Multistate Minutes of Annual Meeting

Project Number: NC140
Project Title: Rootstock and Interstem Effects on Pome- and Stone-fruit Trees
Period Covered: October 1, 2003- September 30, 2004
Annual Meeting Dates: November 10-11, 2004
Location: Byron GA

Participants: Kathie Taylor, University of Georgia

Kathie Taylor welcome the group and called the meeting to order.

Note: Items in RED are action items.
Blue are Motions

Motion: A motion was made and seconded to adopt the agenda as presented. Motion passed unanimously.

Motion: A motion was made and seconded to accept the minutes as is. Motion passed unanimously.

Introduction of new members:
Dave Lockwood, Tennessee
Greg Lang will be official member from MI
Diane Miller will be representative from Ohio
Steve McCarthy-new addition from NC, but holds a 4 state appointment in NC, SC, TN, GA,
VA is in question, faculty position vacant but search underway.
Rafell Parria, Mexico

Future Meeting Sites
2005: Indiana: Peter Hirst will Chair, Mosbah Kushad, Illinois and Peter Hirst will Co Host
2006: New Jersey Win Cowgill will Chair and Host
2007 Colorado; Ron Godin to Chair and Host
2008 Mexico-Terrance will chair, Raffell Parria, Mexico will host.

Tentative date for 2005 meeting- November 13-15, 2004

Report from the Administrative Advisor

We have a new administrative advisor, Dr. Wendy Wintersteen. She could not attend but passed along her regrets.

Reports and Current Planning

Terrence Robinson- Discussion on promoting NC140 for regional meeting

Win and Terrence will write a paper on summary/history of NC140
Paul Damoto- will help with history, Wes Autio noted he has 20 years of NC140 records, we are missing the former 3-ring notebook for chairs?

Ongoing Plantings and Publication Progress

1988 pear planting-Gene Milke, has draft tables, needs to meet with committee. NY, NS, OR, WA, OH, AR, ON, on publishing.

1990 Plum-Joe Massabi passed around draft for 1990 Plum Planting

1992-93 Apple Planting– T Robinson -drafts under way for both, needs data from some cooperators.

1994 Apple-Marini- passed around draft of 94 semi dwarf apple paper, review and submit comments to Rich. Missing IN data.

Paul Domato-Blackheart paper discussion. Paul will write.
Discussion on authorship with regard to incomplete data sets.

Marini, discussion on using probability (significance) level of 0.1 vs. 0.5 in analyzing data. 0.1 is easier to show significant difference. Group agreed to follow last years decision, as presented in 2003 NC140 minutes (unanimously approved motion) as follows "p=0.10 should be used in all future NC140 publications."

1994 apple paper on graft union strength, Parker, Robinson, Raffel-to be published in APS or Hort Science

1994 apple-Kevin Kosslia, WI,- has data on root architecture of nc140, may publish.

1994 Apple-Curt Rom has data on Japanese beetle feeding, but not enough to stand alone, maybe a short communication article to APS.

1994 apple- Rich to do paper on tree quality with relation to precocity

•Discussion on page charges for APS, Marini reported for Crassweller. Robinson moved, seconded by Wes Autio "The senior author for the paper after consulting with each author submit a list to aps business office as to who which project leader by state is to be billed". Passed unanimously. Communicate this motion to Rob Crassweller.

1994 Peach –Reighard publication and published
Discussion on reprint charges for APS journal. Suggestion by Cowgill to have APS Create PDF file of final author in lieu of paying for reprints.
Wes Autio will check with APS to see if the same PDF procedure can be followed.

1998 Apple-Robinson- draft of 1998 apple for Acta Hort, which is in press.

Discussion of G16 and winter injury event in Champlain Valley of NY and its effect on multiple stocks.

1998 cherry -Greg Lang- Collecting data from both east and west plantings to prepare publications for 5-year summary. Matt Whiting and Greg Lang will be moving this along.

1999 apple-Wes Autio-presented two posters for ISHS, 2 papers for acta Hort, 4 posters to ASHS and 2 papers for APS. On rootstocks not in all sites, analyzed and presented in separate table and discussed in papers.

Discussion on how to handle trees that are leaning from wind injury.

Autio- essential to submit data exactly as requested.

