

**Minutes 2003 NE-183 Meeting**  
**Friday, November 7 and Saturday, November 8**  
**Atlantic Food and Horticulture Research Centre (AFHRC)**  
**Kentville, Nova Scotia**

**Attendees** (and University Agency represented): **Bob Belding** (Rutgers Univ., New Jersey), **Jon Clements** (Univ. Massachusetts, Amherst), **John Cline** (Univ. of Guelph, Ontario) **Rob Crassweller** (Penn State Univ.), **Win Cowgill** (Rutgers Univ., New Jersey), **Charlie Embree** (host; AFHRC, Kentville, N.S.), **Elena Garcia** (Univ. Vermont), **Duane Greene** (Univ. Massachusetts), **George Greene** (Penn State Univ.-retired), **Cheryl Hampson** (AAFC – Summerland, British Columbia), **Peter Hirst** (Purdue Univ., West Lafayette, IN), **Shahrokh Khanizadeh** (AAFC- Quebec), **Thor Lindstrom** (Utah State Univ.), **Ian Merwin** (Cornell Univ., Ithaca, New York), **Eugene Mielke** (Oregon State Univ. – Hood River), **Diane Miller** (Ohio State Univ. – Wooster) – secretary for 2003 minutes, **Renaë Moran** (Univ. Maine) – chair for 2003 meeting, **Jean-Pierre Prive'** (co-host; AAFC- Bouctouche, New Brunswick), **Dave Rosenberger** (Cornell Univ. – Hudson Valley Lab, New York), **Robert Seem** (administrator; Cornell Univ.- Geneva, New York), **George Sundin** (Michigan State Univ. – East Lansing), **Keith Yoder** (Virginia Tech AREC, Winchester),

Additional attendees:

**David Bedford** (Univ. Minnesota; on Saturday)

**Call to order:** Renaë Moran, chair 8:15 Friday morning

**Welcome:** Charlie Embree; introduction of staff: David Baldwin, Sonya Shaw (technician with apple breeding program), Amy Dukeshire

**Director's welcome AFHRC:** Roy Bush

**Beginning of business:**

Changes to agenda – add time for rewrite, no committee set yet for rewrite

Review of 2002 minutes – done electronically

Review of membership and participants list – done on web electronically

Attendance list sent around and signed

**Report of administrator:** Bob Seem

There is a web site for initial drafts of projects: NIMSS; the NE-183 project terminates Sept 30, 2004; the group can request 1 year extension to further analyze data, can decide not to renew, or may want to go in another direction (no project, revised project or continue in same as current) so deadline becomes Sept. 2005 – The process is: seek approval from directors to rewrite (whole process takes 1 year), Bob's advice is to go with an extension – otherwise deadline is coming quickly; question – does 1 year extension come with funding? Answer yes, assuming there is funding available from government; continually problem - federal budget is not approved yet, act on last year's budget, assume budget will happen and run accounts in the red; looks like federal formula funding will be stable but each station director may make adjustments; multi-involvement (institution, disciples) are important now but IFAFS will be folded into full NRI program.

**Discussion of publications from 1995 planting:**

There are to be 2 groups of papers from the 1995 planting to be published in the Journal of the American Pomological Society (group #1 – December 2003 deadline and group #2 – March 2004 deadline).

**Introduction paper** – Duane Greene (for group of papers #1) looking for general aspects to correct, not small editorial comments, at this meeting; had sent out first draft for review and received a few corrections thus far – check authorship – include cultivar descriptions (Duane doesn't think it belongs here, suggests putting it in Rob Crassweller's horticultural performance paper); Are there major rewrites? – make it available to group for proofing one more time and then submit it to John Barden for J.APS; December is deadline for first group; which papers included? Those that are ready – Duane Greene's, Steve Miller's, Rob Crassweller's, Dave Ferree's, and Cheryl Hampson's; Ian Merwin – listed off weather data available and suggests including weather data in Cheryl's paper, not enough to stand alone otherwise, no

precipitation data, looking for growing degree days but don't have data logger data often just min and max, have differences in growing degree days to maturity for different varieties; appears when it gets cold at the end of the season it reduces days to maturity; calculated growing degree days from bloom to harvest, not from January to harvest; Rob Crassweller – stability variance for varieties - 0 means it performed same way across plantings; statistical analyses across sites is difficult and differences in interpretation of what high stability variance means; Ian Merwin general suggestions- put weather info summary as a paragraph at end of introductory paper to lead into other papers; have description of varieties in introductory paper (i.e. Duane Greene's), Duane comment – need detailed description of variety performance in Rob Crassweller's paper

