Propagation Protocol Database on the Native Plant Network

R. Kasten Dumroese and Thomas D. Landis
(208) 883-2324
kdumroese@fs.fed.us
USDA Forest Service, SRS
Editor, Native Plants Journal
1221 South Main Street
Moscow, ID 83843

Abstract

The demand for native plants continues to increase but published information on how to propagate natives is extremely limited. A wealth of propagation knowledge and experience exists in native plant nurseries, but there isn't an easy way to share it. The Native Plant Network on the Internet offers basic propagation information as well as a searchable database of propagation protocols. An easy-to-use data form allows growers to submit propagation information as well as update it as new information becomes available.

Key words

Nursery, seedlings, Internet, plant production

Introduction

Forest and conservation nurseries are being asked to propagate an increasingly wide variety of native plants, from ferns and forbs to shrubs and noncommercial trees. Learning how to propagate this variety of plants can be a formidable challenge. For example, compared to species traditionally grown, native plant seeds come in a bewildering array of shapes and sizes that make them hard to collect, clean, and sow. Most native plant seeds also have some type or degree of dormancy and need special treatment before they will germinate.

Research is the traditional source of new technology, but few scientists are working on new native plant propagation techniques in the US, and most of that work

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is with threatened and endangered species. This problem can be traced to recent personnel downsizing as well as a lack of priority by research administrators. So, most new propagation techniques are being developed on-the-job by native plant nurseries but, unfortunately, this information is not being shared for several reasons. Obviously, private nurseries have a proprietary reason for not wanting to share their trade secrets. On the other hand, state and federal government nurseries that were a traditional source of nursery technology just don't have the time to document in writing what they know by experience. In addition, declining government budgets and fewer personnel makes sharing information a low priority. Recognizing this need, the Reforestation, Nurseries and Genetic Resources (RNGR) team of the USDA Forest Service came up with the idea of developing a system for sharing propagation protocols for native plants: the Native Plant Network.

The Native Plant Network

www.nativeplantnetwork.org

The network currently consists of two parts: the Native Plants Journal and the Propagation Protocol Database. The network was begun as a cooperative agreement between the USDA Forest Service Cooperative Programs and the University of Idaho Forest Research Nursery in early 1999.

Native plants journal

The journal, which we like Co describe as an *eclectic* forum for dispersing practical information about planting and growing native plants, is published twice each year in full color. Each issue contains scientific and practical articles, including plant production protocols. All previously published articles are in a searchable database on the Network.

Propagation protocol database

Our focus is on the Propagation Protocol Database. A propagation protocol is a comprehensive procedure on the cultural details of growing a specific native plant—in other words, a recipe. A typical protocol is a detailed, step-by-step process that starts with target seedling specifications and contains information on how to collect seeds or cuttings; how to grow the plant in a nursery; how to harvest the plants, seeds, or cuttings; and how to outplant them (Landis et al. 1999, Landis and Dumroese 2000).

The basic idea was to publish propagation protocols on the Internet using a standard format. Internet publishing has several advantages: first, it is relatively inexpensive compared to trying to publish in hard copy; second, it is quick; and third, computer files are easy to access and update. We are also coordinating with the USDA-Natural Resources Conservation Service to cross-link our protocols with their PLANTS database (http://plants.usda.gov).

As of I December 2001, the database contained almost 1300 protocols with more than 100 plant families represented. Almost 100% of the protocols have been added by government agencies (Table 1). About 400 more protocols are in the process of being added.

Propagation protocols are organized by genus, species, species binomial, state or province, product type (container, bareroot, etc.), organization type, and nursery or company. This organization is necessary because one species can be propagated by several different methods. Also, a wide ranging species may have several ecotypes that have different cultural requirements. For example, the database contains five protocols for quaking aspen *(Populus tremuloides)*. One short protocol identifies the seed dormancy mechanism and suggested presowing treatment for aspen (Baskin and Baskin 2001). At the Glacier Park Native Plant Nursery in Montana, aspen is propagated by either seeds (Luna et al. 2001) or root cuttings (Johnson et al. 2001) collected in the wild. Seed propagation is also the method used at the Colorado State Forest Service Nursery but the cultural techniques are significantly different (Moench 2001). At Los Lunas Plant Materials Center in New Mexico, quaking aspen is propagated using root cuttings from stock plants held at the nursery (Dreesen 2001, Dreesen and Harrington 1999). By providing a variety of protocols, novice growers can chose several propagation options and select the one that best matches their location and objectives.

Table 1. Number of propagators by category and their contribution to the total protocols in the Propagation Protocol Database on the Native Plant Network as of December 2001.

Propagator Classification	Number of Propagators	Protocols	Percentage of All
Private		12	1.0
State			
	University	1	25.0
	State Nursery	6	5.0
Federal			
	USDA		
	NRCS Plant Materials Centers	15	23.0
	National Forests	1	2.5
	Federal Nursery	2	1.5
	Other Forest Service	2	1.0
	USDI		
	National Parks	3	41.0
Total		42	100.0

Searching the Propagation Protocol Database

To search the database, just click on *Search the Protocol Database.* You can search by typing in a genus, species, binomial, Latin family name, by selecting a species from a drop down menu, state or province, organization type, company or nursery name, or various combinations of these parameters. Leaving all of the fields blank will generate a list of every protocol in the database. From the list of matches to your search, you may select particular protocols based on species, stock type, location, date of entry, and so on (Figure 1). One handy feature is the batch print function that allows you to accumulate and print several protocols at a time. Just place a check in the box next to the protocols of interest and they will be formatted so you may print them using the print command in your browser. Printed protocols are in a format that allows them to be three-holed punched for storage in a loose-leaf binder.

