

2014 NC140 Annual Business Meeting Minutes
10-12 November
Clemson University
The Martin Inn and Conference Center

Chair & 2014 Host: Greg Reighard, Clemson University
Chair Elect & 2015 Host: Rachel Elkins, University of California
Secretary & 2016 Host: Greg Peck, Virginia Tech

Monday, 10 November

The business meeting was preceded by an all-day tour of the South Carolina peach industry in Edgefield and Saluda Counties of the South Carolina Ridge region. The group visited field research in grower orchards and packinghouses. Lunch was served at a restored Antebellum House built in 1827 and hosted by the owner of Titan Peach Farms, Chalmers Carr and his wife Lori Anne Carr.

The Asian Pear Working Group Meeting coordinated by Dr. Christopher Walsh, University of Maryland, was held Monday evening.

DAY ONE: Tuesday, 11 November

Greg R. welcomed the group to Clemson and introduced Dr. George Askew, VP for Public Service and Agriculture & Interim Dean for the College of Agriculture, Forestry, and Life Sciences. Dr. Askew mentioned that Clemson's new President is very supportive of agriculture and extension. He also pointed out the importance of fruit research and Greg R.'s research program in particular. Overall, he was much impressed with the cooperation with commercial growers.

Greg R.: Introductions, 41 people in attendance representing 31 institutions

- New members
 - Diana Cochran-Iowa State Univ. (replacing Paul Domoto as voting member)
 - Dario Chavez-University of Georgia
 - Lee Kalcsits-WSU (Stefano Musacchi will remain voting member)

Ron Perry (NC140 Administrative Advisor from the North Central Region):

- NC140 has been a North Central regional project since 1976
- NC regional funds for experiment stations
 - Experiment stations decide on funds allocation to travel, research, etc.
- Annual meeting report must be submitted no later than 60 days after last meeting date (11 Jan 2015)
- Mid-term review (4-year long project)
- Need to account for grants related to this project (including in-kind contributions)
- Need title, authors, and amount for each grant

- Not sure how to address are people who are not associated with NC140, but using NC140 resources, such as coordinated plantings.
- Need committee to rewrite NC140 proposal for 2016
 - Need to outline objectives-currently 5 objectives
 - By next meeting (CA), the new proposal draft needs to be put together well enough and be an agenda item
 - From Wes' notes:
 - Mike Parker is chair-
 - Renae Moran-Introduction
 - Brent Black-Outreach
 - Gennaro Fazio-Rootstock breeding objectives
 - Terence Robinson-Apple
 - Greg Lang- Cherry
 - Greg Reighard- Peach
 - Todd Einhorn- Pear
- 2017-Due date unknown
- (2) Nominations for contributions to fruit industry
- Award from Experiment Station
- Compete against other multi-state projects
- February meeting is when decision is made
- \$15,000 award for national meeting
 - Need letters of support e.g. IFTA, Nursery Industry, Commercial grower, Commodity groups
 - Peter Hirst-survey to get data: wants documentation on transition from semi-dwarf to dwarf (Gennaro has data)
- Rich Marini elected chair of nomination committee
 - Also joining the subcommittee are: Win, Gennaro, Wes, Rob, Terence, Greg L., and Ron

Jon Clements: NC140 Website update.

- Website has been a joint project with Win Cowgill
- Wants trial coordinators to keep content up-to-date
- Suggestions: link to eApples; Apple-crop, IFTA
- Change "Discontinued Projects" to "Completed Projects"
- 2001 and 2002 peach trials are "completed"
- 2003 dwarf apple trial is "completed"
- Google Analytics:
 - Past year 5,799 page views; average durations visitors spent on site was 2 min, 18 sec

