Ten different insecticide treatments will be evaluated. Treatments will be sprayed on plots 2 rows wide by 20 foot long with an untreated row alongside each plot. Insecticides evaluated have a range of modes of action including pyrethroids, carbamates, spintoram, and the new insecticide Movento. Thrips population will be assessed prior to treatment and at 7, 14 and 21 days after treatment.

	Insecticide
1	Warrior
2	Lannate
3	Radiant
4	Radiant + Aza-Direct
5	Movento
6	Vydate
7	Assail
8	Agri-Mek
9	Carzol
10	Check

Effect of Adjuvant and Set Length

Some experience with chemigation suggests that the addition of an adjuvant may improve thrips control. It would seem that the adjuvant concentration would be so dilute in a chemigation application that it would be rendered ineffective. Research is needed to adequately assess the effect of an adjuvant on chemigation applications.

The length of the irrigation set has also been suspected to impact the level of thrips control. A trial will be conducted comparing two different set times; an approximately 2 hour set where the insecticide is rapidly injected and the lines are flushed for about ½ hour following application and a longer set time (approximately 6 hours) where the chemical is injected over a much longer time period and then flushed for ½ hour. Thrips control will be monitored as mentioned above 7 and 14 days after treatment.

Season-long Thrips Management Strategy

A trial will be conducted to evaluate different control strategies. Typically 2 to 4 insecticide applications are made per year in the Klamath Basin to control thrips. All insecticides will all be applied via chemigation. Three applications will be made for the season (actual number of applications may vary depending on thrips pressure). The different application strategies and timing of applications are presented in the table below.

Strategy	1st App. Insect.	2nd App. nsect.	3rd App. Insect.
Single insecticide (pyrethroid)	Warrior	Warrior	Warrior
Single insecticide (carbamate)	Lannate	Lannate	Lannate
Alternating	Warrior	Lannate	Warrior
Tank mix applications	Warrior+Lannate	Warrior+Lannate	Warrior+Lannate
Alternating Early application	Warrior	Lannate	Warrior
Sprayed on alternative chemistry Early application	Movento	Radiant	Radiant
Untreated	—	—	—

Single insecticide strategies will be compared with a tank mix strategy and with an alternating insecticide strategy. Sometimes insecticide applications to control thrips do not begin until July. Some believe this may already be too late in the season, and it is not feasible to bring thrips populations back down to acceptable levels. Therefore, an additional strategy will be evaluated where there will be the same total number of applications but they will begin at a lower initial thrips population (in June). Lastly, another strategy will be evaluated using newer alternative chemistries at an early application timing. Movento will be used for the first application because it is believed to be more effective when used early in the season when populations are lower because it is slower acting but may have longer residual activity. This application will be followed by two applications of the insecticide Radiant. Thrips population will be monitored throughout the season and onion yield will be determined for each plot at the end of the growing season.

The Influence of Herbicide Treatments on Kochia Weed Control, Onion Injury, and Onion Stand. 2010

