UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

FIELD CROP NOTES

SISKIYOU COUNTY
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FALL 2012

In this Issue:

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For special assistance regarding our programs please contact us.

Fall Irrigation of Forages—is late season irrigation necessary?

A few years ago I published this newsletter article, and with the current weather conditions it seemed appropriate to publish it again and update it. In addition, with the strong Chinook salmon run expected, agricultural water use will fall under increased scrutiny this year.

Many growers wonder this time of year: is it safe or advisable to stop irrigating my forage crops for the season? The concern is that fall production will suffer, or worse yet, next year's production or the plant stand may be injured due to fall drought. As you are well aware, crop water needs vary dramatically over the growing season. Water needs peak in mid-summer (typically real close to the 15th of July), but are much less in the spring and trail off in the fall. Therefore, if you use the same irrigation frequency or schedule throughout the season, you are likely over-irrigating at times of the year and under-irrigating at other times of the year. Fall irrigation needs depend on the type of forage crop. Alfalfa and irrigated pasture grasses respond very differently to irrigation, or more precisely lack of irrigation, so the question will be addressed separately for the two types of forages.

Is it necessary to irrigate after the last cutting of alfalfa? While some alfalfa growers do irrigate after the last cutting, I would say that most Siskiyou County growers do not. It is somewhat a question of economics. Since most alfalfa fields are not grazed after the last cutting, it is typically not worth irrigating after the last cutting. Alfalfa responds to temperature, photoperiod (day length), and soil moisture level. Even with a warm fall and sufficient soil

moisture levels for growth, there is minimal fall growth due to short days and lower nighttime temperatures. The alfalfa varieties we produce (with a fall dormancy score of 3-5) are strongly influenced by day length and alfalfa growth slows dramatically even with warm fall temperatures and adequate soil moisture. Then growth nearly ceases after we have had frosts down to the mid 20's, which typically occurs in early October. Irrigating after the last cutting has been considered beneficial in some areas (like Idaho and other more arid states). However, those areas are typically extremely dry regions where there is insufficient rainfall over the winter to refill the soil profile to the depth of the rooting zone of the crop. If the grower does not start irrigating early enough the following spring, subsequent yield, especially first cutting, can be affected. In our area, winter rains in most years are sufficient to refill the soil profile. And, irrigation water is typically more plentiful in spring than it is in fall. So as long as a grower watches soil moisture levels come early spring, is aware of the winter rainfall received and irrigates as needed to refill the soil profile in spring, then I feel irrigation after the last cutting in the fall is not necessary. We have conducted numerous trials over the past decade in both the Intermountain area and other areas of California to assess the effect of deficit irrigation of alfalfa on yield that year and the subsequent year. Even when irrigation water was cut off early in the season, yield rebounded the following year to the same level as the alfalfa that was fully irrigated for the entire season. If water is withdrawn early, even before the last cutting, the alfalfa goes into a drought-induced dormancy and it recovers and produces normally the next year. This suggests that irrigating after the last cutting is not necessary for full production the following season. Irrigation of alfalfa can often cease by early September.

The situation is different for a new fall seeding of alfalfa or when interseeding orchardgrass into alfalfa. Adequate soil moisture is important for plant development before the onset of freezing temperatures. Drought stressed plants are more sensitive to cold temperatures than are plants with adequate soil moisture. Even though fall alfalfa seedings need irrigation through September or early October until the rains start or hard frosts occur, the amount of water needed is very small. The seedling root system is small and typically less than an inch of water is all that is needed per irrigation to provide adequate moisture in the seedling root system.

How late should pasture be irrigated?

