



So. Sacramento Valley Field Crops Report

October 16, 2012

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Southern Sacramento Valley Small Grains Trial – Weather Overview

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This 2011-12 grain season was almost the reverse of last season in terms of rainfall. This season started with a half-inch to an inch of rain in late October and then went to the end of December without any significant rain. I watched entire fields fail during that time. Many growers were forced to irrigate and some couldn't, even if they wanted to. Chart 1 shows what little rainfall we did receive in the southern Sacramento Valley. I have recorded the weather from nine weather stations in our region and we averaged 11.6 inches of rainfall this season. Last season we received a total average of 20.8 inches over this same period of October through June. The 30 year historic rainfall average for the UCCE office in Woodland, CA is 17.8 inches. Though we started out with poor soil moisture, we ended up at a good level later in the season with what I consider representative yields for those fields that made it through December. In Chart 2, for the same nine southern Sacramento Valley weather stations, I show that we had four possible frost events during the pre-boot through grain maturation period (March and April). The March 3rd and 8th dates probably were too early to cause damage. The March 18-19th event occurred at Colusa, Williams, and Dixon and just barely bumped the freezing point so were not likely to cause much damage. We did have one significant freeze on April 5th that I feel did cause some yield loss, but only in the Winters and Hastings areas. I did observe some partially frosted fields but the damage was less than last year. I saw no other serious weather related field conditions to note this season.

Cultivar Assessment Program

This 2011-12 small grains research project evaluated 17 cultivars for their commercial attributes in four environmentally distinct locations in the southern Sacramento Valley. There were 15 cultivars common to all four locations and 2 soft white cultivars unique to the dryland trial. This year's southern Sacramento Valley small grain trials show the effects of a dry November and December.

Average grain yield of the overall locations for 15 cultivars was 6,443 lbs/acre, which is an increase of 796 lbs/ac over last year's average yield. Triticale grain varieties continue to have the highest yields with Trical Brand 118 at 7,775 lbs/acre being the highest, and with a grain protein of 11.7%. WestBred's hard red wheat, WB-Rockland, brought in the highest average grain protein level at 13.2% and good test weight of 63.0 lbs/bu, but had a lower yield of 6,085 lbs/acre. Summit 515 had the best average hard red wheat yield at 6,912 lbs/acre. Disease pressure was moderate over all, with Redwing, WB-Cristallo, Sonora, and Wilt Wolkoring having a stripe rust problem. Patwin had the highest incidence of Barley Yellow Dwarf Virus (BYDV) I have ever seen.

Test Locations and Methods

I conducted four randomized block designed small grains trials, each replicated 3 times. Plot widths and lengths varied per location depending on grain drill used. Widths were 9, 11, or 13ft and lengths were 126 to 186 feet. Total acreage of the 4 locations was 7.8 acres. The following data was collected at all sites: plant population, days to heading from planting, head height, lodging, frost, foliar disease ratings for stripe rust,

leaf rust, barley yellow dwarf virus, septoria, and powdery mildew, harvest grain moisture, test weight, protein, falling number, all full grade data, and yield. Data was analyzed using UC MSTAT analysis of variance (ANOVA) and Duncan's Means Separation at 5% tests. Least Significant Difference (LSD) test and Coefficient of Variation (CV) were used where appropriate. Factorial analysis was conducted for the over locations comparison.