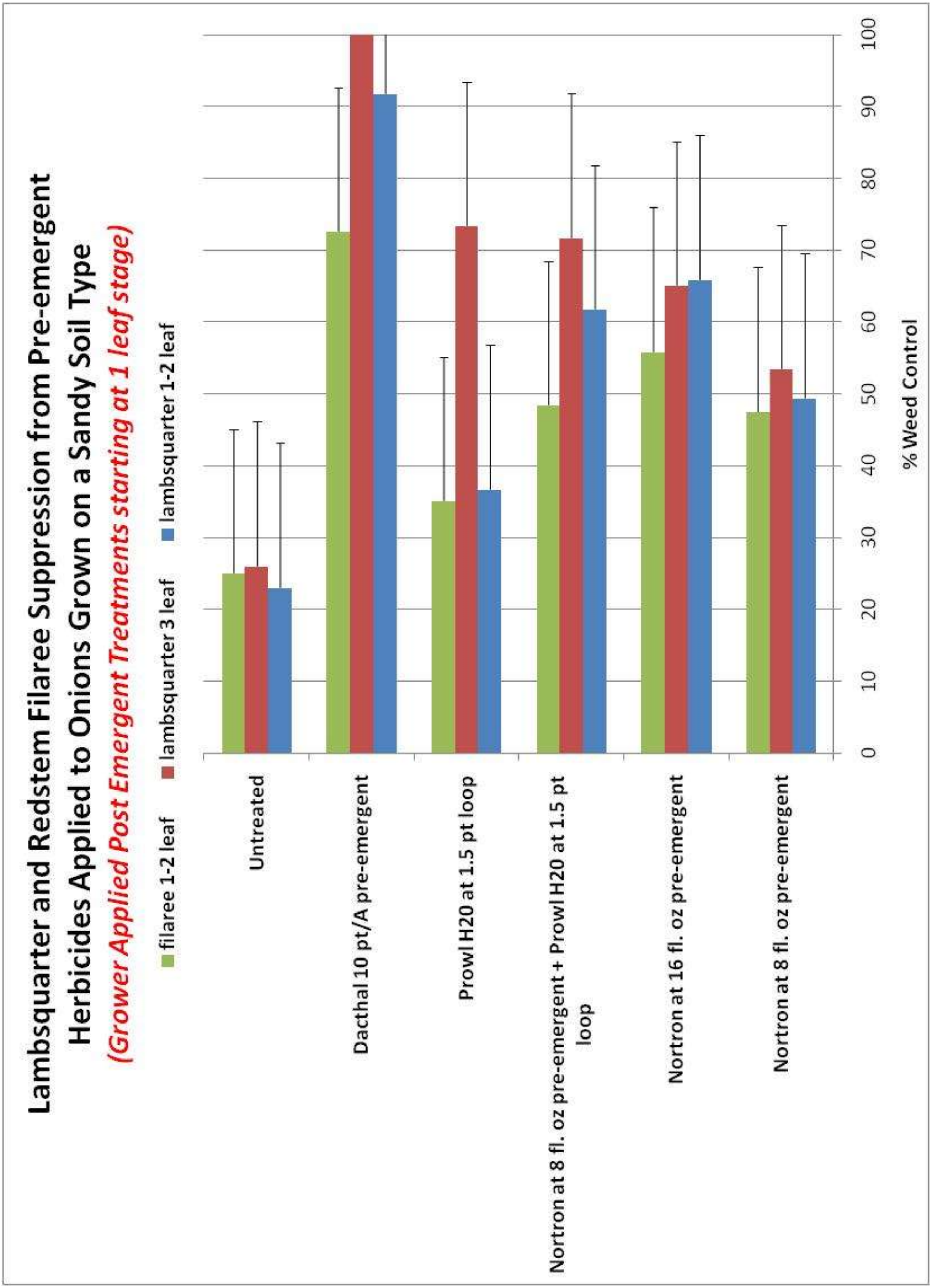
Trt #	Herbicide	Post-Plant Pre	Loop	1-leaf	2-leaf	3-4 leaf	Kochia % Control*	Kochia Density**	Onion % Injury***	Onion Stand****
1	Goal 2XL				6 fl. oz/A	6 fl. oz/A	63.75	104	2.56	171 NS
1	Goal Tender			4 fl. oz/A						
2	Goal 2XL				6 fl. oz/A	6 fl. oz/A	47.5	94	1.68	196 NS
3	Goal 2XL Broadcast				6 fl. oz/A	6 fl. oz/A	56.6	81	2.37	189 NS
3	Goal Tender Broadcast			4 fl. oz/A						
4	Nortron	16 fl. oz/A				16 fl. oz/A	78.75	59	2.56	173 NS
4	Goal 2XL				6 fl. oz/A	6 fl. oz/A				
4	Goal Tender			4 fl. oz/A						
5	Nortron	16 fl. oz/A				16 fl. oz/A	86.25	35	2.68	146 NS
5	Prowl H20		1.5 pt/A			1.5 pt/A				
5	Goal 2XL				6 fl. oz/A	6 fl. oz/A				
5	Goal Tender			4 fl. oz/A						
6	Nortron	16 fl. oz/A				16 fl. oz/A	85	56	2.68	159 NS
6	Prowl H20		1.5 pt/A			1.5 pt/A				
6	Goal 2XL				6 fl. oz/A	6 fl. oz/A				
6	Goal Tender			4 fl. oz/A						
6	Outlook				21 fl. oz/A					
7	Prowl H20		1.5 pt/A			1.5 pt/A	73.75	76	2.37	157 NS
7	Goal 2XL				6 fl. oz/A	6 fl. oz/A				
7	Goal Tender			4 fl. oz/A						
7	Outlook				21 fl. oz/A					
8	Prowl H20 broadcast		1.5 pt/A			1.5 pt/A	66.25	89	2.31	168 NS
8	Goal 2XL Broadcast				6 fl. oz/A	6 fl. oz/A				
8	Goal Tender Broadcast			4 fl. oz/A						
8	Outlook broadcast				21 fl. oz/A					
9	Dacthal	10 pt/A (pre-emergent)					81.25	24	2.18	188 NS
9	Goal 2XL				6 fl. oz/A	6 fl. oz/A				
9	Goal Tender			4 fl. oz/A						
10	Goal 2XL				6 fl. oz/A	6 fl. oz/A	80	60	2.12	189 NS
10	Goal Tender			4 fl. oz/A						
10	Buctril 2EC				16 fl. oz/A	16 fl. oz/A				
11	Goal 2XL Broadcast				6 fl. oz/A	6 fl. oz/A	77.5	66	2.62	189 NS
11	Goal Tender Broadcast			4 fl. oz/A						
11	Buctril 2EC broadcast				16 fl. oz/A	16 fl. oz/A				
12	Goal 2XL				6 fl. oz/A	6 fl. oz/A	92.5	24	2.12	183 NS
12	Goal Tender			4 fl. oz/A						
12	Starane				6 fl. oz/A	8 fl. oz/A				
13	Prowl H20		1.5 pt/A			1.5 pt/A	80	40	2.37	173 NS
13	Goal 2XL				6 fl. oz/A	6 fl. oz/A				
13	Goal Tender			4 fl. oz/A						
13	Buctril 2EC				16 fl. oz/A	16 fl. oz/A				
13	Outlook				21 fl. oz/A					
14	Non-Weeded Control						0	179	0.68	179 NS

* Kochia % control was measured when reached the 4-5 leaf stage.