The situation with pasture is different from alfalfa. Irrigated pasture does not go into the same type of drought-induced dormancy as alfalfa does; it has a fibrous root system that is less able to access deep soil moisture. Livestock producers desire fall feed from grazed pastures so they can delay feeding hay as long as possible. Therefore, irrigation later into the fall may be desirable for pastures to maximize production of fall feed for livestock. However, given this situation the logical question is how late in the fall is irrigation really necessary. Unfortunately, there is no set fixed date when irrigation can cease—it depends on the weather in a specific year, the soil type and previous irrigation practices. In most years, irrigation can usually cease by the end of September. Especially if previous irrigation practices were adequate there should be enough residual moisture in the soil to sustain the pasture through fall. Yield increases from irrigating very late in the season are typically not economical. The growth rate for pasture drops way off as fall progresses and the yield increase from irrigation is minimal. In a study conducted in Scott Valley several years ago, I found the difference in the aftermath yield for grazing on October 20th was only 0.08 tons (not a statistically significant yield difference) when irrigation ceased on September 20th versus October 5th. In an additional study there was no difference in an October 7th simulated-grazing harvest when irrigation ceased on September 5th versus September 20th. When you consider pumping charges, possible electric company standby charges, and irrigation labor, it unlikely that an October irrigation will result in an economical yield increase in most cases. Once the low temperatures fall into the mid-20's grass top growth nearly ceases. I have experienced cases where frost injury was mistaken for drought stress when there was plenty of moisture in the soil.

Soil moisture sensors are very useful to assess the soil moisture status to determine fall irrigation needs of both alfalfa and pasture. Many growers who have starting using soil moisture sensors have realized they can cut back on fall irrigation because the water needs of the crop are so much less than in summer. Ordinarily, the soil moisture status is sufficient so that irrigating in October is unnecessary. Although October irrigations are generally not recommended, it is important to monitor soil moisture in your pastures and alfalfa fields over the winter to assess the water status so that the early growth in the spring is not harmed. Adequate soil moisture in spring is critical, and irrigation must begin on time because most irrigation systems do not have the capacity to "catch up" for a late irrigation start date. In addition, irrigation water is usually more plentiful in spring than in fall.

Save the Date! The 2012 California Alfalfa and Grains Symposium will be held in Sacramento, CA on December 10-12th. For the first time ever this year's California Alfalfa Symposium will feature grain crops as well. The comprehensive conference will focus on the many issues related to forage and grain crops, particularly global issues, economics and crop production techniques. Discussion topics will include water management, fertilizers and nutrients, crop quality and pest management.

The event starts off with a tour of the Sacramento-San Joaquin River Delta region on the 10th. The Symposium starts at 8:00 am on the 11th and concludes at noon on the 12th. It looks like an interesting and worthwhile meeting that will have a lot of valuable information for farmers in our area. You can view the agenda on the last pages of this newsletter and if interested register for the Symposium at the following website: http://ucanr.org/sites/Alfalfa/Agenda_578/

A tentative schedule is located at the end of this newsletter.

Winter Wheat Variety Results

Winter wheat variety tests are conducted annually in the Montague area of Shasta Valley (except for 2011 when fall rains interfered with the planting schedule for UC trials). Trials are also conducted in Tulelake at the Intermountain Research and Extension Center (IREC). Data are presented below for the 2012 Montague trial and then combined over locations and years for IREC and Montague in the next few columns. The variety Stephens has performed well over the years and has become a standard for this area. However, many varieties now out-perform Stephens and growers may want to consider planting them. The variety Mary (just included in the 2012 trials) was actually the top yielding variety and other released varieties, AP Badger and Bruneau, also performed well. The varieties Tubbs and Goetze have done well at some locations/years. Goetze appears to perform better in the Shasta Valley, whereas Tubbs does well in Tulelake. Growers should consider planting some of these newer varieties. Initial results with Mary and AP Badger look encouraging but they both may be somewhat more susceptible to stripe rust. The disease has not been a significant problem in central Siskiyou County but is something to be aware of if the conditions are conducive to disease development. Lee Jackson, formerly the UC Small Grains Specialist and now doing work on these field trials with the California Wheat Commission, evaluated these varieties for their stripe rust susceptibility. While we did not have severe stripe rust pressure, these varieties appeared to be slightly more susceptible in his ratings (see table) and in field experience in stripe rust prone areas in the Pacific Northwest. However, given the performance of these varieties and the moderate to light stripe rust pressure we usually have, I would consider trying these varieties especially on a smaller scale to see how they perform in your fields.

