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2001 REGIONAL BARLEY, COMMON AND DURUM WHEAT, TRITICALE, AND OAT PERFORMANCE TESTS IN CALIFORNIA[1]

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University of California Cooperative Extension cereal evaluation tests were conducted in the intermountain valleys of northeastern California; the Sacramento, San Joaquin, and Imperial Valleys; and in the south central coastal region in 2001. Entries in the tests included standard cultivars, new and soon-to-be released cultivars, and advanced breeding lines from both public and private breeding programs. Fall-sown spring barley (23 entries) was evaluated at 6 locations and spring-sown spring barley (40 entries), at two locations. Fall-sown spring wheat (66 entries total) was evaluated at 12 locations (not all entries were evaluated at all locations); spring-sown spring wheat (23 entries), at one location, and durum wheat (43 entries), at 6 locations. Fall-sown spring triticale (8 entries) was evaluated at 3 locations. Fall-sown spring oat (20 entries) was evaluated at 2 locations.

Tests were conducted at University of California Field Stations or in fields of cooperating growers. Tests were sown at seeding rates of 1.2 million seeds per acre for common and durum wheat tests if irrigation was planned and at 1.0 million seeds per acre for rainfed wheat and all barley, oat and triticale tests. Randomized complete block designs with four replications were used. Each plot was nine drill rows wide (5 to 6-inch row spacing) and 20 feet long, except at the UC Desert Research and Extension Center (Imperial) where plots were 16 feet long. Grain was harvested with a Wintersteiger Seedmaster Universal 150 plot combine. Foliar diseases were assessed at the soft-to-medium dough stage of growth by estimating the percentages of areas of penultimate leaves (flag-1 leaf) affected. BYD assessments, however, were based on the percentage of plants showing symptoms. Black point was assessed on grain samples of durum wheat after harvest. Yield, test weight, kernel weight, plant height, days to heading and maturity, lodging, shattering, disease reaction, and grain quality were determined as indicated in the tables. Information regarding each site is given in Table 1.

The small grain crop for the 2001 season in California included nearly 580,000 acres of wheat (including 80,000 acres of durum wheat), 130,000 acres of barley, and 220,000 acres of oat. Of the wheat acreage, 26.4% was in the Sacramento Valley, 55.5% was in the San Joaquin Valley, 2.7% was in the Coast region, 12.8% was in southern California (primarily the Imperial Valley), and 2.6% was in Sierra and northern California. A substantial portion of the San Joaquin Valley wheat crop was harvested as forage (green-chop) for dairies. Leading wheat cultivars (non-durum) by acreage were Bonus (122,000 acres), Yecora Rojo (113,000 acres), Express (75,000 acres), and Brooks (60,000 acres). Those four cultivars accounted for 74% of non-durum acreage. Bonus, Yecora Rojo, and Brooks predominated in the San Joaquin Valley while Express and Bonus predominated in the Sacramento Valley. RSI 5, grown on 84,000 acres last year, was planted on only 2,500 acres in 2001. It was not marketed in 2001 because of its extreme susceptibility to stripe rust. Kronos was the leading durum wheat cultivar and was grown on 54,800 acres, accounting for 68% of the durum wheat acreage. Wheat and barley stripe rusts were the main diseases in 2001.

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[1]These tests were conducted by the UC Davis Department of Agronomy and Range Science and Cooperative Extension. Land for the tests, the grain produced and other facilities were contributed by cooperating growers identified in Table 1. Quality evaluations were provided by the California Wheat Commission (CWC) quality laboratory. The assistance of growers and the CWC quality laboratory is acknowledged with appreciation. The regional testing program is supported in part by funds provided by the California Crop Improvement Association and the California Wheat Commission.