- Fifty-seven percent of the users were from the USA. There were 1,598 unique users, the bounce rate was 57%, and 29% of the visitors were “new visitors” to the site.
- Discussion of whether or not to put Ads (for Nurseries) on the website
 - The general consensus was to seek sponsorship, but not advertisements
- NC140 listserv-can be opened up to technicians and graduate students
- Membership needs to be updated through “membership database” link on the NC140 homepage
- The suggestion was made to add university names to what’s shown on the membership list
- Jon wanted people to update the member information on the list.
 - Greg Peck said that the public side of the website is not reflecting what is on the membership database. Jon will update.
- Jon said that the “contact info” page does not automatically pull data from the membership database.
- It was suggested that Jon download the membership database info into a Google Docs Spreadsheet so everyone can update and edit their State’s info.
- The NIMSS database is separate, and goes through the Experiment Station director

Trial Coordinator Reports:

2003 Dwarf Apple Rootstock (Rich Marini)

- Handout.
- Trial complete-Rich would like to publish two more papers:
 - 1) Stability data
 - 2) How long to run a rootstock experiment
 - Rootstocks are smaller now- perhaps 10 year is too long to run a trial?
 - Using repeated measures can separate M.9 and M.26 in less than 10 yrs.

2003 Apple Physiology Trial (Rich Marini)

- Handout
- Published three papers
 - Interaction of crop load and rootstock (3-way interaction with location)
 - FW was negatively related to crop days

2009 Peach Physiology Trial (Rich Marini)

- Handout
- Rootstock x GDD early in season related to fruit weight at harvest

- Peaches-warm early, smaller peaches
- Apples-warm early, larger apples
- Four papers
- Going to look at crop load/fruit weight x 5 locations for a 5th paper sometime in the next couple-few years

2009 Peach Rootstock (Greg Reighard)

- Still working on data
- No handout
- 16 cooperators-need them to respond to emails and requests for data
- 2015 protocol online
- Wants data organized exactly as he lays it out
- Will tour planting this afternoon
- Clonal rootstocks
- Essie has 4 out of 16 rootstocks-Greg R. recommends Essie develop a separate publication-will be too hard to put his subset with the full data set
- Only need to count up to 20 suckers
- Will publish 5-year data in JAPS

Michele Warmund—American Pomological Society (APS)

- Each author needs to pay for their own page charges
- All NC140 members are encouraged to join APS

2010 Apple Rootstock (Wes Autio)

- Handout online
- Hasn't summarized data yet
- 2014 will be 5th year
- Jan. 15, 2015 deadline to get data submitted
- Feb. 15
- One-third of the locations have not submitted their data yet
- Data needs to be organized exactly as requested and please verify data before submitting
- Canopy spread is measured at widest distance
- Terence-Biennial bearing index needs to be run as 2 yr. sets

2010 Sweet Cherry (Greg Lang)

- Received good Year 1-4 data from five to six locations for first paper in development ("Training Systems x Rootstock Establishment"); second paper (Years 5-8) will focus on orchard maturation, sustained cropping, and maintenance

- Yields are highly variable by site
- Lots of lost data because of birds, deer, Armillaria, frost damage, bacterial canker, and trial coordinator retirements
- Since most training systems under test are new and novel, questions about proper training and pruning with respect to the spacing and range of rootstock vigors in the trial -- perhaps excessive shading causing some yields to diminish
 -
- Greg L. will update cooperators on draft 2015 guidelines
- Discussion of variety fruiting and growth habits x training system interactions

Brent: Non- NC140 sour cherry trial

- Gi.3 about equal to Gi.5 which were better than Gi.6 and all better than Mahaleb

Ron: Over-the-row harvester trial (berry harvester)

- 5' x 13'
- On new MSU rootstocks (Lake, Cass, Claire, Clinton, and Crawford)
- Root pruning imposed
- Substantial dwarfing on MSU rootstocks
- MSU rootstocks sucker on clay, but not sandy soils
- Gennaro-training systems may influence suckering
- Discussion of hedging in tart cherry systems
- Discussion of pruning timing versus flower bud initiation

2016 Tart Cherry (Matt Stasiak and Greg Lang)

- Matt will be trial organizer, Greg will organize tree procurement
- Will be pushed to 2017 because of nursery issues
- Will have 5 MSU rootstocks, 3 Gisela stocks (3, 5, 12), Krymsk 6, and Mahaleb
- Trial sites: UT (2), WI (2), ON, MI, NY, PA (?), MD (?)
- Tarts will be trained for over-the-row mechanical harvest

