

**Propagation Database for Home Gardeners:
developing access to the extensive propagation records of the
University of California Botanical Garden at Berkeley**

**Final Report
for work performed from July 1, 2008 to June 30, 2009**

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Introduction:

The University of California Botanical Garden (UCBG) is a collection of over 12,000 taxa from around the world, the majority of them of wild origin. Many of these taxa are new to horticulture and are potentially exciting additions to the horticultural trade in support of the home gardener. Detailed records of propagation efforts are recorded on 5" X 8" index cards that are vulnerable to catastrophic loss, as there is no current back-up of this information. The project will provide an electronic archive for ca. 22,000 records of propagation activity by scanning them to individual files; it will fine-tune existing software for data entry of these records; it will provide staff time to begin the process of entering these records into the Garden's plant record data base; and it will provide valuable propagation information for professionals and home gardeners on the UCBG web site.

Objectives:

Our plan is to have all the propagation cards scanned into digital files for safe-keeping in multiple sites; to modify an existing data base for data entry of the information on the propagation cards; to begin and accomplish significant data entry; and to create a web site with which to share this information with home gardeners and nursery and conservation professionals.

Discussion:

All of the propagation cards were scanned to digital files in July 2008 and these files are stored in multiple locations.

Modifications to the existing data base, including development of additional data tables, was completed in November 2008.

Data entry was tested during data base modification. Our initial estimate of five minutes average/propagation card, as impacted by the software modifications, was too low. Modification to the data base tables resulted in a more hierarchical system to detail and track sequential activities. This increased the average data entry time per propagation card to seven minutes (each card can have multiple propagation attempts). Using the earlier figure, we anticipated data entry for ca. 3,500 cards by June 2009. Data entry for 3,286 records was completed.

Nearly every propagation card requires data entry into multiple tables (see Figures 1- 6). As of June 30, 2009, data entry was completed for all California rare and/or endangered taxa and other California taxa alphabetically through the letter Le. We continue data entry with year two funding.

Ms. Keller, with assistance from Mr. Domzalski, developed a detailed explanation of abbreviations used on the propagation cards to improve accuracy of interpretation.

Data entry examples follow in figures 1-6. Information is entered into the data base in tables at each level of activity. We start with a propagation id number (automatically assigned by the system), which is then linked to one or more activities, each of which can have one or more treatments. Data fields without a colored border are pulled in automatically from existing tables. This data entry process facilitates the extraction of information to explain what was done for each propagation effort and its results. For example, in the summary presented in Figure 6 we can see that the *Amorpha fruticosa* var. *occidentalis* seeds were treated by a soak in warm water for 30 minutes, then treated with benlate and physan and placed on bottom heat in the propagation greenhouse, where good germination was achieved three months later. Plants were placed out into the Garden collection 13 months later.

Web site design was completed in collaboration with the campus' Information Systems & Technology unit. Data entered to date, and thence forward cumulatively, is available via the Garden web site's collection page.

Figure 7 is an example of results displayed via the Propagation web site pages. The search page allows for partial entry of names, and will return any scientific names matching the pattern of letters entered. For example, entering "alba" will return all genera and specific epithets with "alba" contained within their name. Buttons allow the user to scroll through the previous or next propagation records that match the search criteria.

Through this work we will increase the knowledge base of propagation techniques for a wide range of plants of known and potential horticultural interest. The enormous amount

of data from UCBG propagation experience is being made available through the web to the home gardener and professional horticulture communities.

Propagation Table [Close] [Maximize] [Refresh]

 Query complete

Propagation ID
Accession Number
Extra Seeds?

Propagation Date
Propagation Type

Taxon

Purpose
Number Started
Collector Number

Collector Name

Comments

Data

Geographic Location

Entered By
Date Entered

Updated By
Date Changed

 Query retrieved 1 record

Propagation ID	Accession Number	Extra Seeds?	Propagation Date	Propagation Type	Taxon
299	89.1070	no	Aug 23, 1989	seed	Amorpha f

Figure 1: Propagation table for initiating new records. The propagation id is unique to each suite of propagation efforts. Provenance information (data and geographic location fields) are filled in automatically from other tables in the data base.

