

## Introduction

We'd like to bring to your attention a project called the International Plant Records Center. The goal of the project is to document and make available data on living collections of plants in botanical gardens. Below is an excerpt from a preliminary report detailing how data will actually be collected from each garden:

"It is envisioned that the initial recording of data will necessitate the utilization of mobile units containing a certain amount of data processing hardware. The basic unit being considered is a vehicle similar to the Dodge Commercial Traveler (bus). This basic unit would be as self-contained as possible so that it could serve as a field office in almost any location. Cost of this unit with anticipated electronic data processing (EDP) hardware is estimated to be:

basic unit	\$14,000
EDP hardware	<u>\$19,800</u>
Total:	\$33,800"

Long-time members of the American Association of Botanical Gardens and Arboreta (AABGA) may recognize that the above paragraph was taken from an AABGA bulletin published in July of 1967 - 27 years ago! We are not exactly sure what became of the project (one of the authors was just learning how to drive while the other was starting kindergarten), but to the best of our knowledge a bus was never outfitted to drive from garden to garden to collect data. Can you imagine such a scheme? We've really come a long way, haven't we?

Or have we?

While there are occasional success stories, the topics of record exchange between gardens, and of having ready access to inventories of botanical gardens, continue to be more of a concept than a reality. In the October 1993 issue of *The Public Garden*, Jim Folsom candidly documents the difficulties they have had at Huntington Botanical Gardens and asks "Are we there yet?" Sadly, no. But the computerized *Plant Collections Directory*

now being distributed by AABGA, and the extensive databases gathered by Botanic Gardens Conservation International (BGCI) in collaboration with the World Conservation Monitoring Centre (WCMC) are good examples of what can be and has been done.

The BG-BASE user community, now some 50+ gardens strong and holding hundreds of thousands of accessions of plants in cultivation, will continue to have a voice in the development of such projects. As this newsletter goes to press, time is approaching for a meeting to plan the next version of the *International Transfer Format*, in which the many comments from the BG-BASE community over the years will be discussed, and incorporated wherever possible. In our discussions with many of you in Pasadena last summer, you made it clear that these are the types of activities you wish us to support. We agree, and pledge to continue to develop BG-BASE to conform with the latest international standards for the management of botanical and horticultural information.

Michael J. O'Neal

Kerry S. Walter

## Announcements

The next annual meeting of the American Association of Botanic Gardens and Arboreta will be held at the Montreal Botanical Garden, Canada, from 25-28 July 1995. Contact AABGA at 786 Church Road, Wayne, PA., 19087, USA for more information.

The Fourth International Botanic Gardens Conservation Congress will be held at Kings Park, Western Australia, 25-29 September 1995. Contact Congress West, P.O. Box 1248, West Perth, W.A. 6872, Australia for more information.

BG-BASE will be demonstrated at both of these meetings - hope to see you there!

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## Recent Installations

- **George Landis Arboretum (June 1994)**  
Located in Esperance, New York, this scenic 100-acre arboretum is located 35 miles west of Albany. While the Arboretum was not formally incorporated until 1966, plantings (and documentation of those plantings) began in the 1930s. The Arboretum's office is located in the original farm house, built in 1830. In addition to computerizing the plant records, *BG-BASE* is being used to generate display and accession labels on-site using an engraving machine.
- **Norfolk Botanical Garden (July 1994)**  
Camellias are the star attraction at this garden, with over 600 taxa of this genus in cultivation. Located in Norfolk, Virginia, this 175-acre garden was founded in 1938. Ground was recently broken for a new visitor center, scheduled to open in 1995. *BG-BASE* was selected because the garden had outgrown its existing in-house *PFS:File* plant records system.
- **Hofstra University Arboretum (July 1994)**  
Hofstra University is located on Long Island in Hempstead, New York, on what used to be a military air base. The 238-acre campus has since been completely replanted (although many parking lots look suspiciously like runways!), resulting in the designation of the campus as an Arboretum. *BG-BASE* was installed on one of the University's several *Novell* networks. Future plans include linking *BG-BASE* to the University's CAD-based mapping system, which includes all buildings and utilities.
- **Harry P. Leu Botanical Gardens (September 1994)**  
Three modules of *BG-BASE* (PLANTS, MEMBERSHIP, and EDUCATION) are in use at this municipal garden in Orlando, Florida. *BG-BASE* is being run on *Netware Lite*, a slimmed-down version of *Novell Netware*, connecting four workstations. Both membership and accession data were converted from an existing *dBASE III* system.

