Rhodiola Research

Project Summary

Rhodiola rosea (rhodiola) has been successfully established as a new crop in Alaska with more than 10 producers actively growing the plant and prospective growers expressing interest. The first large harvest took place in 2013. Because rhodiola has never been grown agronomically in the state before, three primary challenges face the fledgling industry which this project sought to address

- the optimal time in which to harvest the plant to capture the most rosavins in its roots is not known;
- the optimal processing of fresh root to high quality, durable dried root needs to be determined; and
- Alaska needs to develop a national and international market for is rhodiola crops to be competitive with products derived from wild harvested Russian and Chinese plants, as well as cultivation by Canadian and Scandinavian producers.

Project Approach

Alaska Rhodiola Products Cooperative has been in operation since 2010. With the support of this grant received in 2012, we were able to harvest in 2013 and process a crop to a durable, marketable form (dried root). We sold this product and had excellent feedback from those buyers. We also harvested a crop in 2014 and are currently awaiting the chemical analysis results to be able to set a price, as there are several interested buyers. With the assistance of a graduate student at the University of Alaska Anchorage (UAA) biochemistry department, we have learned much about Rhodiola rosea's physiology that we are applying to product quality assurance and marketability. Most importantly, we have demonstrated that it is quite possible to grow very high quality Rhodiola rosea with desirable properties in Alaska. We are very optimistic that, with continued support from university and DNR sources, Rhodiola rosea cultivation can become an important and viable, sustainable economic agricultural industry in Alaska.

Goals and Outcomes Achieved

The goals of the rhodiola project were achieved and are outlined below.

1. Determine the best time to harvest Rhodiola rosea crops to maximize the levels of rosavins.

We continue to work with UAA's laboratory services for rosavin analysis and have had the great fortune of attracting a talented UAA student in a combined chemistry / engineering graduate program to systematically analyze our plants. Our main focus at this time is to develop a simplified "field test" to determine best harvesting time – not only for the important medicinal ingredients (rosavins and salidrosides), but also for the additional bouquets (rose-like odors) that buyers prefer. This is important because it is not feasible to rely on full-scale formal HPLC testing to determine harvest time – as those results may not be ready in time to make the decision to harvest before the ground freezes. Furthermore, we have been able to personally connect this student with one of the foremost former Soviet rhodiola researchers, and together they are collaborating in studying Alaskan grown plants even further.

2. Determine whether there is a relationship between root size and rosavin content.

From the roots that were analyzed in the fall of 2012, it appears that the larger the root mass, the greater the rosavin concentration. Root mass seems to be a function not only of the age of the plant but is also related to when the seedlings were planted. Seedlings that were put into the ground early in the summer were larger and more potent than those of the same age that were planted late in the same summer. Weeding also seems to make a big difference. In fields that were well weeded, roots were significantly larger and more potent than in fields where plants had to compete with weeds (mostly dandelions).

3. Determine whether current Alaska Rhodiola rosea growing practices meet European and Canadian quality standards.
To date, we have only sold our current processed crop in small amounts to individual U.S. buyers for personal use and have received very positive feedback from them regarding flavor and effect. However, we have learned from neutraceutical companies that, despite having favorable rosavin and salidroside concentrations, our samples do not have the desired rose-like odor or coloring that they have come to expect from Siberian wild harvested roots. We are currently actively researching whether this is due to either having harvested too early, or whether this is a function of the rhodiola variety we are currently growing. To answer that question, we have left some of our crops longer in the ground and will reevaluate in the fall of this year. We also intend to obtain seeds from wild Siberian rhodiola plants to determine if they will produce the desired (and more marketable) rosy root products.
In the meantime, we have had serious meetings with a very reputable European neutraceutical company that has expressed a strong desire for us to cultivate rhodiola for them. This company stated that they currently import 50 metric tons of dried wild-crafted rhodiola per year and will consider purchasing from us in the future if we could cultivate a similar quality product.

4. Determine best processing methods to maximize rosavins concentration and purity in processing freshly harvested root into a dried durable and marketable product.
The Co-op purchased the entire harvest of one grower and utilized the resources at UAF's MatSu Experimental Farm to process the harvest. The Co-op paid for repairs to the farm's coolers to properly store the roots, and in exchange the facility provided the space and water for washing as well as the dehydrator equipment and the power for drying. Co-op members, UAA extension staff, and master gardeners volunteered many hours to clean, wash, slice, and dehydrate the crop. We also performed some experiments to determine how much weight the roots would lose in the dehydration process. We also tested the moisture contents after each batch to learn the drying time needed to get them to the proper moisture levels. Much of the work was done by hand and rather inefficiently, but the lessons learned to increase efficiency and eventual mechanization of this process was invaluable. We will apply this hands-on learning to develop a more efficient process for future harvests.
The second grower who harvested this fall intends to process his own roots over the winter. We will provide him our lessons learned at the experimental farm so that he can be more efficient and effective in producing a quality product.

5. Identify at least five domestic and/or international buyers for Alaskan Rhodiola rosea products.
We have identified at least four potential domestic and one European buyer for our product. The limiting factor at this time is volume. These companies are not interested in hundreds of pounds of dried root, they are interested in thousands of pounds, and also reliably producing this amount on a regular annual basis. To that end, our current goal is to attract more growers.

Beneficiaries
The direct beneficiaries of this project include the 20 Rhodiola Co-op members who have greatly benefited from the knowledge gained through this grant project. Indirectly, many other specialty crop producers have also benefited; the Rhodiola Growers website is kept up to date and active with new information, guidelines and potential outlets for Alaska rhodiola. Dr. Illig spoke at the 2014 SARE conference – informing over 200 producers about the option of producing rhodiola as a viable specialty crop in Alaska.

Lessons Learned
Although not initially reported by potential buyers, it has been discovered that many of the interested buyers prefer a Certified Organic product. This was not disclosed in initial research or market analysis. The Co-op is currently analyzing costs associated with organic certification.