All tables for these results are available at:

http://ceyolo.ucanr.edu/Custom_Program724/Small_Grains_Studies/

2011-2012 Over Location Results by Variety, sorted by yield (Table provided at end of newsletter and online)

When all four locations are averaged, the triticale varieties all have the best yields. This season, Syngenta's Trical Brand 118 came out on top in yield at 7,775 lbs/acre with a test weight of 58.5 lbs/bu and protein of 11.7%. Significantly lower in yield were the other three triticale varieties. Trical Brand 115 had the best protein of this group, 12.1%. For the wheat varieties, Summit 515 had the best yields at 6,912 lbs/acre. Summit 515 has good test weight, fair protein, but consistently low falling numbers. If you grow this variety, always have your first harvest samples tested for falling numbers. The same is true for Blanca Grande 515, a high quality hard white variety with very good test weights and slightly lower yields than Summit 515. Cal Rojo is still in the middle of the group for yield and quality. I no longer recommend Redwing as it is now too susceptible to stripe rust. Rockland, at nearly 1,000 lbs/acre lower in yield, is still a variety to consider with its consistently high protein, averaging 13.3% and bushel weight of 63.0lbs/bu this season. Patwin has the best protein levels for the hard white wheat varieties and enhanced quality genes for Asian noodle production. Its weak spot is its susceptibility to Barley Yellow Dwarf Virus. I do not recommend durum production in our area. Yields are consistently lower than other wheat varieties you could grow.

E & H Farms Small Grain Trial (Table provided online)

Located three-quarters mile north of Sievers Rd. on the east side of Curry Rd. about 3.5 mile north of Dixon, CA. Soil: Brentwood clay loam. One irrigation. 15 varieties, 3 replications, planted flat. Tomato-grains-seed crop rotation. Plot width 9ft + 2ft border, length 126 ft. The grower applied a total 118.8 lbs/ac nitrogen in 2 applications; 100 lbs N/ac preplant as NH₃ and 80 lbs N/ac urea as a topdress by air in March. I use this location as an indicator of what the maximum yield potential is for each of the varieties grown in the lower Sacramento Valley. This year was no exception with an average yield for the trial of 6,871 lbs/acre. This is 160 lbs/ac lower than last year at this location.

Four **triticale** varieties topped out at 8,255 lbs/ac with an average yield of 7,853 lbs/ac. These varieties are bred for forage production but have turned out to be great feed grain producers. Unfortunately, seed availability is questionable at this time. Stripe rust pressure over all was less this season so I did not see very much on any the triticale varieties. Please keep a look out for stripe rust if you grow them.

Summit 515 with the two new stripe rust genes, Yr5 & Yr15, had the best **hard red** wheat yields at 7,415 lbs/ac beating out Camelot. At this location it had 12.1% protein and a good test weight of 62.7 lbs/bu. WB-Rockland (WestBred) came in 2nd at 7,101 lbs/ac. This variety appears to like additional nitrogen and consistently gets the best protein (13.2%) and test weight (63.4 lbs/bu). This was the first time I've seen Rockland beat Cal Rojo for yield. Redwing is now, in my opinion, too susceptible to stripe rust to plant in this area. Syngenta's new hard red SY314 had some seed contamination, looked like Camelot, and low yields and test weight.

I had four **hard white** wheat varieties this season. Blanca Grande had the best yield at 6,991 lbs/ac, good protein at 12.4%, and the highest test weight in the whole trial of 64.7 lbs/bu. Both Summit 515 and Blanca Grande 515 have low Falling Numbers so be sure to test your first harvest samples to make sure you're above the 300 min. threshold. Blanca Royale, usually a yield leader, did not perform as well this season. This

variety is not liked by the mills so it is not recommended. WB-Cristallo and Patwin (UC) are both high quality HW but do not yield very well. Patwin is also the most susceptible variety to BYDV I have seen.

Neither of the **Durum** varieties performed very well in this location and I do not recommend their planting in this area.

Hunn, Merwin & Merwin Small Grain Trial (Table provided online)

Located on east side of Jefferson Road, 0.1 mile north of Central Rd, 2mi. west of Clarksburg, CA. Soil type: Omni silty clay. One sprinkler irrigation. 15 varieties, 3 replications, planted flat, tomato–grains-alfalfa rotation. Plot width 13ft + 2ft border, length 186 ft. The grower applied a total 20 lbs N/ac in one preplant application using aqua ammonia. This wheat crop was following processing tomatoes. Very marginal soil moisture caused the grower to replant the field around my trial. It appears the mid-December sprinkler irrigation saved my trial. Low Falling Numbers (FN) plagued four varieties at this location. Much better protein levels in this location than other past Clarksburg locations.

