

**'2024' Annual Meeting of Regional Project NE2231
December 16 and 17, 2024
USDA-ARS, Beltsville, MD (in person and via Zoom)**

AGENDA

1. Call to order, additions and approval of agenda, approval of minutes from last meeting
Han Tan welcomed us and called the meeting to order at 1:00 PM. 2023 minutes (from December 2023 meeting) unanimously approved (moved by Collins, seconded by Clough).

2. Introductions

Paul Collins (USDA-ARS ME), Mark Clough (NCSU), Marcio Resende (UF), Bonny Oloka (NCSU), Xinshun Qu (PennState), Mario Andrade (UMaine), Walter DeJong (Cornell), Han Tan (UMaine), Chris Clarke (USDA-ARS MD), Brett Shelley (USDA-ARS MD), Jenile Livesyi (USDA-ARS MD), Leo Hoffman (UF), John Mason (VT), David DeKoeyer (AAFC), Erica Fava (AAFC), Tom Dixon (NB-DAAF), Mitchell Smith (NB-DAAF), Matt Falise (Cornell), Matt Kleinhenz (OH), Brad Halladay (MediusAg).

3. Appointment of Committees

Resolutions – Paul Collins; Marcio Resende; Han Tan.

Site selection – Chicago, IL during 2025 Potatoes USA? December 8th, 2025;

Nominations – Paul Collins will be the next chair, Mario Andrade will be the next vice-chair, and Leo Hoffman will be the next secretary.

4. Local Arrangements

In-person meeting was held in building 4 at USDA-ARS. The meeting will run till 5 pm Dec 16, and resume at 8 am December 17.

5. Administrative Advisor Report – M. Smith

- NE2231 recently completed its 2nd year of a 5-year project, so renewal decisions are not looming for a couple years.
- This year's report should cover the period from 10/1/2023 through 9/30/2024.
- Among other things, the report needs to emphasize accomplishments for each of the project objectives, and list individual impact statements for ways that your multistate project had an impact on stakeholders.
- A year from now, I will need to conduct a mid-term evaluation of NE2231. This focuses on accomplishments by project objective, impacts, coordination/linkages among participants, information exchange, and attendance/participation.

Documenting those things well in annual reports helps me write a strong mid-term evaluation.

6. National Institute of Food and Agriculture (NIFA) Report – Christian Tobias and.

Christian is responsible for the AFRI genome phenome and potato breeding program, specifically overseeing the NE2231 multistate project. He provided an agency update, discussing various impacts and funding opportunities. He highlighted different funding sources, including the SCRI projects that support potatoes and sweet potatoes. AFRI funds research aligned with the six priorities outlined in the Farm Bill, providing opportunities for breeding and genetic research. Both foundational and applied science also present funding opportunities.

The Request for Applications (RFA) for the potato breeding program grant is scheduled to be posted in January 2025, with a funding amount of \$4 million, primarily resulting from industry lobbying efforts and support from boards. Additionally, the AG2PI RFA is also expected in January, offering \$2 million. He shared application resources and grant links to assist with the application process and tracking progress. Key documents needed include a data management plan and a mentoring plan, which is required for projects involving undergraduate and graduate students, as well as postdoctoral researchers.

7. Research presentations

Brett Shelley - "Understanding the Growth and Diversity of Streptomyces Causing Common Scab." He began by introducing the characteristics of the disease.

During the presentation, he described how a pathogenicity assay was set up, revealing that the gene txtAB is linked to disease severity. Quantitative PCR (qPCR) proved to be an effective method for assessing disease severity, as it can reflect field conditions. However, it is important to note that some environmental and spatial heterogeneity may affect the results. There is a good correlation between the amount of bacteria in the soil and the level of disease pressure, but it should not be considered an absolute factor. Instead, it functions well as part of a comprehensive model for decision-making regarding field use based on cultivar resistance.

Shelley also highlighted differences among various Streptomyces species and their growth patterns throughout different times during the season. He presented the steps taken to assess the diversity of Streptomyces in the United States, noting the discovery of new species in North Dakota and plans to expand the sampling areas.

Marcio Resende - presented the UF potato breeding program updates and recent activities. The program has worked on Pre-breeding, GxE, and Genomic selection projects. The program has been focusing on pre-breeding, genotype-by-environment (GxE) studies, and genomic selection projects. In collaboration with USDA-ARS ME, pre-breeding efforts have targeted heat tolerance and nitrogen use efficiency. This work has successfully identified clones that demonstrate better adaptation and more efficient use of resources. Marcio also shared preliminary results from a GxE study utilizing the NCP

data, where a Factor Analysis (FA) model was implemented to predict the performance of clones in untested environments and to inform regional recommendations for clone selection. Additionally, various models were evaluated within the genomic prediction project, which showed potential for different traits. The program is already applying prediction methods for specific gravity to assist in the selection process during the early generations.

