2010 Northern Hardy Fruit Evaluation Project Update

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The Northern-Hardy Fruit Evaluation Project continues to introduce growers, processors and consumers to unfamiliar yet healthy and delicious fruits that are easily grown in North Dakota. The project provides cultivation and production information to the public so that they can act on their enthusiasm for locally grown, unusual and nutritionally-rich fruits.

Public interest in the fruit project has been outstanding. Outreach activities promoted the project to approximately 540 North Dakota residents in 2010. A grant from the North Dakota Sustainable Agriculture Research and Education program allowed us to invite Dale and Cindy Secher of Carandale Farm, Oregon, Wis., to speak to 65 participants at the CREC Field Day. The Sechers shared their experience with having a fruit evaluation project on their private farm, owning a u-pick fruit business, participating in one of the largest and oldest farmers' markets and promoting the growing of sustainable fruit crops for local consumption.

Efforts continue to be made to introduce food processors to fruits from the project. In 2010, fruit was distributed to Vintner's Cellar, Bismarck; Dakota Sun Gardens winery, Grace City and Berry Dakota, Jamestown, ND. Comments on satisfaction have not yet been received.

Many crops entered their second year of production in 2010. With above average snowfall, winter protection of the plants was good. However, during the growing season, the weather pattern overall was slightly cooler than average and late-ripening fruits like grapes, aronia and elderberry were disadvantaged.

Apples: Flowering was very light in 2010; only 'Hazen' and 'Harelred' produced a small crop. Three of four 'Hazen' had fireblight in 2009, but none was seen this year.

Aronia: Harvests increased 33% but cool, wet weather inhibited sugar production and cracked some of the fruit just before harvest. Pear sawfly (*Caliroa cerasi*) larvae partially skeletonized leaves in early August but caused no lasting damage.

Dwarf Sour Cherry: Developed at University of Saskatchewan-Saskatoon, these zone 2 hardy shrubs produced their first fruit in 2010. Plants are now sold in the US and produce deep burgundy-colored fruit with few pest problems. They are the main cherry for Canadian Prairie Province commercial production. Cherry shrub bark is very attractive to rodents and several at CREC have been girdled. Sheltered and secured rodent bait was placed among the plants last fall.

Black Currants: Production was markedly decreased by a two-week period of mist, wind and cool temperatures that inhibited pollination in early May. The tips of new shoots are affected by powdery mildew though it seems to have little impact on the next year's growth. Some berries were affected this year and two control measures will be applied in 2011.

- 'Black Down' had the best production in the cool weather.
- 'Titania' has the best overall flavor, fresh and processed. It is planted commercially.
- 'Consort' berries have been small and bitter for 2 seasons. We will replace this variety.
- 'Ben Sarek' is noted for high yields and as a plant for U-pick orchards. It is very sour and sunburns at CREC. We will replace this variety.

Red and White Currants: Though they bloom at a similar time, red and white currant production is not as affected by cool weather as black currants are. Powdery mildew does not occur as heavily in these plants.

American Elderberries: Growth above the snow line dies back every year and the berries have not ripened in the past three seasons. We have been made aware of a more suitable population by CREC tour participants and will proceed with acquiring these. The accessions we have now will be removed.

Gooseberry: Each year, many cultivars have been severely affected by powdery mildew and other leaf diseases. Of 13 original cultivars, eight were selected for continued observation; the others were removed to lower disease pressure on the remaining plants. In 2010, imported currant worm sawfly (*Nematis ribesii*) larvae stripped the plants of their leaves after harvest.

Edible Blue Honeysuckle (EBH): As a general rule, if EBH are of Russian parentage, they are designated 'honeyberries'. If they have Japanese parents, they are designated 'haskaps'. These plants are circumpolar natives that are hardy to zone 2 and are now sold in the US. Hundreds of acres of haskaps developed by the University of Saskatchewan are being planted in the Prairie Provinces in hopes of capturing a market in Japan.

Russian honeyberries flowered during a cool period in early May and had excellent first crops.

- 'Berry Blue' plants are larger and bear more fruit. The fruit has to be 'plucked'.

- ‘Blue Belle’ is smaller with similar flavor and less fruit but the berries are easiest to pick.
- ‘Blue Moon’ and ‘Blue Velvet’ are low-growing rounded shrubs. The fruit is later ripening, larger and quite tart.