Triticale varieties were at the top for yield with an average of 9,082 lbs/ac with Trical Brand 115 leading the group with 9,367 lbs/ac. Triticale varieties are a little slow at first as they start developing a deeper root system. This season's poor planting moisture slowed them even more, but with the sprinkler irrigation in December, all the varieties took off. I saw very little disease in the triticale plots. 158EP had the best test weight of the triticale varieties, but Camelot had the best protein by 1.8% over the other varieties.

Summit 515 topped the **hard red** wheat at this site but its low FN would have reduced its value. Cal Rojo, Redwing, and Rockland had adequate FN levels for the hard reds at this location. Rockland had the best protein at 13.3 %.

Blanca Royale and Blanca Grande 515 were the top two **hard white** wheat varieties. They were not significantly different in yield. Blanca Royale had the highest HW at 7,171 lbs/ac. Blanca Grande had low FN of 275 min. All hard white varieties had protein levels of 12% or more, with Patwin getting the highest at 13.1%.

Fortissimo, **Durum** wheat, did well here with the test weight of 64.6 lbs/bu, and yield of 7,553 lbs/ac. However, protein was still unacceptable for a durum at 11.4%. Durum wheat requires protein levels of 13% or greater.

McCormack Ranches Small Grains Trial (Table provided online)

Location on the south side of Montezuma Hills Road 2 miles east of Anderson Rd., west of Rio Vista, CA. Soil type: Clear Lake clay A and Diablo-Ayar on slopes. Dryland hills, no irrigation. 17 varieties, 3 replications, planted flat. 2 year Sheep-fallow-grains rotation. Plot width 13ft + 2ft border, length 155ft. The grower applied a total 21.5 lbs N/ac, with 85 units Aqua preplant and 41 lbs/ac 11-52-0 at planting. Very poor soil moisture in the first replication led to no stand. The other two reps were very weak until rains in December. The variety Volante never did recover and was lost. Russian wheat aphid also showed itself at this location, but did not create significant losses. Characteristically low yields are common in the dryland hills here; this season, with an average yield of 4,247 lbs/ac was no exception.

Trical Brand 118 had the best yield, 5,772 lbs/ac, but ten of the top yielding varieties were not significantly different. Stripe rust was seen in all the **triticale** varieties, heaviest in 118.

Summit 515 was the highest yielding **Hard Red** wheat in the hills. Rockland again showed its high quality ability with grain protein of 13.6%. Redwing had 100% stripe rust and suffered yield and quality losses.

Three **Hard White** wheats were similar in yield with Blanca Grande 515 on top at 5,381 lbs/ac. Patwin had the best protein at 12.8%, but also had 25% BYDV.

I had an additional 2 heirloom **Soft White** wheat varieties at this location. Sonora and Wit Wolkoring are very tall wheat varieties that lodged and are susceptible to stripe rust. Their response to very low soil moisture at planting was to wait and germinate very late in December and therefore had the best stands of the entire trial. Unfortunately, they had the lowest yields at 1,055 lbs/ac and 1,098 lbs/ac, respectively. For the two **durums** at this site, only Fortissimo yielded near the average at 4,170 lbs/ac with 13.2% protein. Volante was lost to the dry soil conditions at planting and never recovered.

Rominger Brothers Small Grains Trial (Table provided online)

Location Southwest corner of County Roads 29 and 89, north of Winters, CA. Soil type: Marvin silty clay loam & Tehama loam. No irrigation, 15 varieties, 3 replications. Tomato-wheat rotation, 60" beds. Plot width 11ft + 2ft border, length 152 ft. The grower applied a total 25 lbs N/ac, with 125 units Aqua preplant. This location has slightly warmer minimum temperatures than any other location in this study. Average yield for this trial location was 6,778 lbs/ac, just under E. & H. Farms, but with much less nitrogen.

