

**Barley Coordinated Agricultural Project Work Plan  
FY07 (4/1/07 – 3/31/08)  
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**Education and Outreach - Educate students, scientists, farmers, processors, and consumers in use of genomics technology for gene discovery and crop improvement.**

**1. Outreach activities for FY 2007 (4/1/07 – 3/29/08)**

In FY2007, we will update the outreach materials (*e.g.*, posters, PowerPoint presentations, brochures) developed in FY06 with the research objectives met by Barley CAP researchers and develop new outreach and publicity materials (Breeze Presentation, Podcast, Post-it notes, etc.). We will also integrate Barley CAP outreach activities with those of the Institute for Barley Malt Sciences and, whenever possible, with Rice CAP and Wheat CAP outreach efforts.

**2. Specific outcomes for FY 2007**

- Utilize survey data on how producer and users obtain their barley information to more efficiently distribute Barley CAP information and gain wider stakeholder awareness and support.
- Update information and graphics in the Barley CAP posters (technical and non-technical) and brochure, if appropriate, with input from Barley CAP members to reflect project advances.
- Develop two new center modules for technical poster: one on disease resistance and one on food/nutritional quality.
- Update PowerPoint presentations for different audiences with new information obtained from Barley CAP researchers.
- Provide information to update Website with pertinent information related to outreach activities and deliverables.
- Create and print newly designed business cards, as appropriate.
- Develop new Barley CAP publicity materials with Barley CAP URL and logo to distribute to stakeholder groups, *e.g.* Post-it notes, pens, refrigerator magnets, *etc.*
- Assist extension evaluator in development of survey tools.
- Work with personnel at Institute for Barley Malt Sciences on development of outreach materials and activities for Barley CAP.
- Work with Rice and Wheat CAP to enhance and increase outreach efforts.

**3. Deliverables for first 6-month period (4/2007- 9/2007)**

- Update technical and/or nontechnical posters, as appropriate, with new research progress.
- Develop one new center module for technical poster.
- Create one Barley CAP awareness-raising material (Post-its, magnets or pens) to distribute to stakeholder groups.
- Provide personalized outreach materials to Barley CAP members, as requested.
- Update PowerPoint presentations with new information from Barley CAP researchers.
- Assist extension evaluator in development of survey tools.
- Work with personnel at Institute for Barley Malt Sciences on development of new outreach materials and activities for Barley CAP.
- Provide information to update Website on Barley CAP outreach activities.
- Develop one outreach activity or outreach material with RiceCAP and Wheat CAP to enhance and increase outreach efforts.

#### **4. Deliverables for second 6-month period (10/1 – 3/31)**

- Update technical and/or nontechnical posters, as appropriate, with new research progress.
- Develop one new center module for technical poster.
- Create one Barley CAP awareness-raising material (Post-its, magnets or pens) to distribute to stakeholder groups.
- Provide personalized outreach materials to Barley CAP members, as requested.
- Update PowerPoint presentations with new information from Barley CAP researchers.
- Assist extension evaluator in development of survey tools.
- Work with personnel at Institute for Barley Malt Sciences on development of new outreach materials and activities for Barley CAP.
- Help to develop Breeze presentation or Podcast in association with Wheat CAP to describe threat posed by stem rust race Ug99 and the methods being pursued by Barley CAP to utilize the tools of genomics in breeding for resistance.
- Provide information to update Website on Barley CAP outreach activities.
- Continue development of outreach activities or materials with RiceCAP and WheatCAP.

**Barley Coordinated Agricultural Project Biannual Progress Report  
FY06 (4/1/06 – 3/31/07)**

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*Objective #5: Educate students, scientists, farmers, processors and consumers in the use of genomics technology for gene discovery and crop improvement.*

