

# BG-BASE for New Zealand botanic gardens

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## Collections management

Effective management of large botanical collections presents major challenges. Collection managers need to track new plants added to their gardens, where they came from, where and when they were planted, what their current names are, any name changes, and when they die or are removed. Additional to this is the need to generate stock-takes and plant labels.

In our information management age, a database is the obvious solution. Off-the-shelf collections management software has advantages over an in-house system – there is a wider user base, compatibility between records held in different collections, and an independent software development team.

*BG-BASE*<sup>™</sup> is a versatile and powerful system that has been developed over 24 years, having originally been developed for the Arnold Arboretum of Harvard University in 1985 by one of its co-developers (Kerry Walter). It is “a database application designed to manage information on biological (primarily botanical) collections. It is used in a wide variety of botanic gardens, arboreta, herbaria, zoos, universities, and similar institutions needing to document their collections as well as to maintain other biological information” ([www.bg-base.com](http://www.bg-base.com)).

## Modules

There are seven modules available for *BG-BASE*; each can be purchased separately:

1. Living Collections
2. Preserved Collections
3. Conservation
4. Education
5. Propagations
6. DELTA (Descriptors)
7. HTML (Web)

The Living Collections module relates directly to plant records needed to run a botanic garden. Data is maintained in tables such as NAMES,

ACCESSIONS and PLANTS. Where accessions record the arrival of new plants, names and where they are from.

The remaining modules are compiled with specific uses in mind. They make use of common data tables, such as NAMES, but also have their own tables specific to their purpose. So a garden wishing to record its herbarium on *BG-BASE* would purchase the Preserved Collections module and use its SPECIMENS table. Similarly, the HTML (Web) module offers a ready-made format for providing names to database driven websites, such as the RHS Plant Finder (<http://apps.rhs.org.uk/rhsplantfinder>) and the Royal Botanic Garden Edinburgh (which makes both its living and preserved collection information available on [www.rge.org.uk](http://www.rge.org.uk)). This module could provide a regularly updated list of cultivated plants if required, and is potentially useful to projects such as the New Zealand Organisms Register (NZOR), with its ability to export a list of names in a structured format.

## BG-BASE in New Zealand

Dunedin Botanic Garden purchased *BG-BASE* in late 1993, and was the first to adopt this application in New Zealand. The main reasons *BG-BASE* was chosen were that it is a relational database, it worked on a standalone PC (and can be networked), and the application came with support.

At that time, other gardens in New Zealand were using a variety of systems including mainframes, Apple computers, and adapted library databases. However, since then, others have purchased *BG-BASE*:

- 1996 University of Auckland – for managing the plant collections growing in the university grounds.
- 2003 The Botanic Gardens of Wellington – for managing collections of all four gardens

Wellington Botanic Garden, Otari-Wilton's Bush, Bolton Street Memorial Park, and Truby King House and Garden.

- 2007 Taranaki Regional Council – for managing plant collections at Hollard Gardens and Tupare. They also have an agreement with the Pukeiti Rhododendron Trust to use *BG-BASE*.
- 2008 Auckland Botanic Gardens – for managing their plant collections and botanic gardens library.

As at 2009, none of the New Zealand users have their records online via *BG-BASE*. The application is limited to meeting each group's individual requirements. Taranaki Regional Council have purchased the HTML module and plan to use it to drive their Taranaki Plants website ([www.taranakiplants.net.nz](http://www.taranakiplants.net.nz)). Auckland Botanic Gardens have four modules: Living Collections, Conservation, Propagations, and HTML.

## Case-study: BG-BASE at the Dunedin Botanic Garden

The Dunedin Botanic Garden uses *BG-BASE* to maintain records for its living collection. This includes:

- name changes and common names
- source details and wild collection details
- propagations
- staff details
- orders for plants, shipments, germplasm, and our library.

Routine work using *BG-BASE* includes:

- extracting data for labels
- area reports
- nursery stock-takes
- apprentice plant identification tests
- responses to external requests for information.

Although *BG-BASE* has the functionality to do so, Dunedin Botanic Garden does not use the application for:

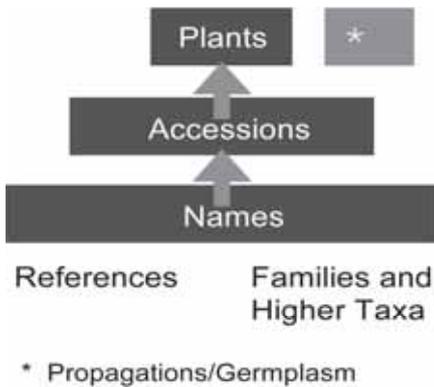
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- managing our small herbarium
- putting our plant names on the internet
- managing our collection of images
- recording wild plants in our bush areas
- GIS mapping.

