

Government Nursery Services

In the July, 1997 issue of FNN, I presented an editorial on "The Role of Government Nurseries" in which I listed developing and sharing information as one of their traditional missions. I decided that it might be helpful if I actually followed-up that article with some examples. So, in the next several issues, I am going to feature some federal and state government nurseries and discuss their technology transfer offerings.

The J. Herbert Stone Nursery in Southern Oregon (Figure 18) has been operated by the USDA Forest Service since 1979 with the primary purpose of growing seedlings for federal forest lands. Production at the Stone nursery peaked in 1990 when almost 27 million seedlings were shipped, but since then, demand has steadily decreased due to the reduced federal timber harvest. During the same period, the nursery began to get requests to grow a wide variety of noncommercial native plants.

Developing Propagation Techniques for Riparian Plants. There has been an increased demand for riparian and wetland plants all over the US but, in the Pacific Northwest, the "salmon crisis" is one of the driving forces. This issue developed in the past 5 years or so because populations of many species and ecotypes of salmon, steelhead, and native trout are in serious decline, and some even have been proposed for endangered species listing. Like most wildlife management problems, loss of suitable habitat is at least partially to blame and so the Forest Service and other land management agencies have initiated projects to restore riparian areas across the Northwest. These projects are fueling the need for a variety of plant materials such as willows and other riparian trees and shrubs. Larger stock types are particularly in demand both to stop soil erosion along the banks as well as provide instant shade for cooling the water temperature in salmon spawning areas (Figure 19). The Stone nursery has responded by growing a wide

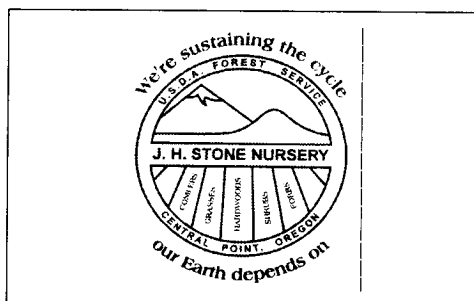


Figure 18. The J. Herbert Stone Nursery grows 944 different seedlots of 81 commercial and noncommercial native plants, as well as grass seed, for federal government agencies all over the Pacific Northwest.

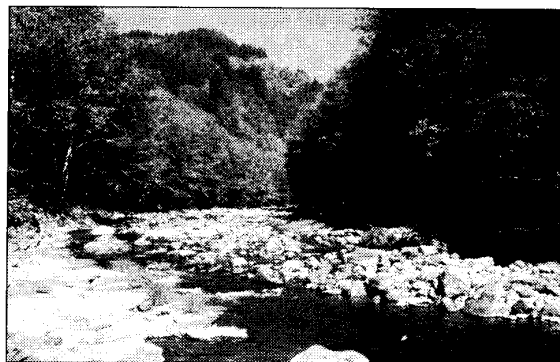


Figure 19. The salmon crisis in the Pacific Northwest has generated a demand for large riparian stock to provide shade in spawning areas and retard streamside erosion.

variety of trees, shrubs, forbs, grasses, and sedges as both bareroot and container stock. Since little is known about how to propagate many of these native species, the nursery is working to develop propagation protocols while producing seedlings for the projects themselves. For example, one National Forest requested seedlings of Oregon boxwood (*Pachistima myrsinites*) but reported that they were having trouble finding and collecting the very small seed. A little research by the nursery staff revealed that ornamental species of boxwood were normally produced by cuttings, and so they recommended that hardwood cuttings be collected in the Fall. This operational trial was a complete success with excellent rooting and survival of the cutting grown in containers. The seeds of many native plants have complex dormancy requirements and getting the stubborn seeds to germinate is a real challenge (Table 7). Stone nursery personnel have developed seed treatments which are being documented in technology transfer publications like *Propagation of Pacific Northwest Native Plants* which is being published by the Nursery Technology Cooperative at Oregon State University. Producing a consistent crop from year to year is another problem, however. The Stone nursery was able to grow a nice crop of bareroot mockorange (*Philadelphus lewisii*) the very first year and thought that they had conquered the seed dormancy problem. However, we all know how nursery work keeps you humble, and another sowing of the same seedlot the following year never germinated at all - a complete crop failure. The nursery will continue to work on these propagation challenges and report their results in annual reports and at regional nursery meetings.

