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Choosing Wheat and Barley Varieties for the 2004 Crop

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Choosing Wheat and Barley Varieties for the 2004 Crop

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Choosing a good wheat or barley variety for the 2004 crop has never been more important. This past year many of the older varieties produced poor yields and quality. The extended wet and cool spring weather was very favorable for disease development, but the continuing development of new strains of the wheat stripe disease may be a more important factor to consider in selecting wheat varieties to plant for the 2004 crop.

This article summarizes UCCE variety testing in the Sacramento Valley for wheat and barley, under both irrigated and rain fed conditions. Be careful when reviewing the tables to note whether they are for irrigated, or rain fed conditions.

Wheat Yields

This year's wheat yields in the Sacramento Valley were severely impacted by wheat stripe rust disease. New races of wheat stripe rust are continuing to develop. Many previously resistant varieties: Anza, Yolo, Klasic, Serra and Yecora Rojo, had high levels of stripe rust throughout the Central Valley in the 2003 crop. Express' grain yields and quality were less effected, but were much lower in the 2003 trials.

The yield results for eleven Sacramento Valley UC Cooperative Extension trials over 2001 to 2003 are given in Table 1. Summit is the highest yielding variety over these three years, averaging 6,120 pounds per acre. Over this same three years Express' grain yield is about 2,000 pounds per acre less yield than Summit, averaging 4,180 pounds per acre.

The three year average Express' yields are higher because this variety was not even moderately effected by wheat stripe rust in the 2001 and 2002 trials. However, Express' three year average yield was decreased by severe shattering losses in the 2002 UC Davis trial. The very wheat stripe rust tolerant variety, Plata which is a hard white wheat, also had low yields due to shattering in this trial.

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Wheat Protein

The new variety, Summit, is a good option if yield is more important than producing high protein grain. Summit's protein content is usually in between Express' protein and the much lower protein varieties like Yolo and Anza. The protein results are shown in Table 2. In UCCE trials over the three year period, 2001 to 2003, Express averaged 0.8 percent protein higher than Summit.

Even if Express has produced high protein grain before, it is a much riskier choice this year. If Express is planted, then a fungicide application may be needed in the spring. Express' severe yield reductions in 2003 were likely due to a combination of new strains of wheat stripe rust disease and the extended wet spring weather of 2003. If 2004 has more typical spring weather, the importance of these two factors on Express' performance will be clearer.

Wheat Milling versus Feed Grain

The anticipated price difference between milling quality grain and feed grain will be an important factor in selecting a wheat variety this year. A review of average milling and feed wheat prices received in the Sacramento Valley during the past few years would be helpful in making this decision.

Another important option is to try to raise the protein levels of Summit and Stander to milling quality by additional nitrogen. Many UC trials over the past 15 years have shown a 1 to 2 percent increase by the addition of 40 pounds of actual nitrogen during the late boot stage to early flowering stage. Given the very high yields of these two varieties this would be a good time to try this, on at least a limited acreage.

Wheat Stripe Rust Ratings

Wheat stripe rust ratings for the four Sacramento Valley trials are shown in Table 3. Be sure to read the disease rating scale in the heading of the table. The ratings range from 1 to a maximum of 8, but a rating of a 4 could be as high as 49 percent infection of the flag leaf. Summit, Stander and Plata had very low areas of the flag leaf affected by stripe rust, less than 4 percent.

Rain Fed Wheat

The results of two rain fed wheat trials done in the Sacramento Valley during the last three years are shown

in Table 4. The Glenn 2003 trial had severe wheat stripe rust disease, but the newer tolerant varieties produced yields similar to irrigated wheat.

Irrigated Barley

Barley is not commonly grown in the Sacramento Valley. Barley is not effected by wheat stripe rust, but has a new disease of its own, barley stripe rust. This disease first appeared in the late 1990's and eliminated many barley varieties. Yield decreases from barley stripe rust have decreased the barley acreage statewide.

However, there are two new barley varieties, UC 937 and UC 933, which have good resistance to barley stripe rust. They also have resistance to scald and net blotch, diseases that are at least partially responsible for barley not commonly being grown in the Sacramento Valley. As long as this disease resistance lasts, it makes barley an option in the Sacramento Valley. Table 5 is a yield summary of six trials over a three year period for several barley varieties.

