RosBREED

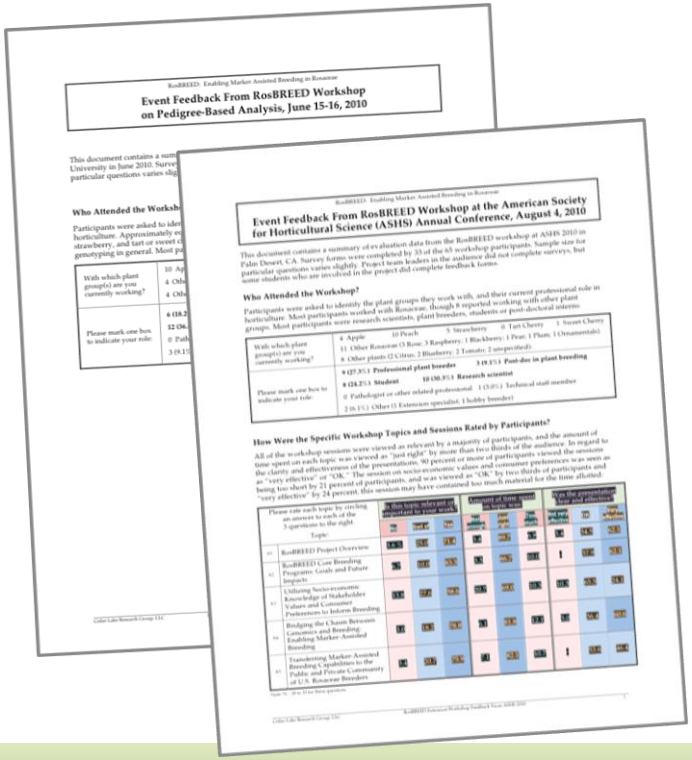
Enabling marker-assisted breeding in Rosaceae

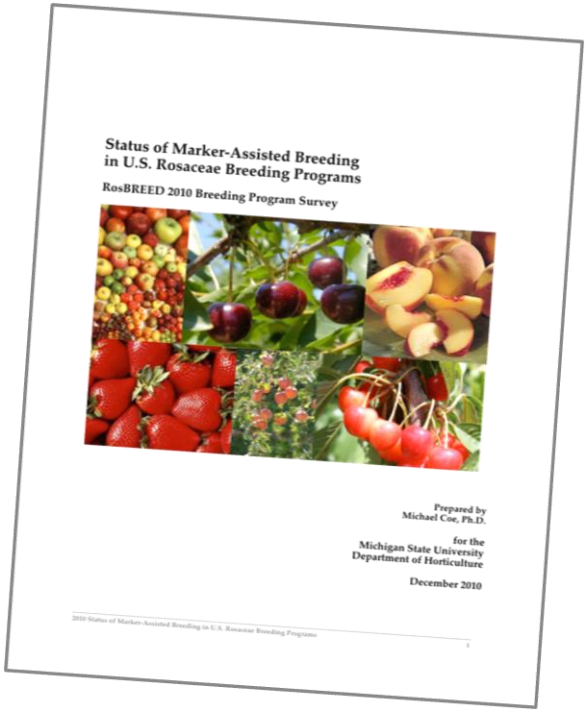
Evaluation of Outreach Efforts

Evaluation Data for 2010

Audience Feedback from RosBREED Events

- **Workshop at the American Society for Horticultural Science (ASHS) Annual Conference, August 4, 2010**
- **Workshop on Pedigree-Based Analysis, Michigan State University, June 15-16, 2010**



