

RosBREED



Enabling Marker-Assisted Breeding In Rosaceae

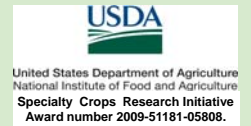
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ABSTRACT

RosBREED will create a national, dynamic, sustained effort in research, infrastructure establishment, training, and extension for applying marker-assisted breeding (MAB) to deliver improved plant materials more efficiently and rapidly. The Rosaceae family (including apple, peach, sweet and tart cherries, and strawberry) provides vital contributions to human health and well-being, and collectively constitutes the economic backbone of many U.S. rural communities. Rosaceae genetics and genomics are developing rapidly but have not been translated to routine practical application. Specific objectives are to:

- (1) Socio-economics: Enhance the likelihood of new cultivar adoption, enlarge market potential, and increase consumption of rosaceous fruits by using socio-economic knowledge of stakeholder values and consumer preferences to inform breeding;
- (2) Genomics: Establish sustainable technical infrastructure for an efficient MAB Pipeline in Rosaceae, including crop-specific SNP genome scan platforms for breeding-relevant germplasm exploiting the shared ancestry of Rosaceae crops;
- (3) Breeding information management system: Integrate breeding and genomics resources by establishing a user-friendly U.S.-wide standardized statistical framework and breeding information management system;
- (4) Marker-assisted breeding pipelining: Implement MAB in core RosBREED breeding programs with a common focus on fruit quality traits; and
- (5) Outreach: Enhance sustainability of cultivar development by transferring MAB technologies to the public and private community of U.S. Rosaceae breeders through training current and future breeders as well as engaging the production, processing and marketing sectors, allied scientists, and consumers.

What need does RosBREED address?

The 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 consumer preferences. This project will utilize genomics information and knowledge of what consumers value to increase the efficiency of cultivar development and deployment.

Why now?

2010 is a watershed year for the Rosaceae with the anticipated publication of the peach, apple and strawberry genome sequences. In addition, over 250 genes and marker-trait associations have been identified in rosaceous crops. Yet, a huge gap exists as this DNA-based information is rarely used to improve plant breeding. RosBREED will bridge this gap and ensure that future breeding efforts leverage this genomics and genetics information to more efficiently reach the cultivar goals.