Ian Merwin– may need bottom line paper at end of whole series to include 1-2 pages of verbal summary and a few tables – good disease resistance – may be called outreach paper – Good Fruit Grower, IDFTA, HortTechnology, some place else besides J.APS? (Win Cowgill and Jim Schupp had previously agreed to write an outreach paper and remain in charge of this paper) and then each cooperator to summarize for his/her state; Dave Rosenberger – need geographic area wide grouping irregardless of statistics, Win Cowgill – put popular article together based on data- Rob Crassweller – come up with logical grouping and NE-183 statistician Ron McNew will analyze, original analysis was done with trunk cross sectional area but that wasn't meaningful production wise; Dave Rosenberger– wants regional totals for TCSA, etc + variability within region; discussion of interactions among sites and tree/fruit parameters; problems with different collections of tree/fruit data and weather data; conclusion of discussion: introductory paragraph for cultivars and table of parentage + plant patent + origin + reason for selection for testing should be included in Duane Greene's paper; Keith Yoder will update disease susceptibility information for the cultivar information table and will contact Henry Hogmire about insect data for the cultivar information table.

Rob Crassweller – how to handle page charges with multiple authors for J.APS; decision – senior author is not responsible for entire page charges for article – bill portion of page charges to each institution included as authors

Discussion of Rob Crassweller's **growth and yield paper** (for group #1 papers) – Rob- paper posted late so send comments to him for improvements after meeting via email; Duane Greene- relate some of our findings to that which is in the literature regarding varieties; delete variety discussion currently in paper – ship that to Win Cowgill and Jim Schupp for outreach paper; drop cultivar descriptions from Rob's paper and beef up what's left with literature references; Rob – doesn't include drops in yields so with a variety that drops it will skew the yield; Duane – then need to use the term estimated total yield= all fruit that were picked plus weight of those plus number dropped; also need percent drop table because it is important to growers; Duane- cumulative yield efficiency – affected by 2 aspects -actual efficiency of variety + tendency for biennial bearing – can this be separated out? Ian – include coefficient of bienniality in table

Discussion of **flowering and biennial bearing paper** – Duane Greene – will be group #2 paper but Dave Ferree has paper written, reviewed and accepted for group #1 on spur and flower characteristics for Ohio (done as individual state, not really a group paper)

Discussion of **disease susceptibility paper**– Keith Yoder – composite data on foliar diseases together, not fruit diseases on web – where will this be published? To be put in plant disease journal – need to be cited in J.APS articles; Peter Hirst- how about 1 page paper for J.APS; Duane Greene – include sentence in introductory paper that disease info is available and where it may be published; George Sundin– put table in of susceptibility; Keith – put down general ratings irregardless of statistics; Peter – do it as stand alone paper in J.APS with mostly verbal and some tables so the complete package is included; Elena Garcia – do it as self-contained within J.APS; Dave Rosenberger– done as B and C tests; put it as generalized in J.APS; won't compromise it for plant disease publications; try for group 1 and if don't make it put in group 2 papers (next March or June)

Break:

Discussion of **nutrition paper** – Teryl Roper not here – it is written, reviewed, group #1 paper

Additional discussion of weather summary – Ian Merwin doesn't think separate weather paper is justified or needed – interest is looking at late ripening varieties across states; some of late ripening varieties ripen earlier in colder areas; is there a way to predict how new varieties will respond and what is the key – growing degree days, drought stress, cold weather at harvest; add one paragraph in discussion part of Cheryl's paper and delete this as separate paper; comment that no one will look up degree days so we have the chance to analyze and summarize; discussion of how to present this and Ian thinks weather data is sparse and questionable and lacking entirely from some sites; bloom date, harvest date (assumption at optimal), number of days to harvest maturity, growing degrees days base 40 degrees F, then base 50 degrees F, 30 days prior to harvest weather analyzed several ways; Eugene Mielke – growing degrees days for first 9 weeks after bloom critical in pears; but Ian thinks temperature right before harvest is critical for apples – late apples develop fast when temperature gets cold; Charlie Embree – may need meteorologist to do this so add to group; discussion of how data is thin both on weather and harvest maturity and N level – looks like hypotheses for future paper; strong point for rewrite/revision; interact with Ron McNew to see what precision is there and if it is publishable; Bob Seem – include Jeff Andresen at Michigan State in project as meteorologist.