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BARLEY

Fall-sown spring barley. The fall-sown spring barley test contained 23 entries, including 10 cultivars and 13 advanced lines. Entries in the test, type of barley, their backgrounds, and seed sources are shown in Table 2.Yield and agronomic performance data are given in Tables 3-10. Stripe rust was severe on several entries (Arivat, Max, Patti, Nebula, APB A-5, WWW BA8017, APB C-26, and APB C-15) at one or more of the following sites: Butte, UC Davis, Madera, and Kings. BYDV was severe on several entries (Arivat, Meltan, and YU597-399) at the Madera site. Lodging was severe on several entries (Arivat, APB A-5, UCD 97-4286, UCD PYT99 A-19, UC 1032R, YU 597-390, and APB C-26) at one or more of the following sites: Butte, Madera, and Kings. Average yields ranged from 870 lb/acre at the rainfed Tulare site to 5880 lb/acre at the Madera site. Entry UCD PYT99 A-13 was highest yielding in the Sacramento Valley; entries UCD PYT99 A-13 and UCD PYT99 C-3, in the San Joaquin Valley; and entries APB C-26, YU 597-390, YU 597-399, and UCD 97-4286, in rainfed sites. In the three-year period 1999-2001, entry UC 933 was the highest yielding in the Sacramento Valley; entries UCD 97-4286 and UC 937, in the San Joaquin Valley; and entries UCD 97-4286 and UC 933, in rainfed sites (Table 10).

Spring-sown spring barley. The intermountain spring barley test contained 40 entries, including 22 cultivars and 18 advanced lines. Entries in the test, type of barley, their backgrounds, and seed sources are shown in Table 11. Yield and agronomic performance data are given in Tables 12-14. Average yields ranged from 2840 lb/acre at the Shasta-Lassen site to 3330 lb/acre at the Siskiyou site. Baronesse was highest yielding at the Shasta-Lassen site while Xena, Lacey and UC/TL PYT99 B-32 were highest yielding at the Siskiyou site. In the three-year period 1999-2001, Statehood and Xena were highest yielding region-wide (Table 14).

WHEAT

Fall-sown spring wheat. The fall-sown spring wheat test contained 66 entries, including 19 cultivars and 47 advanced lines. Entries in the test, type of wheat, their backgrounds, sites of evaluation, and seed sources are shown in Table 15. Yield, agronomic performance, and quality data are given in Tables 16-31. Severe moisture stress reduced yields at the Tulare rainfed site. Lodging was severe at the UC Davis site; entries Stander, Kama, RSI 99WY50413, RSI 99WY51107, RSI 99WY51149, and Summit showed very good lodging resistance. Stripe rust was severe on many entries (Yecora Rojo, Cavalier, RSI 5, Brooks, Cuyama, Eldon, Sunstar King, Brim, GM 40002, GM 40003, Nekev, Bet Hashita, Yaniv, BZ 998-256W, DA 998-50, DA 998-15, WWW BR 9118, GM 40027, Primavera 8233, and RSI 99WY51107) at one or more of the following sites: Butte, Colusa, UC Davis, Sacramento-San Joaquin Delta, Madera, and Kings (Table 28). Leaf rust was severe on many entries (Yecora Rojo, Yolo, Klasic, Serra, Cavalier, Brooks, Bonus, Stander, Plata, WWW BR 5144, YU 997-135, GM 40002, PH 996-7W, BZ 998-181, UC 1297, and RSI 99WY50413) at one or more of the following sites: UC Davis, Sacramento-San Joaquin Delta, Madera, and Kings (Table 28). Grain protein content of samples from four sites in the Sacramento Valley, three sites in the San Joaquin Valley and one site in the Imperial Valley was measured by the California Wheat Commission laboratory (Table 29). Average grain protein content (12% moisture basis) ranged from 10.0% to 13.5% for samples from the Sacramento Valley, from 11.7% to 14.6% for samples from the San Joaquin Valley, and from for 11.3% to 14.8% for samples from the Imperial Valley. Among entries tested at all sites, Yecora Rojo, Express, Brooks, Eldon, Sunstar King, DA 995-127, GM 40002, UC 1268, and WWW COI957-3 all had average grain protein content of 13% or higher. Quality evaluations conducted by the California Wheat Commission laboratory on samples from the 2001 Kings site (Table 30) showed that the highest loaf volumes and overall bread scores were produced by UC 1298, DA 995-127, Express, Eldon, Blanca Grande, Plata, UC 1162, YU 995-135, WWW BR 9118, and RSI 99WY51136. Average grain yields ranged from 850 lb/acre at the rainfed Tulare site to 7820 lb/acre at the Imperial site. Entries RSI 99WY50413, Klasic, RSI 96WY50815C-2, Summit and Bonus were the highest yielding in the Sacramento Valley; entries UC 1110, Klasic, and RSI 99WY51462, in the San Joaquin Valley; entries Nekev, Bonus, and Yaniv, in the Imperial Valley; and entry Cuyama, in rainfed areas. In the three-year period 1999-2001, Summit and Bonus were the highest yielding in the Sacramento Valley; Brim, Summit, Klasic, Serra, Blanca Grande, and Bonus, in the San Joaquin Valley; Klasic, Cavalier, and Brooks, in the Imperial Valley; and Kern, Klasic, Cavalier, and Brooks, in rainfed areas (Table 31).

