

Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Development
Agricultural Development & Diversification Program (ADD)
Grant Project Final Report

Contract Number: 18028

Grant Project Title: On-Farm Trials for Overlooked Fruit Crops-Cultivar Evaluation (Year 2)

Amount of Funding Awarded: \$10,500

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GOALS

This is the second year of an on-going field trial to determine what non-traditional fruit crops can be successfully grown and marketed in Wisconsin. The primary goal of this grant cycle was to perform horticultural screening and evaluation for growth response, susceptibility to insect and disease problems, winter hardiness, dormancy requirements, and response to other environmental factors including temperature, humidity, rainfall and seasonal degree-days.

A secondary goal of this specific grant request was to expand the trial to include a half-acre stone fruit subplot, which would include unconventional plum varieties from Dr. Brian Smith's plum breeding program at UW River Falls.

The ultimate goal of this continuing project is to identify and establish horticultural parameters for new fruit crops that will create new employment opportunities through agricultural diversity. Diversity creates opportunity for agricultural related industry and services as well as new sources of farm income. This contributes to a stable and sustainable rural society.

STEPS TO ACHIEVE GOALS

Steps to achieve the horticultural screening and evaluation goal included the following:

1. Site selection (done the previous year) was based on accepted cultural criteria.
2. The site had a long term cropping history including the use of pesticides and fertilizers typical of most Wisconsin agricultural areas.
3. After establishment, no pesticides or commercial fertilizers were applied to avoid biased results among the many fruit types and cultivars.

4. Cropping history as well as exposure to nearby wild plant species and a Red/White pine sheltered belt guaranteed exposure to a variety of insects and disease pathogens.
5. A weather station was purchased to monitor rainfall, temperature, leaf wetness and relative humidity. All data was digitally recorded every 15 minutes.
6. Consultation with Dr. Brian Smith, professor and state fruit specialist at UW River Falls, and John G. Aue, Entomologist and independent crop consultant.

Steps to achieve the secondary goal of establishing a stone fruit subplot included the purchase (and donation from Dr. Smith) of 17 plum and plum cross cultivars. Several cherry cultivars were also purchased. Site preparation, planting, supports, pruning and maintenance were follow up activities.

PROJECT SUCCESS AND ACCOMPLISHMENTS

Almost all phases of the project met or exceeded expectations. Growth rate of most fruit types through the end of the first growing season (Oct 2003) was very good with two types of Kiwi (Artic and Silver Vine) being the only exceptions. Over-wintering casualties were exceptionally few considering the early hard freeze that abruptly ended the growing season on Oct. 3, 2003. Mulberry, Chinese Dogwood and Hardy Kiwi died back to the root system while Autumn Olive and Goumi suffered some dieback.

Despite an extremely hard freeze on May 3rd that damaged many conventional fruit crops, very little damage was observed. In fact, most of the bushes and shrubs had some fruit production only one year after planting, surprisingly two tree fruits (Medlar and Russian Quince) set fruit.

Within the context of the horticultural screening and evaluation goal, there could not have been a better test year!

An exceptionally wet, cool season with high humidity and long durations of leaf wetness through the end of this project period, accentuated differences in disease resistance and tolerance. With no pesticide intervention, most fruit types showed some leaf disease symptoms. A sharp contrast was becoming evident by June 30, 2004. This was especially evident in the Ribes subplot where most Gooseberry cultivars started to defoliate. The basic cause is thought to be White Pine Blister Rust with the pine shelter belt being the primary pathogen source. Other opportunistic pathogens probably contributed to defoliation. The good news is that the Red and Black Current cultivars exhibited a wide range of susceptibility from very susceptible to highly tolerant. Specific data observed and collected will be analyzed and discussed in a later more detailed report on a cultivar specific basis, after the end of the 2004-growing season.

In addition to the gathering of valuable horticultural information, the field trials have now been expanded to include 34 fruit types, 99 cultivars and 431 plants.

PROJECT SHORTCOMINGS

Within the scope of the plan of work and budget limitations of this grant cycle, there were no specific activities that did not work as planned and there was no indication that anything should have been done differently.

Relating to long-term project activities, that lack of replication during this “shotgun phase” could be considered a project shortcoming. Information obtained cannot be tested for statistical significance and therefore can only be presented in anecdotal terms. This will change as fruit types are eliminated during the trial period. The elimination of undesirable fruit types will make room to replicate more promising ones.

CHALLENGES

Plant quality continues to be the major management challenge. Size and condition of plant materials varied widely. There is some concern about possible mislabeling. Some plant material came with obvious disease symptoms. All three Cornelian Cherry cultivars will be removed and replaced by plants from other sources.

Acquiring plant material that is disease free, of consistent quality and true to type is a major challenge because there are very few nurseries that handle these unusual fruit crops. The project coordinator recently became aware of and joined the North American Fruit Explorers (NAFEX). NAFEX is a “network of people throughout the US, Canada and the world, devoted to growing, evaluating, developing, improving, discovering, and appreciating fruits and nuts.” The library facilities and information exchange available through this organization will be a great asset to help overcome these challenges.

FUTURE ACTIVITIES

Since the grant cycle (July 1, 2003 –June 30, 2004) does not correspond to the growing cycle (Nov 1, 2003 –Oct 31, 2004) data analysis and horticultural planning for the next growing cycle has yet to be done. The project coordinator will be working with his horticultural team to prepare a detailed report on a cultivar specific basis. This report will be completed before the beginning of the next growing season. It is anticipated that some fruit types and specific cultivars will be eliminated based on an analysis of the data collected during this grant cycle. Over-wintering casualties caused by early defoliation is anticipated.

The horticultural team will also develop a sustainable-based pest intervention plan to encourage fruiting so that the marketing potential phase of this long-term project can be initiated during the next growing cycle. It should be noted that many of the bush and shrub fruits did produce some fruit during this grant cycle, but the quantity and quality of fruit was not adequate for serious product development and test marketing.

Horticultural evaluation, product development and test marketing will be ongoing. The emphasis will now shift to fruit production with the ultimate goal to identify new fruit crops that will add diversity and new economic opportunity for agriculture and the agricultural related economy.

BENEFITS TO THE AGRICULTURAL INDUSTRY AND THE STATE OF WISCONSIN

Results obtained from this grant will not provide immediate benefit, but is pre-requisite to the later phases of a multi-year project that has the potential for a major impact on the agricultural industry and the state of Wisconsin.

The introduction of new food products based on little known fruit types with high nutraceutical value, will enhance quality of life. Diversity strengthens the local food system which improves food security. Local food systems keep more of the food dollar in the local economy and create new job opportunities. Local food systems enhanced by diversity are more environmentally sustainable than globalized systems that consume large amounts of non-renewable energy and contribute disproportionately to air and water pollution because of long transportation routes and concentrated production areas.

The economic impact of production, processing, marketing and distribution of new agricultural products could be substantial. Investment in production, processing and distribution facilities could create new job opportunities ranging from unskilled to high-tech.