Adding to the Propagation Protocol Database

Register as a propagator

We strongly encourage professional and amateur plant propagationists to submit any propagation information that they may have. We have tried to make the process relatively easy and are continually updating the process to make it more friendly. The first step is to click on *Add/Edit* Your *Protocols* and register as a propagator. Registering will allow you to add multiple protocols without having to re-enter basic information like your name, address, and contact information. And, if at a later date you wish to update one of your protocols, you may access the file using your username and password. Growers are also encouraged to submit their nursery, company or agency logos which will be displayed whenever someone views your protocols.

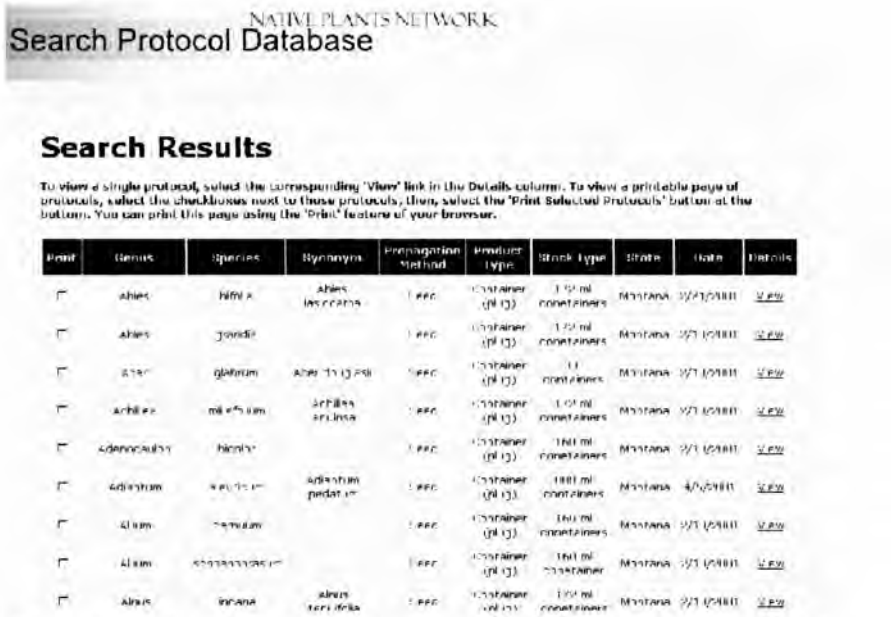

Figure 1. A partial view of search results from a query for protocols from Montana. From this page, searchers may either view protocols one at a time by selecting View, or view multiple protocols by clicking the Print box of desired protocols and selecting the print function at the bottom of the search results. Multiple protocols are then displayed in a format suitable for printing using the print function of the web browser.

Entering a protocol

On the Network, we have provided an example of a completed protocol input form as well as a blank form. Many propagators print or copy the blank form to see what information is requested by the database. They can then compose the necessary information in a word processing program to ensure accuracy and easily cut and paste it to the protocol input form. Given the immense variety of plant types, nursery stock types, and propagation objectives, we realize a one-glove-fits-all approach is not realistic, but on the other hand a free-flow anarchist approach is not conducive to finding and using data. So, our intention is that the standardized form provides only a framework for adding protocols.

Figure 2. A partial view of propagation protocol from the nursery at Glacier National Park showing contact information and agency logo. Protocols from other organizations also provide active URLs to their websites. All protocol output displays with a complete citation so credit can be given to the authors.

The main headings are fairly general and we encourage propagators to use subheadings under main headings when necessary to present their data. Folks familiar with hypertext language can insert their own formatting; others can use the help feature and hypertext format drop-down box for assistance. Some fields are required (for example, genus, species, family) but many are not. Don't worry—if you decide data is not needed in particular fields or you simply don't have that type of data, skip those fields. Blank fields will not be displayed on the protocol output form. Once a protocol is entered but before it is submitted, you may preview it for accuracy. If everything is correct, the protocol can be submitted to an approval queue where it will be checked for appropriateness of content before being added to the database. Protocols are generally approved within seven days and can then be found as part of the Propagation Protocol Database.

Professional credit

We designed the database so credit goes where credit is due. The protocol input form allows the data entry person to list one or more authors for each protocol to ensure that proper credit is provided.

Protocol output

When your protocol is viewed by someone, it appears in their browser with propagator information, organization logo, the protocol proper, and a self-generating citation that includes the authors and other necessary information for relocating the protocol (Figure 2). Again, the automatically-generated citation ensures credit goes to the developer(s) of the protocol. This citation should also be used whenever information in the protocol is referenced. Furthermore, you can add your organization's URL or email address to the database so viewers of your information are only a click away from your website, products, and services. For the private nursery manager, this can be a good marketing technique.

Summary

The Native Plant Network is an excellent information resource for people who want to grow or use native plants. Propagation protocols of-

fer an easy, yet comprehensive, way to share information on how to grow native plants. We hope that all propagators will use this new way to seek cultural information and share their propagation knowledge.

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