Native Seed and Plant Materials Workshops.

How best to share propagation information is always a challenge. The Stone nursery has helped put on technology transfer workshops for the past several years

which have been attended by project planners from federal land management agencies from across Oregon and Washington. Just organizing these workshops requires a lot of work but the nursery personnel also do much of the instruction. Topics at recent workshops have included How to Collect and Process Seed, and Genetic Considerations in Planning Revegetation Projects. Of course, it is always easiest to demonstrate a new procedure and so the nursery uses their seed processing facilities, seedbed trials, and greenhouses to share what they have learned.

Producing Native Grass Seed. National Forest personnel have traditionally sown grass seed after forest fires and for restoration of roadside cutbanks but exotic grasses were used. Lately, restoration specialists are asking for site-specific native grass seed but are having trouble finding reliable local sources. Responding to this demand, the nursery now produces 24 species of native grasses, some of which have 20 or more different varieties. Although seed dormancy has been bred out of most commercial grasses, the nursery has learned that one-fourth of the species required some type of seed stratification. Each species also has its own unique cultural requirements which must be learned and documented. Although many people have the misconception that native plants are more pest-free than cultivated crops, nursery workers are learning that this is not the case. When they are grown close together under nursery conditions, native grasses have some serious insect and disease pests. One sowing of June grass (*Koeleria cristata*) was totally wiped out by a rust fungus- the 200 lbs. of seed that was collected by was totally worthless.

The original intent of the native grass program was to produce breeder seed for local private grass seed growers, who would then gear-up to meet the demand. This has worked to a limited degree. About a half dozen local farmers grow native grass seed on contract for the

Forest Service and Bureau of Land Management. The Stone nursery serves as a source of expertise for these growers and also produces seed of the other species that are not yet considered economical to grow. All of these developments have radically changed the operation of the Stone nursery. In 1988, they produced just 16 species and offered only three bareroot stock types. Just ten years later, the Stone nursery staff is growing 944 different seedlots of 81 plant species, which are produced as 14 different stock types. This broad range of experience insures that the Stone nursery will continue to discover and share new propagation information for years to come.

Sources:

Christensen, J. 1998. Bringing salmon back. *American Forests* 103(4): 16-20, 41.
 Rose, R.; Chaculski, C.E.C.; Haase, D. 1996. Propagation of Pacific Northwest Native Plants: A Manual, Volume Two. Corvallis, OR: Oregon State University, Nursery Technology Cooperative. 73 p.
 Steinfeld, D. 1997. You want us to do what!? Diversifying plant products at the J. Herbert Stone Nursery. IN: Landis, T.D.; Thompson, J.R., tech. coords. National Proceedings. Forest and Conservation Nursery Associations. Gen. Tech. Rep. PNW-GTR-419. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 63-67.

"Sister" Nurseries

I'm sure that many of you have heard of the Sister City program where cities in two different countries agree to a cultural exchange to promote mutual understanding. How about a Sister Nursery? Raul Moreno of Microseed Nursery and I have worked on several projects in Mexico over the past several years but have been discouraged by the steadily decreasing governmental funding. Maybe the answer is a more direct one-on-one a program in which

Table 7. Seed Propagation Information for Some Riparian Plants Grown at the J. Herbert Stone Nursery

Common Name	Scientific Name	Seed Treatment	Cultural Tips
Sitka alder	<i>Alnus sinuata</i>	Cold (C), Moist (M) stratification for 30 days	Grow as 1+0 bareroot (BR) but seed needs light to germinate so use a thin sand or grit mulch
Water birch	<i>Befula occidentalis</i>	C/M stratification for 30 days	Grow as 1+0 BR
Thimbleberry	<i>Rubus parviflorus</i>	C stratification for 90 days	Grow as RL 10 in ³ container (C) stock
Western redcedar	<i>Thuja plicata</i>	C stratification for 30 days	Grow as RL 10 in ³ . C and transplant to 4 gallon C and grow for two years

