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University of California
Agriculture and Natural Resources
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UCCE

Kern County Field Crops

October 2014

2014 Kern County Wheat Variety Performance Trial

The 2014 California wheat crop was 560,000 acres including 47,000 acres of durum wheat. Non-durum acreage decreased 106,000 acres from 2013, a 17% decrease. Durum wheat acreage decreased almost 66% since 2012. The multi-year durum acreage average is 104,000 acres with the low and high at 47,000 acres and 176,000 acres in 2014 and 2009, respectively. Over 60 percent of the common wheat acreage was planted to Summit 515 (90,000 acres), WB-Patron (83,000 acres), PR 1404 (63,000 acres), Cal Rojo (48,000 acres), and Joaquin (25,200 acres). This represents a change in variety preference. There were increased plantings of Summit and Patron. Only 15% of the planted acreage was white wheat. Blanca Grande 515 (14,800 acres) led the hard white wheat acreage in the state and the San Joaquin Valley. Orita (9,000) was the leading durum variety. Volante, Fortissimo and Desert King HP were the most widely planted Durum wheat varieties in the San Joaquin Valley representing 82% of the acreage.

Cereal grain variety evaluations were conducted at multiple locations throughout California. The Kern County results are shown in Tables 1 and 2. The tests included advanced breeding lines but only the top yielding experimental varieties is included in these tables. Multi-site/year averages and additional information are included in an Agronomy Progress report published annually. Copies are available at the local county extension office or on the web at

http://agric.ucdavis.edu/crops/cereals/cereal.htm.

Varietal differences in Stripe Rust resistance, based on observations from the 2013 University of California statewide variety tests, are as follows:

Common Wheat	
Highly Susceptible:	Anza, Joaquin, Mika, Triple IV, FV 2808
Susceptible:	Express, Redwing, PR 1404, Ultra
Resistant:	Blanca Royale, Blanca Grande 515, Cal Rojo, Lassik, New Dirkwin, Patwin, Patwin 515, WB-Patron, WB-Joaquin Oro, WB-Perla

Table 1. 2013 Kern County Durum Wheat Variety Trial Results.

Cultivar	Grain Yield	Test Weight	Plant Height	†BYDV	Black Point	Protein	Lodging @ Harvest
	-- lbs/acre --	-- lbs/bu --	-inches -			-- % --	
DESERT KING	8270	62.1	40	2.0	1.0	12.50	1.0
WESTMORE	8170	61.3	37	2.7	1.5	11.26	1.0
PLATINUM	7910	61.7	37	3.3	1.0	11.70	1.7
UC-MIWOK	7860	62.9	40	2.3	1.0	12.16	2.0
APB-TIBURON	7790	61.5	38	2.3	1.5	11.53	1.7
UC-TIPAI	7770	62.4	39	3.0	1.0	11.98	1.0
DESERT KING-HP	7500	60.7	39	2.7	1.0	11.99	1.0
CROWN	7180	58.5	43	2.7	1.0	11.40	3.0
DURAKING	7100	60.7	38	4.0	1.0	11.56	1.3
MAESTRALE	7100	62.2	45	4.3	1.0	11.30	2.0
WB-MOHAVE	7070	61.6	39	2.7	1.0	11.82	3.3
ORITA	6650	59.5	40	2.7	1.0	12.07	1.7
VOLANTE	6530	60.7	37	1.0	1.5	12.08	1.0
HAVASU	6460	61.0	45	3.0	2.0	12.37	1.3
KRONOS	6420	59.3	42	3.3	2.0	12.07	1.0
TOPPER	6410	60.7	43	4.0	1.0	11.30	1.0
FORTISSIMO	5820	60.0	39	2.7	1.0	12.57	1.0
Q-MAX	5670	57.6	44	4.0	1.0	11.87	2.3
WB-MEAD	5460	59.7	40	4.7	1.0	12.00	2.7
SARAGOLLA	4400	61.4	35	4.3	1.0	11.32	1.7
†† LCS KIKO	8470	61.8	42	1.3	1.0	10.82	1.0
UC 1756	8440	62.2	40	2.0	1.0	11.17	1.0
Mean	7030	61.1	40	2.7	1.2	11.66	1.8
CV %	8.35	0.9	3.8	30.4	26.4		96.1
$LSD_{0.05}$	974.26	0.9	2.53	1.4	0.5		ns

†Ratings scale for diseases (area of flag leaf affected): 1 = 0-3%, 2 = 4-14%,
3 = 15-29%, 4 = 30-49%, 5 = 50-69%, 6 = 70-84%, 7 = 85-95%, 8 = 96-100%.
BYDV, lodging, and black point ratings (see scale above) were based on percentage of plants (or seeds) showing symptoms.
††Top yielding experimental varieties included for comparison.

