

BULBS

The International Bulb Society Quarterly

Volume 3 No. 1

Mar/June 2001

International Bulb Society

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Cathy Craig	Jim Shields	Lawrence Edmonds	Pete Jones
Bulbs@bulbsociety.org	Jshields@indy.net	cle11104@hotmail.com	PCJones@erols.com
949-369-8588	317-896-3925	718-706-1283	703-521-0674

BULBS

The quarterly publication of the International Bulb Society

Editorial Staff	Columnists
Editor	Books
Columns Editor	Pests & Diseases
Associate Editor	Bulb Basics
Pre-press Graphics	

Do you have comments? We want to hear from you! Send comments to: BULBS - Editor, PO Box 92136, Pasadena, CA, 91109-2136, USA. Email to: Editor@bulbsociety.org

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Join the International Bulb Society! Member benefits: annual *Herbertia*, quarterly *BULBS*, semi-annual Seed Exchange (SX), educational website, book discounts, email Bulb Forum, and the Bulb Exchange (BX) (for members of the email Bulb Forum).

1 Year US	\$40.00
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Check, money order, international postal money order, or credit card*

Make payable to: IBS (in US funds only) and mail to: Dave Lehmilller, Membership, 550 IH-10 South, #201, Beaumont, TX, 77707, USA. Email to: IBSMEM@aol.com

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Come to Los Angeles in 2002!

“IBS International Bulb Symposium”

Held at the prestigious Huntington Botanic Gardens

Weekend of April 27th & 28th

Friday April 26th

Social Hour for early arrivals 6pm-7pm

Saturday April 27th

Breakfast

Welcome	President Robert Turley	
Slide Presentation	Dr Dave Lehmilller	Crinum

Break

Slide Presentation	Phil Adams	Lycoris
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Lunch

Slide Presentation	Dr Alan Meerow	Worsleya
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Break

Awards Banquet

Herbert Medal & Traub Award Presentation

Rare Bulb Auction!!

Slide Presentation	Charles Hardman	Hippeastrum
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Sunday May 6th

Breakfast

Slide Presentation	Jim Bauml	Hymenocallis
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Break

Slide Presentation	Michael Vassar	Oxalis
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Registration: by 4/15/02 \$125, after 4/15/02 \$150, at the door \$175

Don't miss out! Reserve your place now. Send your name, address, email address, and check made payable to IBS to: Cathy Craig-IBS-LA 2002

307 Calle Sonora, San Clemente, CA, 92672 or email Batlette@home.com

Or sign up at the IBS web site (available soon): www.bulbsociety.org/

NEWS FROM THE EDITOR

Sharpen Up Your Pest Control Skills

When I was a child I spent quite a lot of time with my paternal grandmother. Grandma Sheller was an avid, if eccentric, gardener. When she 'heeled in' a plant it got heeled in by carving out a rude trench, throwing the plant in lopsided, a handful of dirt dumped on top, and stomped in with her bare foot (she virtually never, ever, wore shoes in her life). In fact, this 'method' often ended up being the only planting a particular plant ever got at her place. This was by no means the end of her eccentricities but I will save those for another time.

I came to gardening late in life, very late 40-something, and some of her peculiar gardening habits have come back to me in the intervening years and have served me very well. In particular, my most cherished and oft-used pest control tool is a simple pair of scissors. I remember following her around as she collected ripe tomatoes and watched with horror and revulsion (at the time), as she sniped tomato worms in half by the dozens.

This now-indispensable tool is what I use on any offender large enough (and slow enough) to find itself between the sharp snap of its blades. Caterpillars, slugs, snails, and even grasshoppers and leafhoppers (if you are very quick and have excellent hand-eye coordination), can be dispensed with immediately without chemical warfare and more importantly, without touching the yucky thing. You must remember to keep the scissors sharp though. While you may get a second chance at a slug once-missed, you are not likely to get second opportunity to bisect a leafhopper. If the blades are not sharp, it is easy for your target to slip out intact.

