NC-140 Annual Meeting for 2010
Project Title: Improving Economic and Environmental Sustainability in Tree-Fruit Production through Changes in Rootstock Use
November 4-5
Provo, UT

Chair: Brent Black, Utah State University
Vice Chair: Greg Lang, Michigan State University
Secretary: Renae Moran, University of Maine

In attendance:
Shengrui Yao, New Mexico State Univ.
Rafael Parra, INIFAP, Sierra de Chihuahua, Mexico
Valdemar Gonzalez, Fundacion Coahila, Mexico
Thor Lindstrom and Brent Black, Utah State Univ.
Essie Fallahi, Idaho State Univ.
Jozsef Racsko, Diane Miller, and Bill Randle, Ohio State Univ.
Gennaro Fazio, USDA ARS / Cornell Univ.
Cheryl Hampson, AgCanada, BC
Michelle Warmund, Univ. of Missouri
Terence Robinson, Cornell Univ.
Jon Clements and Wes Autio, Univ. of Mass
Emily Hoover, Univ. of Minn.
John Cline, Univ. of Guelph
Michael Parker, North Carolina State Univ.
Peter Hirst, Purdue Univ.
Rob Crassweller and Rich Marini, Penn. State Univ.
Paul Domoto, Iowa State Univ.
KaiChun Zhang and Xioming Zhang, Institute of Forestry and Pomology, Beijing Academy of Agriculture and Forestry Sciences, Beijing China
Greg Reighard, Clemson Univ.
Todd Einhorn, Oregon State Univ.
Rachel Elkins and Scott Johnson, Univ. of California
Ramesh Pokharel, Colorado State Univ.
Matt Stasiak, Univ. of Wisconsin
Greg Lang, Michigan State Univ.
Kris Pruski, Nova Scotia Agricultural College
Charlie Embree, Atlantic Food & Hort. Research Center, Kentville, Nova Scotia
Renae Moran, Univ. of Maine

Thursday Nov. 4, 2010
The meeting began at 8:30 a.m.
Brent Black welcomed the group to Utah, and Teryl Roper sent a letter of welcome. Brent introduced Lori Johnson and pointed out members of the Utah team.

Review and Approval of Agenda. One item was added to the agenda – a report on the SCRI project focus group meeting held on Tuesday. The agenda was approved as amended.

A copy of the minutes of the 2009 meeting in Minnesota was given to each attendant. Members were given one day to review them. Greg Reighard requested one correction

- the coordinator of peach physiology trial is not himself, but Scott Johnson. The minutes were approved as amended.

Everyone introduced themselves. There are three new members this year, Shengrui Yao, New Mexico State University; Essie Fallahi, Idaho State University; and Elina Dimitrova Coneva, Auburn Univ.

Future Meetings and Leadership. Greg Lang will chair and host the 2011 meeting and prepare the 2010 report. His plans for next year are to hold the meetings before or after the Great Lakes Fruit Workers Meeting in Michigan. The location with be in Lansing or Grand Rapids. He will email other groups to find out about time conflicts with other meetings. Nov. 1-8 is tentative time for the NC150. Renae Moran will be Vice Chair in 2011 and will prepare the meeting minutes for 2010. 2012 meetings will be held in Maine. Essie Fallahi was elected secretary for 2011 and agreed to host the meetings in 2013.

Report from CSREES Representative.

Report from the Administrative Advisor, Bill Randle. NIFA has gone through reorganization into an institute. There will likely be continued funding of SCRI. Multistate groups are a bridge to SCRI multistate grants. The extension component is highly valued in SCRI grants. NC140 went through midterm review. Bill reported that the NC140 is one of the best run and best attended groups of the multistate projects. There were no problems in this midterm review for the NC140.

Project Rewrite, Wes. Since the same people have done most of the previous rewrites of the proposal, Wes proposed a membership change for future rewrites. Seven people, Parker, Moran, Fazio, Cline, Black, Lang, and Einhorn, were recommended to be on the rewrite committee for the period of 2017 to 2022. The current committee will meet tonight at 8 pm to discuss new objectives for the next five years. It has been suggested that they be changed to some degree and should contain signature words that are popular at the federal level, such as food safety and carbon sequestration.
Suggestions for new objectives:
Fazio – new objectives should have more nursery slant. This area has been neglected.
Rob – include an eXtension objective.
Brent and others – include the important buzz words, local supply, reducing carbon footprint and global climate change, improve sustainability, and labor efficiency.
Terence – there will be more molecular work (marker assisted selection), so objectives 2 and 3 could reflect this.