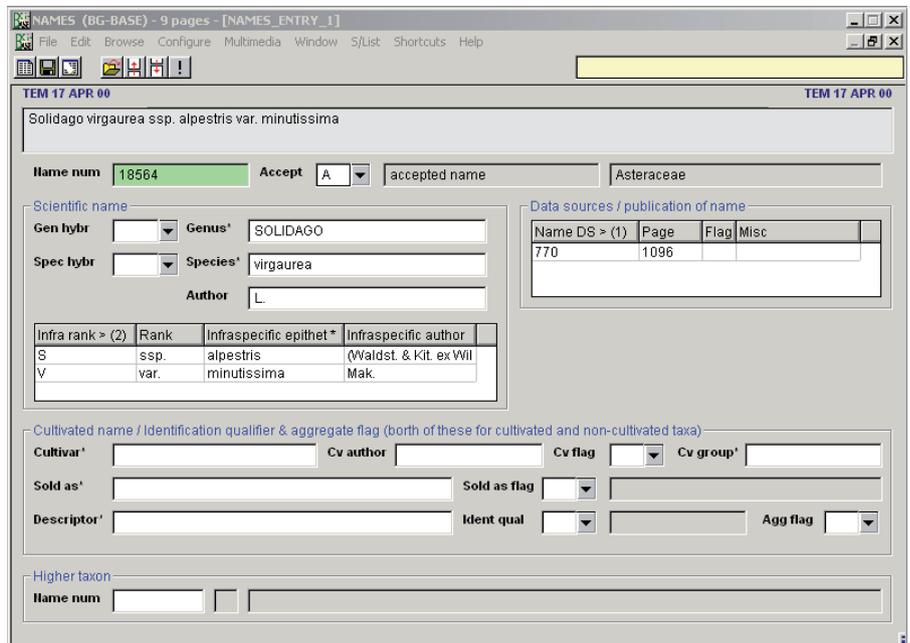
Most staff find the database relates well to their daily work. As new plants are brought into the botanic garden they are registered in the **ACCESSIONS** table, any new plant names are added to the **NAMES** table, if propagation is required this is managed using the **PROPAGATIONS** table and, once ready to plant in the ground, a record is created in the **PLANTS** table.

Accession records provide continuity of information across the system, recording source data, name changes and garden location changes, which make it possible to ascertain if there are living plants of any given name or source. At Dunedin the **NAMES** table contains about 22,000 names, but only about 11,000 of these are in use for 'living' plants. The remaining names are not considered 'living', including both synonyms of the names of 'living' plants and the names of plants no longer alive in the botanic garden. Figure 1 shows how plant names data relates to living plant records.



**Fig. 1** How plant names underlie the living collection data of *BG-BASE*. All plant records require an accession; all accession records require a plant name; all germplasm and propagation (\*) records require a name but not necessarily an accession; not all names or accessions are currently in use for living plants.

Plant names can take many formats including simple species names, unidentified specimen 'descriptor' names, retail names, breeder names, and complex hybrid names.



**Fig. 2** Screen-shot of the Names data entry window. The database is relational: the 'name number' at the top left hand is the relational link 'key field' for this plant name. This number is used in other parts of the database to link to this name. The database uses multivalued fields (fields containing sub-fields). This can be seen in the subspecies area of the Names entry window. Such multivalued fields need to be treated with caution in data export, as many other systems do not 'understand' them; however, *BG-BASE* provides various tools to simplify this matter. The top left and right hand corners of the Names entry window show the staff initials and date of record creation and most recent edit.

A screen-shot of the first page of data entry for the **NAMES** table shows some of the commonly used data fields (Fig. 2). There are nine pages of data entry in all holding data on wild plant distribution range and breeder or introducer information.

### The *BG-BASE* Australia and New Zealand Support Group

Technical support for *BG-BASE* is usually accessed by purchasing annual support agreements with the developers. For questions not of a technical nature users in Australia and New Zealand have recently set up a local support group. This will help with basic questions and queries regarding use of the application.

In an initiative unrelated to the use of *BG-BASE* or any specific database, the Botanic Gardens of Australia and New Zealand<sup>3</sup> (BGANZ) are in the process of establishing a Records Officers group. The role of this group is currently being established.

### *BG-BASE* in other countries

*BG-BASE* has been developed primarily by Mike O'Neal (USA) and Kerry Walter (United Kingdom).

There is a wide user-base – currently 188 institutions from 30 countries are using *BG-BASE*. Collectively these sites maintain information on more than one million accessions of living plants as well as hundreds of thousands of herbarium specimens, making *BG-BASE* the largest distributed plant collection database in the world.

Because participating institutions have identical data structures, they can elect to have their data online, on a Multisite Searches page (<http://rbgweb2.rbge.org.uk/multisite/multisite3.php>).

The Royal Horticultural Society (UK) makes extensive use of *BG-BASE*:

- RHS Horticultural Database (<http://apps.rhs.org.uk/horticulturaldatabase/index.asp>) – "to bring together, into a single cohesive structure, as much horticultural information as possible, based around a comprehensive index of garden plant names".
- RHS Plant Finder (<http://apps.rhs.org.uk/rhsplantfinder>) – "more than 70,000 plants compiled from the catalogues of more than

<sup>3</sup> See [www.bganz.org.au](http://www.bganz.org.au) for general information about BGANZ.

640 nurseries". Data is derived directly from the RHS Horticultural Database.

- Herbarium and standard specimens of cultivated plants, recorded on the RHS Horticultural Database.

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