UC 937 had severe shattering losses in the Butte 2002 trial resulting in a much lower yield than UC 933. UC 937 has a weakness of losing the entire head if winds occur after the grain is mature. Harvesting UC 937 as soon as it is mature will be important if windy weather occurs. UC 933 is a newer variety and seed is limited. UC 937 is capable of very similar yields to UC 933, but must be managed carefully to avoid severe shattering losses.

Rain Fed Barley

There was only one rain fed barley trial in the Sacramento Valley in 2003, so the results of several trials from the southern part of the state are included in Table 6. The good growing conditions in the Glenn County trial and the extended wet spring resulted in yields similar to irrigated conditions.

Summary

There are fewer choices of both wheat and barley varieties for the 2004 crop, but there are several good ones of both wheat and barley. However, in this rapidly changing disease situation, consider planting more than one variety to decrease your risk of severe losses from any varietal characteristic effecting wheat and barley yields and quality.

Table 1: 2001-2003 Sacramento Valley **irrigated** wheat yield summary. Yields are in pounds per acre and the numbers in parentheses indicate the relative rank in the column.

| Variety | Average 2001-03 11 Loc/Yr | Butte | | | Colusa | | UC Davis | | | Sac/SJ Delta | | |
|----------------------|---------------------------------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|--------------|-----------|-----------|
| | | 2003 | 2002 | 2001 | 2003 | 2001 | 2003 | 2002 | 2001 | 2003 | 2002 | 2001 |
| ANZA | 4410 (4) | 2750 (22) | 6700 (17) | 6190 (06) | 2710 (18) | 5850 (08) | 2420 (7) | 4470 (16) | 4720 (23) | 3510 (5) | 4040 (22) | 5190 (24) |
| YECORA ROJO | 3330 (15) | 1920 (32) | 5420 (41) | 4850 (40) | 660 (30) | 5630 (15) | 980 (10) | 3660 (29) | 4670 (26) | 360 (11) | 3390 (45) | 5060 (30) |
| YOLO | 3950 (10) | 2290 (29) | 6800 (12) | 6150 (07) | 850 (28) | 5290 (25) | 1630 (9) | 4070 (24) | 4680 (25) | 2120 (9) | 3810 (30) | 5760 (12) |
| KLASIC | 4320 (6) | 2430 (26) | 5960 (31) | 6320 (04) | 1760 (27) | 6440 (01) | 1670 (8) | 4380 (17) | 5630 (12) | 2450 (8) | 4420 (04) | 6020 (08) |
| SERRA | 4150 (9) | 3770 (15) | 5500 (39) | 6140 (08) | 2700 (19) | 5150 (29) | 2730 (6) | 4700 (11) | 4530 (31) | 2530 (7) | 3520 (40) | 4410 (38) |
| EXPRESS | 4180 (7) | 4040 (13) | 5450 (40) | 5680 (23) | 3870 (15) | 4910 (38) | 3350 (5) | 1790 (43) | 5130 (17) | 3200 (6) | 3460 (42) | 5110 (27) |
| BONUS | 3850 (11) | 2030 (31) | 6590 (19) | 6100 (11) | 170 (36) | 6240 (03) | 670 (11) | 4270 (19) | 5440 (14) | 610 (10) | 3770 (35) | 6440 (02) |
| STANDER | 5600 (2) | 4980 (6) | 6880 (10) | 5790 (20) | 6110 (5) | 5580 (16) | 5540 (3) | 5650 (01) | 6060 (04) | 5980 (3) | 3780 (33) | 5250 (21) |
| SUMMIT | 6120 (1) | 6000 (1) | 7610 (03) | 5660 (24) | 7570 (1) | 5900 (07) | 6260 (1) | 4120 (22) | 6540 (01) | 7310 (1) | 4030 (23) | 6300 (04) |
| PLATA | - | 5880 (2) | 6100 (30) | | 7240 (2) | | 6260 (2) | 2900 (40) | | 6890 (2) | 4070 (18) | |
| BETH HASHITA | 4650 (3) | 3880 (14) | 6100 (29) | 5940 (15) | 4810 (13) | 4920 (37) | 4700 (4) | 2280 (42) | 4930 (20) | 5720 (4) | 2600 (57) | 5220 (22) |
| CV | 9.5 | 14.6 | 7 | 5.3 | 12.7 | 6.4 | 10.8 | 10.5 | 7.4 | 6.8 | 10.4 | 5.3 |
| LSD _(.05) | 170 | 660 | 550 | 450 | 560 | 440 | 450 | 720 | 530 | 310 | 740 | 420 |