*BG-BASE* is now being used by 53 institutions in 18 time zones around the world.

## Recent Upgrades

The following gardens have recently upgraded to version 4 of *BG-BASE* from earlier versions.

Connecticut College Arboretum (membership)  
Cornell Plantations  
Denver Botanic Gardens  
Fairchild Tropical Garden  
Montgomery Foundation  
Niagara Parks Botanical Gardens  
North Carolina Arboretum  
PepsiCo  
Royal Botanic Garden, Hamilton  
Washington Park Arboretum  
World Conservation Monitoring Centre

## Botanic Gardens and Field Gene Banks

At recent meetings on "Conservation and Sustainable Utilisation of Plant Genetic Resources of Central America" at CATIE in Costa Rica, there was a clear consensus that managers of seed banks and field gene banks should be connected with the botanic garden world more than has been the case in the past. Each "side" could learn a great deal from the other, sharing expertise and broadening the concept of both a "botanic garden" and a "field gene bank."

*BG-BASE* was demonstrated to the attendees, and it was agreed that with a few modifications to its structure, *BG-BASE* could function as a much-needed management tool for these critically important collections. We will bring to your attention any developments in this area as they occur.

## Meeting on Living Collections Information Management

The Royal Botanic Garden Edinburgh is contemplating hosting an international conference on Living Collections Information Management, tentatively scheduled for mid-1996. The idea has met with favorable response to date. We would be most grateful to receive an indication of your interest in such a meeting, as well as any particular topics you think relevant.

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## Technical Tip

### VERIFYLH Command - *BG-BASE* version 4

The TCL command VERIFYLH is an extremely powerful diagnostic tool for managing your *BG-BASE* application. Among other things, VERIFYLH tests your files and returns:

- \* detailed statistical information on data distribution and space utilization
- \* recommendations for improving performance
- \* information on any corrupted files, commonly known as Group Format Errors (GFEs)

The syntax for the command is as follows:

**VERIFYLH [locations] [tables] [(options)]**

where:

locations	The location of your <i>BG-BASE</i> files (always DATA for current installations)
tables	The files you wish to test. (i.e., ACCESSIONS, PLANTS, CONTACTS, etc.)
options	Various output and reporting flags. The options are:
<b>D</b>	generate detailed report instead of basic report
<b>E</b>	suppress display of error messages
<b>F</b>	display the report in table format for viewing
<b>K</b>	keep the data from the previous report
<b>P</b>	send the report to the printer
<b>S</b>	suppress display of informational messages
<b>X</b>	display results from the previous test; do not rerun test

For example, if you suspect a problem with your PLANTS or ACCESSIONS file, you could test both of these files at once with the following command:

**VERIFYLH DATA ACCESSIONS PLANTS (DF)**

The most comprehensive VERIFYLH command (and the one we recommend you run regularly) is:

**VERIFYLH DATA (DF)**

This command will test all files in the system, send the results (as records) to a table called

SYSLHVERIFY, then load these records into an entry screen. You can then browse forward (Alt-F) or backwards (Alt-B) through the table examining the results. You will note that in addition to data files, the system tests dictionary files (files that start with "dict"), and index files (files that start with "I") as well.

