

Record-keeping

Leo A. Martin

Gardeners and dabblers take care of a few plants. Experts keep notes on what they do so they don't make the same mistakes repeatedly. They also read and make notes of what they've learned.

For plant enthusiasts, proper record-keeping is a dream that is often deferred. It is not hard to keep records, computerized or on paper. I will discuss a journal of extracts, a growing diary, and a database of one's plants. For ease of reading, I will break them up into three parts.

A crucial aspect of any recordkeeping is to keep multiple identical copies of the information in separate places. If computerized, one should back up often or even copy important files to floppy disk or CD, so if one's main computer or hard drive becomes unusable, the data are not lost. Copy the growing journal file to a floppy disk after each change. If this is too cumbersome, do it every week. If you're not willing to back up your data, you might as well not bother with any recordkeeping because your computer--every computer--WILL fail eventually.

Journal of extracts

Scholars in all fields keep a journal of extracts from their studies. In this, they place tidbits gleaned from people with experience. These journals are consulted frequently to avoid others' mistakes.

I copy text from online discussions to a plain text (*.TXT) document I keep on cactus and other succulents. I keep the date, the person who wrote it with their e-mail address in case I need to contact them in the future, and the information.

Entries are alphabetized according to genus. Each new addition is added to the list after the others in that same genus, separated by two hyphens, so the entries for each genus are in chronological order, like this:

Nananthus*

Sun, 3 Oct 1999 09:30:03 -0500 From: "Phil Bunch" <pbunch@>

A few observations from experience. I should say that I grow all of these in a very gritty mix with a lot of pumice, some coir and a little sand. Most are in 2.25 inch pots but some have been potted up to four inch. Growth on the plants in four inch has generally been faster than those in the smaller pots. *Rhinephyllum muirii* is an exception; I see no difference in growth rate.

Nananthus aff. broomii Virginia Mine; transvaalensis

These are from areas that receive predominantly summer rainfall but there is a lot of variation in amount and timing. They may experience some cold weather during the winter. Mine were treated as the *Aloinopsis* mentioned above and have shown a strong

tendency to growth during the late summer and early fall. I had a lot of blooming last winter and little or none during the spring and summer.

--

An asterisk follows each genus heading*. This way searching for the main entry for a genus is easier; searching on Mestoklema will yield all occurrences of Mestoklema, some of which are in other entries, while Mestoklema* will take me right to the entry for that genus. (Asterisk or asterick is derived from Greek for "small star." I like the first spelling better because when doing something dangerous I have only one *.)

I keep extracts from lots of online discussions:

Aroid.txt
bromel.txt
bulbs.txt
CandS.TXT
cp.txt
cycads.txt
orchids.txt
Oxalis.txt
palms.txt
roses.txt
watergardens.txt

How best to keep these documents? There are a number of considerations.

I use plain text (also called ASCII) rather than a word processor format because plain text yields smaller files, they are faster to search, there is uniformity of appearance, and they can be read on ANY computer with ANY software. Word documents are not really portable. If a person doesn't have your version of Word, they may not be able to read the document. Word documents are enormous compared to plain text files holding the same information.

Plain text is just that: letters, numbers, punctuation marks, tabs. No fonts, no formatting. The files are very small compared to word processor files. They usually have a file extension of .TXT. TXT files can be read on any computer with any operating system. One can e-mail them to any friend with a computer and one's friend will be able to open the file.

Mac users have the Text Editor. Be sure to save files in plain text format.

Windows 3 introduced a plain text editor called Notepad (found in the accessories folder) which is quite useful. With Windows 95, users were switched to WordPad, which is a mini-word processor. By default all *.TXT and *.WRI documents are opened by WordPad, and then saved in a proprietary format. It can also be used for recordkeeping, but its files are much larger than plain text files and they are not universally readable--

only people with Windows will be able to open them. So stick with Notepad. Avoid WordPad. Notepad is still there but not obvious. Look in Start | Accessories or you can open it by hitting Start | Run and type Notepad in the box, then hit Enter. If it's not on your computer, you can get the files NOTEPAD.EXE and NOTEPAD.HLP from a friend who has them. Copy them to your Windows\System directory.