** Kochia density counts were taken from the center two rows in each plot for the entire plot length at the 4-5 leaf stage.

*** Onion Injury was evaluated at the 3 leaf stage. The LSD was 0.9

**** Onion stand counts were measured at 4-5 leaf stage. There were no significant differences between treatments.


Lambsquarter and Redstem Filaree Suppression from Pre-emergent Herbicides Applied to Onions Grown on a Sandy Soil Type
(Grower Applied Post Emergent Treatments starting at 1 leaf stage)
filaree 1-2 leaf
lambsquarter 3 leaf
lambsquarter 1-2 leaf
Untreated
Dacthal 10 pt/A pre-emergent
Prowl H20 at 1.5 pt loop
Nortron at 8 fl. oz pre-emergent + Prowl H20 at 1.5 pt loop
Nortron at 16 fl. oz pre-emergent
Nortron at 8 fl. oz pre-emergent
0
10
20
30
40
50
60
70
80
90
100
% Weed Control

2010 SPRING BARLEY
TULELAKE

		REPLICATE		
NO	ENTRY	1	2	3
204	STEPTOE	78	26	49
900	BARONESSE	1	46	74
960	UC 960	82	4	47
1010	MILLENNIUM	61	45	87
1016	STATEHOOD	22	64	13
1082	CONRAD	62	44	33
1084	LEGACY	79	76	28
1099	UCD-TL20	2	16	29
1135	UCD YP03-8/2	40	15	69
1145	UCD-TLB52	43	36	32
1171	T/S//E 11-18	63	75	53
1200	TLB 68	80	77	88
1201	TLB 148	81	86	73
1202	TLB 150	20	84	9
1217	AC Metcalfe	83	25	89
1219	BZ502-265	21	65	14
1268	UCD 1A	19	85	12
1269	UCD 4A	41	57	68
1270	UCD 15A	38	5	7
1271	UCD 22A	3	24	54
1272	UCD 1B	59	17	8
1273	UCD 3B	42	35	52
1274	UCD 4B	60	56	27
1275	UCD 6B	23	66	48
1276	UCD 7B	18	55	34
1277	UCD 9B	58	6	67
1278	UCD 10B	39	37	72

NUMBER OF TREATMENTS = 27

2010 SPRING BARLEY

TULELAKE

FILL 10	FILL 11	FILL 30	FILL 31	FILL 50	FILL 51	FILL 70	FILL 71	FILL 90
C 1202 9	C 1268 12	C 1099 29	C 1145 32	C 204 49	C 1273 52	C 1135 69	C 1278 72	C 1217 89
C 1272 8	C 1016 13	C 1084 28	C 1082 33	C 1275 48	C 1171 53	C 1269 68	C 1201 73	C 1200 88
C 1270 7	C 1219 14	C 1274 27	C 1276 34	C 960 47	C 1271 54	C 1277 67	C 900 74	C 1010 87
B 1277 6	B 1135 15	B 204 26	B 1273 35	B 900 46	B 1276 55	B 1275 66	B 1171 75	B 1201 86
B 1270 5	B 1099 16	B 1217 25	B 1145 36	B 1010 45	B 1274 56	B 1219 65	B 1084 76	B 1268 85
B 960 4	B 1272 17	B 1271 24	B 1278 37	B 1082 44	B 1269 57	B 1016 64	B 1200 77	B 1202 84
A 1271 3	A 1276 18	A 1275 23	A 1270 38	A 1145 43	A 1277 58	A 1171 63	A 204 78	A 1217 83
A 1099 2	A 1268 19	A 1016 22	A 1278 39	A 1273 42	A 1272 59	A 1082 62	A 1084 79	A 960 82
A 900 1	A 1202 20	A 1219 21	A 1135 40	A 1269 41	A 1274 60	A 1010 61	A 1200 80	A 1201 81

2010 SPRING WHEAT
TULELAKE

		REPLICATE		
NO	ENTRY	1	2	3
1	OR4990114	62	14	110
2	OR4031177	104	5	107
3	Bullseye	99	17	68
4	Cabernet	60	86	94
5	Malbec	61	25	28
6	Jefferson	79	46	8
7	Winchester	1	44	69
8	IDO665	80	66	90
9	BZ901-717	103	65	12
10	Hank	21	106	47
11	Kelse	38	77	109
12	Lassik	63	105	13
13	Kern	41	4	53
14	Patwin	59	57	88
15	OR4051328	40	24	54
16	OR4061191	98	7	91
17	Clear White	39	56	27
18	Nick	18	95	9
19	OR4041268	3	45	73
20	Alturas	100	36	48
21	Cataldo	42	55	87
22	IDO671	81	84	32
23	IDO644	83	6	89
24	IDO668	19	97	33
25	IDO669	78	85	108
26	Alpowa	82	37	92
27	JD	20	76	29
28	Diva	102	35	49
29	Whit	101	26	67
30	Babe	58	16	52
31	Petit	2	75	93
32	Expresso	43	96	74
33	Triple IV	23	64	34
34	Yecora Rojo	22	15	72

