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

Grant Project Final Report

Contract Number: 19041

Grant Project Title: Marketing Potential of Overlooked Fruit Crops

Amount of Funding Awarded: $18,500

Name of Principal Contact Person: Dale D. Secher

Address: 5683 Lincoln Rd.
Oregon, WI 53575

Telephone 608/835-5871 Fax Number: 608/835-5871

E-mail Address: carandal@chorus.net

WEB Address: www.carandale.com

Report Submitted on August 30, 2007

ORIGINAL INTENT OF THE GRANT

Intent of the grant was to evaluate market acceptance of new, unusual and overlooked fruit crops from around the world. This was a continuation of on-farm research that has been evaluating the horticultural adaptability of over 40 fruit types. The ultimate goal was to determine feasibility and establish guidelines for the production and marketing of new food products that would add value and diversity. A broader complement of Wisconsin agricultural food products could justify investment in a local-regional infra-structure and distribution system needed to meet consumer demand for local-regionally produced foods.

The intent was to demonstrate how profitability and investment in Wisconsin agriculture could be accomplished by diversification and expanded marketing opportunities based on a wider range of consumer ready food items. Public information and outreach has been a significant part of this project. This long-term continuing project was initiated to support and expand a sustainable regional food systems approach. The demand for more locally produced food items has the potential to benefit Wisconsin agriculture by diversifying risk, increasing profitability and creating new agriculturally related job opportunities in our rural areas. In fact, the take home messages from this project will go a long way toward achieving DATCP's objectives in the Buy Local, Buy Wisconsin initiative.

STEPS TAKEN TO ACHIEVE PROJECT GOALS

Steps taken to achieve project goals were as diverse as the project goals themselves. In order to address risk management, horticultural screening was an on-going process. In order to assess potential return on investment, product development and consumer acceptance was a major component. Public information and outreach efforts were required to bridge the gap between potential producers and potential consumers.

All three components (horticultural screening, testing consumer acceptance and information outreach) were highly successful because of networking and a team approach. There were of course, challenges. Time and financial resources limited detailed documentation on horticultural screening, but much anecdotal information was collected. Limited amounts of product and the ineffiencies of hand harvesting and preparation, along with arranging taste-

testing sessions with a diverse group of potential consumers was very time consuming. We were very fortunate to have the consultive services of the Center for Integrated Agricultural Systems of UW-Madison for public information and outreach. Information on our team approach and a listing of some key team members who contributed to the success of this project is provided in the original grant proposal.

In retrospect, we probably would not have done anything differently because all information gathered has value. We could have reduced the workload by concentrating on the fruit types that initially stood out, but there was a risk of overlooking potential that was not immediately apparent.

ACCOMPLISHMENTS

Horticultural Screening

Horticultural screening of uncommon and little known fruit crops from around the world has identified at least 15 fruit species that adapt well to regional growing conditions. This is an on-going evaluation. Un-adapted types are being removed and replaced by a wider range of specific cultivars of adaptable types. Other potential fruit crops will be screened for horticultural adaptability as they become available.

The results of this phase of our research are summarized in two fact sheets published by the CIAS at UW-Madison. See the public information and outreach section of this report.

We have determined that Aronia, Elderberry, European Black Currants and Sea Berry are adaptable and can be sustainably grown in Wisconsin. These also show great marketing potential and should be researched for commercial production protocol with an emphasis on regional marketing. Because of their vast value added potential beyond the farm gate, regional processing and distribution could add significant investment and job opportunities for agriculturally related industry in rural areas of Wisconsin.

We have also found that Aronia/Mountain Ash cross, Gooseberry, Red Currant, Russian Quince and Saskatoon show potential, but require further testing. Other fruits that show promise include a variety of stone fruits, especially plums, along with Cornelian Cherry, Honeyberry, Highbush Cranberry and Mulberry.