2010-12 Intermountain Winter Wheat Over Year Yield Summary

Entry	Name	2012 Montague YIELD (lbs/acre)		SHATTER	STRIPE RUST	2012 (2 loc) (lbs-acre)		2011-12 (3 loc-yr) (lbs-acre)		2010-12 (5 loc-yr) (lbs-acre)	
1	STEPHENS	5930	(29)	1	1	6305	(26)	7030	(12)	6870	(9)
2	MADSEN	6370	(16)	1	1	6420	(22)	6970	(14)	6600	(14)
3	TUBBS-06	5490	(39)	1	1.8	6385	(23)	7260	(9)	7060	(4)
4	OR99-175	5680	(31)	1	1	5850	(40)	6560	(25)	6610	(13)
5	GOETZE	6410	(14)	1	1	6130	(32)	6760	(23)	6670	(11)
6	SKILES	6230	(20)	1	1	6445	(20)	6950	(15)	6690	(10)
7	MARS	7220	(1)	1	1.8	7285	(1)	-		-	
8	BRUNDAGE 96	6660	(7)	1	1	6760	(9)	7370	(7)	7010	(7)
9	BRUNEAU	6640	(9)	1	1	6790	(7)	7650	(3)	7670	(1)
10	96-1602A	6500	(11)	1	1	7020	(3)	7910	(1)	-	
11	IDO 663	6840	(4)	1	1	6840	(5)	7610	(5)	-	
12	WA8134	6150	(24)	1	1	6635	(14)	-		-	
13	ARS-AMBER	6360	(17)	1	1	6710	(11)	-		-	
14	970161-3L	5570	(35)	1	1	6060	(34)	-		-	
15	NB 221	6960	(2)	1	1	7145	(2)	-		-	
16	NB 215	5500	(38)	1	4	6520	(19)	-		-	
17	NSA84-2351A	6410	(15)	1	1	6570	(16)	-		-	
18	LWW04-4009	5430	(41)	1	1	6060	(34)	-		-	
19	WESTBRED	5970	(28)	1	1	6085	(33)	-		-	
20	WB JUNCTION	6460	(12)	1	1	6835	(6)	-		-	
21	LEGION	6100	(26)	1	1	6700	(12)	7670	(2)	7040	(5)
22	AP LEGACY	5290	(42)	1	2.8	6165	(31)	7020	(13)	7130	(2)
23	AP BADGER	6810	(6)	1	1.5	6790	(7)	-		-	
24	SYONAKION	6360	(18)	1	1	6660	(13)	-		-	
25	ORCF-101R	6150	(25)	1	1	6225	(30)	6870	(17)	6490	(18)
26	ORCF-102	5600	(33)	1	1	5935	(38)	6730	(24)	6440	(19)
27	ORCF-103	5060	(44)	1	1	5895	(39)	6850	(18)	6560	(15)
28	OR2161835	5460	(40)	1	1	5705	(44)	6510	(26)	-	
29	UICF-BRUNDA	6190	(21)	1	1	6440	(21)	-		-	
30	AP700CL	6330	(19)	1	1	6555	(17)	7250	(10)	7110	(3)
31	WB1070CL	6910	(3)	1	1	6550	(18)	-		-	
32	WB1066CL	5130	(43)	1.5	1	5670	(45)	-		-	
33	CODA	5550	(36)	1	1	6260	(28)	6810	(21)	6550	(16)
34	CARA	6520	(10)	1	1	6370	(25)	6850	(18)	6310	(20)
35	AR997230-6C	6050	(27)	1	1	6305	(26)	7050	(11)	-	
36	OR2070608	6880	(5)	1	1	6240	(29)	6830	(20)	6880	(8)
37	OR2070870	5630	(32)	1	1	5750	(42)	6450	(27)	6540	(17)
38	OR2071071	6450	(13)	1	1	6605	(15)	7350	(8)	7030	(6)
39	OR2071628	5600	(34)	1	1	6000	(37)	6920	(16)	6660	(12)
40	OR2071073	5030	(45)	1	1	5750	(42)	6800	(22)	-	
41	OR2080641	6150	(23)	1	1	6760	(9)	7620	(4)	-	
42	OR0804794	6650	(8)	1	1	6925	(4)	7590	(6)	-	
43	OR2070422	5500	(37)	1	1	5785	(41)	-		-	
44	OR2080764	6160	(22)	1	1	6040	(36)	-		-	
45	OR2080924	5840	(30)	1	1	6385	(23)	-		-	
	MEAN	6090				6350		7080		6800	

Numbers in parentheses indicate relative rank in column.