Notepad opens and displays almost any file you can think of so long as its name corresponds to the old DOS standard of 8+3, even *.EXE files and *.JPG files. It's fun to open files with Notepad to see what they look like. One can open suspect attachments that might be viruses without danger of running the virus and examine the file for signs of its viral nature. For example, suppose one has a virus attachment called Hahaha.vbs . Open Notepad and use the File Open commands to open Hahaha.vbs. without fear.

Notepad suffers from the DOS file name length limitation and files must have names no longer than 8 characters with an extension of 3 characters. The other main drawback to Notepad is that it can only read files under a certain size. My cactus and succulent file is already 652,167 bytes long. Therefore, those using Notepad may eventually need to break files into several pieces, like volumes of an encyclopedia.

Place a shortcut to Notepad on your desktop. Use the search feature to look for the file NOTEPAD.EXE and place a shortcut to this file someplace where you will find it. If you will use it frequently, put it on your Start menu.

There are text editors available that will handle files of any size (up to the limits of installed memory.) Programmers who write software code use these. Some are not quite as easy to use as Notepad, though not difficult to learn at all. Search on shareware sites for "plain text editor".

A crucial aspect of any record-keeping is to keep multiple identical copies of the information in separate places. If computerized, one should copy the file to floppy disk or writeable CD often, so if one's main computer or hard drive becomes unusable, the data are not lost. Copy the growing journal file to a floppy disk after each change. If this is too cumbersome, do it every week. If one is not willing to back up one's data, one might as well not bother with any recordkeeping because the computer WILL fail eventually.

Growing journal

Professional gardeners keep journals. They can see what was happening at a given season in years past; find out what did or did not work in the past; look up the identity of a plant whose nametag has vanished; and so on.

The journal may be kept on paper, as has been done for centuries. The advantage is ease of carrying into the growing area.

I like computerized record-keeping. The advantage is ease of searching. If I want to see how *Acanthocereus* did a few years ago, I just search for *Acanthocereus* and page through the records.

Some keep their growing journals as a single text or word processor document, with entries dated and in chronological order. This works very well. Create a document and place the document on the desktop where one can find it. After each gardening activity, record notes of what was done, what is blooming or breaking dormancy, what is not doing well, what birds one saw that day...anything. After a year or so has been accumulated, one will see the necessity of keeping such a journal.

Some keep their journal together with the plant database. The database can be on index cards in a box, one card for each plant. It can be on paper in a loose leaf notebook with a different plant on each page. On the other hand, the database can be in a computer, either in a database program or in a text document. I use a computerized database program. I have a text field with each plant record in my database. When I work with a plant, I pull up this record and write what I did in the text area, with the current date. Those using a paper card file or loose leaf notebook would make another entry on the card or sheet, and when a card or sheet is filled, add another card or sheet after the filled one. Those using a computerized text document for a database would simply make another entry under the last one for one long document.

Just a few words now and then add up rapidly. I strongly encourage you to begin your gardening journal now.

Plant database

Those who have inherited collections from retiring growers may also received a box of index cards containing information about plants, one card for each plant, with the cards for dead plants in the back of the stack. This is a database. Growers with more than a few plants need some kind of database to record information about:

- where it came from, so it can be replaced or, its legality proven in case of CITES-listed plants or endangered species.
- how much it cost, for insurance purposes in case of disaster. (How much would it cost to replace your collection? A lot more than you might think!)
- who got cuttings, so you can get one back if the parent dies.
- what is its name and which family it belongs to.
- when you have repotted it.
- how you have grown it, including pest attacks, control methods, fertilizer used, weather experienced, anything.

