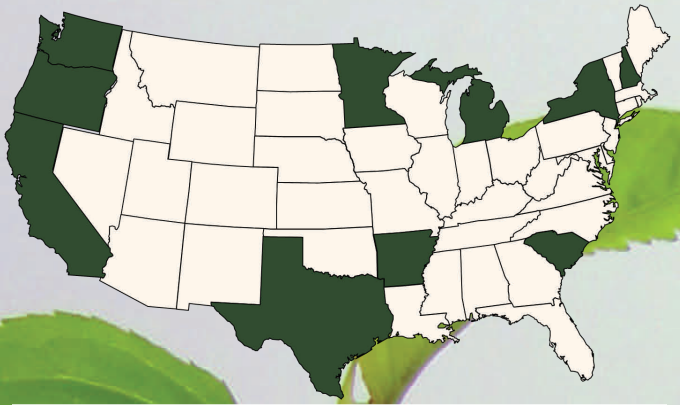
What is RosBREED?

RosBREED is a multistate, multi-institutional, multi-national project dedicated to improvement of U.S. rosaceous crops by targeted applications of genomics knowledge and tools to enhance efficiency of breeding programs. This Coordinated Agricultural Project is funded through the USDA Specialty Crops Research Initiative by a combination of federal and matching funds ($14.4M from 2010-2013).

RosBREED Participants

States designated in maroon are the locations of the 12 RosBREED demonstration breeding programs. Participants in the project come from additional states and nations.



Our first year impacts

- A coordinated Marker-Assisted Breeding (MAB) approach has been adopted in all 12 RosBREED demonstration breeding programs.
- Systematic baseline socio-economic data on all 12 breeding programs and industry market structure is being used to assess current relative value of crop-specific traits and return on investment for MAB.
- RosBREED is the focal point for the first ever international effort to develop and implement a common genomic resource (genome scans based on Single Nucleotide Polymorphisms) in Rosaceae
- A regular electronic newsletter, a dynamic web site, conference presentations, participatory workshops, and Advisory Panel input are providing the interactive communication essential to project success.

RosBREED

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USDA
United States Department of Agriculture
National Institute of Food and Agriculture

NIFA

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Photo credits: We kindly thank David Karp for providing pictures.

Enabling marker-assisted breeding in Rosaceae

Dedicated to the improvement of U.S. rosaceous crops





What needs does RosBREED address?

U.S. Rosaceae crop industries face numerous limitations to profitability and sustainability. Overcoming these barriers requires rapid development and deployment of new cultivars with improved characteristics to meet dynamic industry and market needs and satisfy consumer preferences. This project will identify breeding trait targets based on knowledge of what industry sectors and consumers value and integrate genomics information to develop a sustainable technical platform to accelerate and increase the efficiency of cultivar development and adoption.

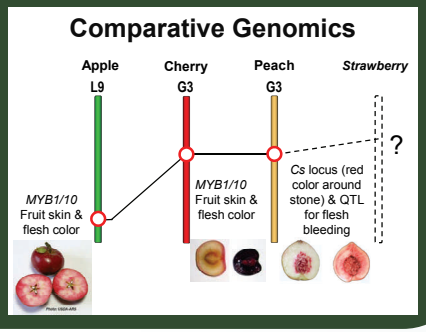
What is Marker-Assisted Breeding?

This approach uses genetic *markers* to detect desirable and undesirable *genes*. RosBREED will enable breeders to use these DNA-based markers to select the *best parents* to combine and the *best seedlings* to advance in cultivar development. Selection for improved fruit quality traits like texture, size, and flavor will thereby be enabled prior to field planting, and set the stage for similar advances in other Rosaceae crops.

Why are we working together as a crop family?

The diverse crops of the Rosaceae are derived from a common ancestor. This shared ancestry can be harnessed to leverage knowledge and resources across commodity boundaries via a process called comparative genomics.

For example, the gene that controls the presence of red pigment fruit and skin in apple likely controls the presence of redness in cherry skin and flesh and around the stone in peach. The same region may control redness of strawberries.



Who will carry out the activities?

Twenty-eight scientists from university, USDA, and private sector programs are working in nine teams:

- Breeding
- Socio-economics
- Industry
- Pedigree Based Analysis
- Information Management
- Genomics
- Genotyping
- MAB Pipeline
- Extension

Collaborators from five other countries provide expertise and an international network in Rosaceae genetics, genomics, and breeding.

What crops and traits are being targeted?

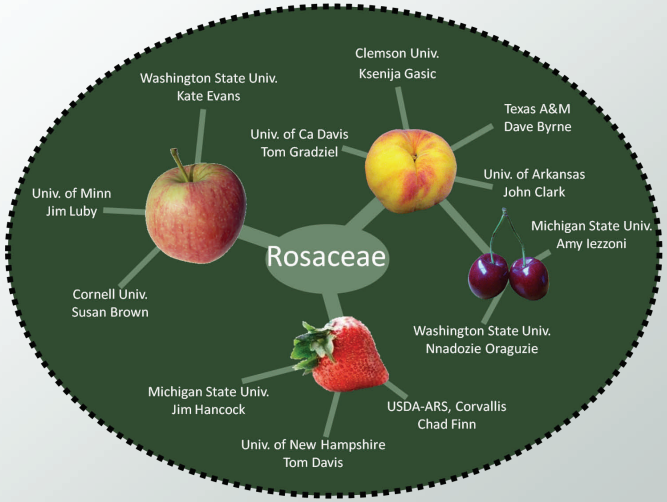
RosBREED focuses on fruit quality traits for five rosaceous crops:

- Apple
- Peach
- Sweet cherry
- Tart cherry
- Strawberry

Market-based information is being used to objectively quantify the importance of fruit quality traits to be targeted for Marker-Assisted Breeding.

Demonstration breeding programs

RosBREED's twelve demonstration breeding programs represent diverse crops and U.S. production regions.



Find out more about our 12 demonstration breeding programs and RosBREED activities at our website:
www.rosbreed.org