

NC-140 Annual Conference for 2011

Project Title: Improving Economic and Environmental Sustainability in Tree-Fruit Production through Changes in Rootstock Use

November 2-4, 2011

Grand Rapids, MI

Chair: Greg Lang, Michigan State University

Vice Chair: Renae Moran, University of Maine

Secretary: Esmaeil "Essie" Fallahi, University of Idaho

In attendance:

Participants

Thor Lindstrom, Utah State Univ.;

Jon Clements and Wes Autio, Univ. of Mass;

John Cline, Univ. of Guelph;

Rob Crassweller and Rich Marini, Penn. State Univ.;

Paul Domoto, Iowa State Univ.;

Rachel Elkins, University of California;

Essie Fallahi, University of Idaho;

Diane Miller, Ohio State Univ.;

Peter Hirst, Purdue Univ.;

Emily Hoover and Emily Tepe, Univ. of Minn.;

Greg Lang, Tiffany Lillrose, Phil Schwallier, and Nikki Rothwell, Michigan State Univ.;

Renae Moran, Univ. of Maine;

Michael Parker, North Carolina State Univ.;

Kris Pruski, Nova Scotia Agricultural College;

Greg Reighard, Clemson Univ.;

Terence Robinson, Mario Miranda Sazo, Steve Hoying, Alison DeMarree, Cornell Univ.;

Matt Stasiak, Univ. of Wisconsin;

Michelle Warmund, Univ. of Missouri;

Shengrui Yao, New Mexico State Univ.;

Gregory Peck, Virginia Tech

Chris Walsh and Julia Harshman, University of Maryland

Win Cowgill, Rutgers Univ.

Dwight Wolfe, Univ. of Kentucky

Kate Evans, Washington State Univ.

Newton Alex Mayer, Brazilian Ag. Res. Corp and National Temperate Ag. Res. Center

Ashaq Pandit, Univ. of Agri. Sci. Kashmir, India, (currently at MSU)

Thursday Nov. 3, 2011

The meeting began at 8:10 a.m.

Welcoming, Introduction, and Membership:

Greg Lang welcomed the group to Michigan and announced that Bill Randle could not be at the meeting. He also mentioned that Gennaro Fazio could not be present due to the travel budget restriction. Greg Lang reviewed the outline of the agenda for the day and it was moved for approval by Matt Stasiak and seconded by Greg Reighard and passed unanimously.

At the request of chairman Lang, participants introduced themselves with their affiliations. Greg Lang mentioned that minutes for the 2010 meeting had been posted on the NC-140 website. Peter Hirst

moved to accept the 2010 minutes and the motion was seconded by Paul Domoto and unanimously approved by the participants.

Gregory Peck, of Virginia Tech has been nominated to become a new member. He needs to be formally introduced and put in the NC-140 system by his Experiment Station Director. However, the NC-140 participants need to vote on acceptance of a new member. Renae Moran moved that Greg Peck to be accepted as new member from Virginia Tech and was seconded by Paul Domoto and was approved unanimously. Win Cowgill mentioned that all new members should be listed in the NC-140 system before November 15, 2011. Greg Lang moved that all foreign members should contact either Bill Randle at wrandle@ag.ncat.edu or Chris Hamilton at chamilton@cals.wisc.edu. The motion was seconded by Emily Hoover and passed unanimously.

Future Conference Sites:

2013 Portland, Maine

2014 Boise, Idaho

2014 Clemson, South Carolina

Greg Reighard was elected Secretary for 2012. There was some discussion that South Carolina does not have major apple experiment site but there are many positive aspects to hold the 2014 meeting in South Carolina.

Reports by Different Groups:

General Comments:

Chairman Lang: Bill Randle said that everything for the project re-write appears to be on target but he does not have anything to report.

Wes Autio reminded that the deadline for the re-write proposal is November 15, 2011 and the length of the proposal is limited to only 12 pages and we can meet this requirement. He reminded that this is the last chance for anyone to make any changes that he/she wishes to make.

Objectives by Various Sub-Committees:

Decision was made on dividing various sub-committees members for group discussion.

OBJECTIVE ONE

Apple Sub-Committee; Chaired by Terence Robinson:

General Discussion: Terence asked if anyone would volunteer to be new sub-committee chair but there was none. Terence discussed the situation of apple rootstocks that are commercially released and those that are currently under further study. These rootstocks include several rootstocks from Geneva, Russia, France, and Poland.