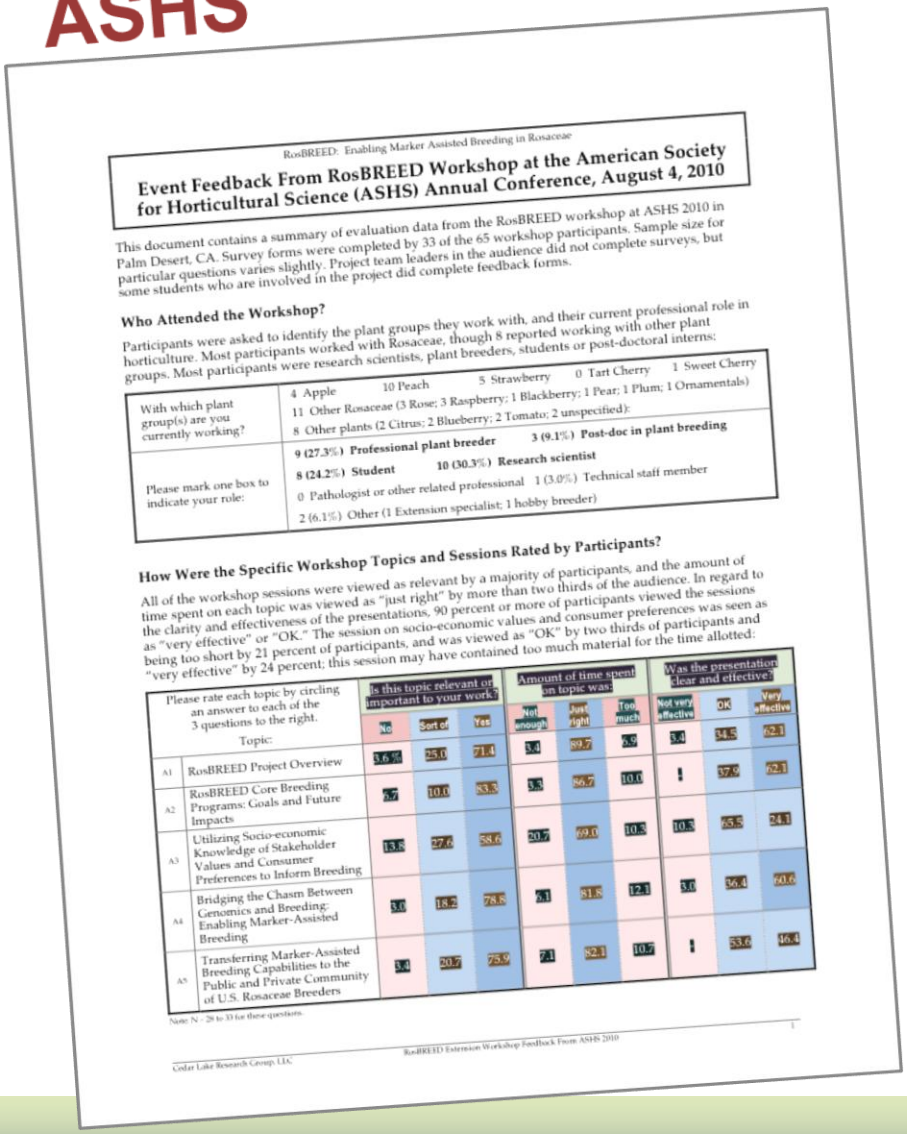


RosBREED 2010 Breeding Program Survey

- **Report: *"Status of Marker-Assisted Breeding in U.S. Rosaceae Breeding Programs"***
- **Baseline snapshot of the Rosaceae breeding community at the beginning of the project**

Evaluation Data for 2010

ASHS



RosBREED: Enabling Marker Assisted Breeding in Rosaceae

Event Feedback From RosBREED Workshop at the American Society for Horticultural Science (ASHS) Annual Conference, August 4, 2010

This document contains a summary of evaluation data from the RosBREED workshop at ASHS 2010 in Palm Desert, CA. Survey forms were completed by 33 of the 65 workshop participants. Sample size for particular questions varies slightly. Project team leaders in the audience did not complete surveys, but some students who are involved in the project did complete feedback forms.

Who Attended the Workshop?

