Propagation of Alaska Native Plants for Restoration and Landscape Use

Michael Emers *(Farmer/Rancher Grant Program)*

Project Numbers: FW02-045

Title: Propagation of Alaska Native Plants for Restoration and Landscape Use

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Mike Emers showing the size of year-old *O. deflexa* plants in 2001.

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Situation:

Restoring natural habitats and landscapes is an important step in developing natural resources, building roads, reclaiming mines and restoring oilfields. Such restorations raise demand for native plants, and those restoring disturbances often source seed from outside Alaska.

However, advantages would accrue from locally produced species:

1. Use of native species would better mesh with natural vegetation, providing aesthetic and ecological benefits
2. Alaskan native species are more likely to survive the state's climate and conditions

Restoration requires around 2.5 pounds of seed per acre. If such seed could be produced for $100-300 per pound, as has been done on the Kenai Peninsula, the 7,000 acres of gravel roads and pads on North Slope oil fields that must be reclaimed after decommissioning could generate $2-5.5 million in seed production business.

A 2000 Western SARE Farmer/Rancher Grant (FW00-050, Propagation of Alaska Native Plants for Restoration and Landscape Use) conducted by Mike Emers provided important results for addressing propagation challenges and developing a protocol for germination and container production. Based on one year's results showing varying survival and growth rates on different areas of Rosie Creek Farm, it was observed that they would grow better with:

- Better drainage than the current soil (almost pure glacial silt)
- Use of a low N fertilizer to reduce weed competition and insect outbreaks

This project proposed to test the new protocols under such drainage and fertility conditions.

Michele Hébert of the University of Alaska inspects native plants at Rosie Creek Farm in Ester.

Native plants growing in pots.

Objectives:

- Assess methods to improve field survival
- Evaluate cost-effectiveness of varying soil pH and amendments
- Determine seed production rates per plant and per unit area
- Assess insect infestations
- Evaluate extent of weeds and weed control methods
- Determine costs of small-scale production and develop cost estimates for larger-scale production

Actions:

In 2000, 400 seedlings each of these species were grown in containers and overwintered:

- *Hedysarum mackenzii*
- *Astragalu alpinis*
- *Hedysarum alpines*
- *Oxytropis deflexa*
- *Oxytropis campestris*
- *Oxytropis viscid*

In spring 2001, beds 3 feet wide and 100 feet long, two rows per bed and 12 inches between plants, were set and fertilized with fishbone meal at 1,000 per acre. Greensand at 1,000 pounds per acre was added for potassium and trace elements. Beds were hand-weeded through the summer and evaluated before counting leaflets and flowers.

The following spring and summer, beds were weeded and evaluated for growth. Seeds were hand-collected in August, then dried, cleaned and weighed at the University of Alaska research farm.

Results:

Early results were encouraging:

- *Oxytropis deflexa* and *Astragalus alpine* greened up quickly and were soon in flower
- *Oxytropis campestris, O. maydelliana* and *O. viscid* greened up slower but still flowered
- *Hedysarum alpinum* did not survive well after planting in 2001, and those that did survive the winter grew slowly if at all

Although some plants grew fast, they were still relatively small after two growing seasons (2-5 cm tall) and weed competition soon became an important factor. Weeding required 30 person hours per week on the ¼-acre plot.

While some species suffered from disease, insects or weed competition, some produced seed:

- *Oxytropis deflexa* – 200 grams
- *Oxytropis viscid* – 20 grams
- *Oxytropis campestris* – 22 grams

Impacts or Benefits on Agriculture:

The experiment was begun under the assumption that, because these are native species, they would require less care to grow. That was far from the case as most of the plants grew slowly, produced little seed and required excessive labor to fight weeds.

However, despite problems encountered, the results on seed collected, particularly *Oxytropis deflexa* at a rate of 31 pounds per acre, were encouraging. Because this was a pioneering effort, the costs of production were exaggerated; in a production setting where the plants would be another crop in a farm plan, the cost would likely be lower.

Growing these plants could be profitable, given the right grower and situation. Thoughts for consideration:

- Start with a sandy or gravelly soil
- Plant directly through a weed barrier fabric
- Grow the plants in containers, then plant directly into their intended setting

Table 1. Results from seed collections from 3 *Oxytropis* Species

Species	*O. deflexa*	*O. campestris*	*O. viscida*
plants	306	216	280
row feet	153	108	140
acreage	0.014	0.0099	0.0129
yield (g)	200	22	20
g/plant	0.65	0.1	0.07
seeds per gram *	635	587	361
seeds per plant	415	60	26
plants per acre	21,739	21,739	21,739
kg/acre	14.13	2.17	1.52
lbs/acre	31.08	4.77	3.34

* T. Jorgenson

Table 2. Projected costs of producing *O. deflexa*

g/plant (from Table 1)	0.65
grams from 5,000 plants	3,250
pounds per 5,000 plants	7.15
farm cost per pound (7.15 lbs/ $4,111*)	$559

* Cost for producing seed on 0.23 acres