Planted:	December 2013
Prior Crop:	cotton
Fertilizer:	about 365# N total
Seeding Rate:	1,200,000 seeds/acre
Water Applied	about 2.5 acre feet
Harvested:	July 2013

Table 2. 2010 Kern County Common Wheat and Triticale Variety Trial Results.

Cultivar	Grain Yield	Test Weight	Plant Height	†BYDV	Black Point	Protein
	-- lbs/acre --	-- lbs/bu --	-inches -		%	
Wheat						
BLANCA GRANDE 515	6880	64.2	41	1.8	11.15	2.0
SUMMIT 515	6880	61.1	37	3.0	11.26	1.0
JOAQUIN	6630	61.1	38	4.0	12.12	1.0
SY 314	6280	59.1	38	3.0	11.65	1.0
REDWING	6200	58.8	34	3.3	12.18	1.0
LCS-STAR	6150	59.4	42	3.0	11.40	1.3
ULTRA	6090	60.9	37	3.0	11.87	1.0
WB-JOAQUIN ORO	6000	62.2	41	3.0	12.39	1.0
WB-9229	5890	61.2	37	5.0	12.67	1.0
BLANCA ROYALE	5820	59.7	34	3.5	12.21	2.3
LCS-ATOMO	5640	59.8	36	3.8	12.02	1.0
PATWIN 515	5620	58.1	34	2.0	12.19	1.0
LASSIK	5590	59.8	38	2.8	11.86	1.0
WB-PERLA	5590	58.5	37	3.0	11.98	1.0
ANZA	5510	60.2	41	3.8	10.45	2.0
WB-ROCKLAND	5430	60.0	34	4.5	12.48	1.0
PATWIN	5260	57.2	36	4.0	12.35	1.0
FV 2808	5140	59.2	40	6.0	10.30	1.0
TRIPLE IV	5070	60.2	41	4.0	11.64	3.0
CAL ROJO	5040	56.7	35	4.8	12.30	1.0
PR 1404	4880	57.3	41	4.3	11.33	1.3
SY-VACA	4880	56.3	46	4.8	11.09	1.3
WB-PATRON	4650	57.2	40	4.3	12.59	1.3
NEW DIRKWIN	3920	55.8	44	3.3	11.24	1.0
MIKA	3590	55.3	45	5.3	13.24	1.0
APB 12104††	7420	61.2	41	3.3	10.70	1.5
Triticale						
WB-PACHECO	7900	58.9	45	1.0	-	1.0
SY 115T	7130	56.8	38	2.3	-	1.0
CAMELOT	6800	54.7	43	1.0	-	1.0
SY 158T	6330	55.2	36	1.0	-	1.0
TRICAL 105	6110	56.5	44	4.0	-	1.0
Mean	5750	59.1	40	3.5	11.81	1.4
CV %	6.73	1.2	3.46	21.1	-	40.2
$LSD_{0.05}$	549.04	1.0	1.97	1.1	-	0.8

†Ratings scale for diseases (area of flag leaf affected) and lodging: 1 = 0-3%, 2 = 4-14%, 3 = 15-29%, 4 = 30-49%, 5 = 50-69%, 6 = 70-84%, 7 = 85-95%, 8 = 96-100%.
BYDV and lodging (see scale above) were based on percentage of plants (or seeds) showing symptoms.
††Top yielding experimental variety included for comparison.

Nitrogen Fertilizer Recommendation Based on Early-Spring Chlorophyll Meter Readings

Nitrogen fertilizer is the most used and often the most mismanaged nutrient input. Nitrogen management has tremendous implications on crop productivity, quality and environmental stewardship. Sufficient nitrogen is needed to optimum yield and quality. Soil and in-season plant tissue testing for nitrogen status are a time consuming and expensive process. Real time sensing of plant nitrogen status can be a useful tool in managing nitrogen inputs. The following is the result of multi-year, multi-location project to assess the usefulness of using chlorophyll meters for making nitrogen fertilizer recommendations in wheat.