The four **triticale** varieties were the best yielding with Trical Brand 118 having the best yield at 7,927 lbs/ac. No diseases were found in these varieties at this location. Camelot usually has the best protein of the four and set a best ever record at 14%. Test weights are a little low for the triticale, averaging 57.7 lbs/bu.

Unlike any other location, Redwing and Rockland had the best **hard red** wheat yields. This is the only location that Rockland did not reach 13% protein, getting 12.3% here. Redwing showed some stripe rust susceptibility here as everywhere else.

Blanca Royale, Cal Rojo, and Blanca Grande 515 all had similar yields. Patwin again showed some BYDV susceptibility along with Cal Rojo at this site. Unlike last year Blanca Grande did not lodge at any location this season.

Both **durum** varieties held up the bottom of the yield table at this site at around 5,150 lbs/ac with 12.3% protein. Durums require a significantly more amount of nitrogen and heat to produce the needed yields and protein levels expected by the industry. I do not recommend growing them for those reasons in our area.

2005 – 2012 Over Years by Location Small Grains Variety Comparisons (Table provided at end of newsletter and online)

This table is a view of how each of the varieties grown commercially in the southern Sacramento Valley has done since 2005. This is when the new strains of stripe rust removed all the old varieties we knew so well. I have lumped Summit and Summit 515 and also Blanca Grande and Blanca Grande 515 together for this comparison, even though very similar they are distinct varieties. I apologize to you purists.

Recommended Small Grain Cultivars for Southern Sacramento Valley

Hard Red varieties

Cal Rojo, Syngenta – good yields and disease resistance, fair protein, good test weight, OK FN

WB-Rockland, WestBred – lower yields, good disease resistance, very good test weight, highest protein, good FN

Summit 515 – best average yields, good field adaptability, lower protein, problem with falling numbers.

Hard White varieties – check with buyer before planting

WB-Cristallo, WestBred – OK yield, check for stripe rust, good to fair protein, good test weight, good quality

Blanca Grande 515, Syngenta – best white yield, good disease resistance, very good test weight, fair protein, marginal FN, popular with some mills

Patwin, UC – good yields, good disease resistance, fair protein, good test weight, good FN, high quality

Triticale – check with buyer before planting, seed availability questionable

Trical Brand 118, Syngenta – very good yields, some stripe rust, good protein, OK test weight

Trical Brand 115, Syngenta – very good yields, watch for stripe rust, good protein, OK test weight

Trical Brand 158EP, Syngenta – very good yields and disease resistance, low protein, OK test weight

Camelot, Syngenta – very good yields, some stripe rust, good protein, OK test weight

Durum – Do not plant without a contract, not recommended

Fortissimo – good yields and disease resistance, fair protein for a Durum, good test weight, fair quality

Grain Protein Enhancement Trial

In the southern Sacramento Valley, daily minimum temperatures decrease closer to the southern “delta” region. Historically, grain protein levels decrease in response to these cooler temperatures. Confusing this response are drought and other stress related responses that increase protein, but also increase dockage. Debate within this cooler region has questioned the ability to offset this response with additional nitrogen applications. This research project is an attempt to answer that question.

Three additional hard red wheat plot treatments were included within the Cultivar Assessment research program this season. These plots researched protein enhancement with additional nitrogen applications at 4 locations in the southern Sacramento Valley. The additional variety plots were Cal Rojo, WB-Rockland, and Summit 515. Each of these plots were subdivided into 5 nitrogen (N) treatment subplots. These N applications were in addition to whatever fertilizer the grower applied. This nitrogen, in the form of urea fertilizer, was applied at the jointing and flowering growth stages. Nitrogen treatments were: Control – no additional N; 30lbs/ac at jointing; 60lbs/ac at jointing; 30lbs/ac at jointing + 30lbs/ac at flowering; 30lbs/ac at jointing + 60lbs/ac at flowering. Results showed a small increase in plant height, yield and grain protein over the treatments and a slight decrease in test weight.