Participants were asked to identify the plant groups they work with, and their current professional role in horticulture. Most participants worked with Rosaceae, though 8 reported working with other plant groups. Most participants were research scientists, plant breeders, students or post-doctoral interns:

With which plant group(s) are you currently working?	4 Apple 10 Peach 5 Strawberry 0 Tart Cherry 1 Sweet Cherry 11 Other Rosaceae (3 Rose; 3 Raspberry; 1 Blackberry; 1 Pear; 1 Plum; 1 Ornamentals) 8 Other plants (2 Citrus; 2 Blueberry; 2 Tomato; 2 unspecified):
Please mark one box to indicate your role:	9 (27.3%) Professional plant breeder 3 (9.1%) Post-doc in plant breeding 8 (24.2%) Student 10 (30.3%) Research scientist 0 Pathologist or other related professional 1 (3.0%) Technical staff member 2 (6.1%) Other (1 Extension specialist; 1 hobby breeder)

How Were the Specific Workshop Topics and Sessions Rated by Participants?

All of the workshop sessions were viewed as relevant by a majority of participants, and the amount of time spent on each topic was viewed as "just right" by more than two thirds of the audience. In regard to the clarity and effectiveness of the presentations, 90 percent or more of participants viewed the sessions as "very effective" or "OK." The session on socio-economic values and consumer preferences was seen as being too short by 21 percent of participants, and was viewed as "OK" by two thirds of participants and "very effective" by 24 percent; this session may have contained too much material for the time allotted:

Please rate each topic by circling an answer to each of the 3 questions to the right.	Topic:	Is this topic relevant or important to your work?			Amount of time spent on topic was:			Was the presentation clear and effective?		
		No	Sort of	Yes	Not enough	Just right	Too much	Not very effective	OK	Very effective
A1	RosBREED Project Overview	3.6%	25.0	71.4	3.4	89.7	2.9	3.4	34.5	62.1
A2	RosBREED Core Breeding Programs: Goals and Future Impacts	2.7	10.0	83.3	3.3	86.7	10.0	!	37.9	62.1
A3	Utilizing Socio-economic Knowledge of Stakeholder Values and Consumer Preferences to Inform Breeding	13.8	27.6	58.6	20.7	69.0	10.3	10.3	55.5	34.1
A4	Bridging the Chasm Between Genomics and Breeding: Enabling Marker-Assisted Breeding	3.0	18.2	78.8	2.1	81.8	12.1	3.0	36.4	60.6
A5	Transferring Marker-Assisted Breeding Capabilities to the Public and Private Community of U.S. Rosaceae Breeders	3.4	20.7	75.9	7.1	82.1	10.7	!	53.6	46.4

Note: N = 28 to 33 for these questions.

Cedar Lake Research Group, LLC RosBREED Extension Workshop Feedback From ASHS 2010 1

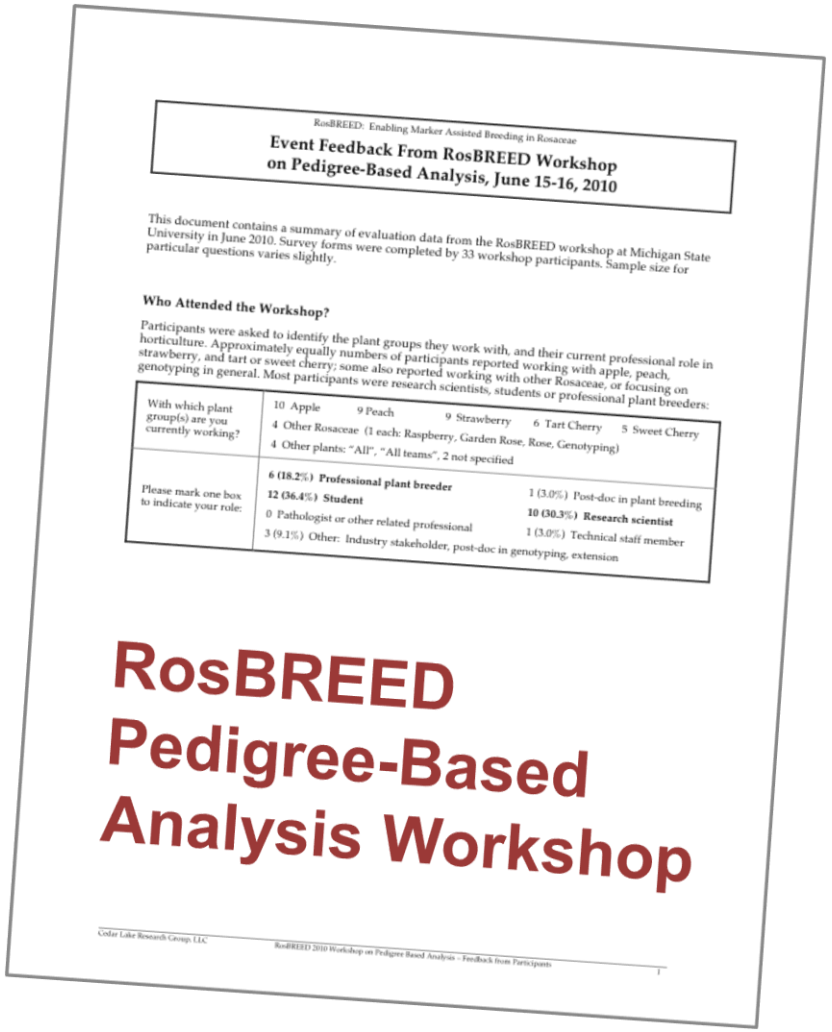
RosBREED Workshop at American Society for Horticultural Science (ASHS, August 2010)