Plots at multiple locations in the southern San Joaquin Valley had nitrogen applications of 0, 100, 200, and 300 lbs. nitrogen per acre applied at planting. At growth stage Feekes 5, nitrogen was applied so that each plot had received a total of 300 lbs N/acre. Plant nitrogen status was tested at Feekes 5 and 10 (tillering and flag leaf extension). Plant nitrogen measurements were made by reflectance, transmittance/absorbance, and wet chemistry.

Good correlations (R^2>0.80) were observed between meter readings and V5 nitrogen concentration (Figure 1). There were some differences between varieties at the different locations. The difference between the meter reading of the well fertilized treatment and the other treatments was calculated.

Grain yields were equivalent for all locations where total nitrogen applied was the same. The total nitrogen applied was greater than the typical amount (50 to 100 lbs N/A depending on yield potential). There was not a decline in yield for over fertilization that can occasionally occur. Once the crop was sufficiently fertilized meter readings became inconclusive and were of no benefit for determining nitrogen status, silage yield and protein and grain yield and protein.

Early season nitrogen fertilizer recommendation is as follows:

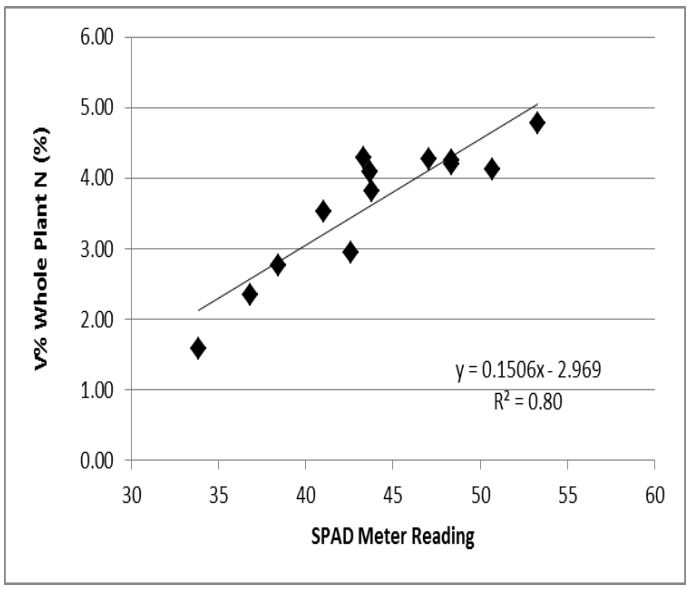
Apply the expected full nitrogen fertilizer rate on a reference area at least three weeks prior to sampling where plants are actively growing. The reference area should be representative of the field and can be several small areas throughout the field or a strip through the field. Meter measurements should be made mid leaf on the upper most fully exposed leaf for greatest consistency and accuracy. Plants and leaves that are not representative of the field, under stress or insect damaged should not be sampled. At Feekes 5 to 6, compare the readings from the reference areas to readings from the remainder of the field. Because individual plants vary, at least 30 readings should be made throughout the field and reference area. The difference between the averages of the readings will give an indication of the need for additional nitrogen fertilizer.

The nitrogen rate calculation is: $N = 40 + 14D$ using the SPAD meter
$N = 20 + 12D$ using the CCM 200 meter

Where:
N = Recommended Nitrogen Rate in lbs N/A
D = Difference in meter reading between measured crop and reference area

As an example, if the average meter reading between the fertilizer reference sites and the field was 10, then the recommendation nitrogen fertilizer rate would be 40 + (14 * 10) for a total of 180 lbs N/A.

Figure 1. V5 Tissue Nitrogen Concentration versus SPAD or CCM 200 Meter Reading.