John Cline is interested in some new rootstocks in 2014. Terence mentioned that some states are interested in rootstocks such as B10 for planting. Discussion on the use of some rootstocks for Organic planting continued. Paul Domoto is not interested in organic planting. Peter Hirst asked what would be the status of some Chinese rootstocks. Terence replied that since dwarfism is not necessarily the goal of Chinese apple growers, their rootstocks are too vigorous for us. Essie Fallahi mentioned that some Chinese institutes may be ready to exchange rootstock materials with us but we are not sure if that would benefit us. Some discussion on the use of more vigorous rootstocks were made for poor soil conditions and for the regions that are not able/afford support system. It is generally agreed that apple industry may not be profitable if growers go back to the vigorous rootstocks and low-density era.

Pre-2015 Rootstock Planting: Terence inquired a head count for those who are interested in a rootstock planting prior to 2015 planting. These would be a combination of top newly released Geneva and Bud rootstocks. Representative of the following regions show interest: New Mexico; South Carolina; Idaho, Maryland; Virginia; Georgia; northwest Michigan, and Arkansas?? Alabama?. The Arkansas NC-140 planting is taken out and their peach planting does not look successful. If we need to have such a pre-2015 rootstock trial, we have to start the trees in 2012.

Organic Rootstock Work: Ramesh Pokharel of Colorado is interested in an organic planting. Terence presented a short background on the interest on an organic rootstock trial. Based on Terence, in Switzerland, performance of apples on a certain group of rootstocks grown under commercially-practiced conditions was different than those under an organic condition. Performance of Gingergold in Vermont was best. Terence and Essie mentioned 'Modi' (a Delicious x Liberty Cross) from Italy as the cultivar. Based on Essie and Terence, Modi is an extremely successful popular cultivar in Italy. Peter Hirst suggested Pixy Crunch and Matt suggested Honeycrisp under low nitrogen regime for this study. There were questions from the attendees about the requirements of organically certified ground for this planting. Finally, it was decided to say that "certified ground is preferred but not required for this organic study". This gives us more choices. Representatives of the following locations expressed interest in having an organic apple rootstock planting: Michigan; New Jersey; Virginia; Pennsylvania; Eastern New York; Wisconsin; Colorado; New Mexico; Minnesota; Western New York; Iowa?; Idaho?; Utah?).

Pear Sub-Committee; Chaired by Rachel Elkins:

2002 planting has one more year to continue. Tim Smith of Washington State has the only 2002 planting in the ground. Todd Einhorn is working on the subject of cold hardiness of quince rootstock on the 2005 pear planting.

2013 pear planting (was going to be 2012 planting previously) will be focused on system trials. The pear researchers will be using tree spacing trials in California, Oregon, New York, and Willow Drive Nursery in Washington will grow trees.

NAP is growing rootstocks for pears and trees are budded now.

Terence is concerned that if WA is not one of the sites, how the issue of cold hardiness can be addressed. Essie suggested that Idaho could be a potential site, but he has not made a commitment to this planting yet. The inclusion of quince rootstock and cold hardiness in the future pear plantings should be further addressed.

Rachel suggested that combining Pyrus Germplasm Group with NC-140 group, including Kate Evans of Washington State University is a good idea.

Peach Sub-Committee; Chaired by Greg Reighard:

Greg discussed options available for peach and peach hybrids and he does not think they are any better than the materials we currently have now. Not many materials available for apricot or plums. Greg Lang likes to work with plums and apricots, using some hybrids rootstocks in the 2016 planting. Terence thinks it is a great idea. States that expressed interest in this idea include: NY, SC, VA, NM, MI, and SC. Rachel Elkins will contact people in California who would be interested in participating trials for stone fruit rootstocks.

Cherry Sub-Committee; Chaired by Greg Lang:

Greg Lang asked who would be interested in participating in a tart cherry rootstock trial for 2015. Representatives from Ontario, Utah, Wisconsin, and Northwest Michigan expressed interest in participation. Greg Lang also asked who would be interested in participating in a sweet cherry rootstock trial. Representatives from New York (Geneva and Hudson Valley), Michigan, California (Chuck Ingels), Nova Scotia, Utah?, and WA? showed interest.

Rachel said that Scott Johnson is retiring at the end of 2013 and there is no money available from California Stone Fruit Commission.

Greg Lang mentioned that Amy Iezzoni has four rootstock selections in propagation for sweet cherry.

The group discussed the rootstocks that need to be included in the next planting.

Utah likes to have more dwarf rootstocks for tart cherry. Terence asked if MaxMa 14 was a good rootstock for tart cherry. Terence thinks inclusion of Gisela 12 for tart cherry is a good idea.

The sweet cherry systems trials planted in 2010 are now in 10 sites (MX, CA, OR, BC, CO, MI, OH, NY-Geneva, NY-Hudson Valley, NS). With WA, IL, and IN having dropped out.