- **Relevance**: Sessions were viewed as relevant by all or nearly all participants.
- **Length**: Time spent on each topic was viewed as "just right" by more than two thirds of the audience.
- **Clarity and effectiveness of particular sessions**: 90% or more of participants viewed the sessions as "very effective" or "OK."
- **Overall workshop quality**: 80% or more *"moderately or strongly agreed"* that the content was consistent with the publicized description and the learning objectives were clearly stated and met.
- **Overall workshop quality**: More than two thirds *"moderately or strongly agreed"* that they gained new knowledge applicable to their work, that there was a balance between theory and application, that they planned to apply what they learned, and that the RosBREED brochures were useful.

Evaluation Data for 2010

Pedigree-Based Analysis (PBA) Workshop (June 2010 at Michigan State University)

- **Relevance**: Sessions were viewed as relevant by all or nearly all participants.
- **Length** of the early sessions was viewed as *"just right"* by 88% or more of participants. Later sessions were more likely to be viewed as hurried. Many participants recommended a longer workshop in the future.
- **Clarity and effectiveness of particular sessions**: Earlier sessions were rated most highly. However, even the later sessions were viewed as *"OK"* or *"very effective"* by 84% or more of participants.
- **Overall workshop quality**: 85% or more *"moderately or strongly agreed"* that:
  - the content was consistent with the publicized description
  - learning objectives were clearly stated and met
  - there was a balance between theory and application, and
  - they would recommend the course to others



RosBREED: Enabling Marker Assisted Breeding in Rosaceae

Event Feedback From RosBREED Workshop on Pedigree-Based Analysis, June 15-16, 2010

This document contains a summary of evaluation data from the RosBREED workshop at Michigan State University in June 2010. Survey forms were completed by 33 workshop participants. Sample size for particular questions varies slightly.

Who Attended the Workshop?

Participants were asked to identify the plant groups they work with, and their current professional role in horticulture. Approximately equally numbers of participants reported working with apple, peach, strawberry, and tart or sweet cherry; some also reported working with other Rosaceae, or focusing on genotyping in general. Most participants were research scientists, students or professional plant breeders:

With which plant group(s) are you currently working?	10 Apple 9 Peach 9 Strawberry 6 Tart Cherry 5 Sweet Cherry 4 Other Rosaceae (1 each: Raspberry, Garden Rose, Rose, Genotyping) 4 Other plants: "All", "All teams", 2 not specified
Please mark one box to indicate your role:	**6 (18.2%) Professional plant breeder** 1 (3.0%) Post-doc in plant breeding **12 (36.4%) Student** **10 (30.3%) Research scientist** 0 Pathologist or other related professional 1 (3.0%) Technical staff member 3 (9.1%) Other: Industry stakeholder, post-doc in genotyping, extension