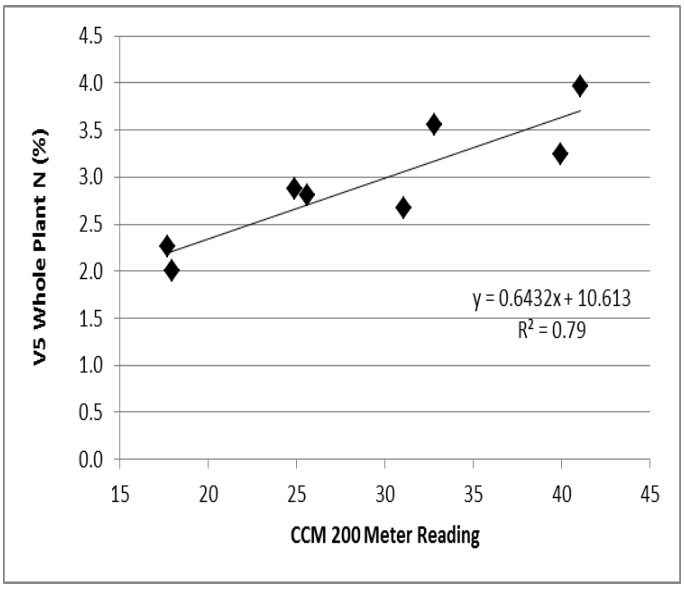
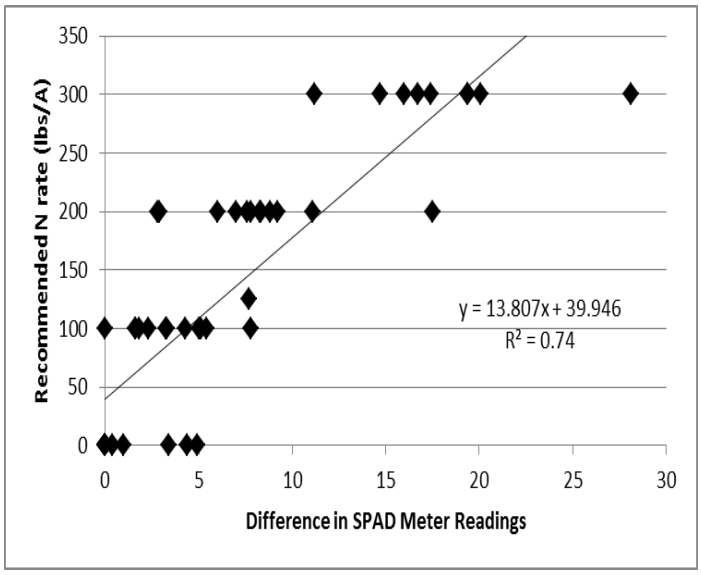
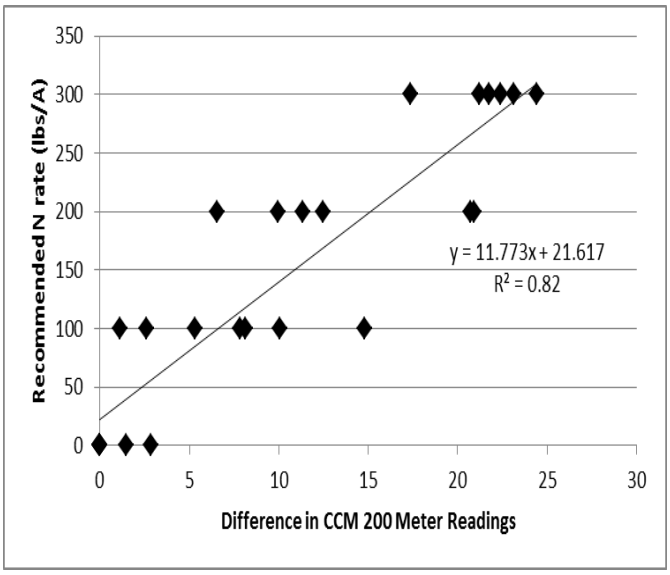


Figure 2. Recommended Nitrogen Rate versus SPAD or CCM 200 Differentials.





Disclaimer: Discussion of research finding necessitates using trade names. This does not constitute product endorsement, nor does it suggest products not listed would not be suitable for use. Some research results included involve use of chemicals, which are not currently registered for use, or may involve use which would be considered out of label. These results are reported but are not a recommendation from the University of California for use. Consult the label and use it as the basis of all recommendations.

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