Spring-sown spring wheat. The intermountain spring wheat test contained 23 entries, including 17 cultivars and 6 advanced lines. Entries in the test, type of wheat, their backgrounds, and seed sources are shown in Table 32. Yield and agronomic performance data are given in Tables 33-34. Average yields ranged from 3950 to 6020 lb/acre at the Siskiyou site. Entries Pomerelle and Jubilee were the highest yielding. In the three-year period 1999-2001, Pomerelle was the highest yielding region-wide (Table 34).

Durum wheat. The durum wheat test contained 43 entries, including 17 cultivars and 26 advanced lines.

Entries in the test, their backgrounds, and seed sources are shown in Table 35. Yield, agronomic performance, and quality data are given in Tables 36-46. Two tests were conducted at Imperial, one with normal irrigation and fertilization (Table 1) and one with low irrigation (3 flood irrigations instead of 6 flood irrigations) and low fertilization (50# N topdress instead of a total of 200# N topdress). Average yields for the normal irrigation and fertilization test were 7920 lb/acre, compared to 5010 lb/acre for the low irrigation, low fertilization test. Lodging was severe on all entries at the UC Davis site and moderate to severe on many entries at both Imperial sites (Table 42). Stripe rust was severe on several entries (Westbred 881, Kofa, Ocotillo, WWW D2514, RSI 99WV30413, and RSI 99WV30401) at UC Davis. Black point was detectable only at UC Davis; several entries (APB D95-217, Westbred 881, Deluxe, WWW D3100, and RSI 99WV30413) had relatively high black point severity. Grain protein content of samples from five of the sites was measured by the California Wheat Commission laboratory (Table 43). Average grain protein content (12% moisture basis) ranged from 10.8% to 14.3% at the UC Davis site, from 10.9% to 14.1% at the San Joaquin Valley sites, and from 12.7% to 15.5% at the Imperial site. Entries Cortez, Ocotillo, Orita, and YU 895-72 had average grain protein content of 13.5% or higher averaged over the five sites. Quality evaluations were conducted by the California Wheat Commission laboratory on samples from the Kings (Table 44) and Imperial (Table 45) sites. Samples of 18 entries from the Kings site and 15 entries from the Imperial site had the highest possible pasta color scores. Average grain yields ranged from 4660 lb/acre at the Madera site to 7920 lb/acre at the Imperial (normal irrigation) site. Entries Duraking and RSI 99WV30411 were the highest yielding in the San Joaquin Valley; and UC D201-35, RSI 99WV30411, Sophia 2000C, Orita, and Topper, in the Imperial Valley. In the three-year period 1999-2001, Duraking and Platinum were the highest yielding in the San Joaquin Valley; and APB D95-217, Kronos, Duraking, Orita, and Deluxe, in the Imperial Valley (Table 46).

TRITICALE

Triticale. The triticale test contained 8 entries, including 4 cultivars, 3 advanced lines, and a wheat check (Yolo). Entries in the test, their backgrounds, and seed sources are shown in Table 47. Yield and agronomic performance data are given in Tables 48-50. Low levels of BYDV were detected, but no other foliar diseases occurred. Average grain yields ranged from 6120 lb/acre at the Kings site to 7640 lb/acre at the Imperial site.

OAT

Fall-sown spring oat. The oat test contained 20 entries, including 9 cultivars and 11 advanced lines. Entries in the test, their backgrounds, and seed sources are shown in Table 51. Yield and agronomic performance data are given in Tables 52-53. Lodging was severe on several entries (Curt, Sierra, Montezuma, and Kanota) at the UC Davis and/or UC BARC (Santa Clara) sites. Powdery mildew was severe on several entries (Sierra, Montezuma, UC 113 and UC 125) at the UC BARC (Santa Clara) site. Average grain yields ranged from 2930 lb/acre at the UC BARC (Santa Clara) site to 3340 lb/acre at the UC Davis site. Entries UC 113, Pert, and UC 125 were highest yielding at the UC Davis site while entries Montezuma and Swan were highest yielding at the UC BARC (Santa Clara) site.