Product Development and Testing

All four of the most adaptable fruit types (Aronia, Elderberry, European Black Currant and Sea Berry) are producer friendly and have very high dietary value. All have high vitamin and mineral content and contain vast amounts of anti-oxidants, essential oils and other nutraceutical components. None have universal fresh market appeal and will require some degree of processing to achieve marketing potential based on their high nutritional value. While this may be a disadvantage in a direct marketing system, it is actually an advantage in a regional marketing system. Freezing, drying and preserving add value and will make those food items available year around which greatly increases consumption and sales volume. Other locally and regionally produced agricultural products could benefit from a value-added regional infra-structure. Capacity to accommodate other agricultural products would increase investment and job opportunities in rural areas.

To evaluate marketing potential, several approaches were used with very encouraging results. One approach was to work with a group of graduate students at UW-Madison, Department of Food Science. This group, which has won past awards in national competition for innovative product development, accepted the challenge of finding unique value added uses for the most unusual and sustainable test fruits (Aronia and Sea Berry). One product they perfected was flavored teas made from the skins of these fruits. Their other emphasis was to develop fruit chips using the juice. The result was a vibrantly colored series of chips that were visually attractive and eye catching (Sea Berry-bright yellow; Aronia –deep purple; Combination-violet), highly nutritious and flavorful. Test quantities were very limited, but the 15 or so people who had the opportunity to sample them were extremely impressed.

The Product Research Report prepared by Rachel Prososki, Research Assistant, Department of Food Science (UW-Madison) is attached as an appendix to this final report. The report, titled

"Exotic Aronia and Sea Buckthorn Chips", does not include specific formulation and recipe information. This information can be provided on a discretionary basis.

Another approach to product development was to blend pure juice from these unusual fruits with plain yogurt. The resulting yogurt drinks (very similar to Kefirs), exhibited the flavors of the unusual fruits. We soon teamed up with Sugar River Dairy who provided the yogurt and experimented with a blended yogurt and a fruit on the bottom version. These later attempts resulted in a very flavorful product, but will require more research to perfect consistency. The preliminary collaborative work with Sugar River Dairy, has shown an exciting potential for new product development that could further support both our dairy and commercial fruit industries. These unusual flavors could be used in ice cream, milk and cheeses, as well as yogurt products.

A third approach to product development was to experiment with a series of jams, jellies, sauces and syrups. Smaller amounts of fruit were required, so we could expand our efforts to include other unusual fruits including: Gooseberry, Gumi, Medlar, Quince, and Saskatoon. For taste testing and educational outreach, we developed rating sheets for public comment on both jams and jellies and the fruit/yogurt drinks previously mentioned. These are included in the appendix section of this final report.

In a series of seven taste testing events (often in conjunction with other public outreach opportunities) we were able to get feedback from nearly 150 people. This does not include feedback from events not hosted by Carandale Farm, such as the Dane County Dairy Breakfast, where yogurt drink products were hosted by Sugar River Dairy and the Family Farmed.org EXPO in Chicago, where CIAS staff shared unusual jellies and yogurt drinks with participants.

Results of these taste-testing events were very positive. Of those who filled out the rating sheets, 77 percent rated the Sea Berry yogurt drink as very good or excellent. Seventy-five percent rated the Black Currant and 60 percent the Aronia in this category (very good or excellent).

It should be noted that about half of the total participants filled out rating sheets. A couple of events took place before rating sheets were used, and at some events it was difficult to make the rating sheets readily accessible to participants. With the number of events and diversity of participants, we feel that the final results are quite representative of the general public.

We did not attempt to analyze the jam and jelly rating sheets because we did not have a full contingency of products available at every tasting event. Anecdotally, the top four (Aronia, , Black Currant, Elderberry, and Sea Berry) got high ratings, but, Gooseberry, Quince, and Saskatoon, were not far behind.

Public Information and Outreach

A significant amount of time and effort has gone into education and outreach regarding this project. We have had receptive audiences ranging from consumer groups, producers, prospective producers, service organizations, food security advocates and government employees. From December 6, 2006 through August 17, 2007, we attended and/or organized 16 events where we provided information, made presentations and conducted consumer product sampling. A listing of the outreach effort is included in the appendix section of this report.

