

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

Contract Number: 20066
Grant Project Title: Pumpkinseed Oil Project – Production and Marketing Feasibility
Amount of Funding Awarded: \$9,400
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- 1) What was the original intent of the grant?
- What did you want to accomplish with the grant?

This grant was intended to test the feasibility of producing high quality pumpkin seed oil in Wisconsin. The project tested the suitability of several pumpkin varieties, demonstrated effective cultivation, harvesting and processing practices, and facilitated the production and marketing launch of the first pumpkin seed oil produced in the United States. Project funds were especially valuable in allowing the project to explore key obstacles that will need to be addressed in establishing pumpkinseed oil as a viable product for Wisconsin. Project funds allowed us to achieve our goal of paying a higher than average, sustainable wage to the workers involved in planting, harvesting and cleaning the pumpkin seeds.

- How was it expected to benefit Wisconsin Agriculture?

Pumpkin seed oil is an important and highly popular component of European cuisine. Although common in Europe for centuries, pumpkin seed oil has been nearly unknown in the US. The initial production of Hay River Pumpkin Seed Oil is the first such product produced in the United States, and will begin the process of introducing the American public to this delicious and healthful oil. This specialty crop, naked-seeded pumpkins, will create Wisconsin jobs and add to our state's reputation for producing artisan quality farm products. The project has demonstrated the feasibility of producing high quality pumpkin seed oil in Wisconsin, and has established a foundation that will provide Wisconsin farmers with an opportunity to initiate a new, high value-added crop and food product that is suited to production by smaller scale growers.

- What makes this project work important or significant?

This project is significant because we are positioning Wisconsin farmers to be the first in the U.S. to produce a new food product that has tremendous potential for reaching a large, high value market. The project is creating entirely new product and beginning to grow the market for it. In recent years, American consumers have become aware of both the nutritional and culinary value of high quality natural oils. We expect that our oil will follow the path of other similar vegetable oils such as olive or sesame. Over the next 20 years, pumpkin seed oil will become a valued part of American cuisine. The project is also important because it adds a new, artisan-based food product that fits into our state's expressed strategy of expanding value-added opportunities for farmers.

2) What steps did you take to reach your goal?

- What worked?

We successfully completed all phases of the project – growing, harvesting, and processing - and are now selling a beautiful finished product. We now have a pattern and process in place that will allow us to scale up and improve profitability in future years. We are especially pleased with the presentation of the label, bottle and website, and believe we've positioned Hay River Pumpkin Seed Oil as a premium product.

- What challenges did you face?

There were several major challenges.

Drought

The summer of 2006 was an extremely tough growing year for pumpkins in our area. The greenhouse grown seedlings were set out the first week of June - at the beginning of what would become a six week drought. The majority of the 5,500 plants were in fields without irrigation, so plants were hand watered from a 65 gallon tank. This was enough to keep the plants alive but there was not sufficient moisture for a good fruit set. At the end of this period of drought, we had unusually high temperatures hitting 104° which further stressed the plants. A smaller number of plants were grown in the 2005 season, and these plants generally thrived under that summer's more favorable weather.

Cucumber Beetles

The mild winters of 2004 and 2005 allowed the larva of cucumber beetles to winter over. All of our growing fields suffered some damage from the beetles, and in one field, the crop was destroyed. The organic approved pesticides such as Neem oil proved expensive and ineffective.

Deer Damage

About half of the plants were in fields that experienced significant damage from deer. Deer are attracted to the high protein and oil content of the seeds and will eat through or kick the fruits then completely eat the seeds leaving an empty shell. The deer damage was severe at the plot grown by project Ken Seguire where we estimate we lost 1/3 to 1/2 of the crop. This damage was doubly vexing in those plots where plants were irrigated, did not suffer the stress of the drought, and would have had good yields of oil.

Low Oil Yield

The delay in fruit set, poor growing conditions and deep predation in the 2006 season resulted in a very low yield of oil from the seeds. Based on the 2005 crop year's results, we had expected to get about 60 gallons of oil but we only obtained 9 gallons from the entire 2006 crop.

Problems Harvesting and Drying Seeds

We began harvesting the 2006 crop the second week of October. Unfortunately, the weather turned unseasonably cold. Temperatures in the low 30s, wind and rain made for miserable field work. It also slowed down the process of the washed, cleaned seeds drying in a greenhouse. Because the seeds were wet we began to experience some mold issues. Seeds were gathered and stored frozen at Prairie Farm Meat Locker till sunshine returned and the drying process could resume.

Error at Botanic Oil Innovations

With the poor yield from 2006, we were grateful to have stored the 2005 crop in a frozen condition at Prairie Farm Meat Locker. The seeds were defrosted and taken to Botanic Oil in July to be dried and then held to be later roasted and pressed with the 2006 crop. Unfortunately, despite explicit instructions, Botanic Oil mistakenly pressed the 2005 crop without roasting shortly after it was delivered it. Roasting dramatically enhances the flavor of the oil and without roasting it is somewhat bland.

To address this problem, the much smaller 2006 crop received a heavy roast and then the two oil batches were blended together. Although the end product has a somewhat lighter flavor than we would have preferred, it is still delicious.