2016 Sweet Cherry (Greg Lang)

- Will be pushed to 2017 because of nursery issues
- Will have 5 MSU rootstocks, 3 Gisela stocks (3, 5, 12), Krymsk 6, MxM14, and possibly some WeiGi stocks (originated from Gisela program advanced selections sent to Weihenstephan research station; working with Dutch nursery)
- Trial sites: OR, CA, WA, ID, MI, NY, BC
 - With Benton as a scion
- Trees will be trained as 2-3 systems in each site

2005 Pear Rootstock Trial (Rachel Elkins)

- Handout with 10 years of data
- Still waiting for data from Mexico
- Then will be ready to draft article for JAPS
- Bartlett/Bosc in CA; Bartlett in NY
- WA dropped out (Tim Smith)
- Horner 4 looks promising, but big tree/doesn't sucker
 - looks best in hot climates
- OHXF87-Not great in hot climates, better in cooler areas
- Pyro-dwarf suckers badly
- Discussion of Yield Efficiency and spacing
 - Could Pyro-dwarf do better at higher density?

2013 Pear Training/Rootstock/Spacing (Todd Einhorn)

- Data is confounded by different variables:
 - Three rootstocks: OHxF87, OHxF69, Pyrodwarf 233
 - Three training systems: Upright V; Bi-Axe (Bi-baum); Central Axe
 - Three spacings: 3, 4.5, and 6 ft.
- The tighter spacing filled space by the 2nd leaf
- Data still being organized
- Pyrodwarf 233 is smaller than OHxF69 + OHxF233
- Bi-Axis trees have smaller TCSA than single axis trees
- No difference in spacing, YET...

2016/17 Quince Interstem (Todd Einhorn)

- Still unclear where this experiment is at
- Looking for cold hardy candidate
- 22 are as hardy as OHxF
- Original trees were in micro-propagation when they got infected with thrips
- 2nd try at microprop in the works (15 cvs)
- Richard Bell doing fireblight tests
- Amelanchier rootstocks might be available
- Interested states include: CA, NY, OR, NS, WA

Tuesday Afternoon.

Honeycrisp trial report by Dr. Suzanne Blatt, AgCanada

Expanding the use of the NC140 trials... PowerPoint Presentation

- Looking at the interaction between insects and apple rootstock germplasm.
 - Finding a rootstock effect for the number of lepidopteron pests present on fruit clusters in the spring.
- Also looking at harvest maturity (using a DA meter) interactions with insect damage.
 - Did find rootstock effects.
 - Finding a difference to the percent storage scald.
 - Not much relationship between color and SSC:TA ratio
 - Not much relationship between ethylene and DA meter reading. But, greater ethylene levels were related to warm night temperatures.
- K. Burgher-MacLellan
 - Looking at RNA-based gene expression for defense/stress responses
 - Gene expression was relative. Looked at which genes were expressed the least.
 - Lots of year-to-year variability.
- Also looking at nematode resistance (root lesion for apple and ring for cherry)

2014 Apple Rootstock (John Cline)

- Has shared an Excel spreadsheet with the cooperators that should be filled out.
- Showed map of planting locations (Red = Fuji; Green = Honeycrisp)
- Question about cropping in the second year. Some trees and/or plantings didn't grow well.
- Terence suggests crop if 18" of new extension growth.
- Terence suggests counting flower clusters and then thinning to 4 fruit/TCSA for Honeycrisp and 5 fruit/TCSA for Fuji.

2015 Organic Apple Planting (Terence Robinson)

- Trees were dug a few weeks ago at Wafler Nursery
- Primarily Geneva stock with a few Malling.
- Modi is the cultivar. Liberty will be pollenizer.
- Trees were grown out for two years in the nursery.
- Five blocks in two-tree sets.
- Will require 1/10 acre.
- MN can't participate because of cold hardiness issues.
- ID would like to participate in place of MN.
- PA is not going to participate.
- Organic certification is optional, but orchard management must be organic.
- Terence has had success with limonin (Avenger) and aerosan (SP?) products. (Organic burn down materials.)
- Land does not have to be organically certified prior to planting.
- Rachel—heard good things about a new Westbridge herbicide called Suppress.