Most notably, in addition to educating the general public, we have created interest with producers about the commercial potential of some of these new fruit crops. As a direct result of a presentation made to the Agri-ventures group (a group of prominent farmers and others interested in agricultural issues), one family farm operation has planted 2500 Aronia plants and plan to plant another 2500 plants as early as the fall of 2007 for a seven acre commitment.

An IPM Field Day was held at Carandale Farm on August 17, 2007 and featured a tour of the test plot. The field day was sponsored by the Wisconsin Berry Growers Association (WBGA) with financial support from CIAS. The attendees, (who are growers of conventional fruit crops), expressed a great deal of interest in the sustainability and grower friendliness of some these unusual fruit crops.

Public information and outreach activities have had support from both the Dane County Extension Service and the Center for Agricultural Systems (CIAS) of UW-Madison. CIAS has provided a significant amount of consultive services for publication, review and promotion including sponsoring a taste-testing event at the Family Farmed. org. EXPO, held in Chicago on March 23-24, 2007. The Center's Eco-fruit project underwrote the August 17 Field Day by $500 through a USDA Special Projects grant.

The most visible service provided by CIAS is the publication of two fact sheets. "Uncommon Fruit Crops with Sustainability Potential" was prepared for producers and highlights the economic and marketing potential of eight unusual and little known fruit crops. This was the primary handout for the August Field Day and will be used extensively when talking to potential producers.

The second fact sheet, "Uncommon Fruits at Carandale Farm", provided by CIAS, is primarily an education tool and highlights the four most promising unusual fruits (Aronia, Elderberry, European Black Currant, and Sea Berry). It is consumer and marketing oriented with more information about nutritional value and culinary use. It also provides background information about Carandale Farm and the fruit trial. This will be used for public outreach and made available to consumer groups through community service organizations and other venues such as the Food for Thought Festival and the Dane County Food Council.

Both fact sheets are included in the appendices section of this final report and can be downloaded individually from the CIAS website at www.cias.wisc.edu

CONCLUSIONS

The introduction of unusual fruit crops that contribute to the health, welfare and well being of consumers, and can be profitably grown in an environmentally sustainable way, will become the cutting edge for developing a regional marketing system. Diversity is the strength of Wisconsin agriculture. Results of this project demonstrate that we can add to that strength. With political will and entrepreneurial leadership, Wisconsin can be the leader and model in

the local foods movement. For more details about the regional marketing concept, see "Why a Regional Marketing System" in the appendix section of this report.

FUTURE PLANS

As time and resources allow, we will continue to research commercial production protocol, gather sustainability data from the test plot, and share our acquired knowledge with perspective growers. We may establish a demonstration planting and experiment with an agri-forestry concept to take advantage of symbiotic relationships among plant species that enhance sustainability. This is a retirement project and we do not intend to make large commercial plantings ourselves. Our objectives are threefold: 1) to acquire and share knowledge so other growers can minimize risk and maximize profitability; 2) to contribute toward the feasibility of establishing infra-structure for a system that can make locally-regionally produced foods more readily available; and 3) promote a sustainable future for humanity.

ENTERPRISE DEVELOPMENT

This project has brought a visionary concept to the threshold of practical implementation. Crossing the threshold will open up new opportunities for Wisconsin agriculture and help define a national trend toward a more responsible approach toward food delivery systems. The basic knowledge and physical resources exist, but the first tenuous steps across this threshold will require political will, entrepreneurial vision, leadership and risk tolerance.

Our observations are that the consuming public are anxious for the agricultural community to cross the threshold and that "Ag in the middle" producers will welcome alternative cash flow opportunities. The biggest obstacles appear to be policy geared toward corporate interests, bureaucratic inflexibility and resistance to change.