OBJECTIVE TWO: BREEDING :

Kate Evans will be pear breeder in WA. Geneva will continue to be the site for apple rootstock breeding. Kate mentioned that the next round of apple planting will be planted in 2013 and WA cannot commit on apple breeding at this stage to meet the objective 2.

Detailed discussion went on breeding for peach rootstocks. Some members believe that lack of cooperation from GA peach rootstock breeder, with regards to providing new selections for test, is an important issue. Wes Autio was asked to contact the GA breeder and ask him to send his report to the NC-140 and join the group.

OBJECTIVE THREE:

John Cline works on some aspects of virus that fits in objective 3. Terrence mentioned that NY is working on tissue culture and propagation with commercial nurseries and NC-140 and other countries.

Chris Walsh has a tissue culture facility and believes that there should be better cooperation between propagation of rootstocks and production of trees. He thinks that objective 3 needs to be modified. Terence also suggested to change the statement of the Objective 3.

Rachel mentioned that Ted DeJong would send a report of his peach rootstock breeding work to the NC-140 group.

OBJECTIVE FOUR:

Mike Parker is working on this objective. Michele Warmund is working on the early acclimation of peach buds that fits under this objective. Essie Fallahi is working on the relationship between mineral nutrients and yield and fruit quality of 'Aztec Fuji' apple on various rootstocks. Kate Evans is also working on this objective. Renae Moran is working on cold hardiness of apples for this objective.

Geneva, NY is working on fire blight resistance of rootstocks which is also in Objective 4.

OBJECTIVE FIVE:

Several people and states are involved in Objective 5. Emily Hoover leads the eApple SCRI eXtension project and Emily Tepe published an article on eApple. Emily Hoover encouraged the group to write articles that can be peer-reviewed. Rich Marini discussed the possibility of publishing eXtension articles in HortTechnology. Based on Rich's conversation with some SCRI officials, the fate of projects after SCRI funding is finished is unclear.

Meeting for Thursday Morning Adjourned

Thursday Afternoon Started at 1:30 pm.

Project Coordinators' Reports:

American Pomological Society Report; Rob Crassweller:

You can become member by paying your dues by a confidential Fax. Essie Fallahi encouraged anyone who is not a member to become one. He described how people can also become a new member through the ISHS website and receive up to 15 free copies of any Journal of APS articles.

2002 Plantings:

1. 2002 Apple: Wes Autio

We are in the last year of 2002 planting and asked if there are any additional data we need to gather from this planting. The deadline for submission of data for this planting is January 15, 2012.

2. 2002 Apple: Jon Clements

He also reported status of 2002 apple planting.

3. 2002 Pear: Rachel Elkins

Todd Einhorn and Tim Smith are working on this planting. Todd sent his progress report for this planting from Hood River, OR.

2003 Apple Planting: Rich Marini

Rich reported that three manuscripts are coming out of this planting as follows: 1) Fruit weight vs. crop load; 2) Return bloom in different rootstocks; 3) Trunk cross sectional area vs. crop load. Rich reported that there was a linear relationship between fruit weight and crop load. He also noted that one must look at the slope of rootstocks over the years rather than pooling values of all years. For up to four fruits/TCSA, the slope was positive.

2006 Apple Replanting: Terence Robinson

Terence reported on the progress on this project and suggested to finalize the data and publish it as soon as possible.

2009 Peach Planting: Greg Reighard

Greg reported on peach x almond rootstock performance. He also reported that HBOK rootstocks are performing as they were reported to perform.

Cherry System Planting: Greg Lang

Terence reported New York's progress on this project and there was discussion of the project establishment data for future publishing. Trees in these plantings were cold-damaged in the nursery, resulting in relatively poor growth during the year of planting (2010). Consequently, all sites were instructed to cut back all laterals at the beginning of 2011 and restart/retrain the initial tree structure, which put most of the systems one year behind their expected development, which will need to be explained in the eventual publication. In MI and NY, the

system training treatments are: KGB, UFO, Tall Spindle, and Super Spindle; other locations lack the Super Spindle. Greg Lang showed pictures of different training systems in MI. Greg will request 2011 (and some 2010) data be sent by the end of 2011.

2010 Apple Planting: Wes Autio

Wes reminded researchers to send their data by Jan 15, 2012. He emphasized that only the requested data should be sent and nothing else. Wes reminded that rootstock codes should carefully be followed. TCSA should be taken in the fall and there should be 4 fruits/TCSA. Different ideas on how to come up with a reasonable crop load were discussed.