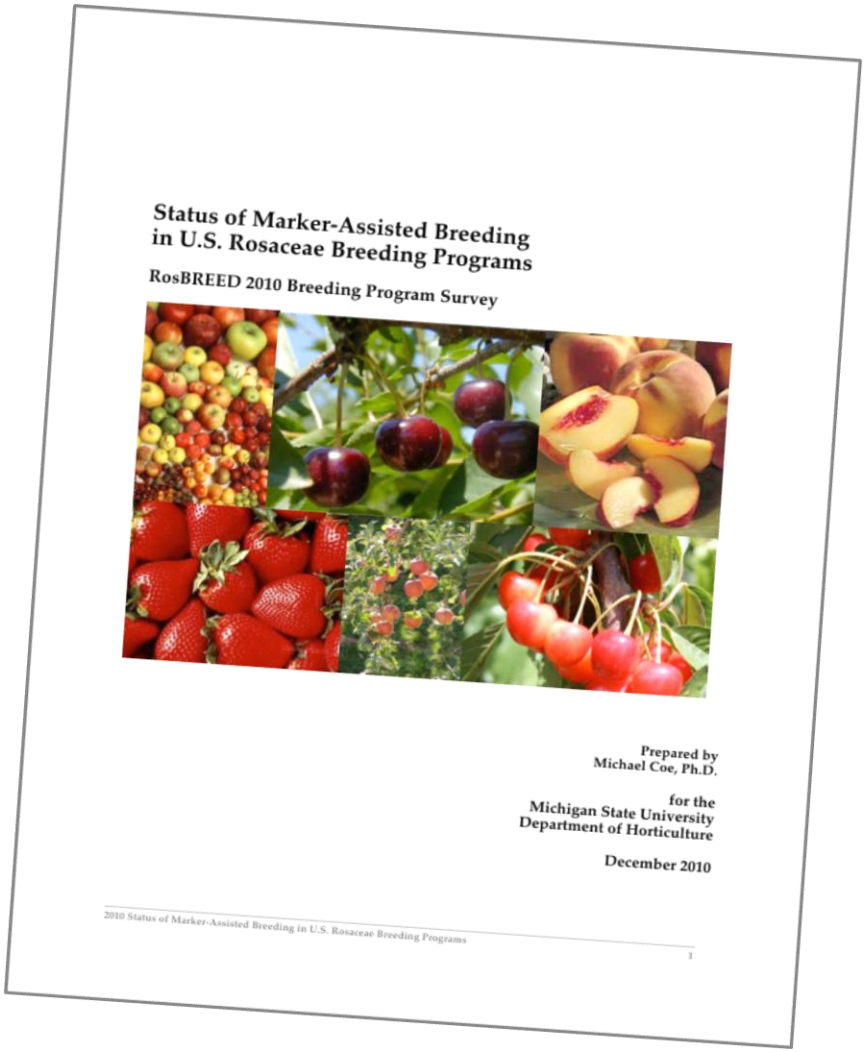
RosBREED Pedigree-Based Analysis Workshop

Cedar Lake Research Group, LLC RosBREED 2010 Workshop on Pedigree Based Analysis – Feedback from Participants 1

Evaluation Data for 2010

2010 Breeding Program Survey

- **Representative Sample:**
  - **35 of 50 known U.S. breeders (70%) and**
  - **58 of 96 known U.S. allied scientists (62%) participated**
- **Topics:**
  - **Crop and Cultivar Focus**
  - **General Background Knowledge of Horticulture, Rosaceae Breeding, Marker Applications**
  - **Knowledge of Marker-Assisted Plant Breeding**
  - **Attitude Toward Marker-Assisted Breeding**
  - **Self-Efficacy (Confidence) for Use of Markers**
  - **Actual Use of Marker-Assisted Methods**
  - **Interest in Further Learning**
  - **Recommendations for Learning Opportunities, Research and Development**