Discussion of **fruit quality paper** – Steve Miller not here – draft is written for review

Discussion of **sensory evaluation paper** – Steve Miller in charge – Mike Brown and Ian Merwin at NY-I did full taste panel on '99 planting varieties which is posted on NE-183 web site; unsure of status of '95 planting variety tasting – not many places did it.

Discussion of **pest problems paper** – Rob says PSU (Larry Hull) has info and may write paper; also Dick Straub at Hudson Valley; Henry Hogmire at WVU; Donn Johnson at Arkansas has data; paper needs prepared; need coordinator to pull together; Rob will send letter to all of them from the chair of this group

Discussion of **rootstock paper** – Cheryl Hampson has this paper written and submitted; include column by fruit size with crop load; pointed out difficulties of taking random fruit samples

Additional discussion of **outreach paper** – Win Cowgill and Jim Schupp in charge; other papers need written up and Win and Jim need a final draft before they can write the outreach paper in order to have data to back up conclusions; can be in group #2 papers; summary and recommendations paper and potential for variety; concluding paper of series; Duane feels it should be in J.APS; Duane Greene motion: submit summary article to J.APS with popular article to Good Fruit Grower; motion passed.

### **1999 planting:**

**Horticulture subcommittee** – Bob Belding; horticulture protocol is written; Cheryl Hampson- how to get average fruit weight? Difficult/impossible to get random sample; Ian Merwin– sample by sector of tree and pick everything; Win Cowgill - practice positive reporting by putting updated date on horticulture data collection each year – even with no changes; handout horticultural protocol data collection from web by Bob (with 2003 date on it); Ian Merwin - come up with last year experiment where data collection is intensive; Duane Greene– suggests Ian come up with parameters and see who can do it; with extension could do it for 2 years (2004, 2005); Correction to protocol – use day of year, not Julian date, in data collection

**Pest management subcommittee** – Dave Rosenberger; get protocol on the web; will get on web in next couple months on what to collect next year in 1999 planting; Larry Hull (PSU) collecting pest data and Dick Straub NY collecting pest data

**Economic subcommittee** – Bill Lord is retiring Jan. 1 and hasn't done anything on this – suggest scratching this objective; difficult to predict value for new cultivars;

Break with discussion of 1999 planting to be continued on Saturday morning:

Saturday discussion:

**Fruit quality subcommittee** – Steve Miller in charge, Ian Merwin question: Since 2003 was very cold and wet in eastern states, was this year a representative year for fruit quality?, i.e. are we getting good representation of these varieties yet? Duane Greene- sugars down, acids up due to weather; maybe the apples in this planting aren't ones that will show well ever; discussion of fruit tasting and differences among sites and among people; Ian – tasting with panel of 30 people –2 page sheet with data rating; Cheryl Hampson- order of tasting makes difference; Duane – selected 12-14 varieties for evaluation at market of University store – reward of free apple to fill out form – has gotten back 500 or so responses; Cheryl – pomologists are not naïve consumers; Cheryl – tries to put control in panel – uses Golden for NE-183 taste panels; Shahrokh Khanizadeh- at Quebec for fruit tasting at advanced selection stage they test after harvest and then put in CA, after CA leave at room temp for 3-4 days and then taste and then send to professional judges; Sonya Shaw – have sensory protocol obtained from Charlie Embree but pomologists don't try to do it themselves; use trained taste panel to screen advanced selections for taste, tasting done in independent cubicles; Win Cowgill– big difference if store for a while or taste right after harvest and we should all do the same; Elena Garcia – different future for different cultivars – pick your own needs tasted right off the tree; some apples taste a lot different off the tree versus after stored for a while; Duane Greene– it makes a big difference; Win – panel should meet and come up with some options for uniform publications purposes; Duane – will contact Steve Miller to resolve issues of protocol - questions to be resolved: taste warm or cold; how soon after harvest; how many people; what kind of panel; Duane – thinks he can pick out good apple, maybe this group doesn't need to be terribly precise; Win – what about desirability rating?; Duane – summarize data from this year and see how different we are, may be mute discussion, good apples are going to shine, losers will be down rated, need to know which sites did taste tests this year; Rob – suggest that every year statistical means for planting are obtained from Ron McNew