Rating scale for foliar diseases (area of flag-1 leaf affected), lodging, shatter, and blackpoint: 1 = 0-3%, 2 = 4-14%, 3 = 15-29%, 4 = 30-49%, 5 = 50-69%, 6 = 70-84%, 7 = 85-95%, 8 = 96-100%.

Alfalfa Production Costs

While farming is a lot of fun, most growers still need to make a profit or the fun goes away really quickly. Determining the profitability of alfalfa production is not an easy task. There are so many inputs to consider including input prices that change rapidly, the fact that many growers have a mix of new and used equipment or mostly used equipment making it difficult to assign an equipment price, labor and hours can be complicated to associate with different field operations, and a broad range of additional issues. Hence, calculating the costs to establish and produce alfalfa can be a daunting task. For years, the University of California Agriculture and Resource Economics Department at UC Davis has been preparing Cost and Return Studies in cooperation with local Farm Advisors. We just recently completed two alfalfa cost and return studies for this region. One is for Scott Valley and assumes a mix of center pivot and wheel-line irrigation and the other one is for Butte Valley and assumes all pivot irrigation.

These studies are intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets, and evaluate production loans. Practices described in the studies are based on the production practices considered typical for alfalfa grown in this region. Sample costs for labor, materials, equipment, and custom services are based on current figures. This study lists the costs typically associated with alfalfa production in this area and can serve as a template for doing your own analysis. A blank column titled "*Your Costs*" is available in Table 3 and Table 4 to enter your own costs.

The hypothetical farm operation, production practices, overhead costs, and calculations are described under the "Assumptions" section. If these assumptions do not fit for your farming operation, you can easily make adjustments for your individual operation so that the analysis better reflects your farm. Summary tables are presented below showing net returns above operating costs, cash costs and total costs for a range of alfalfa prices and yield levels from the Scott Valley study. The analysis shows that when considering total costs, a net profit did not occur until the price per ton reached $175 and the yield was above 6 tons per acre. A profit also occurred for a lower yield provided the price was higher or for a lower price provided the yield was higher than 6 tons. The returns on your farm obviously may be different from those in the tables but these studies can be used as a template to help calculate your break even costs.

The complete study for both Scott and Butte Valleys can be found at:

http://coststudies.ucdavis.edu/files/2012/Alfalfa_IM_Scott2012.pdf

http://coststudies.ucdavis.edu/files/2012/Alfalfa_IM_Butte_2012.pdf

If you do not have internet access and want a copy of either study, just notify my office at (530) 842-2711 and we can mail one to you.

Net Returns Per Acre Above Operating Costs

Price	YIELD (tons/acre)						
$/ton	4.50	5.00	5.50	6.00	6.50	7.00	7.50
125	100	155	209	258	319	373	428
150	213	280	347	408	481	548	615
175	325	405	484	558	644	723	803
200	438	530	622	708	806	898	990
225	550	655	759	858	969	1,073	1,178
250	663	780	897	1,008	1,131	1,248	1,365
275	775	905	1,034	1,158	1,294	1,423	1,553

Net Returns Per Acre Above Cash Costs

Price	YIELD (tons/acre)						
$/ton	4.50	5.00	5.50	6.00	6.50	7.00	7.50
125	9	64	118	167	227	282	337
150	121	189	256	317	390	457	524
175	234	314	393	467	552	632	712
200	346	439	531	617	715	807	899
225	459	564	668	767	877	982	1,087
250	571	689	806	917	1,040	1,157	1,274
275	684	814	943	1,067	1,202	1,332	1,462

Net Returns Per Acre Above Total Costs

Price	YIELD (tons/acre)						
$/ton	4.50	5.00	5.50	6.00	6.50	7.00	7.50
125	-386	-331	-277	-228	-167	-113	-58
150	-273	-206	-139	-78	-5	62	130
175	-161	-81	-2	72	158	237	317
200	-48	44	136	222	320	412	505
225	64	169	273	372	483	587	692
250	177	294	411	522	645	762	880
275	289	419	548	672	808	937	1,067

Fall Management of Irrigated Pastures and Grass Hay Fields. Is it important?