Propagation History Table

Find Add Update Delete Clear Done

Treatment Pot Tags Propagation Summary

Query complete



Propagation Number: 299 Sequence Number: 1 Activity: 1

Accession Number: 89.1070 Propagation Date: Aug 23, 1989 Propagation Type: seed

Activity Date: Aug 23, 1989

Type of Activity: pretreat Percent Success (999 for null):

Taxon: *Amorpha fruticosa* L. var. *occidentalis* (Abrams) Kearney & Peebles

Medium: N/A Germination /Rooting Date:

Propagule Count: Pot Type: N/A Pot Size: N/A

Propagation History Comments:

Date Entered: Dec 3, 2008 Entered By: bkeller

Date Changed: Dec 3, 2008 Changed By: bkeller

Query retrieved 5 records
record 1 selected

Propagation Number	Activity Sequence Number	Accession Number	Propagation Date	Propagation Ty
299	1	89.1070	Aug 23, 1989	seed
299	2	89.1070	Aug 23, 1989	seed
299	3	89.1070	Aug 23, 1989	seed
299	4	89.1070	Aug 23, 1989	seed
299	5	89.1070	Aug 23, 1989	seed

Figure 2: Propagation History tables record different activities, each of which may include one or more treatments. The Propagation id, 299, and activity sequence number 1, at the top of the screen are key identifiers.

Treatment Table [Close] [Maximize] [Minimize]

Find Add Update Delete Clear Done

Query complete



Propagation ID 299 **Propagation Activity Sequence Number** 1 **Treatment Sequence** 1
Taxon Amorpha fruticosa L. var. occidentalis (Abrams) Kearney & Peebles

Propagation Date Aug 23, 1989 **Propagation Type** seed **Propagule Count**

Activity Date Aug 23, 1989

Accession Number 89.1070 **Type of Activity** pretreat

Treatment Type Name soak in water **Concentration**

Begin Date **End Date**

Treatment Notes warm water for 30 min.

Date Entered Dec 3, 2008 **Entered By** bkeller
Date Updated Dec 3, 2008 **Updated By** bkeller

Query retrieved 1 record

Propagation ID	Propagation Activity Sequence Number	Treatment Sequence	Taxon
299	1	1	Amorpha fruticosa L. var. d

Figure 3: Example of one treatment table.

Propagation History Table

Find Add Update Delete Clear Done

Treatment Pot Tags Propagation Summary

Query complete



Propagation Number: 299 Activity Sequence Number: 3

Accession Number: 89.1070 Propagation Date: Aug 23, 1989 Propagation Type: seed

Activity Date: Aug 23, 1989 to Nov 21 1989

Type of Activity: results Percent Success (999 for null):

Taxon: *Amorpha fruticosa* L. var. *occidentalis* (Abrams) Kearney & Peebles

Medium: PT RL S Germination /Rooting Date:

Propagule Count: Pot Type: N/A Pot Size: N/A

Propagation History Comments: good germination

Date Entered: Dec 3, 2008 Entered By: bkeller

Date Changed: Dec 3, 2008 Changed By: bkeller

Query retrieved 5 records
record 3 selected

Propagation Number	Activity Sequence Number	Accession Number	Propagation Date	Propagation Ty
299	1	89.1070	Aug 23, 1989	seed
299	2	89.1070	Aug 23, 1989	seed
299	3	89.1070	Aug 23, 1989	seed
299	4	89.1070	Aug 23, 1989	seed
299	5	89.1070	Aug 23, 1989	seed

Figure 4: This table shows the medium in which the seed was planted (PT RL S, defined in Fig. 5) and, in this case, the germination rate is qualitative.

Medium Table

Find Add Update Delete Clear Done

Query complete



Medium Name

Medium Description

Entered By Date Entered

Updated By Date Updated

Query retrieved 3 records
record 1 selected

Medium Name	Medium Description	Entered By	Date Entered	Updated
PT RL S	a mixture of peat, red lava and sand	bkeller	Nov 14, 2008	bkeller
PT RL S/PU	a mixture of pet, red lava, and sand over pumice	bkeller	Dec 4, 2008	bkeller
PT RL SS TA/PU	a mixture of peat, red lava, supersoil, turface over pumice	bkeller	Dec 3, 2008	bkeller

Figure 5: This table shows an example of the medium descriptions.