2018 Apricot Trial (Terence Robinson)

- Not ready yet. Still working out details with nursery.
- Greg Lang will take leadership in organizing an apricot planting. Date TBD.

- MI, NY, CA (?),

2018 Apple Planting (Terence Robinson)

- With New Zealand rootstocks.

Apple Working Group

- Terence is stepping down as chair. Will need to find replacement.
- Perhaps Stefano (WSU)?

Plum Working Group

- No leadership currently identified.

State Reports

Massachusetts (Wes Autio and Jon Clements)

- Wes: *Prunus americana* was most productive (better than Guardian) in peach trial.
- Jon Clements: Chlorosis rating on Honeycrisp ranged greatly amongst rootstocks. Averaged 45% overall.
- Jon: 2014 apple planting: saw relationship between original tree size and amount of growth over the first year.

Missouri (Michele Warmund)

- “Nothing unusual to report”

Nova Scotia (Suzanne Blatt)

- 2010 Honeycrisp—Hurricane Arthur took out a number of trees. Including, both reps in single blocks.
 - Had high crop loads (7-8 fruit/TCSA) resulting in overall small fruit size
 - Some biennial bearing habits starting to appear.
 - Seeing differences in amount of increase in growth per year. No irrigation, but adequate rainfall. It might be related to crop load.
- Has questions regarding chemical thinning in 2015. Wes suggests this is a local issue. Poll of room shows great differences in chemical thinning practices. Terence suggests that Honeycrisp is very sensitive to MaxCel (6-BA).
- 2010 Sweet Cherry trial
 - Beautiful bloom, followed by frost, good apparent fruit set but most of crop ended up dropping, in trial and around region (tarts did better). Not variety specific.
- 2004 Pyro-dwarf.
 - Trees just started to bear fruit (despite trial being completed). Hurricane Arthur caused fruit loss. Plans to run the trial for one more year.
- Cherry growers are concerned about Spotted Winged Drosophila.
- Terence liked presentation of percent TCSA by year. Would like to see that done for upcoming publications.

Wisconsin (Matt Stasiak)

- 2014 apple plantings did well.
- 2010 apple rootstock trial: Likes several of the stocks
- July 16 Extreme hail event destroyed many fruits—knocked fruit off of the trees. (See pictures in report). Overall fruit size was down ~100g—probably because of hail storm. Also had a very cold winter, with lots of clear sky days. Did Southwest injury assessment. Found many of the Budagovsky stocks had severe damage.

Afternoon Tour of Clemson's Musser Fruit Research Center and research plots: Our group was welcomed by farm manager Jeff Hopkins and several Clemson researchers talked about their research programs. First, Dr. Simon Scott talked about his tree fruit virology program and the Clean Plant Health Network where Musser farm is the location for virus-indexed peach cultivars. Next the new 2014 NC-140 Apple Rootstock trial was looked at and Terence gave pointers on what needs to be considered in the training of these trees. He gave kudos to the technician involved in training this orchard, Dave Ouellette. Next Dr. Juan Carlos Melgar, the new Clemson University pomologist, talked about his future research that will include fertilization and irrigation strategies to optimize water and fertilizer use to produce quality fruit more efficiently. Then the 2009 NC-140 peach rootstock and adjacent 2013 *Prunus* rootstock trial orchards were viewed. New semi-dwarfing rootstocks may have some promise as they are not runting the trees. Next, Dr. Guido Schnabel, Clemson's tree fruit pathologist, talked about his research on brown rot and *Armillaria sp.* root rot. The group looked at his "walking" tree concept orchard, which so far has appeared to be effective in reducing losses to *Armillaria* root rot. Last, Dr. Ksenija Gasic, the peach breeder and *Prunus* genomics leader, talked about her breeding program and the current SCRI research grant where marker assisted breeding is being implemented. Clemson University was selected to be the center of *Prunus* genetics/genomics for the next 5 years in the new 2014 SCRI grant.