Status of Marker-Assisted Breeding
in U.S. Rosaceae Breeding Programs

RosBREED 2010 Breeding Program Survey

Prepared by
Michael Coe, Ph.D.

for the
Michigan State University
Department of Horticulture

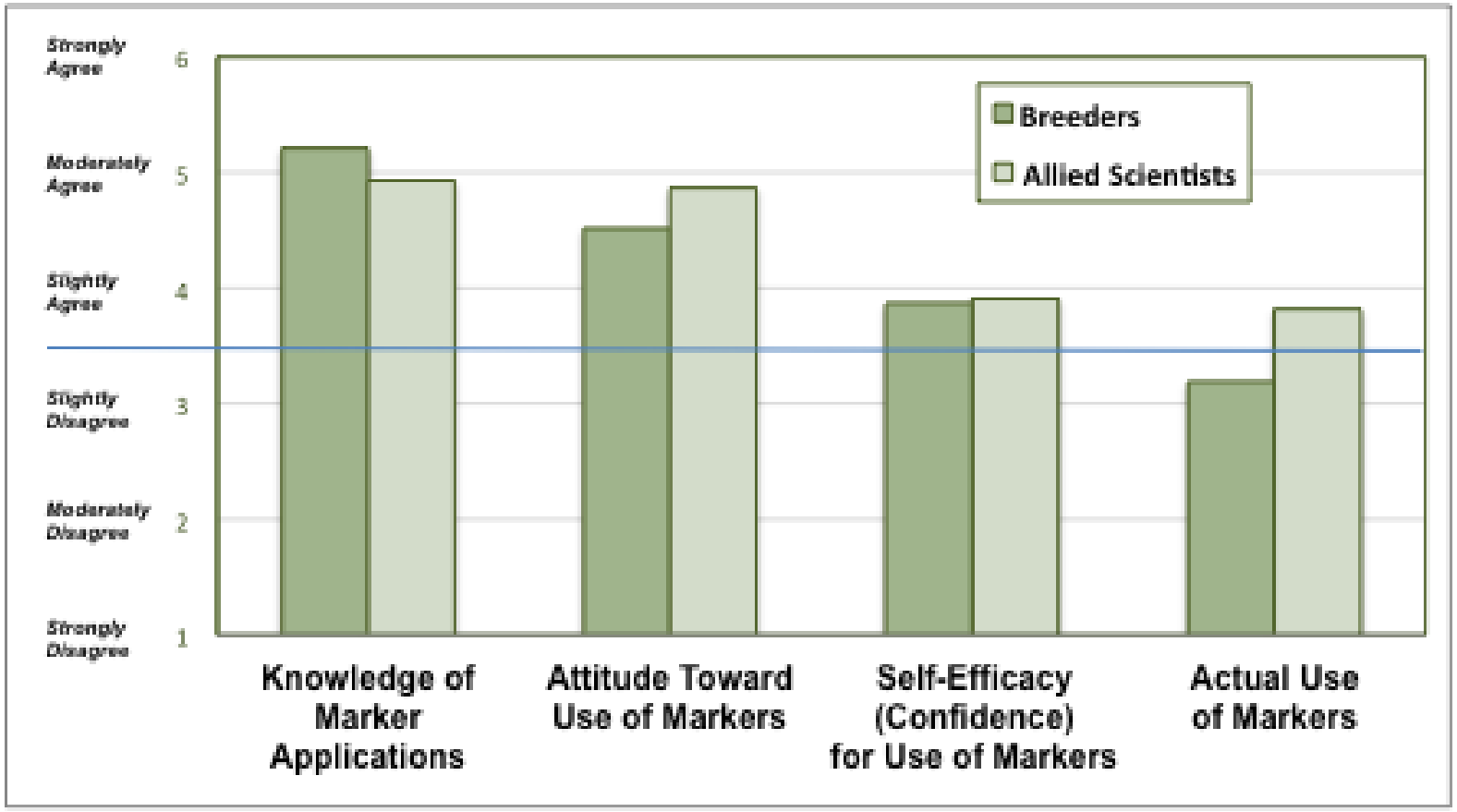
December 2010

2010 Status of Marker-Assisted Breeding in U.S. Rosaceae Breeding Programs 1

Evaluation Data for 2010

Baseline Survey of Breeders and Allied Scientists: Overall Pattern

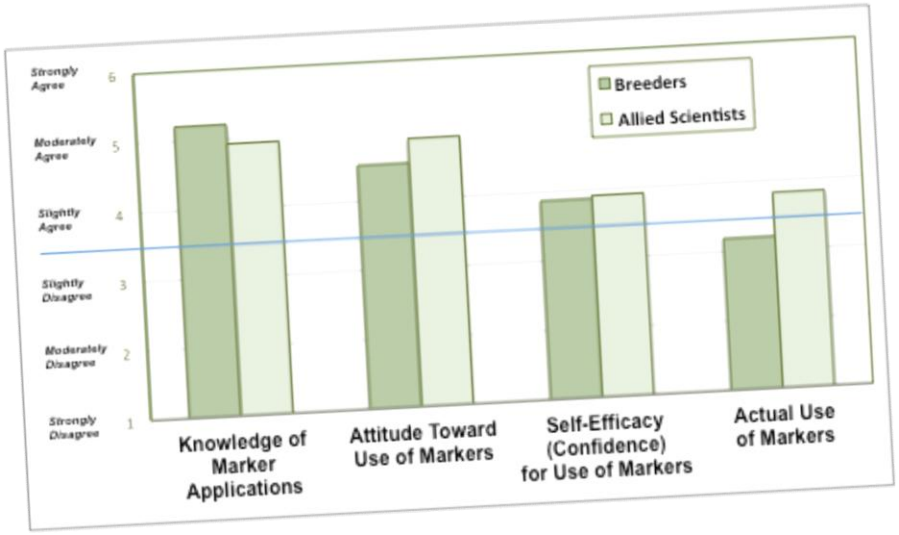
Background knowledge and attitude toward use of marker-assisted breeding appear to be stronger than self-assessed skills or actual use of markers:



Evaluation Data for 2010

Discussion

What challenges or opportunities do you see in these findings?



Contact:
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Table 22. Recommendations for further marker applications: Breeders

Are there questions or problems in breeding or horticulture that you think might be answered, at least in part, through genetic marker research and/or application?
▪ How many loci and alleles regulate remontancy in strawberry?
▪ So many! Almost any trait probably that can be accurately phenotyped. My particular interests now are in disease and insect resistance, fruit quality, precocity, and for rootstocks, mechanisms of dwarfing, induction of precocity, and production efficiency.
▪ Most of my efforts are directed at disease resistance. Pyramiding major genes, identifying QTLs for partial resistance genes, separating these from major genes.
