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Iowa location of regional pawpaw trials

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Iowa location of regional pawpaw trials

Abstract
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Keywords
Agroforestry, Fruit and vegetables, Market research and feasibility studies

Disciplines
Agricultural Science | Agriculture | Fruit Science | Horticulture | Other Forestry and Forest Sciences

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Abstract: The goal of this initial three-year project was to establish the pawpaw trees and bring them to fruiting stage. This was part of a long-term effort to evaluate the potential for an Iowa pawpaw tree fruit crop.

Background

The pawpaw is the largest tree fruit native to the United States. The fruit, known as the “poor man’s banana,” may weigh up to 1 kg. The small, deciduous pawpaw trees are found in the wild in 25 states in the eastern United States, including parts of Iowa.

Fruit set in the wild is usually low, but under cultivation tremendous fruit loads have been observed. The principal investigator has noted an apparent genetically diverse (i.e., wild) pawpaw population near the Iowa River in Louisa County that has consistently produced fruit.

Pawpaw trees have ornamental value and adapt to varying light conditions, increasing their possible value to the nursery and landscape industries. The seeds and stem bark of the pawpaw contain asimicin, which has some pesticidal and anti-carcinogenic properties. Pawpaw trees also may possess some agroforestry and wildlife benefits, perhaps as habitat or food for wildlife.

The long-term project objective is to demonstrate a potentially profitable agriculture enterprise as an alternative to conventional farming. Project investigators seek to evaluate the potential of pawpaw fruit for commercial production in Iowa and the upper Midwest. The first three years of the project involved establishment of the trees at 14 sites (including two in Iowa) as part of the Pawpaw Regional Variety Trials.

Approach and methods

Sixteen different plant and environmental measurements must be made yearly for each tree. Among them are climate, culture, diseases, growth, blossoms, yield, and fruit. The results are sent to the Pawpaw Regional Trial data analysis coordinator. Most of the measurements are easily made and will be collected when the trees begin flowering. Flavor is the quality that is most difficult to quantify objectively and may require cooperators from other states to conduct the evaluations.

Wild pawpaw fruit on the tree
This project has shown that pawpaws can be successfully established to flowering stage under Iowa growing conditions. It also has shown that proper technique in planting is essential for high establishment rates. Further evaluation will determine yield and fruit quality characteristics of the different varieties and accessions.

Three hundred trees were planted, including nine genotypes each from the Wye Experiment Station and the Keedysville Experiment Station as well as ten named cultivars. Trees were planted on Chinkapin Ridge in spring 1999. The Northeast Research Farm (NERF, located in Butler County) trees were planted in June 2000.

The general intent was to test cultivars under a simple management regime with a minimum level of inputs. The intent was to establish healthy, representative trees that will subsequently be rated for fruit-bearing potential.

Results and discussion

The guard row trees (planted around the orchard perimeter) had a 78 percent survival rate, while the grafted trees had a 69 percent survival rate. Overall, 71 percent of the trees have survived. Nearly 8 percent of these are showing obvious flower buds. The guard row trees are slightly taller on average (4 feet) than the grafted trees (3.5 feet). All 20 trees at the NERF site survived. Their average height is 28 inches.

Pawpaw tree (asimina triloba) growing wild in Louisa County, Iowa
Early mortality of trees was mainly attributed to faulty planting techniques. In 2000, four grafted trees and one guard row tree were inadvertently mowed off.

The pawpaw trees slowly go dormant and begin hardening off during October. A hard freeze in early October 2000 resulted in a dieback of about six inches on the trees in the following spring.

The dead trees in the guard rows were to be replaced in spring 2003 with Iowa source pawpaw trees. Grafted trees will be replaced at the same time by rootstock grown from the same seed source as the original grafted trees. Graft wood will come from surviving replications in the planting of the respective cultivar or selection.

Conclusions

This study indicates that producers who planted pawpaws in upper Midwest climatic conditions could expect at least 70 percent survival rates for the trees, perhaps even higher with careful planting techniques. In the past last two years, only four of the 217 trees died, a survival rate of greater than 98 percent.

Impact of results

The project is the only Iowa venue for the Pawpaw Regional Variety Trials. Project investigators established 233 thriving pawpaw trees at two Iowa sites. A few trees at the southern site are showing flower buds. Over the next five to ten years the fruiting characteristics of the trees can be measured. This will lead to cultivar recommendations, approximations of yield potential, cultural training manuals, and an estimation of the overall potential profitability and sustainability of pawpaws in the upper Midwest.

Education and outreach

Results of the trials will be published after data are available on fruit production. The project has been mentioned at ISU Extension Master Gardener classes and programs and other ISU Extension programs related to ornamental trees. Tom Wahl, Practical Farmers of Iowa (PFI) farmer cooperator and former Louisa County Conservation Board member, has presented information about the trial at several PFI field days.