

APPENDIX D
SAES-422

Project/Activity Number: NE1231
Project/Activity Title: Collaborative Potato Breeding and Variety Development Activities to Enhance Farm Sustainability in the Eastern US
Period Covered: Oct 2015 to Sept 2016
Date of This Report: 8 September 2017
Annual Meeting Date(s): 10-11 January 2017 (Beltsville, MD)

Project Participants:

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Brief summary of minutes of annual meeting (January 10-11, 2017; Building 010A, BARC-West, 10300 Baltimore Avenue). Attendees at the January 2017 annual NE1231 meeting were Kathy Haynes (USDA-ARS; our host), Rick Jones (USDA-ARS), Craig Yencho (NC State), Mark Clough (NC State), Walter De Jong (Cornell U), Ramon Arancibia (V. Tech), Greg Porter (U ME), Jay Hao (U ME), Mike Peck (PA State), Xinchun Qu (PA State), Anne Marie Thro (USDA NIFA), Jeremy Buchman (Black Gold Farms).

Minutes from the last meeting were approved. Site selection for the 2018 meeting was discussed. The committee agreed that Beltsville, MD is a good meeting location for the group, Kathy Haynes agreed to host, and January 4-5, 2018 were chosen for the meeting dates. A resolutions committee consisting of Mark Clough and Walter De Jong was appointed. Local arrangements details were covered.

No administrative advisor report was provided as Susan Brown, our administrative advisor, could not attend. Ann Marie Thro provided a report from USDA-NIFA, explain administrative procedures, the importance of our regional effort, and projects about the upcoming federal budget.

State and provincial reports were given describing production status, promising clones, and market needs.

- ME – 46,500 acres (down about 5K from 2015). Some reasons for decline: McCain Foods has cut down on contracts, and *Dickeya* outbreak has reduced seed acres. Vibrant direct sales don't show up on commercial acreage estimates. 50% fry, 15% chips, 18% table and 22% seed. Good rainfall and yield in the north. Bangor and further south was dry, but irrigated land yielded well regardless. Challenges: saw a lot of powdery scab in breeding plots, may have been in commercial fields, too.
- NY – 12,000 acres (down about 3K from 2015). 50% chip, 45% table, 5% seed. Exceptionally dry summer. Essentially no rain in June and July. Yields suffered as a result.
- NC – 14,000 acres (slowly drifting downwards). About one-third of NC potato acreage is managed by Black Gold. Freeze on April 10 was serious, some below ground damage seen. After that – beautiful season. Until June 9, when a dozen days of rain led to a lot of rot. Some trials good, some not; patchy.
- PA – 4500 acres (slowly drifting downwards). 50% chip (decreasing), 50% table (increasing). Hot days and nights this year; some irrigation ponds ran dry, many small potatoes. Re chipping: state is moving towards out of field chipping, away from storage.
- VA – 5000 acres. 30% chip, 70% table. Bad heat necrosis this year.

Comments from industry representatives in attendance at the meeting:

- Jeremy Buchman from Black Gold: Maryland had a good season. Solids were low on account of high temperatures. Blackleg/*Dickeya* was a problem in some fields, on seed lots coming from both Maine and Wisconsin. Yield reduced up to 40% in affected fields. On the topic of dry matter: asked breeders to keep levels high in new varieties.

Research presentations were as follows:

- Rick Jones gave a research presentation on Phytophthora-potato interactions. His focus is on interactions in the apoplast. One research question: why do late blight cellulases attach host cell walls but not fungal cell walls? Along the way has found that overexpression of a cellulose binding protein leads to parthenocarpic fruit.
- Walter De Jong gave a talk about golden nematode resistance. Highlight: 17 years after starting, have finally located a resistance QTL for resistance against pathotype Ro2. It is on chromosome 5. Same region harbors a small effect QTL for resistance to *Globodera pallida*.
- Jianjun (Jay) Hao gave a presentation on bacterial soft rot and blackleg, caused by *Pectobacterium* and *Dickeya*. Outbreaks seen in 2015 and 2016. *Dickeya dianthicola* likely involved last few years. First reported in USA in 1936, but only recently causing problems. *Dickeya* does not appear to survive long in soil. Symptomatic differentiation: *Pectobacterium* blackleg is visible on outside of stem early. *Dickeya* blackleg starts inside the stem.
- Craig Yencho provided an overview of potato and sweet potato breeding in NC. Sweetpotato value in NC in 2012 about \$350 million, potatoes only \$35 million. Yields are

similar per acre, but sweet potatoes sell for twice as much. 100,000 acres of sweet potatoes in NC. Potato production centered in eastern quarter of the state. Sweet potatoes mostly in east-central region.

Plant Pathology and breeding program reports were presented by participants.