Many growers are familiar with the effect that fall harvest management has on alfalfa yield the following spring and the importance of adequate carbohydrates (commonly called root reserves) going into the winter. However, we typically don't give much consideration to fall management of irrigated pastures, but maybe we should. It can affect the ability of the plants to over-winter, determines when new growth is initiated in the spring, and impacts the productivity of the pasture.

Steve Fransen, Extension Forage Agronomist with Washington State University has extensively studied the importance of fall harvest management of grasses and written several articles on the topic. Overgrazing or cutting grasses at too low a height in the fall inhibits the rebuilding of root systems and the formation of shoots for spring growth.

Alfalfa stores carbohydrates in the crown and taproots that are later mobilized for spring growth. In contrast, grasses store much of the carbohydrates used for new growth in the bottom 3-4 inches of stubble and very little carbohydrates are stored in the fibrous root system. Fall is an important time period for grass development because the following years' seedhead meristems are actually established during September and October. This is also the time when the first generation of new grass roots is formed. Over the summer and during the winter many of the grass roots die and are shed while fall and early spring are the time periods of maximum root growth.

Many livestock producers want to maximize fall grazing to delay hay feeding and permit livestock to graze the fields down to nearly soil level. According to Fransen, this eliminates the major carbohydrate storage tissue—the bottom 3 to 4 inches of stubble—and by removing this stubble the grass must draw from its already meager root reserves for winter survival. This management practice can delay spring green up for weeks and up to a month. Therefore, it is advisable not to allow animals to graze lower than 3 or 4 inches from the soil surface for most grasses. The recommended height does vary slightly for different grasses as shown in the table below.

Table 1. Recommended residual heights for grasses during dormant periods (Fransen)

Grass	Minimum Stubble Height
Orchard Grass	3-4 inches
Smooth Brome	3-4 inches
Meadow Brome	3-4 inches
Tall Fescue	3-4 inches
Bluegrass	3-4 inches
Perennial Ryegrass	2 inches
Timothy	4–6 inches

Cool-season grass hay fields should never be cut lower than 3 inches in the fall because you will be cutting off the carbohydrates and nutrients that are produced from the previous season's tillers. These older tillers may appear brown and dormant in the fall but they aren't dead and their storage function is critical. If pastures are grazed or mowed lower than a 3-4 inch stubble height in the fall, carbohydrate reserves are reduced, the new tillers are starved and they are less protected and exposed to extreme weather. The end result of grazing or mowing too close to the soil surface is that root formation will slow or stop and the following spring tillers will grow slower and have fewer roots to support them.

Sometimes grass hay growers who own cattle like to graze the aftermath after the last grass hay cutting of the season. However, this practice can significantly damage the pasture. The stubble that remains after a hay cutting is high in carbohydrates and stored sugars and as such is very palatable to livestock. As discussed above, grasses with inadequate storage of basal sugars going into winter will have reduced root growth and less vigorous tillers come springtime.

This attention to grass stubble height in fall may be a new consideration for many growers/ranchers in our area who are accustomed to grazing fields hard in the fall to take full advantage of available forage. For growers who want to evaluate the impact of fall grazing management on their own, I would recommend close grazing on a portion of the pasture using your standard practice and leaving a stubble height of at least 3-4 inches on another area to compare the performance of the two areas next spring. Research in other areas shows that for long-term survival and high productivity of pastures and hayfields, growers should watch stubble heights and not graze below the recommended levels. The rationale for this practice makes sense and I think it is something that local growers/ranchers should consider.

2012 California Alfalfa and Grains Symposium-(Tentative Agenda)

Tuesday, December 11

8:00 a.m.- 5:00 p.m., Main Symposium Program

6:30 am Registration
7:00 am Exhibits Open
8:00 Introductions—Dan Putnam, UC Davis, Conference Chair
Welcome—Karen Ross, Secretary, California Dept. of Food and Agriculture

Industry Economic Trends—markets, global issues, dairies

Moderator: Steve Orloff, UCCE Farm Advisor, Yreka, CA

8:10 Current Hay & Forage Market Trends—Seth Hoyt, The Hoyt Report, Ione, California
8:35 Global Wheat Market Trends—Steve Wirsching, Director, US Wheat Associates West Coast Office, Portland, Oregon
9:00 Economic Trends for Dairies in California—Bill Van Damm, Alliance of Western Milk Producers, Sacramento, California
9:25 Discussion