We Meet Again

I have grouped the issues this year as I did the Sept/Dec 2000 issue, partly from pricing pressures and partly due to time constraints. The learning curve goes on as procedures change with every issue and overcoming obstacles and problems takes up most of my editorial time. I never fully appreciated the meaning of the word 'infinite' until I assumed this job; there are an infinite number of things that go awry with every issue. Just keeping track of everything is an enormous task itself. Even with all the problems, I enjoy this job more than any I have had in the last 30 years (including the ones I got paid for) and after more than 18 months on the job I am just now feeling like I am getting the hang of it.

We have some really wonderful articles coming up this year. Oh, ok, one little peek; Brian Mathew is writing about some 'particular' (I told you, only a little peek) hardy bulbs in the next issue. Please check the mailing label that came on this issue (or on its envelope) and make certain that your membership expiration date is current. You won't want to miss a single issue!

...And Again

Speaking of meeting, don't forget to get out to the local IBS members' meetings being held throughout the U.S. this year. Our members have gone to a great deal of trouble to organize these meetings for your pleasure and enjoyment. Check out the meeting information in the "IBS NEWS" section under the heading "The Future - Upcoming IBS Events", contact the person in charge for details, mark your calendar, then make sure you go! Let's not be content to remain merely 'members', let's be participants! If you don't drive or have other problems, call the contact person; often they can find you a ride or help out in some other way.

Just remember; Christmas is coming...and I'm keeping track.

Third Annual IBS Members' Meeting

Our third annual Members' meeting will be held in Los Angeles (in San Marino to be precise - a suburb of L.A.) the last weekend of April 2002, at the prestigious Huntington Botanic Garden. Information about this spectacular event can be found in this issue on page 1. The registration form is on page 5. Register early! You may register by snail mail (see registration form), at our web site www.bulbsociety.org/, by email Batlette@home.com, by phone (949) 369-8588, or (new!) by FAX (253) 322-5510.

Everything on page 1 is included in the registration fee as well as all breaks and meals through Sunday morning. Our webmaster, Kelly Irvin, will shortly post additional information, including lodging choices, on our web site www.bulbsociety.org/. See you in Los Angeles!

C Craig, editor

BULBS

Volume 3, Number 1

March/June 2001

TABLE OF CONTENTS

Come to Los Angeles in 2002!		1
Editorial	<i>by Cathy Craig</i>	2
Meet the Board: Jim Shields VP		4
LA 2002 Registration Form		5
IBS News: Meetings & Making Friends		7
Extraordinary Oxalis	<i>by Dr Andrew Wilson</i>	10
IBS First Edition Membership Pin		16
Bulb Basics: What IS a Bulb?	<i>by Carol Wallace</i>	18
In Remembrance: Jim Robinett	<i>by Mary Sue Ittner</i>	22
Books: Well Versed	<i>by Lisa Flaum</i>	23
Hardy Bulbs	<i>by David Fenwick</i>	25
En Garde! Home Made Insecticides	<i>by Roy Sachs & Bill Richardson</i>	29

PHOTO CREDITS

We gratefully acknowledge the following persons who generously contributed their own photographs to this issue of BULBS: Arnold Trachtenberg, Andrew Wilson, Jack Elliott, David Fenwick, Cathy Craig, Michael Vassar, and Bill Dijk.

ADVERTISE IN BULBS!

If you have a small nursery (or not so small) consider advertising in BULBS. Our readers have demonstrated their wish to support businesses that advertise in The International Bulb Society publications.

Ad Rates:	BLACK & WHITE			COLOR		
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¼ page	\$60	\$50	\$200/4	\$75	\$65	\$260/4
½ page	\$100	\$82.50	\$330/4	\$140	\$120	\$480/4
Full page	\$160	\$132.50	\$530/4	\$280	\$240	\$960/4

To inquire about placing ads please see inside front cover this issue.