RELEVANCE FOR THE AGRICULTURAL INDUSTRY

The agricultural industry should embrace the opportunity for more diversity. The industry should support a local/regional marketing concept that puts greater emphasis on community development and keeps wealth at the community level. They should advocate for policy changes that allow flexibility and greater decision-making authority at the local/regional level.

They should also promote product development and marketing research appropriate for a regional sales approach.

APPENDIX

Numerous papers and reports were written as separate stand-alone documents during the course of this grant. To keep the final report concise, the most relevant documents are mentioned by reference in the report narrative and are included in their entirety in this section of the report.

Contents:

WHY A REGIONAL MARKETING SYSTEM?

Dale D. Secher

December 18, 2006

A regional marketing system could address seemingly different issues that have resulted from emphasis on a highly centralized system. One issue is the lack of social and environmental sustainability including poor nutritional quality and environmental pollution that has contributed to increased health care costs. The other is the loss of "family farms" (ag in the middle) that provide the basis for rural economies and land stewardship for a sustainable agricultural future.

What would be the specific goals?

1. A short supply chain which would
    a. Maintain the superior nutritional qualities of locally grown and processed foods
    b. Eliminate (or reduce) the need for chemical additives
    c. Maintain accountability between producer and consumer
    d. Give producers a more equitable share of the food dollar

2. To keep more income flow in the local economy
    a. Stimulate the local economy (provide jobs, capital investment, need for services)
    b. Increase the multiplier effect of the food dollar within the community

3. Reduce environmental impact
    a. Lower greenhouse emissions associated with transportation
    b. Lower point source pollution associated with processing, etc.

What would be the characteristics?

1. Be able to handle significant amounts of agricultural products in an economically efficient manner.
2. Encompass an area demographically large enough to have a consumer base that would support investment in infrastructure.
3. Be geographically large and diverse enough to support production needs for the entire spectrum of agricultural products.
4. Be geographically small enough to maintain a sense of local identity (this is a value-added feature in itself) and to minimize the environmental impact of distribution.
5. Some processing could be multi-regional to have economic efficiency and supply product to more than one region and still meet the general criteria outlined above.

How would it benefit Ag in the middle?

Mid-sized family farms continue to decline due to economic uncertainty and over-dependence on farm subsidies. They can benefit from the bottom-up demand for more local/regionally produced food because they are the ones that have the resources, dedication and potential management skills to support an alternative local/regional marketing system. They would not have to invest in major start-up costs, could continue current farming practices as desired and access additional income flow with minimal additional investment.

What are the challenges?

There are three major components. The first is supply. Supply could be provided by tapping into the resources and management skills of Ag in the middle in addition to those direct marketers who are capable and willing to take the next step in supplying local foods. The challenge will be to demonstrate financial sustainability, reduce risk, and provide technical support. This will require state and local resources for education, training, loans, grants, business planning and perhaps tax incentives.

The second is the need for infrastructure and/or strategic partnerships (sometimes referred to as value chains) for processing, storage and distribution. This will be required to supply a continuous, uniform, reliable, consumer ready product stream that will meet consumer, institutional and wholesale demand. This is the most challenging component. It will require an in-depth analysis to determine specific needs encompassing the entire spectrum of agricultural products. There may be a need for incentives to expand existing facilities and create new ventures. Financing and management could be accomplished in different ways. Private entrepreneurship should be encouraged, producer cooperatives may be a good option and even quasi-public ownership is a possibility. Start-up risks may have to be underwritten by public entities. The third component is to assure consumer demand of local/regionally produced foods that this system could provide. The latent desire for an economically and socially sustainable food system is virtually untapped. The challenge will be to educate the buying public about the many social and environmental benefits of purchasing local agricultural products. When people fully understand the true cost of food in terms of health, social justice and environment, Demand could easily support what a local/regional marketing system could provide even with a price premium to offset the short-term economic benefits of scale enjoyed by the industrialized system. State and local agencies and non-governmental organizations will play an important role in education and outreach.