NUMBER OF TREATMENTS = 34

2010 SPRING WHEAT

TULELAKE

FILL 10	FILL 11	FILL 30	FILL 31	FILL 50	FILL 51	FILL 70	FILL 71	C 8 90	C 16 91	C 1 110
C 18 9	C 9 12	C 27 29	C 22 32	C 28 49	C 30 52	C 7 69	C 34 72	C 23 89	C 26 92	C 11 109
C 6 8	C 12 13	C 5 28	C 24 33	C 20 48	C 13 53	C 3 68	C 19 73	C 14 88	C 31 93	C 25 108
B 16 7	B 1 14	C 17 27	C 33 34	C 10 47	C 15 54	C 29 67	C 32 74	C 21 87	C 4 94	C 2 107
B 23 6	B 34 15	B 29 26	B 28 35	B 6 46	B 21 55	B 8 66	B 31 75	B 4 86	B 18 95	B 10 106
B 2 5	B 30 16	B 5 25	B 20 36	B 19 45	B 17 56	B 9 65	B 27 76	B 25 85	B 32 96	B 12 105
B 13 4	B 3 17	B 15 24	B 26 37	B 7 44	B 14 57	B 33 64	B 11 77	B 22 84	B 24 97	A 2 104
A 19 3	A 18 18	A 33 23	A 11 38	A 32 43	A 30 58	A 12 63	A 25 78	A 23 83	A 16 98	A 9 103
A 31 2	A 24 19	A 34 22	A 17 39	A 21 42	A 14 59	A 1 62	A 6 79	A 26 82	A 3 99	A 28 102
A 7 1	A 27 20	A 10 21	A 15 40	A 13 41	A 4 60	A 5 61	A 8 80	A 22 81	A 20 100	A 29 101

2009 INTERMOUNTAIN WINTER WHEAT TEST
TULELAKE

		REPLICATE		
NO	ENTRY	1	2	3
1	Stephens	41	25	68
2	Madsen	58	37	89
3	Gene	63	116	53
4	Tubbs-06	2	66	29
5	ORSS-1757	84	76	9
6	Goetze	39	106	13
7	Skiles	83	57	94
8	Goetze/Skiles	81	56	51
9	Brundage 96	61	45	70
10	Bitterroot	82	7	88
11	Bruneau	101	17	28
12	Xerpha	43	85	49
13	Westbred 528	97	86	33
14	Westbred 523	78	5	107
15	BZ6W02-616	20	115	10
16	Salute	3	35	50
17	Legion	99	34	32
18	AP Legacy	120	15	90
19	AP Badger	19	74	72
20	ORCF-101	119	27	112
21	ORCF-101R	38	46	113
22	ORCF-102	80	44	73
23	ORCF-103	103	54	11
24	UICF-Brundage	40	65	30
25	ID00-475-2DH	104	4	91
26	AP700CL	21	36	8
27	Coda	117	47	110
28	Cara	100	75	87
29	OR2050910	62	26	111
30	OR2040726	118	77	69
31	OR2060395	102	105	114
32	OR2070011	18	96	108
33	OR2070385	22	24	48
34	OR2070608	23	16	52
35	OR2070870	79	6	93
36	OR2071029	59	64	12
37	OR2071071	98	55	109
38	OR2071628	1	95	71
39	OR2071681	60	14	31
40	OR2070453	42	67	92

NUMBER OF TREATMENTS = 40

2009 INTERMOUNTAIN WINTER WHEAT TEST

TULELAKE

C 15 10	C 23 11	C 24 30	C 39 31	C 16 50	C 8 51	C 9 70	C 38 71	C 18 90	C 25 91	C 27 110	C 29 111
C 5 9	C 36 12	C 4 29	C 17 32	C 12 49	C 34 52	C 30 69	C 19 72	C 2 89	C 40 92	C 37 109	C 20 112
C 26 8	C 6 13	C 11 28	C 13 33	C 33 48	C 3 53	C 1 68	C 22 73	C 10 88	C 35 93	C 32 108	C 21 113
B 10 7	B 39 14	B 20 27	B 17 34	B 27 47	B 23 54	B 40 67	B 19 74	C 28 87	C 7 94	C 14 107	C 31 114
B 35 6	B 18 15	B 29 26	B 16 35	B 21 46	B 37 55	B 4 66	B 28 75	B 13 86	B 38 95	B 6 106	B 15 115
B 14 5	B 34 16	B 1 25	B 26 36	B 9 45	B 8 56	B 24 65	B 5 76	B 12 85	B 32 96	B 31 105	B 3 116
B 25 4	B 11 17	B 33 24	B 2 37	B 22 44	B 7 57	B 36 64	B 30 77	A 5 84	A 13 97	A 25 104	A 27 117
A 16 3	A 32 18	A 34 23	A 21 38	A 12 43	A 2 58	A 3 63	A 14 78	A 7 83	A 37 98	A 23 103	A 30 118
A 4 2	A 19 19	A 33 22	A 6 39	A 40 42	A 36 59	A 29 62	A 35 79	A 10 82	A 17 99	A 31 102	A 20 119
A 38 1	A 15 20	A 26 21	A 24 40	A 1 41	A 39 60	A 9 61	A 22 80	A 8 81	A 28 100	A 11 101	A 18 120