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The International Bulb Society, Inc., is a non-profit organization. Said corporation is organized exclusively for educational and scientific purposes; and especially to promote, encourage, and foster the horticulture, development, and improvement of bulbous or geophytic plants and public interest therein. These purposes are expressly limited so that IBS qualifies as an exempt organization under IRS code section 501 (c) (3).

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COVER ARTWORK

The photograph on our front cover was very generously donated for our use from the private collection of Bill Dijk.

WHO'S WHO IN IBS

Jim Shields IBS VP

This is one in a series of articles that will introduce each of the people who serve on the board of directors of the International Bulb Society. In this issue, we present Jim Shields current vice president of IBS. Ed.

Jim joined the American Plant Life Society [APLS was the original name of the International Bulb Society, ed.] in the early 1970's and has been a member ever since. He currently serves on the IBS Board of Directors as Vice President and also chairs the Bulb Rescue and Conservation Committee (RESCON) of IBS.

Three generations of the Shields family are now hybridizing daylilies in Jim's nursery business. The nursery covers one acre with two greenhouses that are used for tender bulbs and for starting daylily seedlings. His daughter, Andrea, learned to hybridize when she was a child and still works with the daylilies. Andrea gave her four-year-old son, Brian, his first lessons in hybridizing this past summer. Jim's wife, Irma has done some hybridizing herself. They introduced her first registered daylily cultivar, 'Belle Noire', two years ago.

Jim's newest project is to acquire cold hardy and damp-tolerant strains of bulbs from California and from South Africa. He is acquiring stock from the higher elevations and colder regions of the northwestern US and from the Drakensberg in South Africa. The candidate seedlings are being planted out into nursery beds for testing and the survivors will then be hybridized. Jim believes the current climate trend of a lengthening growing season may favor this project.

Jim and Irma have returned to Switzerland nearly every year in the past decade to visit Irma's family. On one of those visits, he visited HERBERT MEDALIST Sir Peter Smithers at his home in Vico Morcote, outside Lugano in southernmost Switzerland. Jim says, "He is a charming gentleman, and his home is magnificent with a steep hillside garden below."

Last year they took a trip to South Africa with John Bryan who is an author and editor of books on bulbs. The tour lasted 18

days, starting in Pretoria, going through Kruger National Park, and finally driving the entire Garden Route along the south coast from Port Elizabeth to Cape Town.

In Pretoria, they toured the National Botanic Garden with Dr. Robert Archer, an IBS member. A few days later, Mr. Floris Barnhoorn, the managing director of Hadeco Pty Ltd., breeders of *Hippeastrum*, took them on a tour of the main farm. In Cape Town, they had dinner with Rod and Rachel Saunders, two very well known South African plantspeople and IBS members. [See Rachel's article in this issue, Ed.] They also managed a full day at Kirstenbosch National Botanic Garden, outside Cape Town, where they talked with Dr. Dee Snijman and met Peter Goldblatt, and Graham Duncan.

Jim says: "It was our first trip to South Africa, but decidedly not the last. Were it not for IBS and the Bulb Forum, I would never have met these wonderful people!"

Jim was born and reared in Indiana. He graduated from DePauw in 1956 with an BA in chemistry, then earned a Ph.D. in biochemistry at the University of California at Berkeley and finished with a postdoctoral in Switzerland from the Organic Chemistry Institute of the University of Zurich. He married his Swiss wife, Irma before returning to the United States.

After a brief stint as an assistant professor of chemistry at Case Western Reserve, he moved to the biochemical research department of Eli Lilly and Company in Indianapolis, Indiana where he worked on peptide and protein research related to endocrinology and particularly to insulin and diabetes. Jim retired in May 1996 to enjoy his long-time hobbies of growing and hybridizing daylilies.



International Bulb Society

International Symposium 2002 Registration Form

Los Angeles, California, April 27th & 28th

Registration for the Symposium includes all meals for Saturday and breakfast on Sunday at the Huntington Botanic Garden in San Marino, (near L.A.) CA. Registrants are to arrange their own transportation and accommodation.

Please fill out this form and return to the IBS address below.

Registration received by 4/15 is \$125. Late registration, received after 4/15 is \$150.