**Photography** – Jon Clements in charge; goal is picture of fruit on the tree, picture of whole tree and picture of fruit in a packing tray (mixed angles of putting fruit in the tray), working on data base and will take pictures to include, submit directly to Jon instead of uploading, will take disease pictures, specs in email – resize pics to 800 x 600 pixels (this is around 200 – 400 K); don't do any touching up; keep originals at higher resolution for your publications; Win Cowgill– put picture protocol on website, positive reporting; database is searchable by state or variety

**Data management subcommittee** – Ron McNew, chairman, absent

**Publishing** – Rob Crassweller is handling 1995 planting; agreement is that Duane Greene and Rob will split the job for the 1999 planting; problem of waiting until 5 year period is over before looking at data; was done with 1995 planting and complicated data analysis; we have also waited until now to look at 1999 data so writing will be complicated ; on 5 year plan so 2004 will be last data collection for 1999 planting – will give 4 years of harvest data and then write it up; Ian Merwin- would like Good Fruit Grower to publish article dealing with difficulty of getting next generation of apple varieties and lack of objective evaluation across geographic regions, Ian and (hopefully) a co-author(s) will write the article, may be most important conclusion from the 1999 planting; Duane – suggests plant breeder be co-author; solicit 2-3 different perspectives, Alan White from New Zealand, club variety perspective, nursery perspective

**DISCUSSION OF NE-183 PROJECT REWRITE:** Ian Merwin- project should be terminated, don't have access to new varieties, breeders aren't giving out best new varieties for evaluation; Dave Rosenberger– project should be terminated, alternative would be major change in direction; Rob Crassweller – break up into different groups and look at aspects, little projects under big NE-183 agenda; Diane Miller– look at disease-resistant varieties; Shahrokh Khanizadeh has 10-12 to evaluate – scab resistance, fireblight, winter hardiness; Diane – there are European ones with multiple resistances; Cheryl Hampson– are they virus indexed?; Rob – Manfred Fischer's releases are in U.S. and could be included; Ian – what about peaches?, how does NC-140 handle multiple objectives?; Peter Hirst– whole group takes certain core data and then breakout for specific objectives; George Greene – not everybody has to have same plantings; every planting has coordinator who does report; Rob – this could help group grow; Charlie Embree– change objectives to be physiology, disease resistance, hardiness instead of varieties; Bob Seem – different objectives need interdependency; suggested potential subcommittees: antique, disease-resistance, stone fruit, pears, physiology and nutrition, processing

Those interested were invited to a Friday night discussion of potential new direction for NE-183 to be reflected in the rewrite; overview of discussion presented to entire group by Duane Greene on Saturday morning as follows: overall objective is variety evaluation: 3 viable areas within variety evaluation—antique varieties, disease resistant varieties, and processing varieties – separate plantings for each with some cross over; individuals for each area coordinators – Ian Merwin and Duane Greene will get antique variety descriptions, Diane Miller and Elena Garcia (with George Sundin) for disease-resistance on varieties; Rob Crassweller and Keith Yoder for processing; did not discuss physiology, may be done under umbrella of each planting, also discussed need for economic analysis for antiques and disease resistance – looking at niche markets; Susanne Thornsby MSU Ag Econ Dept. was suggested; focusing on fruit varieties that won't be international wholesale, very different niche, direct marketers, farmers market, what is profitability? what is packout? is there a viable economic sector? – is this a doable idea?; Rob – we aren't getting right data for economist – weak point of project; Ian -are these varieties marketable? Steve Blanks book – future of Ag in Am – rationale behind next project is to see if there is another sector besides traditional Ag sector – may be a marketing question instead of economic; questions are “are you going to buy it and what will you pay for it?” – a new project not the current project – what is consumer acceptance, how much russet is acceptable – Bridget Behe, MSU or Kathy Kelly from PSU, or Wen-fei Uva (Cornell) should be added to project; need a marketing economist or more than one and none of us have those skills; need co-PI's that are market economists; is there a regional project already on this?; regional marketing of horticultural crops; individual would also be good for disease-resistance apples; Dave Bedford- what about modern antique varieties; include Keepsake and Chestnut Crab and numbered selections; get suggestions from Dave Bedford; Ian Merwin read list that he had developed; how many varieties can group handle?; heirloom, antique, classic; need to move this along in timely manner to get new planting – will take 2 years to get trees propagated; need to show interdependency of these variety plantings to ensure NE-183 will be continued; get DARE variety information; Diane Miller will coordinate with Duane Greene on objectives for NE-183 proposal rewrite; timeframe approve project by summer of 2005; extended project will end in summer of 2005 (mid-June); need to bud next August from next planting to plant in spring 2006; area coordinators need to do a lot of work between now and next summer;

