Research to Determine Osha's Economic Potential as a Sustainable Agricultural Crop

Osha root is a highly revered traditional medicinal herb that native Americans have used for centuries in the upper Rio Grande areas of the American Southwest. Today, its main commercial use involves the treatment of bronchitis, influenza, and other respiratory illnesses.[1] Yet several factors have limited its acceptance into popular American herbalism and commercial markets. First, very little has been written about osha (*Ligusticum porteri* J.M. Coult. & Rose, Apiaceae) in contemporary herb books, mainly because it has been mostly used on a regional level. Also, the herb comes from wildcrafted sources only, so there are concerns over osha's long-term sustainability. Until recently, it has been considered difficult to cultivate commercially.[2]

A joint effort by Elk Mountain Herbs, Inc. of Laramie, Wyoming, and research scientists at the University of Wyoming's Departments of Plant Sciences and Agricultural and Applied Economics is examining the feasibility of turning osha into an economic crop for Wyoming growers.

The first part of the project was funded by a six-month, $70,000 Rural and Community Development grant from the U.S. Department of Agriculture (USDA) Phase I Small Business Innovative Research (SBIR) program. The underlying purpose is to examine the effect harvesting medicinal plants has on the species' natural habitat. The USDA SBIR program creates grants for qualified small businesses to support research dealing with important scientific problems in the field of agriculture, with a focus on problems whose solutions could benefit the public.

Osha's native distribution area extends through the higher elevations of the Rocky Mountains—around 8,000 feet—in Montana, Wyoming, Utah, Colorado, Arizona, and New Mexico. Some isolated populations are also in the mountains of Northern Mexico, where it is known as *chuchupate*. Due to relatively high demand for osha root in local folk medicine—it has been used traditionally in Native American medicine as a treatment for respiratory, digestive, and menstrual problems,[3] among others—and its growing popularity in mainstream herbalism, the species is being over-harvested in some of its more accessible areas. This overharvesting has prompted United Plant Savers, a nonprofit organization that attempts to monitor native medicinal plant populations, to label osha an "at risk" plant. Harvesters have relied on wild sources in part because previous attempts to cultivate osha commercially have met with limited success. Research to develop a successful, sustainable cultivation method for osha may be key to preventing future supply problems, supporting the quantity and quality of the root currently in demand, and preventing the decline of the plant in its native habitat.

Phase I of the Elk Mountain project began in May 2001 at the University of Wyoming greenhouse research facilities and focused on seed germination and propagation techniques. A battery of experiments conducted by Karen Panter, Ph.D., a University of Wyoming horticulture specialist, compared rates of seedling emergence under a variety of conditions emulating the plant's natural environment. Germination rates and seedling emergence of single seeds, seed heads, and lateral root cuttings were studied and compared.

"Dr. Panter was successful in growing osha in the greenhouses at the University. The seeds and [root] crown cuttings went well but lateral cuttings didn't do well at all," said Karin Guernsey, president of Elk Mountain Herbs, Inc.

Application for the Phase II grant was successful, providing more than $250,000 for the planting of test plots of osha in the high elevations of the Rocky Mountains of Wyoming. The 30 percent emergence rate in the test plots was a pleasant surprise to Guernsey.

"After we planted, samples showed that about half of the seeds were viable," Guernsey said. With what was a relatively low viability among the seeds, Guernsey said she was very pleased to see an emergence rate as high as 30 percent.

"The biggest surprise of the whole process was the discovery of the mycorrhizal relationship between osha and a type of fungus found in the soil here. Without the fungus, it's tough to get osha to thrive. We are trying to find out how much native soil needs be inoculated with the fungus to make it suitable for osha," said Guernsey. "Rumors that osha is difficult to grow are misleading—it'll do well in soil that has the right fungus."

More information on the osha project is available at the Elk Mountain Herbs Web site at <www.ElkMountainHerbs.com> or by calling 888-214-0404.

— Kim West/ Sarah Jackson

References:

1. Jellin JM, Gregory PJ, Batz F, Hitchens K, et al. *Pharmacist's Letter/ Prescriber's Letter Natural Medicines Comprehensive Database.* 5th ed. Stockton, CA: Therapeutic Research Faculty; 2003:990-991.
2. Cech R. *Growing At-Risk Medicinal Plants: Cultivation, Conservation and Ecology.* Williams, Oregon: Horizon Herbs; 2002:155-167.
3. Moerman D. *Native American Ethnobotany.* Portland, Oregon: Timber Press; 1998:306.

How much osha is out there?

While Elk Mountain Herbs attempts to develop methods for commercially growing osha, Healing Planet Herbs in Colorado is working on determining just how much of the plant is viably growing in the wild. In a proposal to the National Fish and Wildlife Foundation (NFWF) on December 1, 2003, Healing Planet put forward the designs for a conservation and population study of osha in the Yampa River Basin in northwestern Colorado. Intending to inventory all osha-growing sites in the region, the study will determine population size, age-structure, reproductive status, associated species, and habitat conditions of the plants.

Set to start in spring 2004, the project will last nine months and involve predicting possible osha growth sites, sending out field teams to investigate likely growth areas, estimating the abundance of osha, and then compiling results from the field surveys. Healing Planet intends to use the project as a means to develop methodologies for rapidly assessing wild populations of non-timber forest products (NTFP) like osha. Such systems could help develop a viable market for the sustainable harvest of NTFPs and aid the declining economies of agricultural communities in the Rocky Mountain region.

— Jon Lucksinger