The complete report on the trial can be found at

http://cevalo.ucanr.edu/Custom_Program724/Small_Grains_Studies/

My Retirement Open House

For those few who do not know, I am retiring this October 31st. I first started working with cotton for UCCE Kern County seasonally in 1975. I have put in over 33 years of service with the University, including the past 12 years here at the UCCE Yolo County office. I have conducted research on cotton, tomatoes, peppers (sweet, hot), melons, squash, carrots, artichokes, beans (dry, fresh), potatoes, garlic, onions, sweet potatoes, corn (sweet, field), barley, oats, triticale, and wheat. There may be others, but I have forgotten. A lot can be done in 33 years!

If you would like to come say goodbye, we are having an open house on Tuesday, October, 30th here at our office in Norton Hall (70 Cottonwood Street, Woodland, CA 95695) between 4 and 6pm. Light refreshments will be provided. If you cannot make it, just know I have enjoyed working for the agricultural industry and getting to know all of you. Thank You!

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University of California and U.S. Department of Agriculture cooperating.

Chart 1. 2011 to 2012 Southern Sacramento Valley Small Grain Season Rainfall- inches

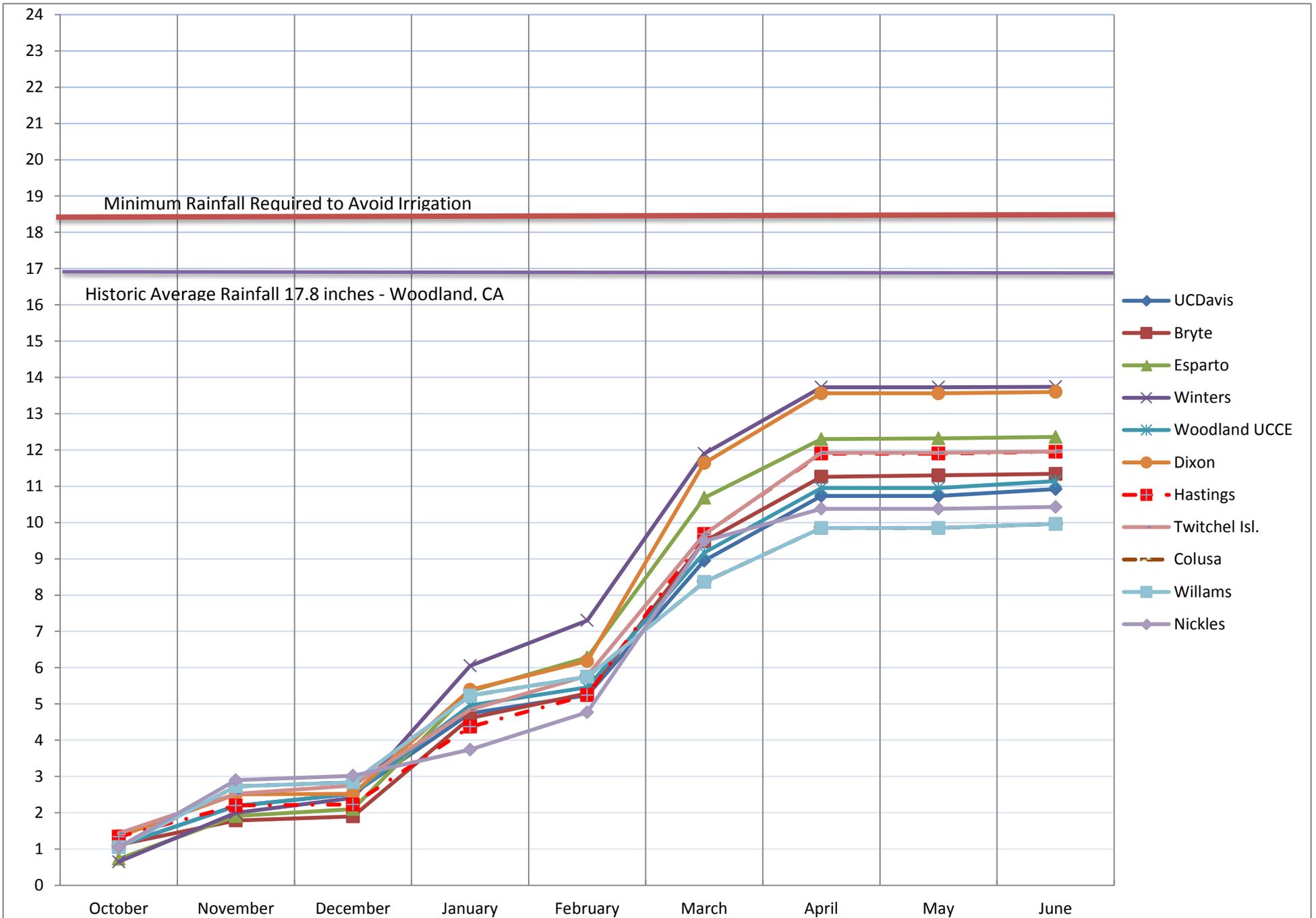


Table 1 2011-2012 SOUTHERN SACRAMENTO VALLEY SMALL GRAINS RESEARCH

Over Locations Summary by Variety Sorted By Yield											Adams Grading Results (NQI)			Duncan's Means@5% Separation