2001peach planting-Reighard told it like it is. Essential to follow protocols and maintain plantings as commercial orchards as if you were going to sell the fruit. All protocols are on the web. Please log on and download.
Note: Jaspi may not be the correct cultivar on the rootstock, may have been misbudded in the nursery.

Discussion on incompatibility of different stocks vs. possible virus issue.

2002 Apple - Autio-Follow protocol-do not include any extra data. Use rootstock names as directed.
Discussion on DNA based different differences between clones. The differences may be in stage of junivility. Supporter 4 is extremely susceptible to replant disorder.

2002 Pear-Mielke-rootstock has not affected tree survival in this trial to date.

2003 Apple- Marini -will ask for data again. Follow PROTOCAL, review data before sending, do not include extra data. Discussion on protocol-Will crop with a moderate load to no crop load in 2004. Goal in 2006 is to have a heavy bloom. In 2000 four adjust fruit by tree, shooting at 4 fruit per cm squared. Record yield and fruit numbers for data.

2004 Pear Mielke – three locations in 2004, only 2 have survived. Shipping damage was involved.

Dr. Dick Okie, USDA breeder made a power point presentation on breeding "New and Unique Peach Varieties in the Southeast." Looking at high color varieties adaptable to the variable climate in southeast, tolerant of early frosts and diseases.

Toured outside plots of NC140 at the Byron USDA station

Standing Committee Reports

Apple -Terrance Robinson chair

•2006 apple Replant Trial x Rootstock Interaction Trial will go forward
2007 Apple Rootstock will go forward, large number of stocks, may be spilt into two trials with one of the early fuji cultivars. Fuji is supposed to be cold hardy to -29F.

Cherry – Greg Lang Chair
All data available from 1998 trial, will write up 5 year report.
Discussion on where to go with tart cherry stocks, cultivar selection, Montmorency vs newer cultivars.
Discussion on new plantings, do we use virus sensitivity in selecting new stocks.

Peach-Reighard Chair
No new plantings in near future, having trouble getting rights to new materials.

Pear-Milke Chair
Having trouble with tissue cultured stocks in trials, not growing the first year in the nursery, not sure why. Recommendation to use only rooted cuttings to ramp up or future trials.

Future Plans
•**Rewrite** for this project needs to start by next years meeting.
•**Rewrite committee-** selected as follows-Wes Chair, Curt Rhom, Matt Whiting, Cathy Taylor, Emily Hoover, Genaro Fazio, Win Cowgill

•Discussion on Apple Technology Roadmap project-focusing on genomics, genetics but applied research, i.e. rootstock evaluations, are not high on the list. This is a concern. Much discussion on how we champion our cause for future funding and better articulate the value of the data we generate from this project.

Motion by Wes Autio, second by Michelle Warmund that Robinson, Shupp, Genaro meet with Phil Bauhger to discuss tech road map. Motion passed unanimous.

Motion by Wes Autio, Paul Demoto seconded "that Genaro Fazzio, Curt Rohm, and Terrence Robinson and a WSU NC140 representative -Meet with Jim Mcpherson as a potential cooperator with NC140. Passed unanimously.

Motion by Terrence Robinsion, Autio second -NC140 committee (anyone from NC140 attending) Meet with IDFTA research committee at 2005 IDFTA winter conference at Wenatchee to discuss objectives of NC140 and seek input from the research committee on rewrite.

Web Committee Report-Jon Clements and Win Cowgill-reviewed the layout of the NC140 website at http://www.nc140.org reviewed the members only data base and file upload feature

Motion by Wes Autio, second by Charlie Embre: budget $75 per registrant next year to web and database development, maintenance and hosting. Motion passed unanimously.

Award Committee-selected-Emily Hoover will chair. Members Ron Perry, Gene Milke, Michele Warmund. Committee will draft an award statement for North Central Region Directors award and US Secretary of Agricultures Honor award. Committee will work with through our new administrator to submit these awards in time for the next cycle.

State Reports

California Summary

In the 1999 Fuji apple planting, 14 trees have died, mostly from fireblight infections. They have almost all been on M9 and M26. None of the CG rootstocks have died. The 2003 Golden Delicious apple trial started poorly in 2003 with about 20% of the trees weak or dead. The problem appeared to be random throughout the block and among rootsocks. Overall the trees rebounded well in 2004 and are now in good shape.