Registration at the door will be \$175.

_____ in my party. I am paying \$125 each (by 4/15) -or- \$150 (after 4/15)= \$ _____

TOTAL= \$ _____

MAILING ADDRESS

Name: _____
Address (line 1): _____
Address (line 2): _____
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State: _____
Zip Code: _____

Telephone: _____
E-mail Address: _____

My method of payment is (circle one): check money order MasterCard VISA

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Name (as appears on card): _____
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CREDIT CARD INFORMATION

Credit Card Number _____

Expiration Date (MM/YY): _____

I authorize IBS to charge my credit card for the full sum detailed above.

Signature: _____



After completing this form, please attach check or money order (US funds only please), if not using a credit card, and send to:

Cathy Craig
IBS Treasurer
307 Calle Sonora
San Clemente, CA 92672

For further inquiry contact Cathy Craig: Ph (949) 369-8588, or via e-mail at batlette@home.com.

You may **FAX this registration** to Cathy at: **FAX (253) 322-5510**

BULB AUCTION

CALL FOR DONATIONS of BULBS LA 2002 IBS SYMPOSIUM BULB AUCTION

ATTENTION all members:

We need your bulb donations bulbs for the LA2002 IBS Bulb Auction
If you intend to donate bulbs you need do only two things:

1. REGISTER YOUR INTENT with Herb Kelly Jr. by email
HkellyJr2@aol.com, or phone 559-294-7676. Send him the following:

- A. GENUS NAME
- B. ESTIMATED QUANTITY OF BULBS

2. SEND THE BULBS to Marvin Ellenbecker:

Marvin Ellenbecker – IBS Curator
1134 South Ross Street
Santa Ana CA USA 92707-1220

IBS-LA 2002

EXHIBITOR TABLES AVAILABLE

Outside vendors may now reserve tables for plant sales

\$100 per table for payments received by March 31, 2002

\$125 per table for payments received on or after April 1, 2002

CONTACT: John Ingram, Exhibitor Committee Chairman

Email: jjingram@pacbell.net. Phone: (303) 650-9360.

LIMITED TO 10 TABLES ONLY

IBS NEWS

THE PAST - REVIEWED

Second Clivia Symposium (report by Randy Baldwin of San Marcos Growers)

The second Clivia Symposium was held at the Huntington Botanic Garden in Arcadia, California, on March 10-11, 2001. The first "symposium" (also held at the Huntington) was in 1996 and was a much more informal event. I felt this more recent symposium was fantastic. There was a tremendous amount of information shared by both speakers and attendees, and there were also many Clivia plants and photos on display. A particularly nice aspect of the symposium was the long breaks, usually an hour between speakers, allowing the participants to network. I was able to meet the speakers, talk with attendees, join the Clivia Club, order seeds, get coffee, view the plants on display and in the gardens, all without feeling rushed.

Some highlights: seeing Jim Comstock's beautiful photos of Clivia seeds, foliage and flowers displayed in the entry hall of the Botanical Center, looking through the draft copy of Harold Koopowitz' and Jim Comstock's new Clivia book, meeting Connie & James Abel from Pretoria who were signing people up for the Clivia club and selling seed, putting a face to several people I only knew through email, and enjoying the great lunch and dinner on Saturday.

The speakers were: Jim Folsom (director of the Huntington Botanic Garden), Harold Koopowitz (author, educator and symposium organizer), Tino Feraro (South African Clivia breeder), Shigetaka Sasaki (Japanese clivia breeder and Yoshikazu Nakamura associate), Dr. James Waddick (author, plant researcher), James Comstock, and David Conway.

For a more thorough review of the topics discussed by each speaker, please see: www.smgrowers.com/info/clivia.asp_or [www.smgrowers.com/and look for the Clivia Conference link](http://www.smgrowers.com/and_look_for_the_Clivia_Conference_link).

Way to go Harold - I can't wait for the third symposium!

