

**Barley Coordinated Agricultural Project Six-Month Progress Report  
(4/1/08 – 9/30/08)  
Lee Jackson, University of California**

**1) Describe the research, education, and outreach activities you completed (4/1/08 to 9/30/08)**

Research

I completed the screening of 96 CAP barley lines from each of 10 participating breeding programs (total of 960 lines) for reaction to scald and net blotch, stripe rust, and BYD under the natural disease pressure that normally occurs on barley at the UC Davis Agronomy Farm. I planted the net blotch/scald nursery on 11/13/07; the barley stripe rust nursery, on 12/13/07; and the BYD nursery, on 3/12/08. A single 8-ft row (1 rep) of each entry was planted in each nursery while one 8-ft row of a susceptible check variety (Meltan/Commander barleys for the net blotch/scald nursery, Cal Red oat for the BYD nursery, and Max barley for the stripe rust nursery) was planted after every 6th row of the respective nursery. Due to extremely dry late winter through early spring weather, only trace levels of scald and net blotch developed in the net blotch/scald nursery. Therefore, no data were submitted for net blotch or scald for the 2008 season. Due to poor emergence and survival under early season drought conditions, the nursery planted for BYD evaluation was abandoned. However, BYD developed to moderately severe levels in the nursery planted on 11/13/07 for net blotch and scald evaluation, so BYD evaluations (recorded on 4/14) were reported. Meltan, the variety planted as a net blotch susceptible check, also is susceptible to BYD in California. Based on its BYD reactions throughout the nursery, ratings of 3 and above in the 2008 nursery indicated increasing levels of susceptibility under the natural disease pressure of the 2008 season. Severe stripe rust developed in the stripe rust evaluation nursery. Stripe rust ratings, in two parts, % Severity and Infection Type, were reported for each of two evaluation dates: 4/21 and 5/8. The susceptible check variety, Max, became infected later than many entries in the nursery. By the time of the 2nd evaluation, it ranged from 30-80% severity (many of the nursery lines had already reached 100% severity by the 1st evaluation date). Cool conditions were favorable for continued development of stripe rust through early May, though many barley lines in the nursery were becoming mature and tissue was naturally senescing by that time. Judging by the disease ratings on the repeated rows of the susceptible check variety Max throughout the nursery, % Severity of 30% or more and Infection Type of 5 or more indicated increasing levels of susceptibility under the natural disease pressure of the 2008 season.

Outreach

The barley disease screening program at UC Davis, conducted as part of the Barley CAP, was included as a portion of the field tours for the Joint Meeting of Western Wheat Workers, Wheat CAP, WERA-97 (Western Region Cereal Disease Workers), and NCERA-184 (North-Central Region Cereal Disease Workers) held at UC Davis on May 12-13 (over 60 scientists from throughout the country attended) and for the Annual UC Davis Small Grains and Alfalfa Field Day held at UC Davis on May 14 (over 100 attended, including Campus-based faculty and students, farm advisors, pest control advisors, crop consultants, representatives of seed

companies, handlers of certified seed, growers, and others interested in small grain production and research).

A “Combine to Kitchen Tour” conducted jointly by the Wheat CAP (represented by Jorge Dubcovsky, UC Davis wheat geneticist/breeder) and the Barley CAP (represented by Lee Jackson, UC Davis Small Grain Specialist) was held on May 16, 2008. It was organized as an “Educational Trip” for students. The objective of the trip was to visit representatives of the different parts of the food-chain, ranging from the breeder, to the grower, grain handler, quality lab and the final end-user. Cristobal Uauy, post-doctoral student in Jorge Dubcovsky’s program, organized the activities for the day. Over 20 undergraduate and graduate students from such diverse majors as Biological Sciences, Plant Biology, Food Science, Electrical Engineering, Horticulture and Agronomy, Human Development, Soil and Biogeochemistry, and Genetics participated in the tour, and were accompanied by Jorge Dubcovsky, Lee Jackson, and Kent Brittan (UCCE Farm Advisor for Yolo County).

## **2) List specific outcomes and deliverables accomplished (4/1/08 to 9/30/08)**

I sent results of the 2008 disease screening program to Jennifer Kling (trait coordinator) for processing. Since the evaluations were conducted under natural disease pressure and the growing season was extremely dry, only trace amounts of net blotch and scald developed, so no data was submitted for those diseases. Disease screening results for BYD and stripe rust were submitted. With regard to the stripe rust screening results, I recommended that data from both stripe rust evaluation dates be archived for future use and for comparison of disease increase over time. I recommended that the 2nd stripe rust evaluation (taken on 5/8) be used as the final disease rating for uploading to THT.