DAY TWO

Rachel Elkins 2016 Meeting

- Nov 2-3, 2016 Meeting on UC Davis Campus PSE 3000 (across from Wickson Hall)
- Nov 4, 2016 Tour
- Hallmark Inn in Davis – about 3 blocks from campus (reserved Nov 1-4 for NC140 participants)
- Closest airport is Sacramento Airport
- Also can fly into San Francisco or Oakland and rent a car (about 2 hours)
- Field Tour: Rachel's plots are ~2.5 hours from Davis
 - Dinner at Buckhorn
 - *Prunus* germplasm repository
 - Nichols Estate in Arbuckle
 - Lake and Mendocino County (along Hwy 101, Redwood Hwy)
 - Organic trial in Anderson Valley
 - Lots of local tourism. Wine tasting. Rachel will put together resources.

Dr. Robert H. Jones, Executive Vice President for Academic Affairs, and Provost, Clemson University.

- Past career was a tree root physiologist and recognizes value of long term plant research
- See changes in climate, pests, etc., which will require research to solve new emerging problems
- Impressed with NC140—"Stay the Course"
- Answered questions from several in the group and impressed upon the group that a university must maintain a balance of teaching and research and not be swayed by whatever is popular for the moment in the public's mindset

Location for 2017 NC140: Penn State, State College, PA—Rich Marini and Rob Crassweller

Location for 2018 NC140: Oregon State, Hood River, OR—Todd Einhorn

Apple coordinator: Possibilities: Stefano Mussachi (WSU), John Cline (U Guelph). Terence will discuss with them.

Participation with Chile:

- Need letter of interest from institution administrator addressed to Ron Perry. Then goes to NC140 Technical Committee for a vote.
- Cooperating entity: CAEF, University of Chile
- There might be issues with import/export of plant material. Also intellectual property protections are a major concern. Some material is privately controlled.
- If Chile becomes a participating member, they were requested to bring a presentation on their rootstock program to the meeting in 2015 (CA).

Mike Basedow (Rob Crassweller's Grad Student)

- Apple graft compatibility issues—particularly with brittle graft unions in Geneva stocks
- Finding a lack of differentiation in tissue
- More fiber tissue, less parenchyma in weaker stock
- Weak unions have less uniform distribution of cells.
- Hypothesized that thicker cell walls would relate to stronger graft unions
- Honeycrisp might have particularly thin cell walls

New Mexico (Shengui Yao)

- Not much to report
- No NC140 trials

Alabama (Elina Coneva)

- Four NC140 Trials
- Might not be able to include data in larger datasets
- Cold winter and frost damage in the spring

- Lost trees were excavated found bacterial canker and Ambrosia Beetles (possibly secondary – moving in after trees died), but not Armillaria. Also high levels of ring nematodes
- Lovell was most vigorous. Mirobac and Krymsk 1 were completely lost.
- Asian pear trial. All Bartletts and Shinsui were lost due to Fireblight. Impressed with Yonashi
- 2014 Apple Rootstock: had trouble getting the trees to start growing. But only one tree died at the time of planting. Expecting blind wood. Vineland rootstocks were the most vigorous.

Georgia (Dario Chavez)

- Steve McCartney put in 2014 NC140 trial. Data to come.
- Dave Lockwood (University of Tennessee) maintaining the 2014 trial

Washington (Lee Kalcsits)

- 2014 NC140 at Sunnyside Research Station (South of Wenatchee)
- Irrigation issues due to break in dam. Caused water stress on the trees. But they established
- Stefano—Nic 29, G.41 on three training systems. With WA38 (Cosmic Crisp) as a scion
- Kate Evans is starting a pear rootstock breeding program

Maryland (Chris Walsh)

- Asian Pear trial will go at least one more year.
- 10 locations.
- Wants data on survival
- No official NC140 plantings
- 2010 Pink Lady on G.41 (60% loss) and G.935 having graft union breakage issues. Usually related to high winds. 90% survival on G.202 (has both tissue culture and standard propagation). Thinks highly of G.202 for Pink Lady in the Mid-Atlantic.
- Pink Lady's had 18 Brix.