▪ This type of research is already used for identification of genotypes and to understand the diversity of our germplasm. As we obtain new markers it will help us identify appropriate parents and even eliminate seedlings at a young stage of growth.
▪ Stress tolerance, primocane fruiting.
▪ Identification of unique linkage blocks (from inversions, translocations, etc).
▪ Yes. See RosBREED objectives and description. My biggest hope is to be able to screen for traits that are not seen easily i.e. post harvest fruit quality.
▪ How important is genetic diversity of a breeding program's germplasm relative to phenotypic diversity for important traits?
▪ I use markers in the grape breeding program. Our stone fruit breeding program is only doing evaluation at this time so I have no chance to use markers for seedling selection where I think it has the most immediate promise. We are using markers for disease resistance first and then might use if for seedlessness when a low % would be found in the population. Fruit quality traits for stone fruit would be useful but the confidence level for selecting must be very precise which I think will be a problem for traits that have low heritability.
▪ I'm not sure. I know we've been told for decades that genetic markers can make breeding more efficient. I'd like to find out I can make that happen in my own program, but nothing I've heard or read so far indicates it is possible for at least one of my crops. Mostly it seems to add a lot more work at a high cost compared to just increasing the size of the program.
▪ Linkage.
▪ Internal browning, predictors of post harvest life, brown rot resistance.