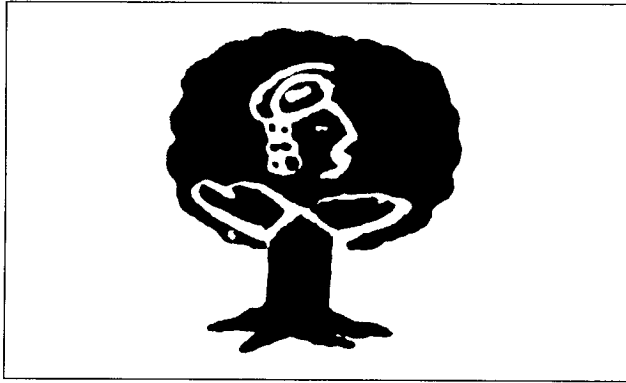


Figure 20. The Organization of the Forest Ejidos of the Mayan Zone (OEPFZM) is working to establish sustainable timber harvest while increasing biodiversity in the tropical forests of the Yucatan peninsula in Mexico

nurseries or individuals in the USA or Canada give technical and financial assistance to small nurseries in other parts of the world.

Although a Sister Nursery program could be done anywhere, we're starting our Vivero Hermano relationship in the Yucatan peninsula region of Mexico. Most of the forest land in Mexico is owned by communities called ejidos, many of which are composed of indigenous people working to improve their economic self sufficiency. The Organization of the Forest Ejidos of the Mayan Zone (OEPFZM) (Figure 20) manages over 250,000 ha. (620,000 acres) of dry tropical forests in the Yucatan region. These forests contain several native trees such as Honduras mahogany (*Swietenia macrophylla*) and Spanish cedar (*Cedrela odorata*) which are highly prized for their beautiful wood. Unfortunately, until the last few years, these species have been overcut by foreign timber companies and attempts at reforestation have had limited success. So, the OEPFZM is working to establish sustainable harvests of these two valuable timber species and, at the same time, enhance the rich biodiversity of the remaining tropical forest.

The OEPFZM has established a new nursery in the town of Carrillo Puerto where mahogany and Spanish cedar seedlings are grown for enrichment plantings in the jungle (Figure 21). For the past 3 years, the Center for the Reforestation of the Americas (CEFORA) at New Mexico State University has been monitoring the survival and growth of their outplantings, and have identified that poor root form and outplanting technique are serious problems. Copper-coated polybags have improved root morphology with other species and so we're going to install some operational trials in the Carrillo Puerto nursery. Another exciting possibility is using copper landscape cloth as a root growth barrier under polybags and under the traditional raised bareroot seedbeds. Other ideas for technical assistance include developing a compost-based growing media, and improving the method of harvesting and transporting of seedlings to the field. As you can see, there are plenty of possibilities.



Figure 21. Raúl Moreno of Microseed Nursery confers with technical advisors and managers at the Carrillo Puerto nursery in the Yucata region of Mexico

Financial support is also needed. With the help of Patricia Negreros-Castillo, a Microseed associate from Iowa State University, we are going to find a way to channel some funds to the Carrillo Puerto nursery. The idea is to provide them with funding which can be used for both practical research as well as day-to-day nursery production. To give you an idea of how far a small contribution can go, consider the following:

- A day's wages for a nursery worker is about 25 pesos or \$3.00
- A kilo of poly bags costs 17 pesos (\$ 2.09)

One of the real deficiencies of the new nursery is that it doesn't have a reliable well pump and irrigation system. Because this will require more funding that we have at present, we're hoping to attract additional funds to see if we can fix that problem too.

In conclusion, we're not sure exactly how this Sister Nursery program will work but we envision a loosely-organized network of people and nurseries who like to get things done. However, we realize that this program will need some structure and so Raúl has offered to let his nursery serve as the focal point. We should be able to set-up a nonprofit organization which would provide a tax credit for the donations of individuals or nurseries. If anyone would like to talk about exploring this intriguing opportunity, get in contact with Raúl or me:

Raúl Moreno
Microseed Nursery
 P.O. Box 35
 Ridgefield, WA 98642
 USA
 Tel: 206/887-4477
 Fax: 206/887-3721
 E-mail: microseed@aol.com
 WWW: www.microseed.com