- What would you do differently?

Our plans for 2007 will address all of the challenges we faced in 2006.

1. We will double the size of the crop, planting a total of 10,000 seedlings.
2. In order to insure a consistent crop, all seedlings will be planted at one site, instead of multiple sites. This site is having an irrigation pond dug so that we will be able to provide abundant moisture regardless of the weather conditions.
3. To address the deer problem the entire growing area will have a double strand electric deer fence.
4. Trap crops will be planted to help prevent damage from cucumber beetles.
5. We will also be certified organic this year and the bottles will carry the USDA Organic Seal.
6. Harvesting will begin the last week of September so hopefully we'll have sunshine and warmer temperatures that will promote rapid drying of cleaned seeds.
7. Botanic Oil was very sorry for their error and I don't believe that will ever happen again but we will continue to be explicit with directions and will closely monitor their process.

3) What were you able to accomplish?

- What are the results from this project?

This project has resulted in the production of 392, 8.45oz. (250 ml) bottles of pumpkin oil. We were also able to employ a total of 17 people on a part-time basis and pay an above average wage. The project determined a seed oil pumpkin variety (Kakai) that grows well and produces good quality oil in Wisconsin conditions. We developed procedures for growing seedlings, harvesting plants, extracting seeds and extracting oil. The project purchased and modified a seed cleaning machine that allowed for efficient small-scale operation.

The project clearly established that it is feasible to produce high quality pumpkin seed oil in Wisconsin. Project results will allow us to scale up production in future seasons and adapt more efficient and consistent production practices.

The project has initiated an initial marketing effort. This includes a web-site, bottle and label design and marketing materials.

- Include any analysis of data collected or materials developed through project work.

Cost of Goods Calculation Analysis

These calculations exclude one time expenses such as design fees for the label and the cost of the UPC code.

Because of the poor growing conditions, we suspected, but did not know for sure, that the oil yield on the 2006 crop would be very low. As it turned out in terms of our COG, it would have been better to simply leave the pumpkins in the field un-harvested but this was not possible. With the larger 2005 crop not be roasted before pressing, we needed any amount we could get from the 2006 crop to be heavily roasted to help flavor the oil. Unfortunately the expense of harvesting drove our cost of goods to an unacceptably high level, just above \$17 per bottle. If we had only used the 2005 crop, the COG would have been a much more acceptable \$10 per bottle. We simply had to complete the project this year and felt it was more important to not make a profit this first year and get Hay River Pumpkin Seed Oil launched in the marketplace.

Over the next few years one of our primary goals will be to develop the efficiencies to allow us to drop our cost of goods, first to about \$12 per bottle so that we can make a reasonable profit on direct sales to the consumer and then eventually to about \$9 per bottle which will then permit sales to retailers. On specialty items such as pumpkin seed oil, many retailers are content with a 30% margin.

4) What conclusions can you make based on project work the analysis of collected data?

We have real potential to create a new food item for the American public. With care and planning for the inevitable problems in farming, we will continue to pay good wages and make this a profitable enterprise. The project manager, Ken Seguire, has extensive experience in marketing nutritional products. In terms of market reception, he reports that pumpkin seed oil has been one of the easiest products he has ever sold.

5) What do you plan to do in the future as a result of this project?

2007 plans include doubling the size of the crop, with irrigation, deer protection and pest management, we expect this to be a good year for oil yield. Our goal is to produce 1,500 – 1,900 bottles. Our strategy will be to utilize the limited yield from our current crop primarily for promotional purposes. We have reserved 20 bottles from our first production batch and in July will be sending them out in press kits to national level media such as Gourmet Magazine, The New York Times and food oriented radio shows like NPR's "Splendid Table." Most magazines work with a 3-6 month production schedule, we hope to garner media hits in October/November, when the 2007 batch is available.

6) What information or additional resources are needed to commercially develop this enterprise?

First, we need to dramatically scale up production and invest in harvesting equipment that will lower the COG. Next, we'll invest marketing dollars into press kits to major media. We've been turning down requests from stores and distributors but when we do have sufficient stock to offer, we will want to support retailers with in-store sampling. We'll pay to have someone making toast cubes and allowing the public to dip and try the pumpkin seed oil.

7) How should the agricultural industry use the results from your grant project?

Pumpkin seed oil from Wisconsin needs to have a chance to develop a reputation as a high quality, artisan produced food product. It fits very well into DATCP's emerging strategy of building markets for local foods and also connecting those food products to farm and rural tourism and economic development initiatives. Pumpkin seed oil can join a range of similar local food products – artisan cheeses, meat and sausage products, fish, wine, beer, etc.

Maintaining a high standard of quality will be essential in expanding market opportunities in the U.S. and competing effectively with imported oils. Hay River Foods should be promoted as the lead company to establish pumpkin seed oil in the US market. As we grow and begin to have success, there will be opportunities for other producers to join our effort or to initiate products of their own. One thing we've tried to do from the very beginning is position Hay River Pumpkin Seed Oil as a premium product emphasizing quality, sustainability, artisan crafted and in 2007, certified organic.