Specialty Crops Research Initiative Focus Group. Gennaro reviewed the focus group meeting of the SCRI Planning grant which met Tuesday and included researchers and members from the nursery industry. He anticipates asking for $5-7 million over five years, but the match requirement will dictate the final amount. The Focus group identified gaps in the industry that need attention, and factors that are currently limiting research in these areas. He will develop a white paper that summarizes these objectives and anticipates completing it by next week. The Focus group has research and industry partners, but still needs people who can address certain areas. Gennaro will send out the paper and solicit participation. The final SCRI proposal is due at end of Jan., so subcontracts, documentation of matching funds and the proposal draft need to be completed by Dec. 15. Gennaro needs volunteers to be team leaders for each objective, and each leader will get a budget. Objectives identified by the focus group

include improvements in propagation to speed up availability of new genotypes, root-soil interactions including replant disease and nutrition, evaluation and selection for greater orchard efficiency and other traits such as cold hardiness, improvements in extension delivery and others.

eXtension Meeting Summary with Emily and Rich as Co-leaders. The purpose is to improve access to information for the industry, extension and other users. Anyone who would like to join the community of practice can be set up with access to the website. They are starting with a focus on rootstocks, but there will be a cultivar piece. The first step will be to establish community of interest that will include the industry, extension educators, gardeners, etc. The next step will be to find out what the community of interest wants through assessment and evaluation, i.e., a survey. The apple part of the eXtension website will not be launched until May 201X.

Reports from Ongoing Cooperative Planting Coordinators
Wes for the 1999 McIntosh and Fuji Apple trial. Final versions of manuscripts were submitted to the J. Amer. Pom. Soc. last summer and need a little revision. The black heart manuscript will be ready for submission later. Mike is working on a tree loss manuscript, so each cooperator should let Mike know the reason for tree loss in the plantings.

Greg Reighard for the 2001 Peach trial. Greg thanked Cheryl for getting the paper in press.

Scott Johnson for the 2002 Peach trial. The paper is being finished.

Wes Autio for the 2002 Apple trial. Wes sent a report around. 2011 is last year, so cooperators should be taking the “end of planting” data. Please send data to Wes by Jan. 15.

Jon Clements for the 2002 Cameo Apple trial. This trial has two locations, NJ and Mass. He sent around a report.

Todd Einhorn for the 2002 Pear trial. He will write up a paper in the next year summarizing nine years of data.

Rich Marini for the 2003 Golden Delicious Apple trial. He passed around two reports, and both are uploaded to the website. Data from the rootstock trial is not analyzed yet. This is the first time he has seen Geneva rootstocks that are more productive than M.9 or M.26. Scott, in his California planting, has a problem with JM rootstocks not being what they should be based on inconsistent tree size. Paul has problems with JM7 in his planting. The possibility of mislabeling was discussed. For the Physiology trial, a decision has to be made. Some sites have only adjusted crop load once. If we end it now, Rich needs the final return bloom data. He is not sure how to present data. Determining the impact of the crop load relationship with tree growth of young trees on different rootstocks in different locations is the primary objective. There is interest in the impact of climate on fruit size and tree growth, so he is looking at relationships and modeling of weather variables, but needs more data to finish it.

Terence Robinson for the 2004 Pear trial. There are two locations. Pyrodwarf is not a good as was originally hoped, and is not as productive as 87. He is presenting a poster at the Argentina meeting.

Rachel Elkins for the 2005 Pear planting. She has summarized data from 2005 – 2009 for the Argentina meeting. No differences occurred in yield efficiency among rootstocks. Todd Einhorn gave a report for the d'Anjou trial.

Terence Robinson and Gennaro Fazio for the 2006 Apple Replant study. Terence shared copies of the Acta Hort. article from the Lisbon meeting. Significant differences occurred among rootstocks and among sites. Tree growth with fumigation was not much different than without fumigation. All rootstocks showed yield response to fumigation. 2010 is the last year so cooperators need to collect "last year" data. G41 is a mixture of types. Terence can tell which trees are not G41, but not in all sites so these trees have to be resampled. Charlie - Trees in Nova Scotia have been stressed and should probably not be included in the full analysis.

Greg Lang for the 2006 Cherry Physiology study. This study could be finished if we have enough data. Trees are getting too big for additional crop load adjustment. The Washington site might be lost.

Greg Reighard for the 2009 Peach Rootstock planting. Greg passed out a report to cooperators. He needs the data sent in according to instructions and sent by Feb. Instructions are on the website.

