Community Breeders' Page

A stone fruit breeding safari
by Cameron Peace, MAB Pipeline Team Leader

California's stone fruit bounty – the result of generations of crop improvement

On two sun-drenched summer days in late June, intrepid explorers and RosBREED Extension Team emissaries Greg Reighard and Cameron Peace embarked on a journey of outreach and fruit gorging in the heart of America's fruit bowl, the vast stone fruit and almond production wilderness of California's Central Valley. With resolute purpose, they tracked down those mysterious beings known as "stone fruit breeders" (*Fructimprovus prunii* L.), part of the wider clade of Community Breeders.

On the first day, a stroke of luck brought together three breeders at one gathering place in Davis: Terry Bacon of Sun World (subsp. *privatus*), David Cain of International Fruit Genetics (subsp. *privatus*), and David Ramming of USDA-ARS, Parlier (subsp. *publicus*). The next morning, several other breeders (all subsp. *privatus*) were tracked to their natural settings: Tom Burchell of Burchell Nursery in Oakdale, and Leith and Grant Zaiger of Zaiger's Genetics in Modesto. The afternoon included trekking to the habitat of Glen Bradford and Jon Quisenberry of B Q Genetics in Le Grand, followed by a foray into the hot plains of Fresno to the territory of John Slaughter of Burchell Nursery. Warm greetings as with old friends were the experience at each locale. Fruit of prized selections were tasted and savored, culminating in an orchard tour at Burchell's Fresno breeding plots and indulging the palate with delicious white nectarines, yellow peaches, peen-tos, and succulent apricots. More stone fruit were enjoyed during the Prunus Crop Germplasm Committee meeting at the Davis Repository a few days later, which topped off a feast of delights from this amazing genus. Subsequent encounters with *Prunus* breeders Tom Gradziel (almond, UC Davis, subsp. *publicus*, also moonlighting as RosBREED's canning peach Demonstration Breeder), Malli Aradhya (interspecific rootstocks, USDA-ARS, Davis, subsp. *publicus*), and John Driver (apricot, CandyCot Fruit Company in Waterford, subsp. *privatus*) rounded out the rounding up of California's population of *Fructimprovus prunii*.
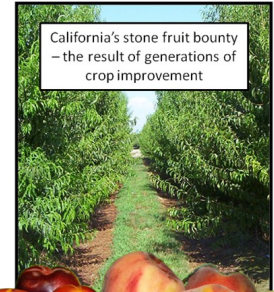
Engagement with each breeder revolved around the theme of "This is what RosBREED can do for you". Discussions covered what RosBREED is (a publicly funded initiative to open the flow of socio-economically informed DNA-based knowledge into U.S. Rosaceae breeding programs, both public and private) and what it isn't (another research project asking for money). Recent quarterly newsletters were provided and the components described of a Demonstration Breeder survey of breeding information management capacity and needs. RosBREED project goals are met if we can help make these stone fruit breeding programs more profitable and creative so they can efficiently provide superior cultivars to industry, resulting in superior products for consumers. Invitations were extended for breeders to engage to the level desired with the RosBREED family – a standing offer to all Rosaceae breeders, geneticists, and genomicists.

Demonstration Breeding Programs By the Numbers:

2,090

Jim Hancock and Sonali Mookerjee after planting a subset of the strawberry CR Set at an MSU Research Station

Number of strawberry seedlings propagated and planted by Sonali Mookerjee, RosBREED Project Associate, Michigan State University. Seedlings propagated represent a subset of the strawberry Crop Reference Set (see definition below). Seedlings will be planted at 5 locations: Michigan State University, USDA-ARS/Oregon State University, University of New Hampshire, California (Driscoll's Strawberry Associates), and University of Florida.

34,980

Travis Stegmeir

Number of tart cherry phenotypic data points that Travis Stegmeir, RosBREED Project Associate at Michigan State University, generated for the tart cherry CR Set in June and July, 2010. Fruit and pit weight, length, width as well as soluble solids, and pit cling were recorded. Color readings were generated using a Minota color reader.

Please visit our website for detailed protocols on how the RosBREED's primary five crops are measuring phenotypic traits (www.rosbreed.org/resources/fruit-evaluation).

RosBREED definition

CROP REFERENCE SET (CR Set): Each demonstration crop (sweet cherry, tart cherry, apple, peach, and strawberry) have developed a CR Set, which is a set of pedigree-linked germplasm that represents the diversity in current and anticipated future breeding stock. Each CR Set:
- Is approximately 480 individuals (cultivars, ancestors, founders, breeding lines, selections, and seedlings) that are fruiting in 2010-2012
- Will enable efficient validation and utility assessment of marker-locus-trait associations
- Will be genotyped with genome-wide SNP markers and phenotyped for fruit quality traits and other high-impact targets
- Is a resource for the common benefit of the Rosaceae breeding programs