For years, people used paper index cards and loose leaf notebooks. You can still do this. Now you can use computerized equivalents as well. Computerized databases allow much faster and more exhaustive searching as well as easier copying. Programs like MS Access, Lotus Approach and the open-source Open Office, available free from www.OpenOffice.org, are not hard to use. If you're lazy, you can buy a pre-programmed plant database for use with MS Access.

A few principles are necessary for all databases paper or electronic to function properly. Each item in the database (plants, for our purposes) will have the same kinds of information entered. For example, for each plant there will be a genus name, a species name, and so forth. One bit of information is called FIELD. Together, all the fields for one item are called a RECORD. There will be a unique RECORD for each unique plant.

Each item in the database MUST have a unique identifier. If you have six *Acanthocalycium violaceum*, you need some way to tell them apart. For people living in the US this identifier is their Social Security number. This number is called the KEY for that RECORD. Any number-assigning method is fine so long as no two things have the same number. Some growers start with the number 1 for the first plant, 2 for the next, and so on. Some use numbers under 10000 for one family, between 10000 and 19999 for another, and so on. It doesn't matter so long as no two plants have the same number. It is probably better not to select a limited numbering strategy, like all numbers under 100 for cacti. What will you do for your 101st cactus? Those are the only important rules for simple databases.

Note that you can write only the key number on the plant label and look it up in the database if needed. This saves time and allows smaller labels. Maybe metal labels are now affordable.

For plants, I would suggest at least the following fields for each record:

Key number (1, the first plant to be entered in the database)

Genus name (Acanthocalycium)

Species and (violaceum)
subspecies,
variety, or
cultivar name(s)

Plant family: (Cactaceae)

Date received: (1998 05 25)

Cost: (\$0.50)

Received from: This could be more than one field, like the person or business, the city, state, country, etc.)

How received: (seed, bare root, bulb, potted, etc.)

Where now: (patio, east greenhouse bench)

Notes: (write notes in chronologic order here. Soil mix used? Dates of bud appearance, blooming, who got a cutting, etc.)

Now, how to do this? For those without computer access, it has been done for years on paper. Because most people will want to sort by plant name, but each plant will have a key number, you will also need a table showing which key number goes with which plant name.

If you have a database already on paper, you can convert each card or sheet to a computerized database record in the future. It will involve a lot of data entry from the cards to the keyboard but it is not impossible, especially if you enter a few cards each day. If you already own a database program, or have a computer, skip to that section below.

First, I will go over how to do this on paper.

On paper

For index cards: blank cards and two boxes in which to store them. Two smaller notebooks with paper (may be bound) or two pieces of loose leaf paper.

For a notebook: loose leaf sheets of paper and two binders in which to store them. Do not start with a bound notebook. Why two rather than one of each? Read on.

1) Have two sets of cards or two notebooks and write the information on each card each time. Store the sets in two different places. You will eventually be glad you did so.

2) Decide on which field to sort the stack (key number or plant name). Do this for all cards or sheets. For this example, we will use the plant name but many people use the key number.

3) Write the records. For index cards: Take out two cards. For loose leaf sheets: Take out two sheets of paper.

Write the sorting field for each plant on the index lines of two cards or at the top of two sheets of paper. Keep all the cards or loose leaf sheets together in a stack in card boxes or binders, respectively. For example, using the record above, if you wished to sort the stack on name, write on the index line *Acanthocalycium violaceum*.

Under this index, write the rest of the information, in the same place for each record. For example, using the record above:

Key number: 1

Plant family: Cactaceae

Date received: 1998 05 25

Cost: \$0.50

Received from: Mesa Garden

How received: Seed

Where now: Sprouting pot

Notes: MG#6. Planted in fine gritty granite gravel, keeping moist outside. Covering when frost expected.