Wes Autio for the 2010 Apple Rootstock planting. Because of the winter injury that occurred in the nursery last fall, there should be an additional column for tree status for Fuji trees that died this season. Indicate a status of 0 for trees that died from legitimate reasons such as fire blight. Indicate a status of 2 for trees hit by tractors or other nonlegitimate reasons for injury or death. Indicate a status of 3 for union breakage and for trees that were broken upon arrival. Indicate 4 for trees that never grew and 5 for trees that started growth and then collapsed in 2010. Similar problems happened with Honeycrisp. Since tree growth was poor, all cooperators should count the number of flower clusters, and then defruit trees in 2011. Terence gave instructions for tree training. Cooperators should tie down branches now, or in spring before bud break. Branches that are already horizontal can be skipped.

Greg Lang for the 2010 Cherry Systems planting.

Friday Nov. 5, 2010

Committee Reports

Terence Robinson for the Apple Committee. There are no definite plantings scheduled, but five possible projects.

1) a multi-location study with new rootstocks including six from New Zealand and 6-10 new Geneva selections. It's a 4-year process to prepare this trial, so it would be ready at the earliest in 2015.

2) Using existing plantings to relate leaf nutrient content to rootstocks. This could potentially be funded by a SCRI grant.

3) Relating leaf and fruit mineral content to storage disorders in the 2010 Honeycrisp planting. This would require a cold storage period of 6 months. It also fits in with proposed SCRI objectives.

4) A study on the impact of replant treatment on yield and yield efficiency.

5) An organic rootstock trial which can be put together right now with available rootstocks with an undetermined scab resistant scion for planting in 2013. This would

require following organic protocol, but certification would not essential. This project would fit with SCRI or OREI as funding sources. This one has to be decided before Feb. if it will be ready by 2013. Possible rootstocks include Geneva 214, 41, 935, 969, and M9. It could have 6-8 rootstocks that have already been tested with a larger number of each rootstock and 4 reps for an estimated 350 trees per site at $7 per tree. Tree support would be required with non-pressure treated posts. Potential cooperators have a few months to think about it before committing to the study. Anyone who agrees to participate is expected to pay for the trees whether or not they continue with the study.

Greg Reighard for the Peach committee. There are plans for a tissue analysis study with the 2009 trial to look at site and rootstock interactions. He could talk to IPI for possible funding. There is interest in a cold hardiness study, but would need partial funding of Michelle's study. They are two years away from having enough wood.

Greg Lang for the Cherry committee. The group met Wednesday and he gave the report on Thurs.

Rachael Elkins and Todd Einhorn for the Pear committee. Kris might work on propagation issues. There are 3 new rootstocks in tissue culture that were damaged by cold temperatures. 2013 is the anticipated date for the next planting with 3 rootstocks - Pyro 2-33, OHxF87 and OHxF69 and 3 amelanchier clones.

Jon Clements for the Website Committee. The statistics on number of visits to the website indicates it has remained constant. The website currently has a link to meeting info, annual report and publications. Contact info for each cooperator needs to be updated if there have been any changes. Things that could be added – a section for photos and tree training instructions for current plantings. Terence brought up the issue of growers and extension not having access or the lack of useful information. We are perceived as being secretive. He suggested increasing access to state reports. This could be a 2-paragraph progress summary of each planting written by the coordinator and made available for the public. A motion passed that allows each willing cooperator to provide a 2-3 paragraph summary for public part of the website. Essie brought up the point that state reports can have explanations that are speculations rather than science, especially results that are based on one year of data.

Wes Autio for the Rewrite Committee. A copy of the drafted objectives for 2012-2017 was shown to the entire group. After we have finished the drafted objectives, he will run them by Bill Randle. Objectives should be written with an audience in mind, probably station directors rather than other fruit scientists. If anyone has ideas about the objectives, they can email them to Wes. Everyone needs to contribute to the methods section by sending plans to Wes. Refer to the old proposal as an example of how much detail to send. The old proposal is on the NIMSS website. One sentence may be enough. From planting coordinators, he needs information on all rootstocks and all cooperators for each trial by March.

State Reports
Oregon, Todd Einhorn.

The Washington trials were discontinued. He has 2 pear trials in Oregon. The d'Anjou trial had its first year of decent yield. There was not much segregation among rootstocks; all trees set well. Yield efficiency was similar for most, but Pyrodwarf did not perform as well. Dave Sugar has a local trial at Medford with quince. The size of

BAC23 ranges from site to site. Quince H is doing well. They are screening for cold hardiness of quince using material available in the germplasm repository. A sweet cherry trial is in its first year, and Lynn Long has an IFTA cherry trial with sweetheart.

