

# ROSBREED

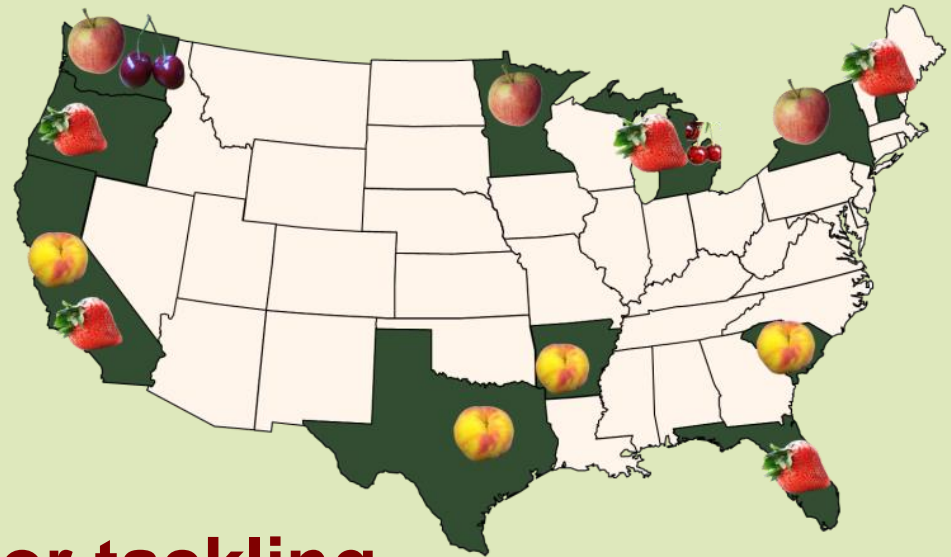
Enabling marker-assisted breeding in Rosaceae

Challenges

# Socio-Economics Team I

## 1. Challenge

- Do not have extension teams for each crop in top-producing states



## Plan for tackling

- See Extension Team Year 2 Deliverable 1

# Socio-Economics Team I

## Plan for tackling

**What:** *Partnerships with extension agents and industry members – create and foster (e.g., attend grower meetings and field days, strategic industry visits)*

**To Whom:** *SE and Extension Teams, Demonstration Breeders, extension agents, industry*

**Intended impact:** *A better communication conduit established between industry and extension agents and between the Extension and SE Teams for more efficient achievement of Extension and SE Teams' goals*



# Socio-Economics Team II

## 2. Challenge

- Motivate the industry to participate in surveys by highlighting utility and importance of the integrated information gained

## Plan for tackling

- Work with other Teams to deliver integrated information to industry by emphasizing utility of knowledge gained for objectively defining selection targets in Rosaceae breeding



# Breeding Team I

## 1. Challenge

- Coordinating phenotyping in multiple programs

## Plan for tackling

- Communication among Demonstration Breeding programs for each crop by email and telephone and recap at March 2011 RosBREED Michigan workshop



# Breeding Team II

## 2. Challenge

- Incorporating previously existing phenotypic data in breeding programs for reference germplasm set individuals with new data obtained with standardized phenotyping protocols since 2010

## Plan for tackling

- Begin with high-priority traits of particular interest to each breeder, rather than all data all at once
  - once data is compiled, analyze and interpret to highlight the value of using this additional data in providing motivation for the treatment of further traits



# Breeding Team III

## 3. Challenge

- Statistical treatment of unbalanced data sets

## Plan for tackling

- Seek advice from statisticians in conjunction with BIMS and MAB Pipeline Teams



# Pedigree-Based Analysis Team I

## 1. Challenge

- Transfer of experience and support to trainees and Demonstration Breeders

## Plan for tackling

- Annual multi-day workshop, web-based follow-up meetings, one-on-one web-based support by RosBREED's PBA support center at MSU, on-site visits to breeding programs by PBA Team members



# Pedigree-Based Analysis Team II

## 2. Challenge

- Dealing with massive data sets of a new type of marker data (SNP genome scans) with regards to quality control, data handling in QTL analyses, computation time, and haplotyping

## Plan for tackling

- Build up experience as soon as possible; start working with RosBREED data as they become available; explore expertise of colleagues with experience using similar data from other crops



# Breeding Information Management System Team I

## 1. Challenge

- Complexity and wide scope of BIMS presents special challenges to development team

## Plan for tackling

- A programmer and developer were hired toward the end of year 1, with database development work done ahead of hiring by existing bioinformatics team; partner with other database developers to create mutually useful modules; adopt a one-at-a-time approach, starting with the WA apple breeding program



# Genotyping Team I

## 1. Challenge

- Not enough personnel for this critical central service; a key technician departed in early Year 2

## Plan for tackling

- Pay attention to hiring an excellent technician; involve breeding trainees in data preparation and handling for their own crops



# Genotyping Team II

## 2. Challenge

- Being on the cutting edge of DNA technologies
  - no one is an expert, and having to learn on the run takes more time than expected, can lead to mistakes, and often requires seeking advice from an international network of collaborators before progress can be made

## Plan for tackling

- Continue to involve collaborative network; report/publish developed protocols to flatten the learning curve for others and streamline necessary follow-up activities of our own



# Genotyping Team III

## 3. Challenge

- SNP genotyping in tetraploid tart cherry and octoploid strawberry

## Plan for tackling

- Use of bioinformatics to identify subgenome-specific SNPs



# MAB Pipeline Team I

## 1. Challenge

- Not enough personnel for furthering connectivity of MAB Pipeline components – could limit development

## Plan for tackling

- Conduct fast-tracked pipelining - Demo Breeders & breeding trainees get experience in Pipeline (as users, they will help improve)



# MAB Pipeline Team I

## 2. Challenge

- Exploring uncharted territory  
(much considering before proceeding)

## Plan for tackling

- Develop foundation of knowledge (success stories, pitfalls)  
via many breeders and many DNA tests



# Genomics Team I

## 1. Challenge

- Ensuring the genomics database infrastructure developed is robust enough to incorporate all relevant genomics, genetics, and breeding data

## Plan for tackling

- Work diligently with the Rosaceae community, the bioinformatics community, and the BIMS Team to ensure a flexible, modular structure which accommodates efficient database querying and intuitive web interface development.
  - Obtain high-capacity storage servers (like “Rose”, 24TB capacity, bought in Year 1)



# Genomics Team II

## 2. Challenge

- Delivery of huge amount of data to research community



## Plan for tackling

- Submit sequences to NCBI's short read archive

# Extension Team I

## 1. Challenge

- Ever-growing extension activities: With project active in full swing, more & more roles are directed at Extension Team that has limited human and monetary resources

## Plan for tackling

- Request that Teams requesting Extension help define clearly what their extension needs are



# Extension Team II

## 2. Challenge

- Developing two-way communication between U.S. Rosaceae industries & project participants

## Plan for tackling

- Need help (in the form of introductions & contact details) from Industry AP members



# Extension Team III

## 3. Challenge

- How best to use web-based resources for maximum impact on stakeholders

## Plan for tackling

- Evaluate where Rosaceae breeders currently or prefer to obtain RosBREED and MAB information, & specific formats they prefer.
  - Already-completed RosBREED 2010 Breeding Program Survey includes useful information for this



# RosBREED

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www.rosbreed.org



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