British Columbia (Cheryl Hampson and Denise Neilsen)

- 2010 Honeycrisp planting.
- Side project with Extenday with hope of improving return bloom in 2015.
- Seeing lots of variability within a single rootstock genotype reps.
- Color development was not necessarily related to crop load.
- Normal propagation versus tissue culture. Normal have larger TCSA.
- Likes G.41 and G.935
- Nutritional work on Honeycrisp—JAPS article for October 2014. Lots of variability. Zinc was most often low. (Summarized in state report.)
- Denise: Training system vs. cherry rootstock trial
 - Doing very well. Gi.3 has lower yield than other 2 stocks. Gi.3 X UFO is not adequately filling in the space.

- Need to reduce crop size by about 50% on some combos to get adequate fruit size.
- Need 190 mm² leaf area for adequate cherry fruit size.
- Nutrition: 2013—less mobile nutrients are becoming an issue (P and K). Depleted soil levels, but also maybe transport issues into the roots
- Gi.3 has more nematodes than Gi.5 or Gi.6. No bacterial canker.
- Interested in looking at rhizosphere biota in cooperation with Tom Forge. Perhaps antagonistic relations with nematodes?

Pennsylvania (Rich Marini and Rob Crassweller)

- Plantings at Rock Springs and in Biglerville (Jim Schupp).
- Rob: 2014 Planting – has partial planting of both Fuji and Honeycrisp
 - Vineland V.6 were very large at planting
- 2010 Apple planting: lost crop in 2012 and part of crop in 2013. Having lots of issues with controlling vigor.
- Non-NC140 Systems trial: minimally pruned is highest cumulative yield
- Crimson Gala: non-NC140 trial: G.935 is looking very good.

North Carolina (Mike Parker)

- Steve McArtney has left NC State to work for Valent BioSciences. They are looking to refill position within the next year. Will remain a multi-state position.
- 2010 Apple planting at Fletcher. Tree survival an issue—posing a statistical challenge.
- Still likes G.935. Similar to M.9 in size. But has lost a lot of M.9 to fireblight.
- Also likes G.4004. Gennaro is looking to promote this stock—doing well in organic and replant trials.
- Peaches—Sandhills Farm: Lost a lot of different stocks to Bacterial Canker.
- Georgia stocks are small in size, but highly efficient. Need to be planted at higher density. Doesn't have much canker.
- Glomerella leaf spot (sexual stage of bitter rot) becoming a major issue for apples. Looks similar to Necrotic leaf spot, but is pathological, not physiological.
 - There might be a rootstock effect—seems to be worse in dwarf trees.

California (Rachel Elkins)

- Had significant winter chill issues. First time in Rachel's career that winter chilling has been an issue.
 - North side of trees had less chill hour problems because it was shadier.
 - Wide variability in fruit size and fruit maturity
- Plus, drought situation is going to continue into 2015. Reservoirs are very low.
- Also rain during pre-bloom period prevented oil applications.

Mike Parker, Dario Chavez, and John Cline with assistance from Greg Reighard are considering putting together a rootstock X training systems trial for peaches. Earliest plant date would be Spring 2017.

Virginia (Greg Peck)

- Winter of 2014-15 was cold and caused quite a bit of Southwest injury to newly planted trees.
- Frosts on 16-17 April made thinning decisions difficult. Did not chemically thin their rootstock trials.
- Has a non-NC140 rootstock trial—actually three side-by-side experiments with York, Gala, and Fuji scions. 2014 was the fourth leaf for this experiment. Data are presented in the VA State Report. Plans to write JAPS article on the trial after the 5th season.