1330 Early-Die/Black-Dot Treatment List

1. Untreated- Raw Seed
2. Cruiser Maxx Seed Treatment *(For all CruiserMaxx trts it was applied at 0.23 fl. oz/ 100 lbs of seed)*
3. Cruiser Maxx + Dynasty Seed Treatment *(for all Dynasty trts it was applied at 2.0 fl. oz/100 lbs of seed)*
4. Cruiser Maxx + Dynasty Seed Treatment & Quadris 0.6 fl. oz/ 1000ft seed row in-furrow at planting
5. Cruiser Maxx + Dynasty Seed Treatment + Blocker (7 pint/A in-furrow at planting)
6. Cruiser Maxx + Dynasty Seed Treatment & Quadris 12 fl. oz/A at 45-50 days after planting
7. Cruiser Maxx + Dynasty Seed Treatment & Quadris 0.6 fl. oz/
   1000ft seed row in-furrow at planting & Quadris 12 fl. oz/A at 45-50 days after planting
8. Cruiser Maxx + Dynasty Seed Treatment & Quadris 0.6 fl. oz/
   1000ft seed row in-furrow at planting & Bravo Weatherstik (1.5 pt/A) 45 to 60 days after planting
9. Cruiser Maxx + LEM 17 FS at 0.5 fl. oz/100 lbs of seed Seed Treatment
10. Cruiser Maxx Seed Treatment & LEM17 20 EC at 1.6 fl. oz/1000 ft of row in-furrow at planting
11. Cruiser Maxx Seed Treatment + Superzyme at 4 qt per100 gallons H20 in-furrow at plantings
12. Vapam 37.5 gal/A & Cruiser Maxx Seed Treatment
13. Vapam 37.5 gal/A & Cruiser Maxx + Dynasty Seed Treatment & Quadris 12 fl. oz/A at 45-50 days after planting
14. Cruiser Maxx Seed Treatment & Quadris 12 fl. oz/A at 45-50 days after planting
15. Cruiser Maxx + XtraPower 8 oz/A in-furrow
16. Cruiser Maxx + STO-01 4 pt/A

Plot Size: 2 row by 25 ft; 6 reps
10" spacing
40 foot borders on top and bottom of field

	Pre	Seed treatment			In Furrow						Post 45-60 days	
	Vapam	Cruiser Maxx	Dynasty	LEM 17	Quadris	LEM 17	Blocker	Super-zyme	Xtr-Power	STO-01	Quadris	Bravo
1												
2		x										
3		x	x									
4		x	x		x							
5		x	x				x					
6		x	x								x	
7		x	x		x						x	
8		x	x		x							x
9		x		x								
10		x				x						
11		x						x				
12	x	x										
13	x	x	x								x	
14		x									x	
15		x							X			
16		x								X		

1330 Fall Applied Vapam Trial   Planted 5/13/10

N ↑

0	Buffer	Buffer	
40'	4 686	1 687	3 710
40'	4 685	1 688	3 709
40'	4 684	1 689	3 708
40'	3 683	2 690	4 707
40'	3 682	2 691	4 706
40'	3 681	2 692	4 705
40'	2 680	3 693	1 704
40'	2 679	3 694	1 703
40'	2 678	3 695	1 702
40'	1 677	4 696	2 701
40'	1 676	4 697	2 700
40'	1 675	4 698	2 699
0	Buffer	Buffer	

Treatment	
1	Control
2	18.8 gal/A
3	37.5 gal/A
4	56.3 gal/A

1320 Russet Variety Trial **Planted : 5-13-10**

N ↑

6ft

Fill	**Fill**	**Fill**	**Fill**	**Fill**	**Fill**
Fill	**Fill**	**Fill**	**Fill**	**5** 96	**24** 97
3 19	**21** 20	**6** 57	**15** 58	**12** 95	**29** 98
18 18	**14** 21	**25** 56	**1** 59	**20** 94	**16** 99
9 17	**23** 22	**11** 55	**7** 60	**27** 93	**10** 100
22 16	**2** 23	**4** 54	**26** 61	**17** 92	**8** 101
10 15	**17** 24	**24** 53	**13** 62	**28** 91	**19** 102
15 14	**9** 25	**29** 52	**23** 63	**1** 90	**4** 103
11 13	**21** 26	**20** 51	**28** 64	**8** 89	**5** 104
14 12	**12** 27	**25** 50	**22** 65	**6** 88	**3** 105
18 11	**16** 28	**27** 49	**26** 66	**7** 87	**2** 106
19 10	**13** 29	**4** 48	**5** 67	**13** 86	**11** 107
22 9	**29** 30	**1** 47	**10** 68	**21** 85	**15** 108
28 8	**27** 31	**7** 46	**6** 69	**12** 84	**20** 109
23 7	**26** 32	**8** 45	**3** 70	**14** 83	**16** 110
25 6	**24** 33	**2** 44	**9** 71	**18** 82	**19** 111
5 5	**6** 34	**15** 43	**16** 72	**25** 81	**17** 112
4 4	**7** 35	**14** 42	**17** 73	**24** 80	**26** 113
3 3	**8** 36	**13** 41	**18** 74	**23** 79	**27** 114
2 2	**9** 37	**12** 40	**19** 75	**22** 78	**28** 115
1 1	**10** 38	**11** 39	**20** 76	**21** 77	**29** 116
Fill	**Fill**	**Fill**	**Fill**	**Fill**	**Fill**
Fill	**Fill**	**Fill**	**Fill**	**Fill**	**Fill**