4) Write the cross-reference table of plant name to key number. For index cards: Take out the two sheets of paper or open the two notebooks. For loose leaf sheets: Take out two sheets of paper. On each, write the key number in the left column, and the plant name in the right. These same sheets will be used to hold the entire table. When these are filled, start another. It will eventually look like this:

Key number	Plant name
1	Acanthocalycium violaceum
2	Mestoklema tuberosa
3	Mitrophyllum clivorum
4	Dorotheanthus bellidiflorus
5	Titanopsis calcarea

For index cards: Store each cross-reference notebook with one of the record boxes. Or, fold the cross-reference sheets and keep in the box with the cards. For loose leaf sheets keep the cross-reference sheets at the front or back of the record notebook.

5) Keep adding records. For index cards: For each new plant, fill out another pair of index cards. Add the key number to the cross-reference tables. For loose leaf sheets: For each new plant, fill out another pair of loose leaf sheets. Add the key number to the cross-reference tables. File the new records according to your choice of index in this example, alphabetically by plant name.

6) Keep notes regularly. Write notes on the card or sheet after the standard fields. Take the time to write your notes twice, once on each stack. Store the stacks separately.

When notes have filled the entire card or sheet, start another. File it after the index card or sheet for that plant.

7) Refer to the notes regularly. If a plant flowers much better one year, you can go back and try to figure out why. If you have killed a plant repeatedly, you can see what you have done and try something different.

8) Duplicate sets are important! It seems a lot of work to write everything twice. What will happen if your house burns down or a flood destroys your cards? All that information will be lost. Keep the duplicate in a fire safe or in another building.

9) Get used to writing the key number on labels. You can find the plant in the database right away. Write the key number on the point of the label where it will be below ground. This way, if the label snaps off, the plant can still be identified.

On the Computer

If you have computer access, doing the database on the computer is much easier and allows easier searching and copying of the database. I highly recommend using the computer if available, and not doing your database on paper. If you have a database already on paper, you can convert each card or sheet to a computerized database record.

Making duplicate copies is much easier on the computer. One simply copies the database files to another location, whether another hard disk, removable media, or CDROM. You do not need the separate cross-reference table for plant name and key number.

You will need: A program for keeping the database. Any can be used. They will require some learning. If you have a database program already, use it.

Microsoft Office has the database Access. It is extremely expensive to buy if it did not come bundled with your computer. There are many free or inexpensive shareware database programs available on the Web. I strongly recommend Open Office, a free download from www.OpenOffice.org. It reads all Windows file formats. I recommend using Open Office if you haven't used a database before.

You can also consider using Google's online suite for keeping your database. That way you can access it from any online computer in the world, and they take care of your data backups.

It is beyond the scope of this message to teach database use for every possible database. The basic idea is that you plan the database structure well in advance on paper. Then you construct the database with the program. Then you enter data. Get it right the first time. This means you must think before doing, often a novelty for me.

You will plan not only what fields to use but also whether the information that goes in each field is text, a number, a date, or whatever. You will also need to tell the computer

how many digits maximum go in each field (except for note fields, which may be quite long).

The design given above is serviceable. So, to begin, open the program. Issue the command for a new database. Give it a name (my plants, for example).

The program will ask the name of the first field. It should be the key number; call it KEY. The program may ask what type of data this will be (text, numerical, date, currency, notes, etc.). Tell the program it will be a numerical field. The program may ask for the format of the number and offer to automatically increment the number with each entry. I recommend not to let it automatically do so but rather that you should enter the number yourself each time. Use a maximum length of eight digits or more, which allows at least a hundred thousand records. Who knows?

Then the program will offer to set rules for the records. It is useful for the KEY to have a rule that this field must be filled out for each record, since this will be what is used to sort the database. It is also useful to have a rule to check the KEY for uniqueness. You might accidentally enter a previously used number and the computer will catch the error.

Once the KEY field is defined, the computer will go on to the next field. I would recommend using GENUS next. Do not put genus and species in one field; use two fields. Again, tell the computer it will be text, define a length (usually 25 characters is enough). This field will not be unique so do not put in a rule for this. You might have a rule that this field must be filled out, even with a question mark.