New York, Terence Robinson.

He presented data on fruit size versus crop load in each year in a Gala planting which was not irrigated. For each rootstock, he looked at the slope of fruit size and increasing crop density with each year adjusted to the same intercept. He will do the same with data from the Golden Delicious trial which was irrigated.

In a pear trial with Nova Scotia, there was an interaction between varieties and rootstocks. Pyrodwarf was disappointing. It produced too many suckers. There were fewer suckers with Bartlett in another trial, in contrast to Bosc. 70836 is a small tree, but has high yield efficiency. Pyro 2-33 looks good in his trials.

The new sweet cherry systems trial may have tree damage with an interaction with rootstock in some systems. SS and TS are almost identical systems but have a different spacing. Tree growth reflected the tree spacing. There was less growth with closer spacing.

His peach trial outyielded trees in the South Carolina trial.

The rootstock breeding program has released 4 new rootstocks. G214 looks promising as a fully dwarfing stock. G210 is semidwarfing and closer in size to M7. G969 is M7 size, free standing with no suckers, and intended for processing. A vertical axe-trained G969 could be spaced at 6 feet. G890 is also a free standing semidwarf. G5202 in one of the plantings is actually G222.

South Carolina, Greg Reighard

He lost only 1 tree in the current planting. Differences in size are apparent already.

Ohio, Joe Racsko

He has 4 trials. The Golden Delicious 2003 planting had a crop, and standard data was collected. In the Buckeye Gala planting, two trees appear to a strain other than Buckeye. Peter Hirst has the same problem. In the 2010 Honeycrisp planting, 15 trees died. The cherry trial lost 5 trees mainly in the UFO system.

Pennsylvania, Rob Crassweller

He has JM series mixups in his 2003 Golden Delicious trial. The 2007 Fuji planting does not look good. Jim Schupp maintained his trials.

Iowa, Paul Domoto

The 2003 Golden Delicious trial had lot of limb breakage from deep snow and subsequent crusting. Fruit set was poor from a mild frost and aggressive thinning. The JM7 off-type was separated from normal JM7, but he is not sure which is actually the true JM7. The 2010 trees were planted late. There were three strong wind episodes, so he no longer has G5202 since it happened before support was in place. Charlie lost trees on same rootstock.

North Carolina, Mike Parker

He is losing trees in peach trial and has noticed one possible incompatibility.

Massachusetts, Wes Autio

In the 2002 trial, there was low yield in the early years, but this year a reasonable crop. In the 2009 Peach trial, trees are growing well. There are a few dwarf trees in

the trial. Trees were defruited this year. The 2010 apple trees are growing except one rootstock. He has several joint publications in press.

Minnesota, Emily Hoover

They had average winter temperatures; -30 °C was the low. Trees did well since rainfall was optimal. The 2010 Honeycrisp planting trees survived with no losses. In another Honeycrisp planting in its 10th leaf, hail caused a 100% yield loss. PIAU990 is a large tree and may be hard to keep in its space. G30 does well in Minnesota. She has other trials with Zestar! and SnowSweet.

New Jersey, Jon Clements for Win Cowgill

Bloom was early followed by a hot summer. He reported on a G16 trial, a 2002 Gala trial and the 2006 Replant study. The Golden Delicious physiology trees had no crop this year. In the 2010 Honeycrisp planting, two trees broke at union. Survival and tree growth were good.

British Columbia, Cheryl Hampson

The season started cool. The 2002 and 2003 Apple plantings were severely pruned which lowered yields. They have local trials with the Vineland series and Shahrokh's rootstocks. V3 has done as well as M9. V4 is too large. V1 and V2 are larger than M9. The St. Jean rootstocks are from tissue culture. They fruited the Golden Delicious physiology trial with different croploads, and G.16 had smaller fruit. Trees in the 2010 Honeycrisp trial were broken when they arrived.

Idaho, Essie Fallahi

He has 4 projects. He measured tree survival of the Aztec Fuji 2010 planting in spring and fall. Some rootstocks had greater tree deaths in Idaho and Utah. They injected zinc into injured trees and some trees recovered.

Coahila, Valdemar Gonzalez.