Entry #	Entry Name	Trial
1	Russet Norkotah	SWR
2	AOTX96084-1RU	SWR
3	AOTX98152-3RU	SWR
4	ATX9332-12RU	SWR
5	Ranger Russet	WR
6	Russet Burbank	WR
7	Russet Norkotah	WR
8	A97066-42LB	WR
9	A98345-1	WR
10	A0008-1TE	WR
11	A00324-1	WR
12	A01010-1	WR
13	AC99375-1RU	WR
14	AO00057-2	WR
15	AO96305-3	WR
16	AOTX95265-1Ru	WR
17	AOTX96216-2Ru	WR
18	AOTX96265-2Ru	WR
19	CO98067-7RU	WR
20	CO99053-3RU	WR
21	CO99053-4RU	WR
22	CO99100-1RU	WR
23	PA00N14-2	WR
24	PA99N2-1	WR
25	PA99N82-4	WR
26	Alpine	IREC
27	Classic	IREC
28	Clearwater	IREC
29	Premier	IREC

## 1320 Specialty Trial		Planted: 5-13-10

N ↑

6'

	Fill	Fill	Fill	Fill	Fill	Fill
	12 137	**22** 138	**14** 179	**13** 180	**21** 221	**26** 222
	28 136	**11** 139	**5** 178	**10** 181	**30** 220	**23** 223
	17 135	**4** 140	**25** 177	**2** 182	**31** 219	**19** 224
	1 134	**15** 141	**3** 176	**8** 183	**6** 218	**27** 225
	9 133	**29** 142	**16** 175	**20** 184	**24** 217	**7** 226
	24 132	**17** 143	**20** 174	**22** 185	**29** 216	**12** 227
	25 131	**2** 144	**31** 173	**19** 186	**3** 215	**5** 228
	15 130	**18** 145	**30** 172	**9** 187	**7** 214	**27** 229
	16 129	**13** 146	**28** 171	**23** 188	**10** 213	**6** 230
	21 128	**32** 147	**8** 170	**1** 189	**11** 212	**4** 231
	26 127	**14** 148	**22** 169	**24** 190	**12** 211	**11** 232
	14 126	**28** 149	**19** 168	**5** 191	**23** 210	**1** 233
	29 125	**27** 150	**7** 167	**25** 192	**20** 209	**13** 234
	2 124	**32** 151	**21** 166	**3** 193	**31** 208	**16** 235
	10 123	**30** 152	**6** 165	**26** 194	**8** 207	**9** 236
	3 122	**1** 153	**4** 164	**15** 195	**17** 206	**18** 237
	7 121	**16** 154	**13** 163	**21** 196	**32** 205	**31** 238
	8 120	**19** 155	**10** 162	**28** 197	**27** 204	**14** 239
	22 119	**25** 156	**11** 161	**12** 198	**9** 203	**20** 241
32 244	**18** 118	**23** 157	**15** 160	**6** 199	**5** 202	**29** 242
18 243	**30** 117	**24** 158	**17** 159	**4** 200	**26** 201	**2** 240
Fill	Fill	Fill	Fill	Fill	Fill	Fill

Entry #	Clone/Variety	Trial
1	Dk Red Norland	WR
2	Red LaSoda	WR
3	BTX2332-1R	WR
4	CO99076-6R	WR
5	CO99256-2R	WR
6	COTX94216-1R	WR
7	COTX94218-1R	WR
8	A99326-1PY	WR
9	A99331-2RY	WR
10	POR03PG80-2	WR
11	Purple Majesty	WR
12	Yukon Gold	WR
13	A00286-3Y	WR
14	A99433-5Y	WR
15	ATC00293 -1W/Y	WR
16	CO00412-5W/Y	WR
17	Purple Majesty	SWR
18	Yukon Gold	SWR
19	ATTX88654-2P/Y	SWR
20	ATTX98510-1R/Y	SWR
21	ATTX01180-1R/Y	SWR
22	BTX2103-1R/Y	SWR
23	CO01399-10P/Y	SWR
24	COTX01403-4R/Y	SWR
25	TC02072-3P/P	SWR
26	TX1674-1W/Y	SWR
27	Norland (Dark Red)	SWR
28	Red LaSoda	SWR
29	AOTX91861-4R	SWR
30	ATTX98453-11BR	SWR
31	NDTX5003-2R	SWR
32	NDTX5438-11R	SWR