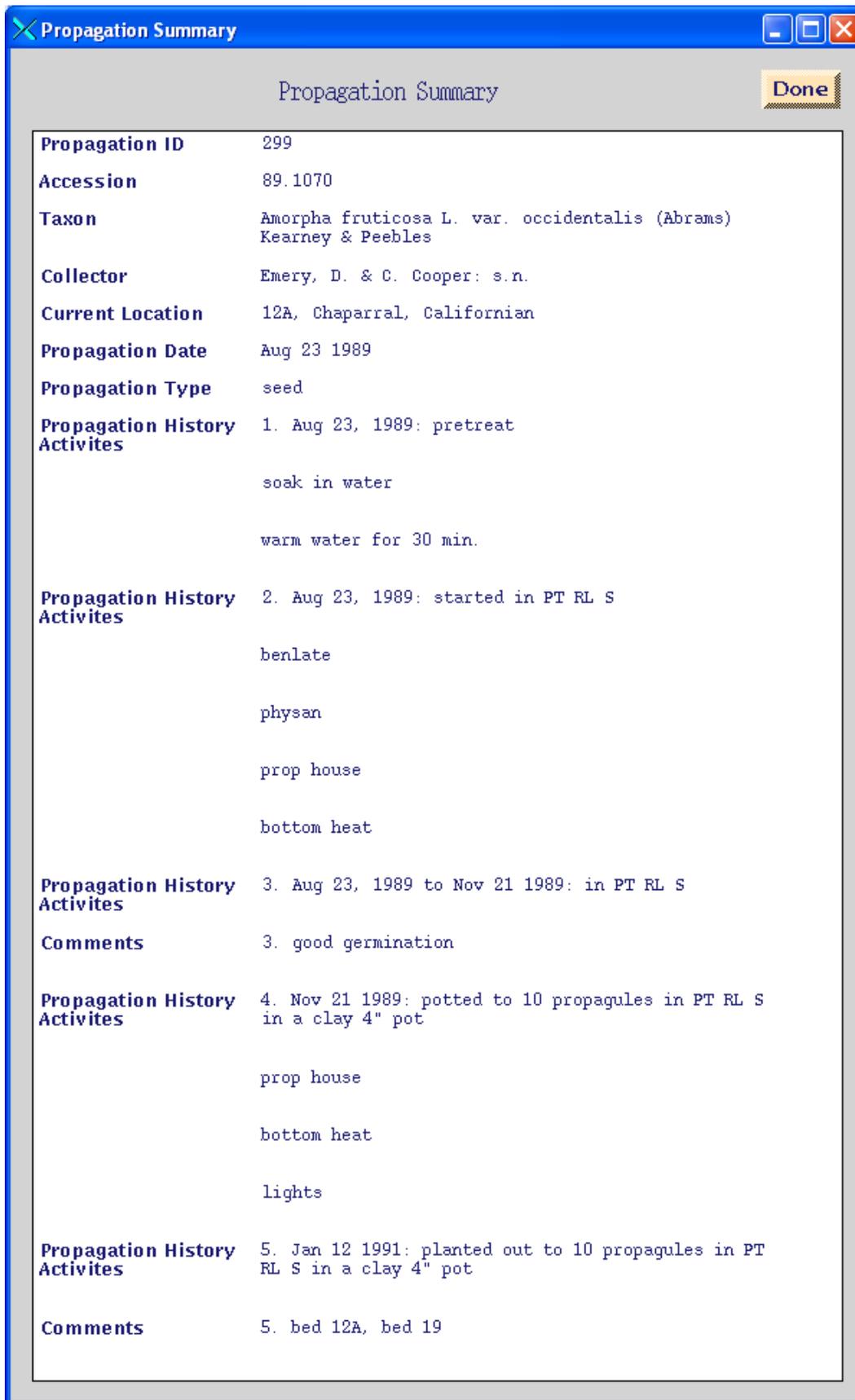


Figure 6: Summarizes activities for this propagation effort. The Propagation Summary will formed the basis of the web site information.

UC Botanical Garden at Berkeley :: Plant Collections - Mozilla Firefox

http://mip-qa.berkeley.edu/bgpw/PropDetailSearch.action?propId=1363¤tRowId=4

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Plant Propagation Site

[Propagation Home](#)
[New Search](#)
[Collections](#)
[Botanical Garden Home](#)

PROPAGATION INFORMATION

Summary Detail for id# 1363

[Back to Scientific Name Search Results](#)

Scientific name	Ceanothus confusus
Accession number	2006.0595
Collected from	Sonoma County, California, U.S.A., North America
Current location	28B, Chaparral, Californian and 29, Chaparral, Californian
Propagation date	Oct 17, 2006
Propagation type	seed
Result	X
Number started	25
Activity #1	Oct 17, 2006: pretreat to 25 propagules
Treatment	soak in water
Treatment note	hot water until cool
Activity #2	Oct 17, 2006: started 25 propagules in perlite mixed with sand and UC Davis mix (peat, firbark and sand) over perlite in a plastic 4" pot
Treatment	Oct 17 2006 - Dec 4 2006 cold stratification
Treatment note	in refrigerator
Activity #3	Dec 4, 2006 to Mar 28, 2007: results for 25 propagules 56% successful in perlite mixed with sand and UC Davis mix (peat, firbark and sand) over perlite in a plastic 4" pot
Activity comment	14 plants
Activity #4	Mar 28, 2007: changed pot to 14 propagules in perlite mixed with sand and UC Davis mix

Figure 7: Example of web page search results for propagation for the California Native Plant Society List 1b species Rincon Ridge ceanothus (*Ceanothus confusus*). Additional information would be revealed by scrolling down.