He had problems with the replant trial due to lack of rain and issues with water supply. This was reflected in tree performance. There was no difference due to fumigation in this year except in flower number. The Geneva rootstocks had greater yield. There has been a serious problem with phythophthora. Fumigated soil improved trees.

Indiana, Peter Hirst

In the 2002 Gala trial, Bud9 from Treco was bigger than the other Bud9. Fruit size was small because of insufficient thinning. In the 2010 Honeycrisp planting, growth was ok. One tree was broken upon arrival. The Sweet Cherry Systems trial was eaten by dear, and he hopes to have a better fence installed next year.

Chihuahua, Rafael Parra

In the 2002 Gala trial, he noted differences in tree vigor among rootstocks. There was a frost in early may so fruit size was small and trees set fruit on one-year growth. In the 2003 Golden Delicious physiology trial, there was no crop load adjustment this year. The replant trial may not have had a bad replant problem. Trees for the 2010 Fuji and Honeycrisp trials arrived in bad condition. Trees were vigorous trees but had small root systems. The 2005 Bartlett Pear trial lost all flowers last year so trees fruited this year. In the 2009 Redhaven Peach trial, he lost trees on one rootstock possibly from root rot or replant. He requested more replant studies for peaches. The 2010 Sweet Cherry Skena trees are in good condition.

Maine, Renae Moran
Standard data was collected in the 2003 Golden Delicious trial. Yield was low because of a freeze at petal fall. Most of the fruit was on one-year wood. The Physiology crop load adjustment was not possible due to the freeze. Cold hardiness of several rootstocks was measured in a local trial with M26, B9, P2, G11, G30 and G41. Hardiness of the trunks in December did not differ between rootstocks based on shoot growth. Roots were damaged by temperatures of -10 °C and below with mortality occurring in all rootstocks at temperatures of -18 °C and colder.

Nova Scotia, Charlie Embree
Bloom was early and harvest was early for some varieties. Neither the 2010 Honeycrisp or Sweet Cherry Systems trial grew as well as in other years. He lost some trees in Honeycrisp planting. All cherries survived. He plans to put half the cherry trees under a tunnel.

University of Wisconsin, Matt Stasiak
Bloom was early bloom, so he was apprehensive about thinning. Tart cherries had a full crop, but the sweet cherry crop was lost. He did not adjust crop load in the 2003 Golden Delicious Physiology study. Two trees were lost in the 2010 Honeycrisp planting. He has a local trial testing 2- and 3- foot spacings with Zestar and Royal Court using sleeping eye and Bibaum trees.

Colorado State Univ., Ramesh Pokharel
He lost the cherry and peach crop to winter injury. There was a delay in the start of season. He summarized data from the 2008 apple planting. Some tree mortality occurred due to herbicide damage. In the 2009 Peach planting, one tree of some of the rootstocks died.

California, Scott Johnson
In the 2003 Golden Delicious trial, the JM's in general are way too vigorous. M9 has not done well. More vigor is needed for heat and sunburn. G6210, G935 and G16 look good. The trees are somewhat neglected and leaders have been lost to fire blight. Trees in the 2009 Peach planting grew well and had a crop. Everything survived this year. Ted continues to look at HBOK selections.

California, Rachel Elkins
The pear trial is in two locations. The Sacramento site is on heavy soil and is not managed by grower. The North Coast site is in vigorous growing conditions, but some frost hazard. Harvest was delayed this year, the third cropping year. With Bartlett, Horner-4 stood out in filling its space and producing fruit. Pyro 2-33 did not produce well this year. Not much difference occurred among rootstocks with Bosc. Flooding is a problem near the Russian River which can take out the trellis.

Utah State Univ., Brent Black.
Several trials with apple, peach and cherry were shown on the tour. Tree deaths occurred in both 2010 Apple plantings. Rootstock differences were noted in the Peach rootstock trial.

Other Business

Brent asked about the possibility of private researchers attending the meeting as they do with the small fruit multistate project. There are other venues that are more appropriate for interacting with the industry such as the IFTA meeting.

John Cline brought up the 1998 Cherry planting and the lack of someone to take over the publication. He would like to see Ontario data get published and would like to know the possibility of seeing this through. Brent will see if Teryl can take on the Montmorency planting. Rob Crassweller might take on the Hedelfingen planting but needs the data. The Bing trial is already written by Frank but never submitted, so Cheryl will find the paper and get it submitted.

2:30 Utah County Tour and Dinner. Special thanks was given to Brent, Thor and the rest of the tree fruit team at Utah State Univ. for hosting this year and putting together a great meeting.