Fruit and Berry Crop Trial Program for Native Alaskan Rural Communities in Interior Alaska

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Title: Fruit and Berry Crop Trial Program for Native Alaskan Rural Communities in Interior Alaska

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This "Bob Appleseed" project was initiated in 2006 by Robert (Bob) Wheeler to seed Interior Alaska with tasty, nutritious fruits and berries. Sadly, Wheeler passed away at age 57 June 29, 2009, in Fairbanks before he could see the full fruits of his labors.

Wheeler, who moved to Alaska in 1997, worked for the University of Alaska Cooperative Extension as a forestry specialist. His infectious enthusiasm extended deep into his work:

"It is easy to get excited about the potential for the trees since they look to be in very good condition," he said of his SARE project March 31, 2009, in an email to Western SARE. "Success with these apple varieties has really started a small gold rush of enthusiasm for fruit tree production in the region for both producers and home owners." Wheeler said he had hoped to seek a follow-up grant to involve producers in the next round of testing.

Western SARE Grant: $193,324

Situation:

Many Interior Alaska communities face an uncertain future affected by poverty, high unemployment, high energy costs and issues related to nutrition and health. While vegetables have played an important role in augmenting diets, limited planting and testing has been done of fruit trees and berries. Rising costs for importing fruits and berries presents an opportunity to help rural communities grow low-cost fruits and berries.

Most of Interior Alaska falls within zones 1 and 2 for plant hardiness classification (down to minus 60° F and eight months of winter), a tough climate for growing fruit trees and berries. However, recent cold-climate research has shown tremendous improvements in technology and the development of cold-tolerant fruit and berry varieties. Success testing cold-climate production could provide an incentive, and serve as a model, for rural communities.

Objectives:

1. Establish test plots of cold-hardy fruit tree and berry crops under high tunnel and outdoor growing conditions in Interior Alaska
2. Assess variety performance based on climatic conditions and agronomic needs
3. Assess high tunnel management performance for growing tree fruits and berries
4. Develop support documents outlining protocols for tree fruit and berry production under high tunnels for Interior Alaska
5. Engage local communities and schools in outreach

Actions:

High Tunnels

A site was selected at the University of Alaska Fairbanks Experiment Farm for two high tunnels, 42 x 96 feet each, based on:

- Prevailing wind patterns
- Soil drainage
- Maximum sun exposure


Recently planted trees inside the high tunnel.


One of two high tunnels in the project.

Trees

Trees, purchased from Dan Elliott near Wasilla, were grafted on the rootstock of Ranetka crabapple, a cold-hardy Siberian tree. Thirty-nine apple varieties were planted in 2007, 60 trees in each tunnel and each outside plot.


Arctic Red in bloom.


Arctic Red fruiting.


Arctic Red ripening.

Weather monitoring equipment

Ten Hobo micro-stations, five inside and five outside, were placed on trees to measure:

- Air temperature and relative humidity
- Soil temperatures between 5 and 10 inches

Two HOBO weather stations were set up, one inside and one outside. Using data loggers, the stations recorded hourly measures through the winter on:

- Air temperature and relative humidity
- Soil temperature between 5 and 10 inches
- Soil moisture
- Wind speed
- Solar radiation
- Photosynthetic active radiation


Data being recorded during the winter.

Weather data from these tests can be compared with similar sites in rural communities.

Results:

These observations were made after the 2008-09 growing season, during which outside temperatures dipped to minus 50° F:

- High tunnels were 10-15 degrees warmer
- Soil temperatures inside were lower and fluctuated more than those outside

Tree survival rate after two seasons was higher inside the tunnels (80%) than outside (30%):

- Varieties that survived well both inside and outside the high tunnels were Altaiski Sweet, Arctic Red, Carroll, Collet and Northland
- Varieties that survived best inside the tunnels were Goodland, Heyer 12, Heyer 20, Northland, Parkland, PF-12, Prairie Magic and Summer Red
- One variety, Trailman, survived better outside than inside

Flowering was not expected until the third growing season, but 12 trees flowered in 2008 and 27 flowered in 2009. Fifteen of the 27 flowering trees produced fruit; the two outside trees that flowered produced no fruit.

Apples harvested in 2009 varied in size from 20 to 200 grams and in sugar content from 8 to 20 °Brix (a measure of sugar content).

Work Remaining:

The project team will continue to collect climate and crop data through summer 2010, which should allow for confident recommendations on apple varieties and high tunnel usage in the Interior and throughout Alaska.

Outreach Planned:

- Prepare a Cooperative Extension publication focusing on high tunnel construction, establishment and management
- Prepare a Cooperative Extension publication with recommendations for apple varieties suitable for the Interior and other locations with similar climatic conditions


Ukalskojie in bloom.


PF-12 in bud.


Ukalskojie ripening.


PF-12 ripening.