**A. Proposed Benchmarks for Calendar Year 1:**

- Secure an Internet domain and develop website for Barley CAP.
- Prepare a logo for Barley CAP in first 6 months.
- Prepare and print a one-page brochure for BarleyCAP in first 6 months.
- Prepare a poster for Barley CAP based on brochure and upload to website for download by users in first 6-8 months.
- Help prepare graphics for introductory PowerPoint presentation based on brochure and upload to website for download by users in first 6-8 months.
- Work with others to prepare an introductory Breeze presentation—as time permits and as sufficient information exists (intellectually and technically) in 6-12 months.
- Facilitate and support outreach activities of Barley CAP members.
- Develop user-friendly “QTL Miner” software, user guide, and tutorials for general use.
- Hold a marker assisted selection workshop at a national meeting.
- Conduct a survey of producers and users to determine their needs in optimizing barley production, end-use, utilization, etc. and the best means of disseminating information to these stakeholders.
- Identify and enlist extension educators who will disseminate Barley CAP information in each state.
- Enhance linkages with barley end users on the applied outcomes of Barley CAP.
- Hire a professional extension evaluator for assessing effectiveness of outreach and education efforts.
- Prepare and disseminate press releases, newsletters, and publications on Barley CAP activities.
- Educate the next generation of scientists in the application of genomics to crop improvement.

**B. Accomplishments for each benchmark for Year 1:**

***Secure Internet domain and develop website for Barley CAP.*** The short, intuitive web domain name of [www.barleycap.org](http://www.barleycap.org) was secured within the first month of Barley CAP and a website was developed shortly thereafter by Sarah Jameson-Jones and Lynne Medgaarden. The website has been significantly expanded since its inception to include all pertinent information needed by Barley CAP researchers, other members of the scientific community, and producers and users of barley.

***Prepare a logo for Barley CAP.*** A logo was designed by Barbara Alonso at UC Berkeley within 3 months that featured a stylized, graphic image of two-rowed and six-rowed barley composed of colors that are complimentary to those chosen to represent Barley CAP (blues and greens). The Barley CAP and CSREES logos are displayed on the website and on all outreach materials that were developed, *e.g.*, brochures, posters, business cards, and PowerPoint presentations.

***Prepare and print a one-page brochure for Barley CAP.*** A trifold brochure (see “Outreach” section of website) was created by Barbara Alonso and Peggy Lemaux at UC Berkeley with input from G. Muehlbauer, K. Smith and B. Steffenson. Content was based on that of the nontechnical poster (see below). The front of the brochure, which features the logo, a close-up of a six-rowed barley spike and a field of barley ready for harvest, states the central theme of the project, “Leveraging Genomics, Genetics and Breeding for Gene Discovery and Barley Improvement”. The back of the brochure lists the Project

Director contact information, explains Barley CAP, and shows a map highlighting the states involved in the effort. Inside the brochure is a center panel that features the fact that Barley CAP efforts will examine barley from 10 breeding programs to study over 40 target traits related to agronomic performance, disease resistance, and food and malt quality. Text around the center panel addresses the issues of: (1) How you create 1 breeding program from 10; (2) What are SNPs?; (3) What is marker assisted selection (MAS)?; and (4) How MAS will aid breeding efforts.

A total of 1000 Barley CAP brochures were printed and disseminated at venues where poster and PowerPoint presentations were made. Brochures were also sent specifically to 8 individuals in MN, ND, VA, WA and WI, who subsequently distributed them to key stakeholders. We printed an additional 1,500 more brochures for future distribution.

***Prepare poster for Barley CAP based on brochure; upload to website for download by users.*** Two Barley CAP posters were created as aids for outreach efforts, including a technical and non-technical version. The goal of both posters was to present the main objectives of Barley CAP and to present a colorful, eye-catching, and easy-to-understand format. The technical poster was initially created for K. Smith and used at the American Society for Brewing Chemists meeting in June 2006. The poster included colorful images that related directly to Barley CAP efforts with a malting/brewing focus. Sections in the poster focused on what Barley CAP is, what institutions are involved, and the different technologies that were used to achieve its goals, like marker assisted selection, genomics and a centralized marker and trait database. The center panel focused on Barley CAP's efforts to identify markers for malting quality. The center of the poster is designed to be modified for individual presentations depending on the venue and the interests of the audience. Such was the case for presentations made by T. Close and P. Hayes at national and international venues. A poster is currently being prepared by Outreach personnel for Paul Schwarz to present at the American Society of Brewing Chemists Annual Meeting, June 16-20, 2007 in Victoria, British Columbia.