Both the 2001 Red Top and 2002 Redhaven peach trials yielded fruit in 2004. VVA-1 continues to hold promise as a dwarfing rootstock with good potential fruit size. Many of the other rootstocks have problems with fruit size, incompatibility, excess vigor or tree survival.
Scott

Colorado Summary

In the 1998 Sweet Cherry trial the G5 were the highest average yielding trees followed by W10 and W158. Mazzard had the lowest average yields with highest mortality of any of the varieties in the trial. Similarly, G5 also had the largest fruit size, ten percent larger than the next variety. Four varieties had nearly identical but lower fruit size than the G5. Two other varieties with significant mortality are the Mahaleb and the Gi 290/1. The W53 is by far the largest tree with a TCA of 130 cm^2 with the remainder of the varieties being of moderate size with the exception being W72, the smallest with a TCA of 45 cm^2.

In the 2001 Peach rootstock trial SLAP, Bailey and K146-43 had the highest average yields. Kiawatha, P30-135 and K149-44 had the lowest average yields. Thus far, mortality is very high in the BH4, both K146s and the WA-1 rootstocks. For 2004, all the Jaspi rootstocks harvested one month earlier than all other varieties as was the case in Washington State, leading to the supposition by the NC-140 group that Jaspi rootstock had the incorrect scion. The WA-1 had the

largest average fruit size of 300 g per fruit, 12% larger than the next largest variety. The Julior and SLAP rootstocks had the largest tree with a TCA of 37 cm^2 with p30-135, WA-1 and both the K146s having the smallest TCAs of less than 7 cm^2. In the 2002 Peach rootstock trial Cadaman had the highest yields with VSV-1 and VVA-1 the lowest. Mortality is not a problem thus far, however, Pumiselect is doing poorly with two trees dead and four of the remaining six trees not producing this year. The Pumiselect that did produce had the largest average fruit size of any of the varieties at 212 g per fruit. The least productive trees were the largest trees with VVA-1 and VSV-1 respectively.

Georgia Summary

Georgia has the 2001 and 2002 peach trials and the 2003 apple trial. All are performing well, with the apple trial now being well established with good survivability. This season additional losses to the 2001 peach trial included two Hiawatha, one Jaspi and one Julior rootstocks. Yield was generally very good during the 2004 (second production year) season. Larger trees produced greater numbers of fruit (Bailey, BH-4 and Lovell) with the trees on more dwarfing stocks producing smaller fruit (K146-44 and VVA-1). In this location, the 'Redtop' trees are generally affected by fungal gummosis. Scoring of trees for gummosis suggests little difference based on rootstock although, Pumiselect and VVA-1 maybe slightly more affected. The 2002 peach rootstock trial was budded with Redhaven. The trees were spaced 5m x 6m and are irrigated with a microsprinkler system by replacing evapotranspiration loss. During the 2004 season three Adesoto 101, one Pumiselect and four VSV1 rootstock were lost. Generally, trees on the VSV1 rootstock displayed signs of scion/rootstock incompatibility, apparent as extensive leaning of the trees and graft union anomalies such as shouldering and gum formation. Similar to the 2001 trial, larger trees produced greater numbers of fruit with the trees on more dwarfing stocks producing smaller fruit. In the 2002 trial, we generally had too many fruit falling into the size range below 2.5". We will make adjustments in 2005, thinning earlier and harder to improve this condition.

Iowa Summary

Participation on the 2003 apple rootstock trial continues. After growing poorly in 2003 due to wet soil conditions, trees on all rootstocks grew well in 2004. Tree mortality attributed to wet soil conditions were confined to one tree each on JM.7, CG.5179 and CG.6210. Differences in truck cross sectional area were evident, but generally reflected the size of the trees at planting. Exemptions to this trend existed for trees on JM.7and JM.4, which were large trees planting but were intermediate in size after two years, and CG.6210 which were relatively small at planting, but were intermediate in size after two years. No differences existed between rootstocks for blossom clusters per tree or suckers per tree.

Maine Summary

The 2003 NC-140 Golden Delicious rootstock and physiology plantings were maintained according to local and NC-140 protocol. Three trees have died, one from mechanical damage and two from unknown causes, possibly poor establishment. The winter was severely cold with a midwinter minimum of-27EC and 12 days with minimums below -20EC. With bare ground for much of the winter, soil temperatures reached a minimum of approximately -7EC. All trees survived this, but some showed mild symptoms of winter injury. Data collected in 2004 included number of blossom clusters, trunk circumference and status.