THE PRESENT NEWS

HERBERTIA Update and Sneak Preview

HERBERTIA volume 55 is in production and will hopefully be in members' hands by this fall. The journal is nearly ready to be sent to the printer at this writing. I hope to also be able to sneak volume 56 in just before the New Year, thereby putting the journal back on schedule. I appreciate the patience of the IBS membership; scanning and editing myriad slides is a time-consuming task. (Authors can help facilitate this process by insuring that their contributions are prepared according to the contributors' guidelines posted on the IBS web site and printed in every issue; by providing electronic copy of their word-processed articles at submission, and when possible, sending 1000 DPI resolution TIF format files of their illustrations.)

Highlights of volume 55 include an excellent article on *Calochortus* by Dr. Hugh McDonald, several articles on *Eucomis*, a review of horticultural parameters for producing *Triteleia* by Dr. Susan Han, articles on *Corydalis*, *Fritallaria*, propagation of "specialty" bulbs, a very nice article by the McMasters on East Cape bulbs, several other profiles of South African bulbs, an article on *Siphonochilus* (an African ginger related to *Kaempferia*), and a new *Crinum* sp. from Dr. Dave Lehmler. As in vol. 54, a compiled bibliography of geophyte literature for 2000 will be provided.

"IBS AFFILIATE" PILOT PROGRAM LAUNCHED

The IBS is excited to announce a new program for non-members that will introduce them to many of the benefits offered by IBS - all for only \$14.95! The category "Internet Affiliate" (IA) is scheduled to make its official debut in the year 2002. If you are already an IBS member, please refer this to a friend, or order it as a gift for them.

Just \$14.95 will provide the following privileges:

BULBS (electronic copy) - The newest and

most EXCITING publication covering tender and hardy flowering bulbs and how to grow them.

The Seed Exchange (SX) - A list of geophytic seeds available to you from our members who donate seeds (often difficult or impossible to acquire, otherwise) for the meager price of \$1 (US) per packet. You will receive these lists in electronic format to print out, complete with your information, and mail back to IBS.

Book Discounts - on certain bulb books and books written by authors who are IBS members.

The Bulb Forum - An active e-mail interchange between members and affiliates about flowering bulbs. Many of the world's leading authorities on geophytic plants are members of this forum.

The Bulb Exchange (BX) - A low-cost service provided via the LISTSERV that makes bulbs and short-lived seed available to members and affiliates for immediate shipment and planting.

For further details, please visit: http://www.bulbsociety.org/IBS/internet_affiliate.html

THE FUTURE – UPCOMING IBS EVENTS

Pacific Bulb Society Meeting

The next meeting of the Pacific Bulb Society is tentatively scheduled for this fall at the home of Cathy Craig in San Clemente, CA. This event will be held in the afternoon

and evening of one Saturday and will include; a social hour(s) of wine and cheese, a potluck dinner, garden tour (always providing some of the bulbs cooperate), and a presentation by Dylon Hannon of some of his fabulous slides. All interested persons and their guests are cordially invited. For further information please contact Cathy Craig: (949) 369-8588 or email: Batlette@home.com.

NEW local IBS group to meet! WDC, Maryland, and VA Society Meeting

Pete Jones has volunteered to initiate a meeting of IBS members local to the Washington DC area. The meeting is tentatively scheduled for late fall of 2001, from 10:30 a.m. to 12:00 noon. Says Pete, "This meeting could serve as a 'getting to know each other and sharing information on bulbs that grow in the DC area'." All interested members (non-members also welcome) are urged to contact Pete directly if they are interested in forming a local study group. He needs to know how big a room will be required so please contact him (Pete Jones) at (703) 521-0674 or email: PCJones@erols.com. Pete lives in Arlington, VA.

Great Lakes Bulb Society Meeting

The next meeting of the GLBS has been tentatively scheduled for late fall of 2001. For more specific information as those months approach, please contact Jim Shields at (317-896-3925) or email: Jshields@indy.net.