A nontechnical poster was designed for the general public. For this effort, the text was shortened and put in layman's language to make it easy for the general public to understand. The center panel highlighted three categories of traits that are targets for Barley CAP research—agronomic performance, disease resistance, and food and malt quality. This poster was printed, laminated and sent to Ed Kaleikau, along with brochures, to be used at the CSREES offices in Washington. The laminated poster also was sent to Marvin Zutz for presentation to producers at several barley meetings in the autumn 2006.

Both posters are available to Barley CAP members in the "Outreach" section of [www.barleycap.org](http://www.barleycap.org) in PDF format and also PowerPoint format, which makes it possible to change the title and center panels to suit the venue and audience. Their availability was made known to participants in the September 2006 Barley CAP newsletter and at meetings of Barley CAP project members.

During 2006, the BarleyCAP poster was displayed at seven different meetings in four different states where the total attendance was over 7,700. Barley CAP brochures and business cards (see below) also were distributed at these meetings.

In addition, Barley CAP business cards were designed that had the U.S. map with the participating states featured on the front and Barley CAP objectives and URL on the back. These cards were intended to help viewers of the poster remember Barley CAP and its URL where they could obtain more information. These cards were specifically sent to nine individuals in CA, IA, ID, MN, OR and WA for subsequent distribution to other stakeholders. They also were also disseminated at various venues where the poster was presented. Over 850 business cards have been distributed to interested individuals during these meetings. The card was redesigned to be business card-sized and another 1000 cards are currently being printed.

***Help prepare graphics for an introductory PowerPoint presentation based on brochure and upload to website for download by users in first 6-8 months.*** A PowerPoint slideshow, based on the technical poster, was created for Don Obert (ID) to use at the U.S. Barley Food Summit in Aberdeen, ID in November 2006. In addition, a modifiable version of the PowerPoint presentation was created for G. Muehlbauer that was also based on the technical poster. A PowerPoint slide template, featuring the

CSREES and Barley CAP logos, is available on the “Outreach” section of the website for all Barley CAP researchers to use.

***Work with other Barley CAP members to prepare an introductory Breeze presentation—as time and ideas are formulated.*** A Breeze presentation has not been initiated at this time. Through a poll currently being analyzed by outreach and information specialist, Karen Hertsgaard, partially funded by Barley CAP, for the Institute for Barley Malt Sciences (IBMS) at North Dakota State University (see “Conduct a survey” section below), we have obtained feedback from potential target audiences to determine the advisability of creating a Breeze presentation or a Pod cast. We have discussed the possibility of creating an audio or video Podcast about the efforts being made by Barley CAP to identify and transfer by marker assisted selection resistance to the new east African stem rust race Ug99 (TTKS). We will contact the Wheat CAP to jointly develop this presentation.

***Facilitate and support outreach activities of Barley CAP members.*** As part of their work plans, Barley CAP members were encouraged to include various outreach activities in their Barley CAP efforts. We have supported these efforts through the development of various printed materials (*i.e.*, posters, brochures, etc.) and PowerPoint presentations. We also have covered the travel expenses of some members for their outreach activities.

***Develop user-friendly “QTL Miner” software, user guide, and tutorials for general use.*** The source code for the “QTL Miner” software is being written and tested. The user guide and tutorial will be developed later in 2007.

***Hold a marker assisted selection workshop at a national meeting.*** In conjunction with the Wheat CAP, a workshop entitled “Marker assisted strategies in crop improvement” was held at the American Society of Agronomy meeting in Indianapolis on November 15, 2006 (website [http://www.acsmeetings.org/2006/pdf/program\\_book.pdf](http://www.acsmeetings.org/2006/pdf/program_book.pdf)). Two hundred attendees were present at this workshop.