The 1995 Cultivar-Rootstock Trial, conducted with MA and NS was in its final year. Several of the more vigorous trees appeared to have die back of the leader from winter kill. Data collected this year included trunk circumference, tree height, tree width, yield and status.

A local trial comparing G16 and M26 on a site previously planted to apple trees was established in 2002 with Honeycrisp as the scion. Trees were planted in unamended or in compost amended soil. Two M26 trees died from what looked like winter injury, but all of the G16 trees survived. Data collected this year included trunk circumference, shoot length, tree height, number of blossom clusters and status.

Massachusetts Summary

In 2004 in the 1998 NC-140 Apple trial, largest trees with the smallest average fruit size (1999-2004) were on G.16. Cumulative yield per tree (1999-2004) and yield efficiency were similar among trees on G.16, M.9, and M.9 EMLA.

In the 1999 NC-140 Dwarf Apple Trial in 2004, largest trees were on CG.4013 and the smallest were on M.9 NAKBT337. Cumulative yield (2001-04) was greatest from trees on CG.4013 and smallest from trees on M.9 NAKBT337. Cumulative yield efficiency was greatest for trees on Supporter 2 and Supporter 3 and least for trees on M.26 EMLA. Average fruit size (2001-04) was greatest for trees on M.9 NAKBT337 and least for trees on Supporter 2.

In the 1999 NC-140 Semidwarf Apple Trial in 2004, largest trees were on G.30N, M.7 EMLA, and Supporter 4 and the smallest were on CG.4814, M.26 EMLA, and CG.7707. Cumulative yield (2001-04) was greatest from trees on G.30N and smallest from trees on M.26 EMLA. Cumulative yield efficiency was greatest for trees on CG.4814. Average fruit size (2001-04) was unaffected by rootstock.

In the 2002 NC-140 Apple trial in 2004, largest trees were on PiAu51-4 and M.26 NAKB, and smallest were on B.9 (Europe), B.9 (Treco), M.9 NAKBT337, and Supporter 4. Root suckering, yield, yield efficiency, and fruit size were not affected significantly by rootstock in 2004.

In the 2002 NC-140 Peach trial, largest trees were on Cadaman and Lovell, significantly larger than trees on the other rootstocks. Rootstock did not affect root suckering. All flower buds were lost in 2004 due to midwinter cold temperatures.

In the 2003 NC-140 Apple physiology trial, rootstock did not affect trunk cross-sectional area or root suckering.

In 1995, a trial was established including McIntosh, Cortland, Macoun, and Pioneer Mac on 12 rootstocks. In 2004, the largest trees were on V.1, and the smallest were on P.16. Cumulatively (1997-2004), Mark and V.1 trees yielded the most, and trees on P.22, P.16, and B.146 yielded the least. Cumulatively, the most yield efficient trees were on P.16, and the least efficient were on V.1. Average (1997-2004) fruit weight was largest for trees on V.1 and smallest for trees on B.146, P.16, and P.22.

In 1996, a trial was established including McIntosh on 5 rootstocks. In 2004, trees on V.2 were the largest. Cumulative (1998-2004) yield and average fruit size (1998-2004) were unaffected by rootstock, but V.3 resulted in the greatest cumulative yield efficiency, and V.2 resulted in the least.

In 2002, a trial was established including Cameo on 3 rootstocks. In 2004, trees on G.16 were larger than those on B.9 or M.9 NAKBT337. Cumulative yield, cumulative yield efficiency, and average fruit size (2003-04) were unaffected by rootstock.

Missouri Summary

In the 2002, 'Redhaven' peach trial, all trees except one each of MRS 2/5 and VSV-1 produced fruit in 2004. Trees on Cadaman averaged 5.5 kg more fruit than those on Lovell, the most commonly planted rootstock in Missouri. Trees on Adesto 101 averaged 18.5 kg fruit/tree, but those on all other rootstocks produced <15 kg fruit/tree. Four of eight Pumiselect trees have died due to undiagnosed problems. Average fruit weight from trees on Pumiselect, VSV-1, and Penta was less than that from trees on other rootstocks. Trunk circumference of VSV-1 is about half that of Lovell.