- USDA-ARS in Beltsville will soon make job offer – if federal hiring freeze doesn't take effect first - to a potato pathologist. Position once held by Leslie Wanner.
- Greg Porter distributed scab trial data for all NE1231 entries. Teton Russet performed very well. Greg also distributed reports for PVY and PLRV symptom expression (from colleague Andrei Alyokhin). Most clones tested were susceptible to both.
- Agnes Murphy (AAFC Fredericton) sent data for resistance to common scab, golden nematode, and wart. Hard copies distributed.
- Xinshun Qu included results of common and powdery scab testing from PA, as well as late blight resistance trial results, in the annual report he emailed several days ago.

Breeding program reports were presented.

- Maine. Ek Han Tan was recently hired as a plant geneticist at U Maine. Research interest in aneuploids and diploids, prior experience collaborating with International Potato Center. 50,000 seedlings. Saved about 3.0% (1581) at single hill stage. Grew 1400 second year clones: most looked great, so selections were made based on gravities and internal defects. Sebec was released in 2014: chips well in South, but gravity typically 2-4 points less than Atlantic. Still shows promise. J. Buchman commented that Sebec internal necrosis and heat necrosis were much less than for Atlantic. Sebec vines are pale, which looks scary, but it isn't. Easton also released in 2014, but has failed at commercial level due to bruise and high susceptibility to tuber rot, including late blight. Caribou Russet released in 2015, doing very well, about 145 acres of seed.
- New York. 18,000 seedlings. 70% chip / 30% fresh. Difficult to select this year because of severe drought. Golden nematode, scab and PVY are priorities for resistance breeding. NY152, a cold chipper, is most interesting clone currently being evaluated. Hollow heart is the primary issue of concern. J. Buchman noted that many processors do not like the size profile of potatoes harvested between July and September; this has not been a problem with NY152.
- North Carolina. 13,000 seedlings, saved 7.6% at single hill stage. 70% chip / 30% other. NC0349-3, a clone of interest last year, had high levels of hollow heart in nationwide trials in 2016. Program is now crossing twice a year: in fall (table and specialty crosses) and spring (for chipping). Resistance to CPB, GN and PVY are primary targets. Are using several markers routinely now to select for Ry-adg, Ry-sto, H1 and Ry-fsto.

- USDA-ARS. 15,000 seedlings (down from 20K+). Difficult to select in Maine this year, as growing conditions were so good. Continuing to work with Papa Criolla-type potatoes (orange flesh). Distributed summary of research progress (2 pages).

The NE1231 seed nursery shopping list was distributed and each clone was discussed. No major changes were suggested for 2017.

Breeder's choice selections for 2017 (all sites must evaluate these):

AF4648-2 (dual-purpose, round table/chip)
AF5040-8 (chips, higher gravity than Atlantic)
AF5429-3 (chips)
NY158 (chips)
NY161 (yellow flesh, purple splash skin)
BNC364-1 (chip and possible table)

Standard varieties to include in all NE1231 trials so K. Haynes can analyze G x E:

Atlantic
Dark Red Norland
Snowden
Superior
Yukon Gold

Mark Clough provided an update on the project website: the process of including data is working well on his end and the database is growing. People are welcomed to provide input on improvements. Reports can be posted on the web site. Mark Clough reminded all of a decision made last year that all evaluators would include a merit score for each clone tested. Where:

1 = outstanding
2 = good
3 = so-so
4 = not acceptable

Each evaluator is to integrate all the trial data they collect for each clone each year, along with their knowledge of the local potato industry, to arrive at the merit scores.

After lengthy discussion, decided that in future years, all evaluators would include a merit score for each clone tested. Where:

1 = outstanding
2 = good
3 = so-so
4 = not acceptable

Each evaluator is to integrate all the trial data they collect for each clone each year, along with their knowledge of the local potato industry, to arrive at the merit scores.

Greg Porter provided an update on the Eastern USDA-NIFA Special Grant for Potato Breeding Research. Funding was obtained from the 2016 RFA and subcontracts should now be in place. Appreciation was expressed to everyone for getting grant material in on time. Our grant continues to receive positive reviews as an applied breeding project, but we need to be looking at funding opportunities to expand research beyond our current framework. Note that our current special grant includes an expanded extension component – please reflect this in progress reports. The next potato special grant RFP will likely come out in Spring 2017.

NE1231 rewrite is in progress. March 15 is our internal deadline. NE1231 impact statement needed before submission, too.

Committee Reports

Resolutions (approved unanimously):

- a) We thank Greg Porter for his leadership and service as our project coordinator, including shepherding the special grant through each year.
- b) We thank Jeremy Buchman for his willingness to contribute perspectives from the potato industry
- c) We thank Anne Marie Thro for her continued guidance and participation
- d) We thank Kathy Haynes for her willingness to host both this year's and next year's NE1231 meeting.
- e) We thank all presenters for their thought provoking talks