***Conduct a survey of producers and users to determine their needs in optimizing barley production, end-use, utilization, etc. and the best means of disseminating information to these stakeholders.*** A survey of barley users was conducted in summer 2006 via the American Malting Barley Association email list serve. This list serve targets 90 individuals and is the most comprehensive list of members of the malting and brewing industries. Additionally, the Barley CAP partially funded an outreach and information specialist (Karen Hertsgaard) for the Institute for Barley Malt Sciences (IBMS) at North Dakota State University. The National Agriculture Statistics Service, in conjunction with IBMS, conducted a survey of barley producers in the three states of North Dakota, Montana, and Idaho. Over 5000 surveys forms were sent out and follow-up telephone conversations will follow. These survey data are in the process of being collected and conclusions from the survey should be available in the near future.

***Identify and enlist extension educators who will disseminate Barley CAP information in each state.*** We have identified at least one extension educator in all of the participating Barley CAP states (that have significant acreage of barley production) who will assist in outreach and extension activities. These educators will make presentations about Barley CAP and deliver printed material, such as the brochures, to barley growers at various venues in their states.

***Enhance linkages with barley end users on the applied outcomes of the project.*** In addition to the already strong linkages with the malting and brewing industries, we extended our outreach activities to a new barley end user group, the food barley commodity. Don Obert gave a presentation about the applied aspects of Barley CAP to this group at the Food Barley Summit in Aberdeen, ID in November 2006.

***Hire a professional extension evaluator for assessing the effectiveness of outreach and education efforts.*** To assess the effectiveness of our outreach and extension activities, we budgeted for an extension evaluator. In consultation with the Associate Dean (Michael Schmitt) and extension evaluator (Tom Bartholomay) at the University of Minnesota, we developed a logic model and a preliminary plan for the types of information and instruments needed for this purpose. In February 2007, we hired Sue White as our extension evaluator at 30% time. We will be consulting with Wheat CAP to explore how our efforts of extension evaluation can be enhanced between the two projects.

***Prepare and disseminate press releases, newsletters, and publications on Barley CAP activities.*** After the March 31, 2006 press release by CSREES announcing the funding of the Barley CAP, we initiated or fostered the release of six other press releases (see “News” section on website). Moreover, we prepared and posted three Barley CAP newsletters on our website that provide key updates on the activities of the project (see Section C). Finally, a high profile commentary in the Proceedings of the National Academy of Sciences (December 5, 2006; Vol 103:18385-18386) was recently published that mentions Barley CAP and its important objectives. Patrick Hayes and Peter Szucs wrote this commentary.

***Educate the next generation of scientists in the application of genomics to crop improvement.*** Nine graduate students, two post-doctoral research associates, two technicians, and seven undergraduates were hired on the Barley CAP. These individuals will be involved in research, as well as the outreach and extension activities, as part of our goal to educate the next generation of scientists. Documentation will be collected on the presentations and publications of these individuals as the Barley CAP moves forward in the next three years.

### **C. Integration of outreach into the overall project:**

We expect that all members of Barley CAP will participate in outreach and education activities. During the first six months of the project, over 50 presentations were made by 20 different members of Barley CAP in 14 states and four countries (Italy, Canada, Finland, and Australia). Moreover, we presented the posters to over 7,700 people and distributed 1000 brochures and over 850 business cards. These efforts were made possible by making outreach materials easily available to project members via the Barley CAP website or, as requested, modifying the poster or PowerPoint presentations to suit the presenter and the venue. By achieving this goal, we integrated research and outreach goals and presented to the target audience a unified message that Barley CAP researchers are focused on the needs of the stakeholders, both producers and end-users alike. It also serves as a model for the more junior members of the project to see that the PIs are committed to communicating their efforts and successes to the target audiences at appropriate venues and in the appropriate language.

One important mechanism for updating Barley CAP researchers and the target audiences regarding outreach efforts is through the Barley CAP newsletter (available in the “News” section of [www.barleycap.org](http://www.barleycap.org)). This informational piece focuses on research and outreach efforts of Barley CAP participants, describing such events as the international outreach effort of Roger Wise in participating in a breeding and genomics course in Finland. It also includes updates on Barley CAP technical efforts with, for example, QTL Miner and OPAs.