In the 1999 Fuji dwarf and semi-dwarf apple rootstock trial, a storm with high winds uprooted additional trees on July 4, 2004. In the dwarf planting, four trees on CG.4013 and five trees on CG.5179 remain. Three or fewer trees on other rootstocks remain with only one each of M.9 NAKBT337 and CG.3041. Yields on CG.4013 (48.5 kg/tree) and CG.5179 (53.2 kg/tree) were comparable to that of G.16 trees. However, fruit weight on trees of CG.4013 (238 g) and CG.5179 (230 g) was greater than that of G.16 trees (211 g). Additional trees on semi-dwarf rootstocks were destroyed as a mini-tornado came down the hill along the outer rows of the planting. Four trees each of CG.4814, CG.7707, and M.7 EMLA remain. All the trees on Supporter 4 were blown over and uprooted. Yield of trees on CG.4814 (53.9 kg/tree) was greater than that on CG.7707 (35.2 kg/tree) and on M.7 EMLA (33.2 kg/tree). However, fruit weight on M. 7 EMLA trees (227) was less than that on CG.7707 trees (263 g) and CG.4814 (244 g).

Minnesota Summary

In the spring of 1999, 12 dwarf and 8 semi-dwarf rootstocks with McIntosh as the scion cultivar were planted at the HRC. Fireblight was a serious problem in the first few years of the planting. We are still losing a few trees a year from those early infections. CG171, M.26 and M.9 were removed from the analysis of the dwarf plantings because of very low number of trees surviving, as were M.26

and Supp4 in the semidwarf planting. This planting allows us to test different rootstocks for winter hardiness, precocity, and size control of the scion. In the dwarf planting, trees on CG 202, CG 13 and CG 395 are the largest trees in the planting with G16N and Supp3 the smallest. We have had significant tree loss I nCG171, M.26 and M.9 in the dwarf planting and they are not included in the analysis. In the semidwarf planting Supp4 and M.26 were removed from the analysis because of low tree numbers. CG30T and CG30N were the most yield efficient trees in the semidwarf planting.

North Carolina Summary

North Carolina has five of the NC-140 cooperative apple plantings. The trials that are currently under investigation in North Carolina are the 1994 gala dwarf and semi-dwarf trials, the 1998 gala planting, and both the 1999 fuji dwarf and semi-dwarf plantings. In the 1994 dwarf gala planting, the rootstock with the largest cumulative yield was V.1 and those with the smallest yield were on B.469 and P.16. In the semi-dwarf planting, trees on V.2 had the largest cumulative yield which was significantly greater than the yield of trees on G.30, M.26 and P.1. In the 1998 gala planting the TCSA of trees on G.16 and M.9 EMLA are significantly larger than trees on M.9NAKBT337. Trees on G.16 had the largest cumulative yield compared to the two M.9 selections. In the 1999 dwarf fuji planting, trees on CG.4013 had the largest TCSA and trees on M.9 NAKBT337, Supporter1, 2, and 3 the smallest. The trees on CG.5935 had the greatest cumulative yield and trees on Supporter 1, 2,and 3 had the lowest yield. In the 1999 fuji semi-dwarf planting, there were no significant differences in survival or TCSA. Trees on G.30N and CG.6814 had the greatest cumulative yield and trees on M.7 EMLA the lowest. However, two tropical storms hit western NC in mid-September with two major rain events 1 week apart with 10+ inches of rain with each approximately 1 month before the fuji harvest. Minimal damage occurred with the first storm as winds were calm. However, with the second storm winds of greater than 50 mph occurred compounded by winds from opposing directions. In the dwarf fuji planting two supported trees of CG.5179 blew over. In the semi-dwarf fuji planting a significant number of trees blew over for several rootstocks which were; 2 out of 6 for Supp.4, 5 out of 6 for CG. 7707, 4 out of 5 for G.30N and 2 out of 4 for G.30T. None of the trees snapped at the graft union and the failure for each rootstock was in the structural roots. Studies are underway to determine the strength of the graft union for approximately 12 different rootstocks.

New Jersey Summary

1998 G16 Trial-There were do significant differences in TCSA, yield, cumulative yield, yield efficiency, cumulative yield efficiency and average fruit weight.