University of California Cooperative Extension - Kent L. Brittan											Falling No. (min)	Protein (%)	Test Weight (lbs./bu)	
Variety	Grain Color	Stand (Plants/ft ²)	Days to Heading	Plant Height (in)	Lodging (harvest)	Rating (1-8) ¹			Powdery					
						Stripe	Rust	BYDV Septoria	Mildew					
Trical Brand 118	TR	28	153	40	0	1	1	1	1.0	NT	11.7	58.5	7775	A
Trical Brand 115	TR	28	165	38	0	1	1	1	1.0	NT	12.1	58.5	7466	B
Trical Brand 158EP	TR	29	165	38	0	1	1	1	1.0	NT	11.6	58.4	7449	B
Camelot	TR	26	151	43	0	1	1	1	1.0	NT	12.9	57.7	7214	B
Summit 515	HR	26	154	36	0	1	1	1	1.3	338	11.7	62.4	6912	C
Blanca Grande 515	HW	25	150	37	0	1	1	1	1.0	328	11.9	64.4	6623	D
Blanca Royale	HW	29	153	34	0	1	1	1	1.0	417	12.4	61.6	6483	D
Cal Rojo	HR	26	153	33	0	1	1	1	1.0	389	12.0	60.6	6363	DE
SY314	HR	25	159	36	0	1	1	1	1.0	348	12.0	60.2	6192	E
Redwing	HR	28	155	34	1	4	1	1	1.0	385	12.1	59.7	6111	EF
Rockland	HR	28	153	33	0	1	2	1	1.0	402	13.2	63.0	6085	EF
Patwin	HW	28	191	36	0	1	3	1	1.0	402	12.6	60.0	5890	FG
WB-Cristallo	HW	26	161	37	2	2	2	1	1.0	392	11.9	62.0	5775	G
Fortissimo	DR	23	189	33	0	1	1	1	1.0	408	12.6	61.3	5624	G
Volante	DR	22	174	33	0	1	1	1	1.0	424	12.6	62.1	4687	H
Average		27	162	36	0	1	1	1	1.0	385	12.2	60.7	6443	
C.V.		9.9	6.3	1.8	529.9	36	16	7	NA	12.8	5.3	1.3	4.9	
L.S.D @5%		2.1	8.2	0.5	0.8	0.4	0.17	0.1		40.0	0.5	0.6	257.4	
Significance by Location		**	**	**		**	**			**			**	
Significance by Variety		**	**	**	**	**	**			**	**	**	**	
Significance by Interaction		**	**	**	**	**	**				**	**	**	