2012/2013/2016 Pear Plantings: Rachel Elkins

Rachel reported on 2012/2013 pear planting very briefly. She emphasized that quince as rootstock and/or inter-stem needs to be included in the 2016 pear planting.

Asian Pear Planting: Chris Walsh

Chris has been growing Asian Pear in the eastern USA for over 20 years. They have recorded fruit per cluster and measured soluble solids, fruit weight, and yield. Essie Fallahi described the Asian pear project that they have had since 1999 in Idaho. Chris suggested to create a joint presentation between University of Maryland and University of Idaho data for the Organic Fruit Conference in June of 2012.

2015 Tart Cherry:

Greg Lang asked for a volunteer to lead this planning. Brent Black could be a potential leader.

Other Potential Projects:

2013 and 2014 Vineland Apple and "The Combined Pre-2015 ": John Cline

Vineland rootstocks not yet tested by NC140 include V5, V6, V7. John proposed testing them against M9EMLA, M26, MM106, M.7, and Bud 9. They are using Honeycrisp as cultivar. Vineland series are more cold tolerant. John Cline suggested to have cooperators from other regions to work on these rootstocks. He is wondering if Cornell rootstocks can be added to this cooperative test. Terence Robinson asked if the Vineland rootstock test can be combined with the apple pre-2015 planting of outstanding and released rootstocks and make it one project. Terence suggested to have a total of 10 rootstocks, including B10, 3 Vineland rootstocks, 2 Mallings, and 4 top released Geneva rootstocks. There will be five blocks, each with two trees = 10 trees/rootstock/location. Total number of trees in each location will be 100. All members who expressed interest in the pre-2015 planting (as previously discussed) agreed to this "Combined" project. **Therefore:**

Representatives of the following regions showed interest: Idaho, New York, New Mexico; South Carolina; Maryland; Virginia; Georgia; Maine; nowrthwest Michigan, and Arkansas?? Alabama?. If we need to have such a pre-2015 rootstock trial, we have to start the trees in 2012. Trees will be trained into tall spindle. These trees will be planted in 2014. Total of 15 sites??

Use of Bioregulators: Mario talked about his project on Tiburon and MaxCel on tree branching.

Various aspects of rootstocks for tart cherries were discussed.

Chris Walsh felt that Asian Pear could be categorized under a different project.

Meeting of Thursday November 3, 2011 was adjourned at 5:00 pm.

Friday Nov. 4, 2011

The meeting was opened by Chairman Greg Lang at 8:00 a.m.

NC-140 Website: Jon Clements

Jon Clements made a presentation about the NC-140 website. The site is operational. Idaho is missing from the list on the website and Jon corrected it.

eXtension: Emily Hoover

Emily Hoover showed how to use eXtension. Any state can be added to the eApples site. News items can also be posted on this site. Each state has an eXtension representative.

Morning Break

State Reports

A copy of each State report is distributed alphabetically on the table and each participant received a copy. Each report contained detail progress report for each state and posted on line. Therefore, we will avoid taking a detailed note on each report.

California Apple and Peach: Rachel Elkins

All NC-140 experimental apples are removed in California. Peach physiology report was distributed. As far as the California peach rootstocks is concerned, Controller 6 (H-BOK) by Ted DeJong is released. Greg Reighard commented that yield with Controller 6 was good.

California Pear: Rachel Elkins

The season was late in 2011 and pear fruit did not gain sufficient size. Horner 4 from Hood River is a vigorous rootstock and crops well. Rachel likes this rootstock and thinks it has a good potential. Bartlett/OH x Farmingdale had small size and was planted at 6 x 10. Rachel prefers if this was planted at 6 x 12. Bartlett/Horner 4 had good fruit size.

California Cherry: Rachel Elkins

California sweet cherry systems trial is going well. Gisela 12 is included in the California site for the KGB and UFO systems, but other sites do not have G 12 in their trials.

Idaho Apple Report: Essie Fallahi

They did not have further tree loss in 2010 Fuji apple trial in Idaho. Trees are growing extremely well and they were thinned chemically and by hand. They had up to 18 fruits per tree and leaving fruits on the tree did not diminish the tree growth. Essie showed slides from some promising rootstocks. He also briefly described a "Canopy-Rootstock-Spacing" experiment in Idaho. Terence Robinson said that this experiment perfectly fits within the scope of NC-140 and should be reported under NC-140. Terence thought the tree growth in Idaho was great. Essie said that they have been bending side branches to form a tall spindle and they need to continue bending new branches before they get too thick.