Table 2: 2003 common **irrigated** wheat grain protein summary for the Sacramento Valley. Grain Protein % is expressed at 12% moisture basis.

| Variety | Average 2001-03 10 Loc/Yr | 2003 | | | |
|----------------------|---------------------------------|-------|--------|-------------|-----------------|
| | | Butte | Colusa | UC Davis | Sac/SJ Delta |
| ANZA | 11.4 | 11.0 | 11.7 | 11.6 | 12.0 |
| YECORA ROJO | 12.8 | 12.8 | 12.9 | 13.4 | 13.7 |
| YOLO | 11.4 | 11.2 | 12.3 | 12.7 | 11.8 |
| KLASIC | 12.6 | 12.8 | 13.2 | 13.8 | 13.1 |
| SERRA | 12.4 | 12.6 | 12.8 | 13.4 | 13.8 |
| EXPRESS | 13.3 | 13.2 | 12.8 | 13.1 | 13.7 |
| BONUS | 12.1 | 13.1 | - | 13.9 | 13.8 |
| STANDER | 12.6 | 12.4 | 11.9 | 13.2 | 12.6 |
| SUMMIT | 12.5 | 12.9 | 12.3 | 12.4 | 13.4 |
| PLATA | | 11.4 | 12.0 | 12.3 | 12.3 |
| BETH HASHITA | | 12.2 | 11.7 | 12.4 | 12.7 |
| LSD _(.05) | 0.9 | | | | |

Table 3: 2003 Wheat stripe rust summary for the Sacramento Valley. The rating (percentage of the flag leaf affected) scale is: 1 = 0-3%, 2 = 4-14%, 3 = 15-29%, 4 = 30-49%, 5 = 50-69%, 6 = 70-84%, 7 = 85-95%, and 8 = 96-100%. The numbers in parentheses indicate the relative rank in that column.

| Variety | Average (4 locations) | Butte | Colusa | UC | Sac-SJ |
|----------------------|--------------------------|-------|--------|-------|--------|
| | | | | Davis | Delta |
| ANZA | 4.5 (07) | 5.0 | 4.5 | 5.3 | 3.0 |
| YECORA ROJO | 7.7 (11) | 7.5 | 7.3 | 8.0 | 7.8 |
| YOLO | 6.8 (08) | 4.8 | 8.0 | 8.0 | 6.5 |
| KLASIC | 7.3 (09) | 7.0 | 8.0 | 8.0 | 6.3 |
| SERRA | 4.5 (06) | 4.0 | 4.5 | 5.5 | 3.8 |
| EXPRESS | 3.5 (05) | 3.0 | 5.0 | 2.8 | 3.0 |
| BONUS | 7.5 (10) | 8.0 | 8.0 | 8.0 | 5.8 |
| STANDER | 1.2 (02) | 1.0 | 1.3 | 1.3 | 1.0 |
| SUMMIT | 1.5 (03) | 1.3 | 1.5 | 1.8 | 1.3 |
| PLATA | 1.0 (01) | 1.0 | 1.0 | 1.0 | 1.0 |
| BETH HASHITA | 1.6 (04) | 1.0 | 2.3 | 2.0 | 1.0 |
| CV | 13.6 | 19.4 | 8.9 | 12.3 | 11.5 |
| LSD _(.05) | 0.3 | 1.1 | 0.6 | 0.9 | 0.7 |

Table 4: 2001-2003 Sacramento Valley **rainfed** wheat yield summary. Yields are in pounds per acre and the numbers in parentheses indicate the relative rank in the column.