Aside from being made available on the website, the newsletter is distributed to:

- National Barley Growers Association Grower Board (26 individuals): members from each major barley growing state and their state staff executives
- US Barley Workers (239 individuals): includes anyone interested in barley research and/or who wishes to receive information about barley from the National Barley Improvement Committee (NBIC)--primarily comprised of barley researchers, but also involves industry and grower personnel, including members of:
  - NBIC North Central Region (64)
  - NBIC Northwest Region (83)
  - NBIC East Region (34)
  - NBIC Southwest Region (43)
  - NBIC South Central/Southeast Region (15)
- Graingenes courtesy of Dave Matthews. The Graingenes website (<http://wheat.pw.usda.gov/GG2/index.shtml>) has over 800 subscribers and averages over 30,000 hits per month from users in as many as 118 different countries.
- All members of Barley CAP.

- Moreover, state barley grower organizations include some of the highlights from the Barley CAP newsletters into their individual newsletters and also will post a link to <http://barleycap.org/>. The barley grower newsletters are sent out to over 10,000 individuals.

In addition to integrating research and outreach efforts within Barley CAP, we are also integrating outreach activities with Rice CAP and Wheat CAP. This integration is being facilitated by Peggy Lemaux, who is a leader on the outreach team for Rice CAP and an Advisory Board member for Wheat CAP, and by Barbara Alonso, who is involved in the development of the outreach materials for RiceCAP. This interaction will be encouraged and increased in the future, allowing us to “draft off” each group’s most effective outreach and education efforts. Rather than delivering conflicting messages about the importance of genomics research efforts with different crops, the goal of all CAP programs should be to support and strengthen the outreach effort and its message about the importance of funds to support research focused on crop improvement for U.S. farmers.

#### **D. Personnel involved:**

- Barbara Alonso, UC Berkeley.
- Alonso and Lemaux designed and developed Barley CAP Outreach Educational Materials in consultation with B. Steffenson, G. Muhlbauer and K. Smith and other Barley CAP members.
- All members of Barley CAP

#### **E. Deliverables**

- The simple, intuitive web domain name of [www.barleycap.org](http://www.barleycap.org) was secured.
- A Barley CAP logo was created and is being used in all outreach materials.
- Two Barley CAP posters—technical and nontechnical—were created and displayed at seven different meetings in four different states where the total attendance was over 7,700.
- A Barley CAP brochure was developed and printed; 1000 copies were distributed at ten different meetings in five different states where the total attendance was over 8,000. In addition, the brochures were given specifically to 8 individuals in 5 states to deliver to key stakeholders. An additional 1,500 copies were printed and are being distributed.
- Barley CAP business cards were designed and printed; over 850 were distributed at ten different meetings in five different states where the total attendance was over 8,000. In addition, the cards also were sent specifically to nine individuals in six states for dissemination to key stakeholders. The Barley CAP card was redesigned in a smaller format and an additional 1000 cards are being printed.
- PowerPoint presentations and a PowerPoint template for individualized presentations were created and used in presentations to a variety of audiences by Barley CAP members. The template of the presentations is available on the Barley CAP website.
- Over 50 presentations (from formal scientific meetings to field days) were made by 20 different members of Barley CAP in 14 states and four countries.
- A workshop on marker assisted selection was held at the American Society of Agronomy meeting in Indianapolis on November 15, 2006
- A survey of producers and users was made to determine their needs in optimizing barley production, end-use, utilization, etc. and the best means of disseminating information to these stakeholders. Data from this survey are being analyzed to facilitate outreach efforts.
- Extension educators were identified in target states and recruited for Barley CAP outreach and extension activities.
- An information and outreach specialist was hired at the Institute for Barley Malt Sciences with partial funding from Barley CAP. This person, in consultation with current Barley CAP outreach personnel, will conduct various outreach activities for producers and end-users .

- A preliminary logic model and plan for the types of information and instruments needed for assessing the effectiveness of our outreach and extension activities were developed. An extension evaluator was hired for Barley CAP at 30% time.
- Press releases, newsletters, and publications on Barley CAP activities were developed and disseminated widely to a very large audience both electronically and in printed form.
- Nine graduate students, two post-doctoral research associates, two technicians, and seven undergraduates were hired to participate in Barley CAP efforts.