Also, because the results of this test are stored in a table, you can use the LIST command to view the data in columnar format. A good diagnostic report would include at least these three fields from the SYSLHVERIFY table:

#### SIZELOCK

displays a code that indicates whether your files can be automatically resized, optimum value is 0 or 1 (note: please contact your technical support center if the sizelock is greater than 1)

#### TESTING\_STATUS

displays Group Format Error test results, optimum value is Good

#### RECMD

displays any optimization recommendations

One possible command for displaying these fields in report format (after running the VERIFYLH command) would be:

```
:LIST SYSLHVERIFY TABLENAME SIZELOCK JUSTLEN  
4 TESTING_STATUS JUSTLEN 7 RECMD JUSTLEN 30  
ID-SUPP (P)
```

By running VERIFYLH regularly (say, once a month on a fairly active system), you can minimize the possibility of corrupted data and maximize the throughput of the system. We would encourage users with technical support contracts to forward this report to their support office.

#### Note to users of *BG-BASE* versions 1-3.5:

There is no comparable command to VERIFYLH in early versions of *BG-BASE*. The closest thing is the FILESUMMARY command, highlighted in *BG-BASE News* 1(1):5.

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## Technical Tip

### SAVING FREQUENTLY USED TCL COMMANDS, *BG-BASE* versions 1.0-3.5

By now most *BG-BASE* users have developed a series of commands to generate basic reports. When a particular report is needed, out comes the "cheat sheet" and the commands -- likely several -- are typed in. However, it is possible to save these commands so that you only need to type one word in order to issue the entire command. To demonstrate, do the following:

At TCL enter

```
:TEXT VOC AAH.TEST.REPORT
```

(where **TEXT** is the command, **VOC** is the name of the file (the VOCabulary file), and **AAH.TEST.REPORT** is the name of the record within the VOC file – command names cannot contain any spaces or asterisks)

This will invoke *Revelation's* TEXT editor. On the first line type **TCL** in upper case, then press [ENTER]. On lines two and below, type any valid TCL command(s), each on its own line, such as

```
TCL
SELECT FAMILIES WITH MAJOR.TAXON = "D"
LIST FAMILIES
```

Press **Shift-F2** to file the report, then at TCL enter **AAH.TEST.REPORT**. Doing so will issue both the SELECT and the LIST commands in sequence.

Another good use of this technique would be to shorten the amount of keystrokes needed to call an entry screen. For example, instead of typing **ACCESSIONS.ENTRY** at TCL you could create a much shorter VOC record. At TCL type

```
:TEXT VOC AE
```

then, once in the VOC record type

```
TCL
ENTER ACCESSIONS.ENTRY
```

Press **Shift-F2** to file the record. Now, just by entering **AE** at TCL you will be able to call the **ACCESSIONS.ENTRY** screen. You can create a VOC command for any entry screen in the system. The exact name of an entry screen can be found in the upper left-hand corner of the screen itself. Also, you must always put the word 'ENTER' in front of the screen name in the VOC record.

Like all good things, however, there is potential danger in using this technique incorrectly. Please note that you can inadvertently over-write an existing command stored in the VOC file if you are not careful. If you use the **TEXT** command and find that a record already exists by the name you called it, press **Ctrl-F9** to abort the text editor. Re-issue the command, choosing a different word for the name of the command.

We also strongly recommend that you start the command name with the initials of your institution so that you will not interfere with existing *BG-BASE* commands, which could have serious implications! In other words, you should call the command **AAH.TEST.REPORT** instead of simply **TEST.REPORT** (if you are at the Arnold Arboretum).

Assuming that you use the recommended naming convention, you can then select all "your" institutional reports by a command such as

```
:SELECT VOC STARTING "AAH."
```

Then you could type

```
>LIST VOC (P)
```

to print these special commands. Remember, you can then use the TEXT editor to modify any of these commands at a later stage.

At some point you may wish to delete a command you have created in the system. Using our previous example, the easiest way to do this would be by typing at TCL

```
:DELETE VOC AAH.TEST.REPORT
```

Needless to say, only delete your own VOC records!

**Note to version 4 users:** You can create VOC records in version 4 of *BG-BASE* as well. Instead of using the **TEXT** command (which does not exist in AREV), use the **EDIT** command. Also, press **F9** to save the record instead of **Shift-F2**.

