



Eastern Potato Varieties & Farm Sustainability

This project has developed improved potato varieties, helping farmers provide safe, nutritious potatoes to the potato processing industry and consumers in an environmentally and economically sustainable way.

Who cares and why?

Potato ranks in the top three vegetable crops produced in the eastern U.S., generating hundreds of millions of dollars and supporting thousands of jobs. Growing conditions, consumer demands, and marketing opportunities vary widely across the region, creating need for tremendous diversity in potato varieties. Many traditional varieties available to eastern farmers are not well adapted to their specific growing conditions or markets. This makes it difficult for farmers to supply high quality products to consumers while maintaining economically and environmentally sustainable farming practices. For example, many traditional varieties are susceptible to pests (e.g., Colorado potato beetle, aphids, and leaf hoppers), diseases (e.g., scab, and silver and black scurf), and other stressors, which can destroy crops or cause defects in appearance, taste, or texture, making them unmarketable. Currently, farmers rely on costly chemical pesticides to prevent crop loss due to pests and diseases. However, these chemicals can result in chronic environmental degradation and health problems for agricultural workers. Farmers also need to know the best growing practices for specific varieties, including how far apart seed pieces should be planted and how much water and fertilizer will be needed. Furthermore, farmers must make sure that in-demand red-skinned and purple potatoes maintain their bright color while in storage after harvest. While demand for fresh potatoes is high in the region, potatoes with uniform shape, consistent color, and few defects must also be produced to fill contracts with large, international chip and French fry processing companies.



NE-1031 research has helped farmers know how to successfully grow different varieties of potatoes in different climates and for different uses (top photo by Lincoln Zotarelli, University of Florida). The group's potato breeding efforts have resulted in varieties like Lamoka potatoes, which have good qualities for making chips (photo by Kent Loeffler, Cornell University).

What has the project done so far?

Over the past five years, NE-1031 has fostered collaboration and communication among researchers, growers, and industry members so that new potato varieties can be adopted in a timely manner. This project has facilitated experimental- and commercial-scale trials that have evaluated yield, quality, and pest resistance of potato breeding lines at multiple locations across the eastern U.S. NE-1031 scientists have improved regional potato breeding and selection strategies so that the appropriate varieties are grown in various geographic areas. Researchers have also mapped the genetics of several important potato varieties. As a result, breeders have released new potato varieties with improved shape, color, and nutritional traits for fresh market and chip and fry processing. For example, NE-1031 scientists helped develop the Waneta and Lamoka potato varieties, which have good qualities for making chips. Other studies have focused on disease resistance in the field and in storage.

This research has led to the development and adoption of Red Maria, a high yielding, red-skinned potato variety that is resistant to the golden cyst nematode and common scab, as well as the Pike variety, which is highly resistant to pink rot. Scientists have shared their research results and insights with other researchers and stakeholders through a project website, a web-based potato variety performance database, scientific journals, and Extension presentations and field days.

Impact Statements

Strengthened communication and interactions among potato scientists located in the eastern U.S. and elsewhere.

Provided growers with better marketing opportunities and profits by releasing and aiding the adoption of new potato varieties with more desirable characteristics. Recent eastern releases have potential to be planted across tens of thousands of acres and have an estimated end value of \$35 million.

Enabled a steady supply of high quality potatoes for consumers.

Improved the sustainability and profitability of the chip and French fry industries by developing potato varieties with desirable characteristics like uniform shape and appealing color.

Reduced crop loss, improved worker safety, and reduced pesticide load in the environment and human diet by releasing disease and pest resistant potato varieties.

Stabilized communities dependent on potato production by making potato production more sustainable.

What research is needed?

The needs and expectations of the potato industry and consumers are constantly changing, keeping up demand for new potato varieties. For example, potato chip processors in the northern U.S. would like varieties that can be stored for at least nine months to ensure a stable supply throughout the year, while potato processors in the South seek varieties that better tolerate heat stress. More research is also needed to provide potatoes with excellent boiling and baking qualities, uniform size and shape, and better pest resistance.



During field trials at multiple locations across the U.S., NE-1031 researchers have evaluated the yield, quality, and pest resistance of different potato breeding lines (top photo by Walter De Jong, Cornell University). This research has led to the development of potatoes like Red Maria, a high yielding, red-skinned potato variety that is resistant to the golden cyst nematode and common scab (photo by Kent Loeffler, Cornell University).

Want to know more?

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Project website:

<http://potatoes.ncsu.edu/NE.html>

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Compiled and designed by Sara Delheimer