The next field could be SPECIES. It might be longer than the GENUS field if you will be putting "ssp, var, fma, cv" or the like along with the species name. Or, you might create a third field SUBTAXON for these. The SPECIES field could have the default entry "sp" automatically assigned for one to change. It could have a rule requiring this field to be filled out. If you choose to use a SUBTAXON field, it would go next. It should not have a rule requiring it be filled out since it will not be used all the time.

I would next enter FAMILY as a field. It should have a rule requiring it be filled out, even with "?". For this field I have a list of families built and a drop-down box from which I can choose. When I type the first letter, the first family name beginning with that letter appears in the box, and I can scroll with the arrow keys to arrive at the proper one. This eliminates misspellings. You could do the same with GENUS, but it would be a lot of work because there are so many more genera than families. It is easy to add more entries in the future to these drop-down lists. Databases also allow adding photos! I would then enter the remaining fields, finishing with a free-form notes field of unlimited length.

To use the database, open it, and go to the data entry view. You can copy a previous record, assign a new number, and change the fields as needed. Or, you may begin with a new blank record. Get used to writing the key number on all labels.

Get in the habit of making new entries as soon as plants, seeds, or cuttings are received, and as soon as you have worked with them. Also, get in the habit of reading your notes regularly; for example, when acquiring *Mitrophyllum clivorum*, read in your database about other Mitros, and also look them up in your extract journal.

When you have worked with a plant, open the database, go to the appropriate record, go to the notes section, and record what you observed or did together with the date. There will be a record of the plant's growth.

You can search any field in the database for a particular word or number, or you can search the entire database.

Find out which files your program generates for each database and be sure to back up and keep multiple current copies of all these files in different places. Mine still fits on a 3 1/4" floppy disk.

There are other approaches to use. If you're really a technophobe you may duplicate a paper card file or notebook database on the computer with simpler tools. These approaches are not quite as useful as a full database program but much simpler.

You can use a word processor or plain text document. Every plant becomes a different entry. You should still use the key identifying number and have the same fields for each plant. You can use the search function to find information. Beware: Your document will probably get very long very quickly and take a long time to load.

The first section of your document will be the entry template:

Genus species #
Plant family
Date received
Cost
Received from
How received
Where now
Notes

The next section of you document will be the key number-plant name cross-reference:

1. *Acanthocalycium violaceum*
2. *Mestoklema tuberosa*
3. *Mitrophyllum clivorum*
4. *Dorotheanthus bellidiflorus*
5. *Titanopsis calcarea*

To make an entry, highlight the template text, copy to the clipboard, and paste into the document at the appropriate spot. Then go to the name-key number cross-reference list and enter the key number and name at the appropriate position.

You must keep this sort of database alphabetized on your own. It is useful to insert a page before each new genus with just the name of the genus followed by an asterisk, like this: *Acanthocalycium** to make searching easier. Searching on *Acanthocalycium** will take you straight to the start of the *Acanthocalycium* records.

As before, you must make multiple copies of the current file and keep them separate to avoid losing your work.

Windows 3.0 program had a program called Cardfile. It is simply a computerized index card file. Cards are automatically alphabetized according to what is on the index line. You can add new cards easily at any place in the stack, duplicate cards, and edit text on the card. It even accepts bitmap images to be pasted on the card!

The program consists of two files, `CARDFILE.EXE` and `CARDFILE.HLP`, which are in the Windows directory of a Windows 3.x installation. To put on a newer Windows computer, copy the files into the Windows directory of the newer computer. Find the `CARDFILE.EXE` file. Make a shortcut to the file and put the shortcut on the desktop or on the Start menu.

Run the program. A blank card is displayed with the cursor in the body of the card. Type something like "My plant file." There will be nothing in the index line. For sorting purposes, nothing comes before something and spaces come before special characters like ~ ! @ #. Numbers come next, then letters. This card with nothing in the index will always be on the top of the stack. Save the file with the commands File | Save As and give it a name (but limited to only eight characters.) Perhaps the name could be "MYPLANTS." `CARDFILE` data files are stored with default extension `*.CRD`, so the file would be `MYPLANTS.CRD`. Store the file where you wish. Find the file and make a shortcut, placed where you wish. Close the program.