## User Profile

In this issue, we highlight the **Royal Botanic Garden Edinburgh (RBGE)**, one of the two institutional development and support centers for *BG-BASE*. RBGE has been using *BG-BASE* since July 1990, when an earlier, purpose-built system was converted.

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Founded in 1670, the RBGE currently maintains the fifth largest collection of living plant taxa in the world, a collection that draws over 900,000 visitors a year to the Garden. The collection is maintained to support the Garden's horticultural and botanical research (for example, Ericaceae; Umbelliferae; *European Garden Flora*; floras of China, Bhutan, Socotra, among others), training and education programs, as well as for amenity horticultural purposes.

The Garden's 39,055 accessions (44,774 plants) represent 21,449 taxa and 16,693 species, 6% of the world's vascular plant species. There are 2,993 genera (25% of the world's total) and 329 families (61% of the world's total) in cultivation. 20% of the taxa are of hybrid or cultivar origin, the rest are naturally occurring taxa.

The oldest plants in the collection are *Encephalartos natalensis* and *Sabal bermudana* (before 1810) indoors and *Abies alba* (1680) outdoors. Over the past 15 years, the Garden has acquired between 1,785 and 5,305 (average: 3,324) new accessions a year. Since 1977, the Garden has sent out 65,489 shipments of plants, and since 1990, it has initiated 12,524 propagations, 80% of them from seed.

21,108 accessions (54% of the total) are of known wild origin and come from a total of 141 countries. The strongest country representations are from China (3,904 living accessions representing 1,852 taxa), the US (1,847 accessions, 1,230 taxa), and Nepal (1,172 accessions, 692 taxa). The best represented families are Ericaceae (4,417 accessions, 1,908 taxa), Orchidaceae (2,511 accessions, 1,397 taxa), and Rosaceae (1,618 accessions, 1,120 taxa). There are 1,246 taxa of *Rhododendron* alone, one of the Garden's long-term research interests.

The Garden has 1,130 globally threatened taxa in cultivation, of which 13 are extinct in the wild. The Garden heads the international Conifer Conservation Programme, for which individual genotypes are propagated and planted out in 43 sites external to RBGE, and it also works closely with the World Conservation Monitoring Centre in its production of *Threatened Plants of the World*.

The living collections are grown at four sites totalling 117 ha (289 acres) - **Logan** (a subtropical garden in southwestern Scotland), **Benmore** (a very wet site in western Scotland), **Dawyck** (a cold site south of Edinburgh), and **Inverleith** (the site in the city of Edinburgh). The collections are managed as one unit, but each site

has specialty taxa and collections.

Information on the collection is managed using *BG-BASE* version 4 running on a 90-node Novell Netware network using unshielded twisted pair and fiber optic cabling and a 3 Gb, 66-MHz 486 file server (in addition to another server for administration). Approximately 70 of the 220 staff members use *BG-BASE* as part of their scientific, curatorial, management, or public outreach activities. In addition to daily curatorial tasks, *BG-BASE* is used to assess the collections in terms of the Garden's Acquisition Policy. Staff at Logan, Benmore, Dawyck and the Edinburgh nursery are linked to the central file server via 14.4-bps modem links. The Garden has a 2 megbit/sec Internet link and will soon be putting some of its living collections data on the World Wide Web (WWW).

Recently, work has begun to link *BG-BASE* to the Garden's computerized engraving machine as well as to its bar code printers and readers that will be used primarily in the nursery. Work is underway to complete the development of the micropropagations (with the Royal Botanic Gardens Kew) and herbarium modules of *BG-BASE*. The Garden recently purchased a UNIX-based digital photography subsystem for taking and storing digital images of its extensive illustration archives, among other things. These digital images will be stored on optical media and be available to *BG-BASE*.

**Note:** the collection statistics for this User Profile were produced by *BG-BASE* for an external Horticultural Review of the Garden. We will highlight how to produce such analyses in an upcoming issue of *BG-BASE News*.