1320 Chip Variety Trial   Planted 5/19/10

Planted at Walker's

N ↑

6ft

								Fill
						Fill	Fill	**10** 254
			Fill	Fill	Fill	**5** 272	**15** 263	**2** 253
Fill	Fill	Fill		**18** 288	**3** 280	**2** 271	**8** 262	**18** 252
8 316	**18** 309	**10** 302	**8** 295	**14** 287	**9** 279	**17** 270	**7** 261	**15** 251
6 315	**13** 308	**7** 301	**1** 294	**11** 286	**16** 278	**12** 269	**4** 260	**3** 250
2 314	**9** 307	**4** 300	**3** 293	**2** 285	**18** 277	**10** 268	**11** 259	**1** 249
11 313	**3** 306	**1** 299	**5** 292	**4** 284	**14** 276	**6** 267	**16** 258	**9** 248
5 312	**16** 305	**15** 298	**10** 291	**6** 283	**13** 275	**1** 266	**13** 257	**5** 247
17 311	**14** 304	**12** 297	**13** 290	**9** 282	**11** 274	**4** 265	**6** 256	**12** 246
15 310	**12** 303	**7** 296	**16** 289	**17** 281	**8** 273	**7** 264	**14** 255	**17** 245

Entry #	Clone/Variety	Trial
1	Atlantic	WR
2	Chipeta	WR
3	A00188-3C	WR
4	A01143-3C	WR
5	CO00188-4W	WR
6	CO00197-3W	WR
7	CO00270-7W	WR
8	AC01151-5W	SWR
9	CO02024-9W	SWR
10	CO02033-1W	SWR
11	CO02321-4W	SWR
12	Pike	IREC
13	Dakota Pearl	IREC
14	CO97043-14W	IREC
15	Dakota Crisp	IREC
16	Frito 2053	IREC
17	Frito 2048	IREC
18	Frito 2126	IREC

1460 Chip Mgmt Trial

Planted at Walker's

N

3'

			5 406		1 418		6 430		1 442		5 454		3 466		5 478		3 490		
			6 405		2 417		5 429		5 441		1 453		5 465		3 477		5 489		
			4 404		6 416		2 428		3 440		6 452		4 464		1 476		1 488		
			2 403		3 415		1 427		2 439		3 451		1 463		6 475		2 487		
			3 402		5 414		4 426		6 438		4 450		2 462		2 474		4 486		
			1 401		4 413		3 425		4 437		2 449		6 461		4 473		6 485		
			S2		S4		S2		S3		S1		S3		S1		S2		
			4 400		1 412		2 424		4 436		4 448		3 460		6 472		6 484		
			1 399		6 411		4 423		1 435		2 447		4 459		3 471		5 483		
			6 398		3 410		6 422		6 434		5 446		1 458		5 470		3 482		
			3 397		5 409		3 421		2 433		1 445		5 457		2 469		1 481		
			2 396		4 408		5 420		3 432		6 444		6 456		4 468		4 480		
			5 395		2 407		1 419		5 431		3 443		2 455		1 467		2 479		
Border 9" seed spacing (1533)	Border 9" seed spacing (1533)	Border 9" seed spacing (1533)	S3	Border 9" seed spacing (1533)	S1	Border 9" seed spacing (1533)	S1	Border 9" seed spacing (1533)	S4	Border 9" seed spacing (1533)	S4	Border 9" seed spacing (1533)	S2	Border 9" seed spacing (1533)	S3	Border 9" seed spacing (1533)	S4	Border 9" seed spacing (1533)	Border 9" seed spacing (1533)

Entry #	Variety	Spacing
1	Pike	S1= 6.75 in spacing, 34 hills/plot, 19.04ft plot length
2	Dakota Pearl	S2= 9.25 in spacing, 25 hills/plot, 19.25ft plot length
3	Dakota Crisp	S3= 12.5 in spacing, 18 hills/plot, 18.74ft plot length
4	FL 2053	S4= 15 in spacing, 15 hills/plot, 18.75 ft plot length
5	FL 2048	
6	CO97043-14W	

2990 Dryland Forage & Grain Trial

Planted: 4/7/2010

Border = Rojo

↑ **N**

5'