Oregon haskaps are advanced selections of pure Japanese ancestry from the research of Dr. Maxine Thompson, retired, Oregon State University. They flower 7-10 days later than Russian honeyberries.

Canadian haskaps were bred at University of Saskatchewan-Saskatoon from Russian and Kuril Island parents and released for sale in Canada in 2007. CREC obtained plants in 2008 and they have not produced fruit yet. The only named cultivars to date are ‘Tundra’ and ‘Borealis’.

Juneberry: Fruit production tripled in the second picking year and little disease was observed. 22% of plants have lower vigor due to wooly elm aphid damage in prior years, but they appear to be growing.

- ‘Thiessen’, ‘Martin’ and ‘JB30’ berries are larger, juicer and fruitier than most Juneberries.
- ‘Honeywood’ and ‘Smoky’ berries are smaller, denser and more traditionally flavored.

Plums: Production was good; ‘Waneta’ fruit had a blossom end rot-like condition that was not identified by either NDSU Plant Pathology lab or UW-Madison Plant Disease Diagnostics Clinic. ‘Waneta’ fruit is slightly tastier than ‘Pipestone’ and ‘Pembina’. ‘Toka’ fruit is delicious but small. Squirrels will pick almost-ripe fruit, or even green fruit when conditions are dry.

Sea Berries: Also known as sea buckthorn, these plants are vigorous and aggressive. All of our varieties fruited heavily but were not harvested due to the difficulty of doing so. The fruit does not release from the stem and the plants have thorns hidden among the fruit and leaves. Sea buckthorn roots produce large quantities of suckers. Of greater concern is the discovery of four seedlings growing in another area of the orchard; birds eat the exposed fruit in winter. Research reveals that although this species is being suggested as a new crop in the Prairie Provinces, it has become invasive in Alberta. CREC will remove these plants in 2011.

Grapes: Grape establishment at CREC has been difficult for three reasons. First, the soils in central North Dakota encourage vigorous growth for too long into the growing season; second, the information provided at regional meetings was not adequate for our soil and weather conditions and finally, in light of the information provided at the meetings, the project manager had not gathered the correct knowledge or experience needed to manage the out-of-balance growth that appeared.

In the CREC vineyard, excellent soil conditions allow grape plants to acquire large energy stores in their roots. The typical recommendation for second-year training of grape plants is to train one or two canes, or if they did not survive the winter, one or two buds to become the trunk of the grape vine. In the third spring, horizontal canes (or buds) are trained to become cordons. When we used these recommended methods at CREC, we saw tremendous growth of the several buds we allowed to develop into trunks the second year. The following spring, this growth was dead.

While at first we were impressed with the tremendous growth shown by the grape plants, in fact, these were ‘bull canes’, whose growth is fueled by root reserves. They are known to not be winter hardy. Descriptions of this growth pattern over several years did not elicit the correct advice from grape-growing professionals based in Minnesota.

In 2010 and early 2011, however, advice was solicited from grape researchers at University of Iowa and University of Michigan, where rich soils and grape growing are commonplace. Procedures are now in place to try to solicit a more disciplined growth habit from the plants. Nitrogen and water are being restricted by grass growth and a late summer cover crop. Plants were allowed to have many shoots in 2010 and then canes with moderate growth were protected over the winter. In 2011, four to six over-wintered canes will be retained and allowed to carry fruit to drain excess root reserves. In the future, the number of canes will be decreased until only one trunk and set of cordons is being managed per plant.

In addition to the grape variety trial there is a trial to determine whether ‘grow tubes’ either help, hinder or have no effect on the establishment of grapes. We are using the variety ‘Frontenac’ as it was the most widely planted grape when the experiment began in 2008. There are 5 experimental treatments which are randomized and repeated 4 times. Three years of data will be collected.

Results: Each fall, variety trial and observational plantings are evaluated for the following parameters: Growth (height), crown width, vigor, disease and insect damage. Yield, sugar content, ripening date and taste were evaluated for the fruit if practical. Overall, the plants seem to have excellent growth, health and winter hardiness characteristics. The exceptions are the several gooseberries which were removed due to leaf diseases, the elderberries which die back to the snow line and require a longer season to ripen and the sea berries which are formidable to grow and harvest.