Don Weber – USDA-ARS research entomologist, presented on the topic of the Colorado potato beetle and tools for behavioral control. He began with a brief introduction to the Colorado potato beetle, highlighting its destructive impact on potato crops. Notably, he emphasized that this is a constructed agroecosystem, as neither the potato nor the beetle is native to the area.

Weber provided a list of chemicals to which the beetle has developed resistance and discussed various management practices, including chemical controls, biological control, cultural practices, and plant resistance. However, the primary focus of his talk was on behavioral control.

He addressed the use of pest pheromones, predator pheromones, and plant volatiles in managing the beetle populations. In experiments, males of the beetle species stayed longer on plants that had previously been exposed to females, demonstrating a preference observed in a one-choice experiment where plants were either exposed to females and males or not.

Weber described research conducted by Haber and Weber in 2021, which tested the attraction of field Colorado potato beetles (CPB) to volatile cues from conspecifics and potato plants. The results indicated that beetles were 2.3 times more responsive to plants treated with decamdiol compared to untreated plants.

Additionally, he discussed the use of the predator, the spined soldier bug, employing its pheromone to deter beetles from feeding on plants. The synthetic pheromone produced non-consumptive effects on the beetle, leading to fewer larvae and less damage to plants, resulting in an impact on tuber yields. Interestingly, the pheromone also affected other CPB predators. Weber concluded by highlighting the importance of integrating these behavioral control strategies to reduce reliance on chemical control measures.

8. State Site Reports

FL – Potato acreage was 20,000 to 22,000 acres, good weather through the season, resulting in high specific gravity.

OH – acreage still low, a few thousand acres. Matt described the season as experiencing two extremes. In the South, it was primarily very dry, with only the areas that received irrigation performing well. In contrast, regions without supplementary irrigation suffered, resulting in poor crop quality. The rainfall was unevenly distributed, which negatively affected tuber quality and led to issues such as secondary growth. On the positive side, the season made field management easier.

ME – Potato acreage was 54,000 for the 2024 season (NASS). Yields in 2024 were higher than in 2023, at 340cwt/acre total tuber yield. The industry is about 60% fry and chips, with a higher number of fry growers, 20% fresh, and 20% seed. There was one late blight case registered in the state.

NY – Potato acreage 12,000 and 15,000. season weather was dry, some wind damage in the raised plots, and the yield was average.

NC – Potato acreage ~13,000 – Some planting occurred in mid to late February, much of this acreage had to be replanted in March due to wet, cold weather in early March. Overall, the season was very dry in April and June rainfall was just over a half inch. In July untimely rains cause late season rot and drops in gravity and yield. Still early season harvests had adequate yields and high gravity.

PA – Potato acreage ~5,000. 60% chipping and 40% fresh market. Season with high temperatures and dry conditions. In the research trial, the yields were below average and high hollow heart. PVY increases in this season.

NB/DAAF - Approximately 53,000 planted acres this year with very little abandonment. In late July and early August, things looked favorable for potential record yields, however, it turned quite dry. Overall, yields look decent around 320 cwt. Round whites, reds, yellows, and chippers yielded well. Russets came out at average or slightly below. The quality looks good and much better than in 2023. No major storage issues to speak of.

[Meeting adjourned at 5:00 pm December 16. Resumed 8:00 am December 17].

9. Comments from Industry

N.A.

10. Pathology Reports

Xinshun Qu: 39 potato cultivars and advanced clones were evaluated for resistance to early and late blight, and 40 for common scab.

David DeKoyer the scab plot did not show good symptom expression for the screening trial.

Group discussion about the increase in PVY over different regions.

11. Breeding/Genetics Reports

Maine. Planted 39,000 single-hills, saved 1.3%. The program currently has 55% russets / 35% chips and round whites fresh / 10% reds/specialty. Disease resistance priorities are for late blight, potato virus Y, and common scab. Use markers to identify clones with

golden nematode and PVY resistance genes (3 sources). Varieties that graduated from the regional program have been evaluated for commercial release.

New York. A total of 18,000 to 20,000 first-year clones were planted using 4-hill plots, with a distribution of approximately 70% for chipping and 30% for fresh market. Selection in the third year based on table clones. For the fresh market, Walter mentioned that round whites are considered a niche market, while reds and yellows are the priority for the program. All advanced clones in the program exhibit resistance to PVY, except for some yellow clones. The adg gene is the most common source of this resistance. The NY174 clone is showing promise for release depending on industry needs. However, its size profile is reduced, so adjustments may be necessary to increase the sizes.

North Carolina. A total of 6,250 first-year clones were planted using 5-hill plots; during selection, a 10% intensity selection was deployed, remaining 622 clones were to second year (the lowest since we began to use 5 plant plot system) – waiting for lab results for PVY. Aiming 390 to go to the field. 70/30 chippers/fresh. In year 2 we planted 2 phenotyping trials and in year 3 we planted 2 phenotyping trials in NC and the University of Florida also planted the same lines in a phenotyping trial. Data from 2nd and 3rd trials (5 trials) were used to determine the top 10% of lines to move forward to year 4 trialing upcoming in 2025. NC821-30 continues to be cleaned up in the Potatoes USA program. High PVS levels hold back its advancement into the Fast track system.