RATING SHEET FOR YOGURT DRINKS

We would like your comments about the fruit/yogurt drinks. Please rate according to taste for potential marketability. Thank you.

PRODUCT	*POOR*	*FAIR*	*GOOD*	*VERY GOOD*	*EXCEL*	*COMMENT*
ARONIA YOGURT DRINK						
BLACK CURRANT YOGURT DRINK						
SEA BERRY YOGURT DRINK						

RATING SHEET FOR JAMS/JELLIES

We would appreciate your comments about the jams/jellies. Please rate according to taste for potential marketability. Thank you.

PRODUCT	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT	COMMENTS
ARONIA JAM						
ARONIA JELLY						
ARONIA-ASH JELLY						
BL CURRANT JAM						
BL CURRANT JELLY						
ELDERBERRY JELLY						
GOOSEBERRY JAM						
GUMI JELLY						
MEDLAR JELLY						
SASKATOOON JAM						
SEA BERRY JELLY						

A listing of outreach activities from December 6, 2006 through August 17, 2007 follows:

December 6, 2006-- made a presentation to the Agri-Ventures group consisting of progressive farmers and agri-business representatives. Prepared a handout.

January 4, 2007—attended the Wisconsin Local Food Summit at Stevens Point, WI. Participated in group discussions about local food systems.

January 7-9, 2007—Attended the Wisconsin Fresh Fruit and Vegetable Conference at Oconomowoc, WI. Networked with other growers to promote interest in alternative fruits.

January 31, 2007—met with Bill O'Brien and Dale Nelson (O'Brien Seeds) to discuss Aronia as an alternative crop. The Agri-Ventures presentation had sparked their interest.

February 8-9, 2007—Participated in the Citizen's Advisory Committee (CAC) meeting with CIAS staff and associates. Conducted taste testing and presented poster display which became the basis for two fact sheets.

February 13, 2007—Cindy conducted a taste testing event for teachers at Lapham Elementary School, Madison, WI

February 17, 2007—Made presentation at West Waubesa Coalition meeting held at the Promega Center in Fitchburg, WI. Prepared handout material.

February 28, 2007—Made presentation and conducted a taste testing event during a brown bag lunch for DATCP employees.

March 2, 2007—Did a taste testing event in conjunction with a soft fruit production workshop that I conducted at the Michael Fields Institute at East Troy, WI.

March 7, 2007—Participated in Madison Public Market meeting held at West Madison Agricultural Research Station, spoke in behalf of grant objectives for regional marketing opportunities.

March 8, 2007—Conducted taste testing event during and eco-berry questionnaire session held at DATCP.

March 12, 2007—Made presentation and conducted a taste testing event for the Dane County Extension Staff.

March 13,2007—Made a presentation to the Oregon, WI Rotary Club. Invitation was by one of the Agri-Ventures attendees.

March 23-24, 2007—Taste testing conducted by CIAS staff during the Family Farmed.Org Expo held at the Chicago Cultural Center.

March 26, 2007—Presentation and taste testing at the “Planting Seeds for our Future” conference sponsored by the Dane County Food Council and held at the Alliant Energy Center, Madison, WI. Sugar River Dairy and Carandale Farm provided Black Currant and Aronia yogurt for more than 100 attendees during lunch. Prepared hand out material.

April 14, 2007—Conducted a roundtable discussion during the “Future of Farming and Rural Life in Wisconsin” statewide conference sponsored by the Wisconsin Academy of Sciences, Arts and Letters. Prepared handout material.

June 9, 2007—Sugar River Dairy introduced Aronia and Sea Berry yogurt drink for participants at the Dane County Dairy Breakfast.

August 17, 2007—Hosted Unusual/Minor Fruit Crop IPM Field Day at Carandale Farm. Networked with potential growers of unusual fruits and provided Aronia, Sea Berry, Black Currant, and Elderberry yogurt drinks as well as various jellies for taste testing.