Next, tell you computer to open all files with an extension `*.CRD` with the `CARDFILE` program. Using the search, find your plants cardfile (from the example above, `MYPLANTS.CRD`). Right click on the file and go to Properties or Settings. Go to the Associations page and associate the extension `*.CRD` with the file `CARDFILE.EXE`. Or, go to Start, Settings, and find the file association utility buried there, and do the same. Now any file with extension `*.CRD` will be opened with `CARDFILE.EXE`.

Now, let's use the database. Open your database by double clicking on the icon or shortcut `MYPLANTS.CRD`.

Create a template for all your future cards. This card will be copied and the information changed for each new record. From the menu, Card | Add (or shortcut key F7). The index line is shown. On this line put one space (hit the spacebar once;) then type "Genus species #" and hit enter. Because the index line starts with a space, this card will be sorted just behind the front card with no index, and in front of other cards with indices beginning with characters, numbers, or letters. It will always be the second card in the

deck. To find it fast, Search | Go to or F4, type a single space in the box, then hit enter. On this card, put the cursor in the body of the card. Type:

Plant family

Date received

Cost

Received from

How received

Where now

Notes

Add any other fields you wish. There are ten lines per card, so you may wish to combine several entries per line.

Now save the file (File, Save).

To enter a new plant, use the template. Have the template visible. Duplicate the template from the menu with Card | Duplicate. Edit the text of the new card with Edit | Index or F6. The whole index is shown highlighted; when one begins typing, this will be replaced. Replace "[space] Genus species #" with the name and key number of the plant you are entering. For example, *Acanthocalycium violaceum* 1. Hit enter. The cursor moves to the body of the card. Replace the section headings with the proper information. When you are done, save your work. The new card should look like this:

Acanthocalycium violaceum 1

=====

Cactaceae

2001 05 25

\$.50

Mesa Garden

Seed

Sprouting pot

MG#6. Planted in fine gritty granite gravel, keeping moist outside. Covering when frost expected.

Repeat the process for future cards.

When the card is full, make another with the same index: On the menu, Card | Duplicate. The new card will have the identical information as the previous one and will be filed after it. Delete the text in the body and begin typing.

For the cross reference index of plant name to key, make a new card (Card | Add or F7.) In the index type one ! because this shifted number is sorted before the rest. Computers alphabetize these characters (like % or # or @) ahead of letters and numbers. Hit enter. This card will be near the top of the stack, just behind the template card. On this card, begin the cross-reference list as before:

1. Acanthocalycium violaceum
2. Mestoklema tuberosa
3. Mitrophyllum clivorum
4. Dorotheanthus bellidiflorus
5. Titanopsis calcarea

When this card is full, duplicate it (Card | Duplicate), delete the old text on the new card, and resume entering data.

The normal CARDFILE view is one card at a time, with the indices of a few later cards visible. You can change the view to a list of just card indices on the menu, View | List and back again with View | Card.

To page through the stack hit Page Up or Page Down. To go to the first card in the stack hit Ctrl-Home. To edit the index information, Edit | Index or F6. To search the stack, Search | Find or F4. The stack can be printed, but each card will be printed in the center of a separate piece of paper.

Remember to make extra copies of your data on another drive or on removable media. It would be a good idea to include the CARDFILE.EXE and CARDFILE.HLP files too since they are not commonly found any more.

A crucial aspect of any record-keeping is to keep multiple identical copies of the information in separate places. If computerized, one should copy the file to floppy disk or writeable CD often, so if one's main computer or hard drive becomes unusable, the data are not lost. Copy the growing journal file to a floppy disk after each change. If this is too cumbersome, do it every week. If one is not willing to back up one's data, one might as well not bother with any record-keeping because the computer WILL fail eventually.