Iowa Apple Report: Paul Domoto

Paul presented a comprehensive report on various projects in Iowa. He said that they have observed Leaf Zonal Chlorosis on 'Honeycrisp'. Paul is including Zonal Chlorosis as a measurement in this trial. The possible relationship between zonal chlorosis and biennial bearing was discussed.

Kentucky Apple Report: Dwight Wolfe

The 2011 growing season in Kentucky was variable for most fruits. However, dates ran fairly close to normal. B9 is grown by a lot of growers in Kentucky. Dwight reported on 2002 apple rootstock and 2003 apple physiology plantings in Kentucky.

Maine Report: Renae Moran

Renae reported that 2003 Golden Delicious planting had low crop. Some trees were lost due to wind. She reported progress on the freeze and cold hardiness study and indicated that trees on G935 had good low temperature survival. This study is an important one to address cold tolerance of certain rootstocks.

Maryland Report: Chris Walsh

Chris reported the effect of fire blight (both blossom blight and hail-damage blight) on Asian pears. They had some wind damage in 2011.

Massachusetts Report: Wes Autio

Wes reported that 2011 had some severe windy days. Hailstorm occurred on August 1st and snowed (about 18") in late October. These events damaged the experimental orchards. 2009 Peach planting is doing well. 2010 Honey Crisp did not grow well.

Michigan Report: Greg Lang

Greg Lang reported on apple rootstock trial in MI. Dr. Guo-Qing Song at MI is working on gene silencing of Prunus ring spot virus in the rootstock, to see if the silencing message can be transferred into the scion and stop infection of this pollen-borne virus.

Ron Perry appreciated the NC-140 group for their work. Ron mentioned that by mounding soil around the tree and then removing it as the tree matures, dogwood borer infestation of the burrknots will be eliminated. Whether rootstock root formation from the burrknots increases vigor, as observed during the Wednesday field tour, deserves further study.

Minnesota Report: Emily Hoover

Emily is very pleased about the 2010 planting of 'Honeycrisp'. Trees reached top of the wire and the growth was great.

New Jersey Report: Win Cowgil

Win still has the 2006 planting. Mike and Win took some data from that block. They have conducted some pre- and post-plant fumigation in that block.

North Carolina Report: Mike Parker

Thirty-five trees of 2010 apple planting were lost, but trees were growing fine in 2011. 2005 and 2006 plantings are continuing and Mike gave a comprehensive report on these two trials. In North Carolina, trees planted on fumigated sites had much better performance than those planted on non-fumigated sites. G30 performed well in North Carolina. Gala on M7 on the fumigated site had more yield than other trees.

Mike reported that peaches showed blossom blast in North Carolina.

Pennsylvania Report: Rob Crassweller

In 2003 apple planting, Bud 9 was more efficient. 6210 was more efficient than M.26. The 2010 Fuji planting was poor to begin with. Rob asked if the missing trees could be replaced with non-experimental guards. The answer is yes it can be done.

Purdue Report: Peter Hirst

Honeycrisp branches were broken by deer. For 2010 planting, deer fence has been put in the orchard.

South Carolina Report: Greg Reighard

Greg gave a comprehensive report on S. Carolina 2009 peach plantings (see written report). Fruit size on most rootstocks except Fortuna was good.

Utah Report: Thor Lindstrom

Thor reported the results on 2009 peach rootstock, 2009 peach physiology and 2010 apple planting. Some rootstocks performed differently when used for Honeycrisp vs 'Fuji'. Fuji and 'Honeycrisp' growth was satisfactory in 2011.

Wisconsin Report: Matt Stasiak

Wind caused major damage on trees. Apple trees on Bud 9 rootstock looked great, particularly for yield efficiency. Matt reported that tissue culture trees vary in bloom density.

Nova Scotia Report: Kris Pruski

Kris reported on 2010 Honeycrisp /rootstock, 2010 Sweet Cherry Rootstock/Pruning System, 2006 Apple Replant Study, 2004 Pyro-Dwarf pear rootstock trial.

SCRI Status:

Tom Bewick joined the group by phone and talked for 15 minutes about the status of SCRI grants. Essie Fallahi asked if the SCRI support is along the party line. It seems that SCRI has fairly good support from different groups. Tom mentioned that the "Super Committee" is determined to cut 1.3 Trillion dollars and we may get 8% cut in the process. Tom emphasized that importance of "Impact Statement" in the proposal preparation.

A side meeting was held to discuss the possibility of writing a SCRI proposal for NC-140, to follow up on the SCRI planning grant obtained by Gennaro Fazio in 2010. Greg Lang will lead this effort with Gennaro, Terence, and others from NC140.

NC-140 meeting was adjourned at 3:00 pm, Friday November 4, 2011.