2002 NJ/UMASS G16 Trial- B9 was the smallest stock by TCSA, G16 the largest. B9 was the most yield efficient stock in 2004 and also in cumulative yield efficiency 2003-2004.

2002NC140 Apple- Tree growth was excellent in 2004. Rootstocks affected TCSA and Yield at the end of the 3nd growing season. The largest trees at the end of 2004 were P. 14 and PiAu51-4 and the smallest were B.9Europe followed by B9Treco. The B9 stocks had the highest Cumulative yield efficiency. There were no significant differences in fruit size.
NJG30 Trial- There was no significant cultivar rootstock interaction. CG 30 is always the largest stock as measured by TCSA. G30 had significantly higher cumulative yield as compared to M26.

2003NC140 Apple-trees grew well. After the first growing season, rootstock did not affect trunk cross-sectional area.

2001NC140Peach- Cadaman produced trees with the largest TCSA (67.8 cm^2) followed by Lovell and BH-4 (57.6 and 55.6 cm^2). The smallest stock was VVA-1 with a TCSA of 26.2 cm^2 Jaspi and Julior were the only rootstocks producing rootsuckers this year. Trees on Julior rootstock had the highest mortality, with 25% dead, K146-44 had 17% mortality. Trees on Lovell rootstocks produced the highest yield in 2004. Trees on Bailey and Lovell rootstocks had the highest cumulative yield 2003-2004

2002NC140 Peach-Cadaman had the largest TCSA. VSV-1, VVA-1 and Penta rootstocks were the smallest trees. Trees on Penta rootstock had high mortality, 37% dead. Cadaman rootstock produced the highest yielding trees this year (13.0 kg), followed by Lovell (9.7 kg) and Pumiselect (9.0 kg)

South Carolina Summary

In the 2001 peach rootstock test, Pumiselect and SC-17 continued to be the most vigorous rootstocks in 2004. Julior, Jaspi, K146-43, and VVA-1 continued to be the least vigorous. Eight additional trees died in 2004: one tree on Hiawatha died of oak root rot in Winter 2003-04; one tree on P30-135, one on VVA-1, and four on Jaspi died from bacterial canker; and one tree on Julior died after harvest, possibly due to *Phytophthora spp*. Only Julior, Jaspi, and VVA-1 had significant root suckering. Trees on Pumiselect and Julior bloomed earliest, and trees on Cadaman bloomed last. Fruit on Julior and Jaspi trees matured earliest, whereas SLAP, SC-17, and Hiawatha fruit matured last. SLAP and Cadaman produced the largest fruit. Jaspi produced the smallest fruit and had the lowest yield. BH-4, SLAP, SC-17, Bailey, Pumiselect, Lovell, and Cadaman had the highest fruit yields. SLAP, SC-17, Bailey, Pumiselect, and Lovell have yielded > 95kg/tree over the last 2 years.

In the 2002 peach rootstock test, Cadaman and Lovell continued to be the most vigorous rootstocks in 2004, while VSV-1 and VVA-1 were the least vigorous rootstocks. Six additional trees died in 2004: two trees on Pumiselect died during the summer, possibly due to *Phytophthora spp.*; two trees on MrS 2/5 died due to bacterial canker, and one tree on Penta and one on Pumiselect were snapped just below the graft union by tropical storm winds. All rootstocks suckered except K146-43. Trees on Adesoto 101 bloomed and matured earliest. Trees on Cadaman, Lovell, and K146-43 bloomed last. Fruit of trees on Pumiselect, Cadaman, and Lovell matured last. VSV-1 and VVA-1 produced the

largest fruit, but also the lowest fruit yields. Pumiselect produced the smallest fruit and a relatively low fruit yield. Cadaman had the highest fruit yield, 30% higher than Lovell, and also had the highest yield efficiency.

In the 1998 sweet cherry rootstock test, only two additional trees, one on GI 195-20 and one on GI 148-1, were lost to bacterial canker in 2004. Only Hedelfingen on GI 148-8 had 100% survival after 7 years in the field. GI 195-20 and Weiroot 53 have the poorest survival record. Mazzard and Weiroot 10 continued to produce the most vigorous trees, and GI 148-2 and GI 209-1 continued to produce the least vigorous trees. Trees on GI 209-1 bloomed earliest and trees on Weiroot 13 bloomed last. Fruit matured latest on Weiroot 10, Weiroot 13, and Weiroot 158 rootstocks. Trees on GI 148-1, GI 148-2, GI 195-20, and GI 209-1 had the lowest yields (< 10 kg/tree). Weiroot 13 and Weiroot 158 produced the highest yields (>20 kg/tree). Fruit size was largest for Mazzard and Weiroot 10 rootstocks and smallest for GI 195-20.