2 Factor Factorial Analysis - Location, A = Variety

** = significant 99% of the time

* = significant 95% of the time

¹ Foliar Disease Rating (1-8): 1=0-3%, 2=4-14%, 3=15-29%, 4=30-49%, 5=50-69%, 6=70-84%, 7=85-95%, 8=96-100%

Grain color/type: **HR** = Hard Red Wheat

DR =Hard Durum

TR = Triticale

NT = measurement not taken

No significant Lodging, Shatter, Leaf Rust, Loose Smut detected

NQI = National Quality Inspections, Inc.

Not recommended

Excellent	Dk. Green
Very Good	Lt. Green
Check	Lt. Yellow
Caution	Yellow
Problem	Lt. Red
Not recommended	Dk. Red

Table 6. 2005-2012 Over Years By Location Small Grains Variety Comparisons
University of California Cooperative Extension - Kent L. Brittan

Varieties		Dixon			Clarksburg			Esparto & Walnut Grove			Rio Vista		
		Averaged over Years	Yield (lbs/ac)	Protein (%)	Averaged over Years	Yield (lbs/ac)	Protein (%)	Averaged over Years	Yield (lbs/ac)	Protein (%)	Averaged Dryland Hills over Years	Yield (lbs/ac)	Protein (%)
Blanca Fuerte	HW	5	7907	10.9	4	4860	12.3	5	7698	10.5	2	3767	10.0
*Blanca Grande 515	HW	6	6178	12.0	5	5205	12.2	6	5959	10.7	3	4088	11.1
Blanca Royale	HW	7	6806	11.7	5	4491	11.9	6	6762	11.3	1	3202	10.8
Cal Rojo	HR	8	7070	11.6	7	5499	11.8	8	6629	11.1	3	3943	11.1
Camelot	TR	5	7738	11.3	4	6768	11.5	4	7882	11.4	2	4717	11.0
Clear White	HW	5	6110	11.8	4	4366	12.1	3	6403	10.2	1	3461	11.3
Desert King HP	DR	3	7215	10.8	1	4361	10.9	3	6042	11.8	1	3643	10.5
Espresso	HR	6	6382	12.3	5	4141	13.1	7	5964	11.5	2	2984	11.0
Fortissimo	DR	4	7261	11.3	3	6406	11.5	4	6625	11.8	2	3989	11.4
Lassik	HR	4	6769	11.6	3	4391	13.3	3	6704	10.7	0		
Patwin	HW	8	6753	12.2	6	4938	12.9	8	6599	11.6	3	3611	11.4
PR1404	MR	4	5396	11.6	3	5143	11.5	3	5528	10.9	0		
Redwing	HR	7	7252	11.7	6	5068	11.8	7	7154	10.9	3	3458	11.3
Rockland	HR	2	6587	12.6	2	5053	12.8	2	6549	12.7	2	3396	12.5
*Summit 515	HR	6	7314	10.8	6	5860	11.1	6	7148	10.3	3	4167	10.8
Trical Brand 115	TR	1	7674	12.6	1	9367	10.7	1	7380	12.9	1	5445	12.2
Trical Brand 118	TR	7	6542	11.2	6	6021	10.4	7	7257	11.6	3	4760	11.2
Trical Brand 158EP	TR	3	9210	9.9	2	7784	9.9	2	7708	11.2	2	4751	10.4
WB-Cristallo	HW	4	5705	12.7	3	6514	12.7	4	6260	13.3	2	1055	12.2

* Summit and Summit 515 - are similar enough in growth, yield, and quality that I combined them for this comparison.

* Blanca Grande and Blanca Grande 515 - are similar enough in growth, yield, and quality that I combined them for this comparison.