USDA-ARS ME - program planted a total of 33,000 single-hills this season. Currently, 10% of the program consists of diploid varieties. The diploid materials used in the USDA-ARS program are sourced from both its own research and other programs. However, the program still has fewer entries in the most advanced stages due to a lack of leadership in breeding over the past few years.

AAFC - David DeKoeyer presented the program's numbers: approximately 190,000 TPS from 262 families, with around 23,000 clones in year one using 1-4 hill plots. From these, 1,050 clones were selected for the next season. The program utilizes MAS for PVY, PVX, H1, and potato wart. The disease screening process for potato wart is progressing well, demonstrating good symptom expression. However, isolating the pathotype from field trials proves challenging, making it difficult to identify the specific strain present. While some work has been done on markers, they still need to be validated.

Florida – program is slowing growing; updated new grading line and cold storage at Hasting; planted 8,000 year-one clones using 1 to 4-hill plots, goal to get to 12,000 4-hills plot year one; 60-70% chips and 40-30% fresh; Hastings incorporated some new land in the station, that has been used to the year one trial; Breeder seed was produced on an off-site in Citra, FL, which allows the program to have new seed to send to cooperators and national trials. No internal quality issues were reported in the trials.

12. Update on the NE2231 website/database/data reporting

The data we submit to Mark Clough will be posted publicly unless we request otherwise. A new feature in neproject.medius.re was demonstrated by Brad Halladay from MediusAg, which includes new weather data available for each trial as well as new methods to split the data for comparing the performance of clones. Matt Kleinhenz and Mario Andrade suggested that weather-related data linked to plant development should be included on the site. Additionally, Marcio and Mario inquired whether it is possible to download pedigree data in an Excel file containing three columns: clone, parent 1, and parent 2.

13. Seed nursery – Mario Andrade

Mario emailed all participants a list of 27 test clones and 12 standard varieties to be considered for evaluation.

Breeder's choices (all sites must evaluate these):

- AF6465-7 (russet)
- AF6550-2 (chip/dual)
- AF6551-4 (fresh)
- AF6671-10 (chip)
- NY179 (chip)
- NY180 (chip)
- NY181 (chip)
- B3403-6 (chip)

Standard varieties to include in all NE2231 trials:

- Atlantic
- Chieftain
- Katahdin
- Kennebec
- Snowden
- Superior
- Yukon Gold

14. Eastern Region Potato Special Grant

We are currently in year 2 of 2 for the Potato Special Grant and will need to submit a proposal in Spring 2025.

15. Grants/Funding: new opportunities?

-

17. Old Business

-

18. New Business – none.

19. Committee Reports

1. We recognize Christopher Clarke, ARS Beltsville, and his lab for providing all the wonderful snacks and local arrangements for our 2024 NE2231 to enable us to meet in person and in hybrid mode on Zoom on December the sixteenth and seventeenth of the year two thousand and twenty-four.
2. Although Greg Porter is now fully retired, we would like to remind the 2025 committee that in 2024, the resolutions committee had wanted us to invite Greg to give the talk “Reflections on 38 years of regional project activity, NE107 to NE2231” in our next meeting. This committee, unfortunately, did not have the foresight during the organizational phase to extend this invitation this time around.
3. Han Tan, Paul Collins, and Mario Andrade for being the current chair, vice-chair and secretary of this meeting.
4. Leo Hoffman for stepping up to be the secretary for the 2025 NE2231 meeting.
5. We would also like to thank Christian Tobias (National Program Leader for National Institute of Food and Agriculture/NIFA) for presenting an overview of the NIFA funding programs.
6. Brett Shelley (USDA-ARS), Don Weber (USDA-ARS) and Marcio Resende (UF) for giving presentations on their research to the project members.
7. Mark Clough of North Carolina State University and Brad Halladay of Medius Ag for his leadership on the database management and electronic data capture efforts on behalf of the NE2231 project.
8. Craig Yencho of North Carolina State University is recognized for his decades of leadership in the Eastern Breeders group. We wish you a speedy recovery and hope you get well soon.
9. Mario Andrade for leading the discussion on the Eastern Regional Potato Special Grant Project, including the budget, RFA, last year’s reviews, and new ideas.
10. All NE2231 presenters, potato breeders, agronomists, plant pathologists, industry, technical assistants, collaborators, and trial cooperators for their dedication to

our group effort and their intellectual engagement in the process of potato improvement, selection, and variety development.

11. Why does an Andean potato get mad on long days? [pause] Because its stolon its tubers.

20. Other Business – none

21. Adjournment – 10:35 AM 12/17/2024 - Mark and Paul Collins