

What's in Season from the Garden State

Seasonal Highlights from Cooperative Extension, a unit of Rutgers New Jersey Agricultural Experiment Station

November 20, 2012



Cranberry wet harvest operations at Haines & Haines Farm, Chatsworth, NJ. After bogs are flooded, thrashers loosen the cranberries from the vines. Once freed from the vines, they float to the surface. They are then corralled and fed into a chute that pours them into waiting dump trucks. The trucks deliver the fresh cranberries to the local Ocean Spray processing plant.

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Not all's Backwards in the Backwoods

The New Jersey Pine Barrens – the backwoods of New Jersey, is contrary to all we consider standard “Jerseyness”. It’s the most unpopulated part of the most populated state. It is untouched wilderness on the urban fringe. The people that dwell there are known as “Pineys” – simple folk living off the land. It’s the part of Jersey with ghost towns, lore and legends. It’s the birthplace of the Jersey Devil. It is one of a few barren forests emerging from sandy, acidic soil that hosts mostly pitch pine and scrub oak and cedar swamps. Contrary to our reputation as the Garden State, the nutrient-poor soil of the Pines was labeled barren due to its unsuitability for growing crops (with the exception of cranberry and blueberry, native plants adapted to the conditions of the Pine Barrens).

Even cranberries are contrary to standard “Jersey Freshness”. The cranberry doesn’t grow on bushes or trees, but on vines in a bog. A standard way to harvest this backwoods fruit is to flood the bogs, thrash the vines and scoop the floating berries. Even the cranberry industry bases its harvest practice on lore. Cranberry growers developed a method for sorting good cranberries from bad based on the fact that good cranberries bounce. They acquired this useful information in the mid-nineteenth century from a tale of New Jersey cranberry grower John “Peg Leg” Webb. Webb and his peg leg had difficulty bringing a barrel of cranberries down the steps from the loft of his barn where he stored them. The barrel tipped and the cranberries tumbled. The bad ones would stay on the steps and the good ones would bounce to the bottom. Peg Leg’s discovery led to the development of bounce sorters that are still used today to separate good firm cranberries from soft ones.

Peg Leg’s discovery isn’t the only advancement to the cranberry industry that came out of the New Jersey Pine Barrens. In fact, the New Jersey cranberry industry, third in the nation after Wisconsin and Massachusetts, contributed much to the development and modernization of the US cranberry industry.

While accounts vary, records indicate that in New Jersey, commercial cranberry cultivation began around the 1830s or 40s in Burlington and Ocean Counties. Barrels of fresh cranberries were sold to ship merchants for sailors to use as a source of vitamin C. Just as limes prevented scurvy (vitamin C deficiency) for British sailors, the cranberry was of service to American sailors.

In the 20th century, a New Jersey cranberry grower, Elizabeth Lee of New Egypt, usually threw out any damaged berries she harvested. One day she decided to cook the berries, creating a tasty sauce and started selling it as “Bog Sweet Cranberry Sauce.” The cranberry sauce was not an instant hit, but within a few years it caught on, and Elizabeth formed her own company. She eventually merged with a cranberry company in Massachusetts that had also been marketing cranberry sauce, and this became the basis for what is now the largest cranberry cooperative - Ocean Spray, formed in 1930.

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High Tech in the Lowlands

The Philip E. Marucci Center for Blueberry and Cranberry Research and Extension was first established at Whitesbog in 1918 and has been in its permanent location in Chatsworth since 1962. Today, the modern research facility, located in the midst of New Jersey's cranberry and blueberry industry in the Pinelands, is recognized by the federal government as the national Center for Vaccinium Research. In addition to providing information on the cultural needs of cranberries and blueberries, the facility supports an extensive cranberry breeding program in cooperation with scientists from Massachusetts and Wisconsin.

What is going on down there is the research station in the Pines? Here's a sampling of the advanced technologies used to support the cranberry industry from the station in the backwoods.

- Marucci Center researchers have isolated specific compounds from cranberry fruit, called condensed tannins or proanthocyanidins, which were found to prevent infectious *E. coli* bacteria from attaching to cells from the urinary tract.
- Marucci cranberry breeders have developed DNA-based technology for fingerprinting and genetic studies in cranberry.
- To prevent cranberry fungal diseases, Rutgers pathologists utilize tools such as remote sensing and geographic information system (GIS) methodologies that use geographical data to detect, map, quantify and track plant pathogens as well as classical mycological and molecular methods to characterize pathogen populations and species.
- Researchers in entomology are investigating insect-plant interactions, tritrophic interactions (between three organisms), chemical ecology, and host-plant resistance.

The 1950s saw the invention of the Darlington Mechanical Dry Harvester. Named for its inventor Tom Darlington, of the Whitesbog cranberry operation in Burlington County, this harvester produced a superior product for dry packaging of whole berries in plastic bags. Wet harvesters continued in use for harvesting of berries destined for processing – for juices or sauces.

Not only did the early modernization of the cranberry industry get a boost from the New Jersey backwoods, the local growers benefitted from scientific university research and advancements to their industry conducted not far away in the halls of academia, but right in the heart of the Pines.

The Philip E. Marucci Center for Blueberry and Cranberry Research and Extension, a substation of the Rutgers New Jersey Agricultural Experiment Station (NJAES), generates and disseminates research information directly applicable to the production of high-quality blueberries and cranberries and develops new cultivars for industry (see sidebar).

Today, New Jersey cranberry growers, like other farmers, face economic challenges related to market consumption and production costs. These growers, in cooperation with research efforts of the Rutgers NJAES, the United States Department of Agriculture and their own cranberry associations and cooperatives, have greatly expanded the database of knowledge related to the successful growing of the fruit. In the 21st century, the application of science and technology to cranberry production, often with equipment of local design and invention, has allowed growers to face both traditional and modern farming challenges. Cranberry growers are using new technologies to decrease the impact of farming on the wetland environment, analyze crop health, and maximize and model cranberry yield.

Space Age Technology Comes to the Pines

A visit to a state-of-the-art New Jersey cranberry operation would be convincing that not only are these backwoods not backwards, but what goes on in the bogs is rather mind-boggling and downright out-of-this-world (no exaggeration – we're talking Global Positioning System (GPS) satellites).

What can GPS be used for in a cranberry bog? One application that cutting edge cranberry growers use is guiding tractors through GPS technology. Tractors equipped with GPS units take the guesswork out of field operations. Unlike geometrically shaped farm fields, cranberry bogs are irregularly shaped. During a spraying operation, when the tractor turns around at the edge of the bog, the unit senses the area that has already been sprayed and automatically shuts off the nozzles so there is no overlapping coverage. During harvest, the sensors prevent the tractors from driving twice over the same area, preserving the vines below from further wear and tear. In the environmentally sensitive ecosystem of the Pine Barrens this enables cutting edge farming with an environmentally softer footprint.

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