Iowa (Diana Cochran)

- Paul Domoto took 2014 data; report is online

Minnesota (Emily Hoover)

- 53 days below zero last winter, but snow cover from Thanksgiving until April
- 2010 apple planting: hasn't lost a tree. Lots of wind. Might have experimental design issues with one of the rows that was particularly damaged by wind combined with cold temperatures.
- 2014 Honeycrisp. Trees not growing very much. Lost a few trees to graft union breakage.
- Had warm temperatures up until a cold front this week. Concerns about winter hardiness. Winter of 2014-15 might be hard on the trees.

New York (Terence Robinson)

- Root2Fruit SCRI: Preproposal (Stakeholder Relevancy Statement) rejected in 2014. Will try again in 2015. Terence wants Gennaro to lead the grant in 2015. That decision is still under consideration.
- New rootstock is being released. Gennaro—trialed as G.4814 will be released as G.814
 - Good replant tolerance, good fireblight resistance (better than G.935), and increased fruit size in Gala trials in Washington State. Good propagation characteristics. Susceptible to apple stem pitting (TmRSV). A little smaller than M.26.
 - Being released from Prosser—virus free and true-to-type
 - Expect to see in the commercial nursery trade in three years.
- Cornell is going to start licensing the rootstocks directly to nurseries (see list in NY State Report)
- Currently available G.41, G.11, G.935, and G.202. A few others still out there, but in very low numbers.
- G.41 has graft union issues (also G.935). Nurseries are losing trees due to wind. WA38 and Pink Lady seem particularly bad. Looking at different budding times and techniques (Brent Black's grad student is working on this issue.) Also looking at ways to increase graft union strength through irrigation, nutrition, and PGRs.
- Scion plays a big part of the graft union compatibility issues. Pink Lady, Envy, WA38 are particularly bad. Gala moderate.

- Virus susceptibility: one planting in Highland. A second planting is going to be established in VA (Yoder and Peck).
- Nutrient studies underway with Gennaro. Will be a part of the proposed SCRI project.
- Will be talking at IFTA 2015 on the value of NC140
- 2010 Honeycrisp Trial
 - Looking at biennial bearing index. The lower the number, the less biennial bearing. Cut off is 0.5. (see NY State report for data from 2013 and 2014).
- Looking at SnapDragon on lots of stocks. This cultivar will need a stronger stock
- Terence proposes to allow future NC140 trials to be spaced according to regional recommendations.
- ReTain (2,000 ppm/acre) is helping with fruit set on Regina sweet cherry when applied at popcorn stage
 - Todd hasn't found a statistical difference between 20 and 80% full bloom, but both timings had significantly better fruit set than doing nothing.
 - Gi.3 can't get enough fruit, even at high density.
 - Tall spindle cherry is doing the best for NY
- All peach flower buds were killed during the 2013-14 winter due to cold temperatures.
- Sweet cherry buds came through winter without very much damage.

Oregon (Todd Einhorn)

- 2005 Pear trial – 10 year dataset
 - Trial is now completed.
 - Pyrodwarf looks good in this trial, but didn't look as good in previous trials.
 - Suggestion was made to apply ReTain for fruit set in 2015. Todd will consider this option.
- Horner Rootstock Trial
 - OHXF 87 produced the highest yields (75 tons/acre) over either Horner stock
 - Only Anjou had a fruit size effect from rootstock
- Looking at using a browning scale on Quince germplasm—finding some Quince that are cold tolerant
- Amelanchier clones: good root quality, fire blight resistance.
 - Looking very good for fruit set on young trees.
- Quince Eline(?) (from Europe) looking very good.

New York II (Genaro Fazio) PowerPoint Presentation

- Finding pH and nutrient effects and associated genes
- Published paper on the nutrient work in 2013 (see NY State Report for citation)
- Published paper on dwarfing gene (Dw2) in J of ASHS in 2014 (see report for citation)

Idaho (Essie Fallahi)

- PowerPoint: Discussed many NC140 trials, as well as some related projects.
- Finding an increase in fruit size as spacing increases.