Megatrends Affecting Alfalfa & Grain

Moderator: Janice Cooper, California Wheat Commission,

10:10 Megatrends: Fertilizer Supply & Cost Trends–Rob Mikkelsen, International Plant Nutrition Institute, Merced, California
10:35 Megatrends: What about California Water Prospects?--Sarge Green, CSU, Fresno, California
11:00 Megatrends: Emerging Water Quality Requirements for Irrigated Lands--Joe Karkoski, Irrigated Lands Program, Central Valley Water Quality Control Board
11:25 Megatrends: What are the strategies for future of water-use efficient alfalfa production systems? - Dan Putnam, UC Davis
11:50 Discussion

Breakout Session I: Producing Alfalfa from A to Z: What are the most important things to remember about producing a high yielding, high quality alfalfa crop?

Moderator: Rachel Long, UCCE Yolo County and Steve Orloff, UCCE Siskiyou County

1:30 Key Issues for Stand Establishment—Dan Putnam, Department of Plant Sciences, UC Davis
1:50 Variety Selection—Carol Frate, UCCE, Tulare, CA
2:10 Key Strategies for Weed Management—Mick Canevari, UCCE Emeritus, Stockton, CA
2:30 What are the Most Important things to remember about Insect Management?—Larry Godfrey, Department of Entomology and Nematology, UC Davis
2:50 Discussion
3:30 What are the most important Soil Fertility Issues for Alfalfa?-Tim Hays, Wilbur Ellis Co., Lancaster, CA
3:50 Key Irrigation Management Practices for Alfalfa—Blake Sanden, UCCE, Bakersfield, CA
4:10 Harvest Management Principles—Steve Orloff, UCCE, Yreka, CA
4:30 What are the Most Important Alfalfa Quality Attributes?—TBA
4:50 Discussion

Breakout Session II. Producing Wheat from A to Z. What are the absolutely most important things to remember about producing a high yielding, high quality wheat crop?

Moderators: Janice Cooper, California Wheat Commission and Doug Munier, UCCE, Glenn County

1:30 Wheat Variety Selection--Lee Jackson, CE Specialist Emeritus, UC Davis
1:50 Stand Establishment--TBA
2:10 Weed Management in Wheat--Steve Wright, UCCE, Tulare, CA
2:30 Nitrogen Management to Maximize Yield and Protein--Steve Orloff, UCCE, Yreka, CA
2:50 Discussion
3:30 Irrigation Managment--Mike Ottman, Agronomist, Arizona State University
3:50 Fungicides for Stripe Rust--Doug Munier, UCCE
4:10 Understanding Grain Quality--Gene Aksland
4:30 Marketing Grains--Geoff Schulz
4:50 Discussion

Wednesday, December 12

8:00 a.m.- 12:15 p.m., Main Symposium Program

Growth and Development of Wheat and Alfalfa

8:00 Introductions
8:05 Understanding Wheat Growth Development to Maximize Yield Potential—Mike Flowers, Oregon State University, Corvalis, Oregon
8:30 Current Advances in Genetic Improvement in Wheat—Jorge Dubcovsky, UC Davis
8:55 Understanding Growth and Development of Alfalfa to Enhance Management for Forage Yield and Quality—Larry R. Teuber, UC Davis
9:15 Envisioning the Future of Genetic Improvement in Alfalfa--TBA
9:40 Discussion
10:00 Break

Current Trends in Markets and Technology

10:30 Hay Export Situation and Prospects--World Demand For Forages--John Szczepanski, US Forage Export Council, Portland, Oregon
10:55 Innovations in Forage and Grain Harvesting Technology--Matthew Digman, USDA-ARS Dairy Forage Center, Madison, WI
11:20 Observations on Conservation Tillage with Forages and Grains and Promoting Change in Agriculture--Dino Ciacomazzi, Dairy Farmer, Hanford, CA
11:45 Discussion
12:00 ADJOURN

FIELD CROP NOTES

DATED MATERIAL

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