20'	**15** 60	**10** 59	**5** 58	**7** 57	**14** 56	**15** 116	**12** 115	**2** 114	**1** 113	**10** 112	
	1 51	**3** 52	**6** 53	**11** 54	**8** 55	**8** 107	**4** 108	**3** 109	**6** 110	**5** 111	
	13 50	**2** 49	**12** 48	**4** 47	**9** 46	**14** 106	**9** 105	**13** 104	**11** 103	**7** 102	
	4 41	**11** 42	**15** 43	**3** 44	**2** 45	**7** 97	**5** 98	**15** 99	**14** 100	**8** 101	
	5 40	**9** 39	**10** 38	**1** 37	**13** 36	**3** 96	**2** 95	**11** 94	**10** 93	**6** 92	
10' Border	**8** 31	**7** 32	**14** 33	**6** 34	**12** 35	**9** 87	**13** 88	**1** 89	**12** 90	**4** 91	10' Border
	7 30	**15** 29	**11** 28	**13** 27	**4** 26	**2** 86	**6** 85	**10** 84	**15** 83	**14** 82	
	2 21	**14** 22	**8** 23	**12** 24	**1** 25	**5** 77	**1** 78	**4** 79	**7** 80	**12** 81	
	10 20	**6** 19	**3** 18	**9** 17	**5** 16	**13** 76	**11** 75	**8** 74	**3** 73	**9** 72	
	3 11	**1** 12	**4** 13	**2** 14	**15** 15	**1** 67	**3** 68	**9** 69	**2** 70	**15** 71	
	9 10	**5** 9	**7** 8	**8** 7	**11** 6	**10** 66	**14** 65	**7** 64	**12** 63	**13** 62	
	14 1	**13** 2	**12** 3	**10** 4	**6** 5	**6** 57	**8** 58	**5** 59	**4** 60	**11** 61	
			Hay					Grain			

Entry	Variety	Cereal Type	LBS/A
1	Alpowa	Wheat	100
2	102 Triticale	Triticale	100
3	Merlin	Triticale	100
4	Rye	Common	100
5	Baronesse	Spring Barley	100
6	Twin	Spring Beardless Wheat	100
7	Strider	Facultative Barley	100
8	Stephans	Wheat	100
9	Cayuse	Oat	100
10	Charisma	Oat	100
11	Stockford	Beardless Barley	100
12	Metcalfe	Spring Malting Barley	100
13	Peas/Alpowa	Peas, wheat	30 + 50
14	Yecora Rojo	Hard Red Wheat	100
15	Hairy Vetch/Alpowa	Vetch, wheat	20 + 50

SPEAKER LIST

Mike Davis CE Plant Pathologist, Department of Plant Pathology, University of California Davis

Larry Godfrey CE Entomologist, Department of Entomology, University of California Davis

Steve Orloff Siskiyou County Cooperative Extension County Director/Farm Advisor, University of California, Yreka, California

Larry Teuber Professor, Department of Plant Sciences, University of California Davis

Kris Tollerup Post Doctoral Researcher, Department of Entomology, University of California Davis

Rob Wilson Center Director/Farm Advisor, UC Intermountain Research and Extension Center, University of California, Tulelake, California

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SPONSORS

We would like to thank the following sponsors who help make Field Day and our 2010 Project Research such a success! This support made it possible to conduct all proposed project research as well as provide handouts and lunch. Thank you!!

- Alsco Irrigation
- AMVAC
- Basin Fertilizer & Chemical Company
- California Garlic & Onion Research Advisory Board
- California Potato Research Advisory Board
- City of Tulelake
- Floyd A. Boyd
- JW Kerns Irrigation
- Lassen Canyon Nursery
- Macy's Flying Service
- Modoc County Department of Agriculture
- Northwest Farm Credit Services – Klamath Falls
- Olam International
- Oregon State University
- Siskiyou County Department of Agriculture
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- Crawford Farms
- Dan Chin
- David King
- Huffman Farms
- Jim Baley
- Jim Lyman
- McKoen & Son
- Russell Peterson
- Scott Seus
- Staunton Farms
- Walker Farms

Agenda

8:00 a.m.	**Registration & Refreshments** – Please sign in for lunch
8:30	**Introductions** – Rob Wilson, Center Director/Farm Advisor, UC Intermountain Research & Extension Center
8:45	**Potato Management Trials –** Rob Wilson, Center Director/Farm Advisor, UC Intermountain Research & Extension Center
9:05	**Fall Harvest Management Strategies for Alfalfa** – Steve Orloff, County Director/Farm Advisor, University of California, Yreka
9:25	**Alfalfa Fall Dormancy and Winter Survival** – Larry Teuber, Professor, Department of Plant Sciences, University of California Davis
9:45	**Management of White Rot of Onions with Fungicides** – Mike Davis, CE Plant Pathologist, Department of Plant Pathology, University of California Davis
10:05	**Integrated Pest Management of Insect and Mite Pests of Peppermint** – Larry Godfrey, CE Entomologist, Department of Entomology, University of California Davis
10:25	**Alfalfa Variety Evaluation in Mountain Valleys of Northern California** – Steve Orloff, County Director/Farm Advisor, University of California, Yreka
10:45	**Break**
10:55	**Effect of Postemergence Herbicides and Application Time on Small Grain Injury and Yield** – Steve Orloff, County Director/Farm Advisor, University of California, Yreka
11:15	**Management Practices for Improved Thrip Control in the Klamath Basin** – Steve Orloff, County Director/Farm Advisor, University of California, Yreka
11:30	**Onion Weed Control –** Rob Wilson, Center Director/Farm Advisor, UC Intermountain Research & Extension Center
11:45	**Small Grains Variety Trials Update** – Rob Wilson, Center Director/Farm Advisor, UC Intermountain Research & Extension Center
11:50	**Potato Variety Trials** - Rob Wilson, Center Director/Farm Advisor, UC Intermountain Research & Extension Center