- Fuji/Bud.9 yield 42 ton/Ha on 4th leaf in a tall spindle. But M.9Nic29 is too big a stock at 3' spacing.

Utah (Brent Black)

- 2014 had greatest yields in UT since Brent started
- Has developed a modular DTA system to look at bud hardiness. In UT most damage in the fall.
- Usually installs two NC140 trials to represent the different pedo-climatic conditions in the state
- Hypothesizing that there is a rootstock by soil type effect for causing suckering.
- 2010 Apple Rootstock trial: one Fuji, one Honeycrisp, wishes he had switched the locations because of the vigor differences
- 2014 Apple Rootstock, Fuji: Good vigor in 2014.
- Doesn't see very much zonal chlorosis in Honeycrisp, compared to what Eastern research reports.

Kentucky (Dwight Wolfe)

- 2010 Apple Rootstock Trial
 - A severe fireblight infection was sustained in 2013. The fireblight was pruned out in late winter and early spring, and no infections were observed in 2014. But the combination of fireblight in 2013 and some winter injury from fluctuating temperatures during the winter of 2014 resulted in the loss of seventeen trees in 2014 (5 on M.26 EMLA, 4 on M.9 NAKBT337, 3 on M.9 Pajam, 2 on B.64-194, 2 on Supp.3, and 1 on PiAu51-11).
 - Yield was greatest for scions on G.5087 and G.5222 and lowest on B.7-20-21.
 - Scions on PiAu 9-90 and B70-20-20 rootstocks have the largest and scions on B.7-20-21 and B.71-7-22 have the smallest trunk circumferences.
- 2009 Peach Rootstock Trial
 - Four trees on Krymsk 1 (the least vigorous rootstock) were lost due to winter injury.
 - Scions on Atlas yielded the most fruit per tree as they did in 2013.
- Peach physiology trial. Crop load was inversely proportional to fruit size for both Cresthaven and Redhaven cultivars. Crimson Lady did not have any fruit due to early spring freezes.

Colorado (Greg Litus)

- Discontinuity for pomologists in CO. CSU will be searching for a replacement for Amaya Atucha in the coming months.
- Winter temperatures weren't a major problem, but spring frosts were an issue.
- 2009 Redhaven Peach
 - No data due to late spring freeze
 - Cytospora canker is an issue
- 2010 Apple trial
- A biochar project was started by Amaya Atucha
 - Found lots of tree death for Viking rootstock

- Greg R. said that there is an issue with bareroot planted Viking trees
- Biochar (30 ton/acre, 5' wide, worked in 5" into soil) didn't affect rootstock mortality

Michigan (Greg Lang)

- 2010 Apple rootstock trial: highlighted Honeycrisp results for newly-released G.814.
- Cherry rootstock X training system trial
 - 2012 freeze and subsequent bacterial canker caused dead spurs, which caused low flowering spur numbers for 2013 and 2014.
 - Cravo retractable roof protective structure had greater yields than Voen row cover protection and lastly, unprotected trees.
 - SSA was most precocious in the early years, but productivity has now started to diminish. Perhaps reached full canopy volume in year 3-4, and now starting to shade out fruiting wood; summer hedging timings are now being investigated
 - Fruit quality trends for systems have been variable each year
 - Time to winter prune plus summer hedge per ha was greatest on SSA> KGB> UFO > TSA

New Jersey (Jon Clements presented for Win Cowgill)

- 2014 Apple planting; Fuji grew pretty well, but Honeycrisp did not
- 2010 Apple Planting: G.4814 was middle of road.

South Carolina (Greg Reighard)

- Three plantings: 2 peach and 2014 Apple Rootstock Trial
- Cold injury to the peach trees, no peach seedling rootstocks have lost a tree yet but many of the other species and hybrids have had tree loss especially after the rainy 2013 summer season and cold 2013-2014 winter. Ambrosia beetles were very common in weak and dying peach trees in 2014.

Rob C. Motions to Secretary to write letter to Greg R.'s Director of Experiment Station.

Greg R. Concludes meeting at 3:00PM