In the 1999 Nagafu 6 Fuji apple rootstock tests, no additional trees died in 2004. In the dwarf rootstock planting, trees on 16N continued to be the most vigorous, with the greatest height, width, and trunk circumference. Trees on Supporter #1, #2, and #3 rootstocks were the least vigorous. Fruit size was largest on M.9T337 and smallest on Supporter rootstocks. There were no significant differences in the 2004 or cumulative fruit yields. Trees on CG.179, Supporter #2, and Supporter #3 had the highest yield efficiencies. In the semi-dwarf planting, there were no significant differences in tree vigor, mean fruit weight, or total fruit yields.

New York Summary

V.1 and V.3 are looking good, now licensed by Ontario to Tod Cameron, Cameron Nursery for sale. In the Champlain 2004 freeze, O.3, V.3, V.1, G.16, G.30 had the highest survival rate of all apple stocks under test.

Wisconsin Summary

Before removal of the 1994 dwarf apple rootstock planting, we carried out a trial of air excavation of structural and fine roots on 3 rootstocks (M9 NKBT337, M26, and M27). Air excavation of roots was rapid, with no effect on fine root integrity compared to roots recovered by hydropneumatic elutriation of soil cores, and no significant effect of rootstock. Work at this site during 2004 was focused on Objective 1. We have two rootstock plantings that are currently fruiting. In the 1999 dwarf apple rootstock planting CG202 is the most vigorous rootstock (Table 1, TCSA), with the lowest yield effiency. Yield and yield efficiency were both greatest for M9 MKBT337, which was the smallest rootstock. In the 1998 cherry rootstock planting, with Montmorency as the scion, Gisela 6 produced the largest tree, and W.53 the smallest. Yield and yield efficiency was highest for W 13, which was similar in size to Gisela 6. Yield, yield efficiency, and fruit size were all smallest for W 53. Gisela 7 had the largest average fruit size (g).

Vermont Summary

The performance evaluation of rootstocks under the extreme low temperatures we experienced in Vermont this year will give us a better understanding of the adaptability of these rootstocks in our climate. Damage to two and three year old wood was apparent at bloom time where there was only a very small amount of viable flower clusters on two year old wood for all rootstocks. Most rootstocks did not have any fruit in this wood at harvest. The damage on three year old wood was not as severe. No other symptoms of winter damage were visible throughout the season. Despite the harsh winter temperatures the last two years, this block continues to perform well both in yield and tree growth.

Motion by Peter Hirst, seconded by everyone, for secretary to write to Dr. Cathy Taylors Department head for the outstanding job she did in coordinating the 2004 NC140 technical committee meeting.

Meeting adjourned at 4:25

Meeting Participants

B	Andersen	Cornell	S.	McArtney	North Carolina State
W	Autio	UMASS	M.	Newell	University of Maryland
J	Clements	UMASS	D.	Ouellette	Clemson University
W.	Cowgill	Rutgers University	M.	Parker	North Carolina State Univ.
P	Domoto	Iowa State University	R..	ParrA	INIFAP, CHILUAHUA
C.	Embree	Agriculture Food, CA	R.	Perry	Michigan State
G.	Fgazio	Cornell	J..	Prive	AAFC
R.	Godin	Colorado State	G.	Reighard	Clemson University
P.	Hirst	Purdue University	T.	Robinson	Cornell University
E.	Hoover	University Minn.	C.	Rom	University of Arkansas
K.	Kosola	Wisconsin	J.	Schupp	Penn State University
M.	Kushad	UVE	S.	Seeley	Utah State University
G.	Lang	Michigan State	K.	Taylor	University of Georgia
D.	Lockwood	University of Tennessee	M.	Warmund	University of Missouri
G.	Lokaji	Rutgers University	A.	Weibel	Cemson University
R.	Marini	Penn State	M.	Whiting	Washington State Univ.
J.	Masabni	University of Kentucky	D.	Wolfe	University of Kentucky