Discussion of other possible focus areas by group - physiology and stone fruits- Peter Hirst-environmental effects on ripening dates – get a planting together and collect right dates to understand, e.g. environmental effect on fruit size; Duane Greene– may be done with few varieties and ones that may get responses from, e.g. Honeycrisp, Pink Lady (extremes); Eugene Mielke -use cultivars in existing 1999 planting but Ian Merwin response- only have 5 single trees reps, need more trees; Ian -shift emphasis to internal quality of varieties instead of cosmetic appearance Rob Crassweller- good scientific project; Ian – may not be logical outcome of NE-183 project – regional project concept of interaction of environment and variety especially with representatives from N, S, E, W and center of North America; recognize that things don't perform the same at each site but why do they differ?; Peter Hirst with Ian Merwin will head this up; develop consensus among interested people and then send out to everyone

Keep everyone up-to-date by email on the development of these projects

Canadian comments on interest in rewrite: Cheryl Hampson– interested in disease resistance, no funding for physiology; Charlie Embree– interested in disease resistance and processing, reorganization in progress; John Cline – less of an interest, funding is limited, what about virus-certified wood for antique varieties, J.P. Prive.- physiology is interest, especially weather studies, Shahrokh Khanizadeh– disease resistance and processing

Overview – Area coordinators (antique, disease resistance, physiology) should form subcommittees and have something written to send to group by email by Feb. 15; consider separate plantings- maybe 15 varieties for each of the plantings; Bob Seem- key is to tie it together so it looks like unified project instead of bunch of smaller units doing plantings – look to NC-140 for guide; include a thread across everything – standard G. Del or so; perhaps look for overlap disease resistant and processing varieties; check with Keith Yoder for disease resistant processing varieties; Duane Greene– horticulture plantings and disease resistance plantings and quality – how do we get both disease resistance and quality data from one planting; difference wholesale quality and niche quality;

Ian Merwin- should we emphasize up front more the use of the web in future of this project and putting project info on web; this should be emphasized continually in the project – esp. with antique varieties there is info out there and for disease resistance varieties; consider general public and home gardeners who want to do a “Google” search and come up with NE-183 for antique and disease resistance; can take same info for J.APS (audience of 2000) and “Google” and serve thousands of people; want searchable web information – use Win Cowgill and Jon Clements expertise- may already be doing it but want to emphasize this in project renewal; include searchable info on disease resistance

Out-reach web based descriptions – Bob Seem: can have extension component to project, doesn't have to be entirely research – if appropriate good to have extension involved – can be a separate objective – create up to date web based info that includes what's available in literature along with what we generate. Win and Jon will be leaders of this and want people to funnel info to them, they will not create info but they will reformat and put it on the web; emphasize the results of our research (not all results from literature review); new page – antique apple page; disease-resistant page; Shahrokh Khanizadeh has some info on his website can link; searchable web site e.g. interested in disease resistant apples in Arkansas – get varieties we could recommend from this project;

Win Cowgill – for project need to have approved minutes posted on web site – track vote and make changes to minutes; get final copy back and post on web site; done within 60 days of meeting. Give it 5 day vote

What about including other fruits (besides apples) in project – Bob Seem– don't want this viewed as diffused effort – shouldn't be monster process- what words go in title; Ian Merwin– niche market is overlapping concept for potential renewal; regarding stone fruits, growers want to know what will survive winter, brown rot, instead of different varieties is now different species; Rob Crassweller- follows NC-140 protocol; Greg Lang is trying to put together cherry variety evaluation project and Wally Heiser from Summit Sales has cherries from Bob Andersen at Cornell-Geneva; Duane Greene– would different set of investigators want to tie into this project; Thor Lindstrom– Utah will focus effort on cherries, Eugene Mielke- want do you want focus to be – is it niche marketing or is it physiology? Is there a national group? Don't want to cannibalize each others money by proliferating NE projects; Bob Seem: Could have coordinating committee – researchers with similar interests get together once/yr, no research funds associated with it; Dave Rosenberger – one of original aspects of original proposal is “multidisciplinary”– if spread out to stone fruits may not be able to keep multidisciplinary – may cause split; Ian – overarching theme is local market sectors and locally adapted varieties of fruit and quality; Eugene consensus – feeling is not to go to other fruits now or with next proposal; Rob – send out email to everyone and see what interest there is – however after further discussion Rob withdrew his email idea; consensus: forget expanding project to other fruits for now

