RosBREED's Extension Team - delivering RosBREED outcomes to the Rosaceae community

By RosBREED's Extension Team (Cholani Weebadde, Michael Coe, Carlos Crisosto, Gennaro Fazio, Karina Gallardo, Amy Iezzoni, Jim McFerson, Dorrie Main, Cameron Peace, Gregory Reighard, Audrey Sebolt, and Kenong Xu)

RosBREED's Extension Team is a diverse group based throughout the U.S., with expertise in various scientific disciplines and crops. Each of us is dedicated to enhancing the sustainability of cultivar development in public and private U.S. Rosaceae breeding programs and understands the challenges facing extension activities, in a project as large as RosBREED, the largest funded to date by the USDA Specialty Crop Research Initiative ($14.4 million over four years). We are also tremendously excited about RosBREED's focus on fruit quality traits, and how advances in genetics and genomics will be translated to routine practical application in the Rosaceae crops. Furthermore, stakeholders expect research activities like RosBREED to contribute directly to human health and well-being, as well as to sustain the economic vitality of their own communities.

Based on existing genetic variation in a crop, marker-assisted breeding (MAB) is a promising modern breeding tool for developing new cultivars. As it does not require the use of transgenic techniques, new cultivars developed with MAB do not need to undergo lengthy and costly regulatory processes and avoid any marketplace issues associated with GMOs. MAB can make breeding much more efficient for crops of the Rosaceae family. Rosaceous crops are clonally propagated and require expensive and extensive field testing, thus greatly slowing breeding progress compared to annual field crops and vegetables, especially for complex traits like fruit quality. However, MAB has not been applied in Rosaceae as it has in other crops, due to long generation time, costs, lack of training, and a small genomics knowledge base.

Karina Gallardo (RosBREED SE Team) interviewing Jim Hancock (RosBREED demonstration breeder) at RosBREED I.

An important activity of the Extension Team is to analyze and understand both the technical and socio-economic issues of the MAB approach and communicate effectively among project participants, stakeholders and the public. Through coordinated extension, training, and outreach activities we will work directly with RosBREED's 12 demonstration breeders, who focus on apple, peach, sweet cherry, tart cherry, and strawberry, to demonstrate the MAB approach as well as train this and the next generation of Rosaceae breeders. We will also work directly with the project's Socio-economics (SE) Team as they systematically analyze the value and preference for various fruit quality traits held by the research, production, processing, market intermediary, and consumer components of the supply chain.

Our approach: We will use a multi-faceted approach to deliver RosBREED outcomes to the Rosaceae community, including traditional meetings, workshops, short courses, and hands-on computer training sessions. We will emphasize web-based communication and networking to engage the broader community of Rosaceae breeders; scientists outside of genomics, genetics, and breeding; and stakeholders.

Amy Iezzoni speaking to AP Members, Co-PDs, and project associates at RosBREED I.

Progress assessment at annual meetings: We will have four annual meetings (RosBREED I-IV) for our project participants, collaborators, and AP members to critically assess project progress, discuss work to be completed, provide technical training, incorporate feedback from participants and stakeholders, and network. RosBREED I took place at the Plant & Animal Genome XVIII conference in San Diego, California, 7–8 January 2010. Twenty-seven scientists from the U.S., 10 scientists from five other countries, and 21 AP members gained fuller appreciation of the scope and potential impact of RosBREED (see www.rosbreed.org/node/16). The major focus of RosBREED II and III will be the training of our 12 demonstration breeders and their breeding trainees in the use of MAB Pipeline software programs. RosBREED IV will include a thorough assessment of progress, ensure project deliverables are completed, and plan research and extension activities building on the RosBREED foundation.

RosBREED's Extension Team cont.

Enhancing the RosBREED network at professional meetings: Through existing platforms, we hope to enhance our network of community breeders and share RosBREED's successes and failures. In August 2010, we will host an introductory workshop at the American Society for Horticultural Science annual conference in Palm Desert, California, to introduce RosBREED to a broader research and extension audience. In addition, our Co-PDs will present five talks/posters at the 2010 International Horticultural Congress in Lisbon, Portugal, to involve an international scientific community in RosBREED's activities.

Technical training for RosBREED breeders and breeder trainees at RosBREED I.