| Variety | Average | Glenn 2003 | Yolo 2001 |
|-------------|---------------------|---------------|--------------|
| | 2001-03 2 Loc/Yr | | |
| ANZA | 1665 (8) | 2070 | 1260 |
| YECORA ROJO | 1745 (6) | 2210 | 1280 |
| YOLO | 1720 (7) | 1940 | 1500 |
| KLASIC | 2295 (4) | 3070 | 1520 |
| SERRA | 1875 (5) | 2380 | 1370 |
| EXPRESS | 2750 (3) | 3770 | 1730 |
| BONUS | 1105 (9) | 820 | 1390 |
| STANDER | 3350 (2) | 5050 | 1650 |
| SUMMIT | 3795 (1) | 5780 | 1810 |
| PLATA | | 6030 | |
| CV | 38.0 | 32.9 | 28.4 |
| LSD (.05) | - | 1280 | 580 |

Table 5: 2000-2003 Sacramento Valley **irrigated** barley yield summary. Yields are in pounds per acre and the numbers in parentheses indicate the relative rank in the column.

| Variety | Average | Butte | | | UC Davis | | |
|-----------|---------------------|----------|-----------|-----------|----------|-----------|-----------|
| | 2001-03 6 Loc/Yr | 2003 | 2002 | 2001 | 2003 | 2002 | 2001 |
| UC 603 | 4740 (5) | 4880 (6) | 4070 (07) | 4040 (11) | 6250 (5) | 4630 (03) | 4570 (09) |
| PATTI | 5438 (3) | 6760 (1) | 5450 (04) | 5010 (05) | 7600 (3) | 3390 (09) | 4420 (10) |
| UC 933 | 6207 (1) | 6620 (3) | 6090 (01) | 5280 (04) | 8570 (1) | 5060 (02) | 5620 (02) |
| UC 937 | 5532 (2) | 6690 (2) | 3750 (08) | 5370 (02) | 7670 (2) | 4260 (04) | 5450 (05) |
| MELTAN | 4198 (6) | 4960 (5) | 3210 (10) | 4250 (10) | 5420 (6) | 2220 (10) | 5130 (06) |
| UC 969 | 4970 (4) | 6470 (4) | 3380 (09) | 4390 (08) | 6980 (4) | 3970 (05) | 4630 (08) |
| CV | | 7.3 | 19.8 | 11.8 | 8.3 | 21 | 8.3 |
| LSD (.05) | | 710 | 1130 | 760 | 920 | 930 | 570 |

Table 6: 2000-2003 Sacramento Valley **rainfed** barley yield summary.

Yields are in pounds per acre and the numbers in parentheses indicate the relative rank in the column.

| Variety | Average 2001-03 (7 loc/yr) | Glenn | San Luis Obispo | | | Tulare | | |
|----------------------|----------------------------------|-------|-----------------|------|------|--------|------|------|
| | | 2003 | 2001 | 2002 | 2003 | 2001 | 2002 | 2003 |
| UC 603 | 2510 (6) | 5650 | 2010 | 4460 | 920 | 380 | 1940 | 2190 |
| MAX | 2090 (8) | 5040 | 1010 | 3980 | 1200 | 670 | 1420 | 1320 |
| PATTI | 2310 (7) | 5200 | 1710 | 3790 | 900 | 550 | 1900 | 2110 |
| UC 933 | 3050 (1) | 6870 | 3010 | 5360 | 770 | 930 | 1930 | 2450 |
| UC 937 | 2840 (4) | 6530 | 2040 | 4240 | 1340 | 800 | 2370 | 2580 |
| MELTAN | 2890 (2) | 5320 | 2790 | 5080 | 1180 | 1120 | 2240 | 2500 |
| UC 969 | 2540 (5) | 6020 | 2660 | 3410 | 810 | 500 | 2220 | 2170 |
| CV | 19.2 | 13.0 | 23.7 | 14.2 | 45.7 | 41.3 | 15.3 | 11.0 |
| LSD _(.05) | 270 | 1140 | 790 | 890 | 690 | 510 | 430 | 340 |

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