How impacts and accomplishments are measured and outreach planned should be part of the rewrite objectives

A one-year extension of the current project should be a short paragraph and Bob Seem will write it and submit it

Continuation of web discussion: Win Cowgill- any papers or abstracts should be submitted including the URL to Win to reference on web; send pictures to Jon Clements; make sure to have file extensions when uploading; individuals cannot delete- only the webmasters (Win and Jon) can delete and then reports can be resubmitted with same name

**Election of new secretary:** Cheryl Hampson (tentatively accepted but has since declined); **there is no secretary in line for the 2004 meeting.**

Discussion of regional designations: Rob Crassweller – do it on growing degree days?; what about logical groupings where one location fits into more than one group? Suggested groupings based upon growing degree day accumulation and length of growing season (frost-free days): 1- short and cool growing season (ME, VT, NS, WI); 2- intermediate and cool growing season (MI, NY-Ithaca, NY-Geneva, ONT, MA); 3-

long and cool growing season (NJ, NY- Hudson Valley, PA- State College); 4- long and warm growing season (PA- Biglerville, WV, VA, OH, IN); 5- long and hot growing season (AR, NC), 6- long and dry growing season (BC, WA, ID, UT), 6- long, cool and wet growing season (OR)

All cooperators should send number of frost free days and soil type and classification at their NE-183 sites to Ian Merwin, for possible inclusion in weather related report, or to determine appropriate sites for potential new experimental plantings.

**1999 Cultivar discussion:**

101 – Ambrosia: great taste, very susceptible to scab; some russet; overall well liked

102 – Autumn Gold: splitting and cracking in mixed review; NJ likes it

103 – BC8S26 50: very biennial; resistant to fireblight; ugly apples in some areas due to russet

104 – Chinook: small in many areas and susceptible to scab

105 – Co-op 29 (Sundance): very biennial; late; tart; aromatic flavor; some states like it; may have flavor changes from year to year; acidity varies from site to site; resistant to quince and cedar apple rust but susceptible to mildew; heavy russet

106 – Co-op 39 (Crimson Crisp): hard, nice, well-balanced flavor, more sweet than acidic

107 – CQR10T17: hard, big yellow fruit; in 2003 had a lot of cedar rust; in some sites it has water core

108 – CQR12T50 (Princess): very hard; stem end russet; may be low yielding

109 – Delblush: excellent fruit; high drop; very susceptible to mildew; similar to GoldRush; in some states one of the best; it has not performed well in some states such as MA

110 – Golden Gibson: typical Golden Delicious

111 – Hampshire: very susceptible to scab if unsprayed; unattractive in some areas; survived frost in PA in 2002; colors better than Empire

112 – Jubilee Fuji (September Wonder?): much earlier than Fuji; high productivity in some areas; pinker color; questions on scab due to regional variability in susceptibility

114 – NJ90: good taste; high drop; McIntosh area apple; very susceptible to scab; susceptible to Hawthorn rust; resistant to cedar apple rust

115 – NJ109: overall lower quality than NJ90; lowest amount of scab; susceptible to quince rust

116 – NY79507-49; very large fruit; rated highly in NY and Utah; some quince rust; low in rots for the time it ripens

117 – NY79507-72: low cumulative yield; middle of the road cultivar; good resistance to most diseases; hawthorn rust susceptible

118 – NY65707-19: good eating, but may not have more storage quality; susceptible to quince rust, cedar apple rust and mildew; big apple

Cripps Lady – (only in southern states): very susceptible to scab; not ready in PA on Nov. 5; starch index around 5; pinkish color; appears to be good after storage; beautiful tree

120 – Pinova (Sonata): rated highly; very high flavor; russet; not scab resistant; comparable to Golden Delicious in its susceptibility to scab

121 – Runkel: nothing good to recommend it; blooms late; high yielding

Scarlet O’Hara: Only in the disease planting; very susceptible to fireblight; moldy core; stores well; long picking window

123 – Silken: Very nice, mild-sweet flavor; highly recommended by several; high susceptibility to scab

124 – Zestar!: high quality, very attractive early season variety; susceptible to quince rust and scab; red color development may be a problem in some areas