Technology transfer to regional breeding programs: Using RosBREED case studies, we will conduct regional and participatory workshops in years 2012 and 2013 to facilitate transfer of MAB technologies to our community breeders and to engage our industry stakeholders and allied scientists. Nine participatory workshops in New York, Michigan, South Carolina, Arkansas, Texas, California, Washington, Minnesota, and New Hampshire will be integrated within annual local industry meetings and hosted by the breeding programs of our demonstration breeders in the region.

We will also coordinate regional workshops in 2013 in New York, South Carolina, Washington, and California, hosted by four of our Extension Team members: Kenong Xu, Greg Reighard, Karina Gallardo, and Carlos Crisosto, respectively. Taking a "train-the-trainer" approach, we will provide regional extension specialists with useful educational materials on DNA-informed breeding in general and RosBREED outcomes in particular.

Mentoring future Rosaceae breeders: Training the next generation of plant breeders is vital and a direct requirement for sustainability. Our demonstration breeders are fully committed to this activity and are involving graduate students in RosBREED's activities as breeding trainees. Newsletters will contain up-close and personal features on all breeding teams. Breeding trainees will receive significant travel support and a head start on developing professional networks and liaisons with stakeholders.

RosBREED stakeholder interaction: RosBREED's three Advisory Panels constitute our initial communication portal with stakeholders to enhance engagement with important sectors. Our Industry AP represents different crops, production regions, fresh and processed products, and linkages with key trade associations while our Scientific AP represents a multidisciplinary array of talented researchers working on Rosaceae and non-Rosaceae crops. Our Extension AP similarly comprises an array of active scientists based in all important Rosaceae production and processing areas of the U.S.

Stakeholder interactions: Cameron Peace, RosBREED Co-PD, speaking to producers and industry at an annual field day in Wenatchee, WA.

For providing convenient, reliable access to timely, clear information on RosBREED's activities to all stakeholders and project participants, we are using the power and reach of internet-based extension, delivering science-based knowledge in a cost- and time-effective manner. Our website (www.rosbreed.org), a centralized and regularly updated resource for RosBREED participants and the entire Rosaceae community, currently provides access to the project calendar, newsletters, and workshop information, including downloads of the project description and PowerPoint presentations. In addition, we produce quarterly newsletters and a RosBREED brochure providing general information on the project, and we rely on our AP members as our active communication channels for information exchanges.

Ensuring we serve you better: We want to ensure that our extension efforts are effective. Cedar Lake Research Group LLC, an independent research and evaluation firm, is providing external evaluation services to RosBREED, gathering feedback from various participant groups and extension audiences about the quality, relevance, and utility of our extension activities. This information will be used for ongoing quality improvement of our efforts.

It is both a grand challenge and grand opportunity to be the extension and outreach platform for RosBREED. We look forward to working with all of you along the way.

Who's Who in the Extension Team

Cholani Weebadde
Michigan State University
Area of interest: Outreach
Role: Extension Team Leader

Michael Coe
Cedar Lake Research LLC
Role: External evaluator

Carlos Crisosto
UC Davis
Area of interest: Peach extension
Role: 2013 CA regional meeting host

Gennaro Fazio
USDA-ARS, Cornell University
Area of interest: Apple extension
Role: Coordination with other RosBREED Teams

Karina Gallardo
Washington State University
Area of interest: Agricultural economics
Role: 2013 WA regional meeting host

Amy Iezzoni
Michigan State University
Area of interest: Cherry breeding and genetics
Role: Project Director

Jim McFerson
Washington Tree Fruit Research Commission
Area of interest: Industry research
Role: Industry liaison

Dorrie Main
Washington State University
Area of interest: Bioinformatics
Role: RosBREED website development

Cameron Peace
Washington State Univ.
Area of interest: Apple & cherry fruit quality
Role: Coordination with other RosBREED Teams

Greg Reighard
Clemson University
Area of interest: Peach extension
Role: 2013 SC regional meeting host

Audrey Sebolt
Michigan State University
Area of interest: Cherry breeding and genetics
Role: Extension Team Leader's assistant

Alexandra Stone
Oregon State University
Area of interest: Vegetable extension
Role: PBG Works website administrator

Kenong Xu
Cornell University
Area of interest: Genomics of fruit trees
Role: 2013 NY regional meeting host