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WDC/VA Bulb Soc

Pete Jones

PCJones@erols.com

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EXTRAORDINARY OXALIS

By Andrew Wilson

It is the middle of winter as I write. The days are short but flowers of yellow, lurid pink; orange and white brighten the scene. The bulbous Oxalis have opened the New Year.

Mere mention of their name generally raises the blood pressure of many plant lovers. Reviled and feared, Oxalis may not be allowed entry to the gardens, and certainly not to the bulb collections of people who are otherwise pragmatic in their choice of plants. Like witches, they must be hunted down and dispatched.

There really are some evil types to keep out of your garden or your potted collection but there are also some cherubs. Once you have seen their beauty, deciding which ones to cull becomes the work of the devil.

Oxalis species make very enthusiastic plants. They grow freely, propagate easily, flower bountifully and are not demanding in their needs. You will not see them limping along. With the exception of a few species, there is no reason why you should not enjoy them. If you avoid a small number of bad guys and follow a fairly obvious set of guidelines you will enjoy Oxalis. We'll discuss which are the bad guys and the guidelines for dealing with the rest shortly.

There are well over 800 species of Oxalis found in Europe, North and South America and South Africa. How can they all be weedy? On their own they can not, but man has not been careful in handling some, by allowing them to be spread to areas where nothing eats them or by cultivating land and encouraging them to produce lots of bulbs near the surface and enhancing the rate of increase. A few are just aggressive and spread by seed or by vegetative increase almost anywhere they get the chance.

Let us first discuss these bad guys. Then we can get back and talk about some

of the others, in particular the bulbous ones from South Africa.

The Bad Guys

At the top of the hit list are *O. corniculata* from the Old World and *O. latifolia* from the New World (Mexico). Cold climates may kill them but in greenhouses they have spread around the globe, costing the nursery business major sums to control. We have all had to deal with them, the latter coming in both green and bronze-leaved forms.

The Brazilian, *O. megalorhiza* is a handsome yellow-flowered species with succulent leaves and large tuberous roots. If allowed to spread in a sub-tropical or frost-free climate or in a greenhouse it can be a menace, seeding freely. In cooler climes it does not present a problem. If you can keep it under control, it forms a really very handsome caudex and produces flowers for months. I have learned my lessons the hard way. Now I just shear off the flowers or place them in isolated confinement.

The South African *O. pes-caprae* is another very attractive species but a terror in places like western or southern Australia, California and even in its homeland in the western Cape. Yet, in more humid and colder lands it may even be difficult to grow. It forms tubers that dive much deeper than the bulbs. They serve to pull the bulbs down where they survive more easily. In tilled soil they go deep and are then nearly impossible to eradicate. While glyphosate compounds (Roundup in the US and UK) will soon kill all the surface bulbs the tubers will probably survive to start new growths and later young bulbs. It may take years of applications to get them all out. By the way, in case you feel inclined, both man and beast can and do eat them. Grow them at your own peril.

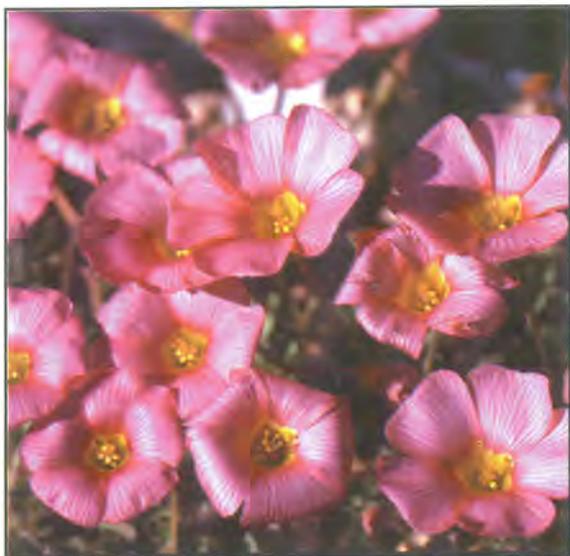
A few others, succulent types from South America, may also have escaped in

parts of Australia but these four bad guys are the primary culprits.

The Others

Of the others we'll deal mainly with the bulbous ones from South Africa. Of these, nearly all come from the winter-wet, summer-dry areas. This narrows down the growing conditions we must describe. Dealing with just these types will not make this discussion comprehensive, but may make it more comprehensible.

There are over 200 bulbous species in South Africa and some people believe there are a lot more. Certainly a species like *O. obtusa* exists in many different variations of flower color and size and even of leaf form. The experts will argue about whether they should be split up. We will leave that subject for others to work out. In any event, it is not surprising that the place the bulb was collected is very commonly added to the species name and, even to the garden hobbyist, the differences between some of the forms are worth finding out.



Oxalis obtusa (Andrew Wilson)

With so many species to choose from and so many that are highly attractive it is a pity that they are not more commonly

grown. In fact, they are rarely available at bulb nurseries - I'm referring here only to the bulbous ones. Their bad reputation is responsible in large part. In my experience that reputation is not warranted. Five years ago I began experimenting. I planted out bulbs of *O. hirta* (a vivid pink form) and *O. purpurea* (a white form). Those bulbs are still in place. They have not seeded, have not spread and, in a year like this, they actually need to be watered. Otherwise they will just go dormant too soon. It seems that apart from the "bad guys" other *Oxalis* present no problem in my garden. Now, the climate here is very dry (9 in. (225 mm) rainfall per annum) and the soil is poor and sandy. So, I checked with two other people who have grown them under different conditions.



Oxalis purpurea 'Burgundy' (A. Wilson)

I can quote from Mike Mace in the San Francisco Bay Area where it is much wetter (25 in. or 650 mm). He tells me:

"I have tried some surplus bulbs in the ground in a low, dry-laid rock wall. The *Oxalis* were dropped into the soil and were then shoved between the rocks. Last year these *Oxalis* bloomed very enthusiastically.

cally. This year the weather has been a lot drier, and they have been shyer to bloom. But there are still a lot of leaves and the bulbs seem to be surviving.

Some of the *Oxalis* bloom very early in the autumn, before the leaves emerge (same time as *Colchicums*). There is another flush of bloom later in autumn, tailing off in mid-winter. Several pots are in bloom now (late December) but there will be another burst of bloom (from other pots) in spring. Some of the species seem to produce few or no offsets, but the majority are very prolific. I don't know how far they would spread in the ground, but they offset a lot in the pot, and I would definitely keep them away from a plunge bed."

I also checked with Michael Vassar who lives just north of Los Angeles, also in an area with higher rainfall than here (about 18 inches or 450 mm). He says:

"Too bad two species have ruined it for a wonderful plant family. I think the one thing that growers do not believe about the winter growing *Oxalis* from the Western Cape is that they must be grown HARD. I have some growing in my front yard in the ground in areas that have just recently gotten some water - actually they should be dead! The entire plants (mostly of *O. obtusa*), including about 20 leaves, are about 3/4 inch tall and less than 1 1/2 inch wide - so wonderfully compact. When grown in a rich mix they don't even look like they could be the same species."

So, as you can see from three people in different parts of California, these plants are very worthwhile in the ground - as long as you avoid the bad guys. In dry areas they present no problems of spreading. In wetter areas it is safer to plant them where their offsets or underground stolons are contained.

Guidelines for growing *Oxalis* in containers

More generally, whether you live in a mild winter climate area, or one that is very wet or gets heavy frosts every year the safest way to grow them is to treat them as pot plants. That way you can re-

duce escapes to zero.

In pots I use a mix of 50% pumice (or quarter inch(10 mm) grit) plus 25% coarse sand plus 25% sandy loam. Mike Mace uses a mix with more organic material. He uses 50% peat, 25% sand, and 25% perlite and amends this with about two tablespoons of Lilly Miller bulb fertilizer. Take your pick, or make up your own from the materials you have to hand. I find Mike Mace's mix is fine unless you leave the bulbs in the same pot for a few years, in which case the organic material will have shrunk to nothing.

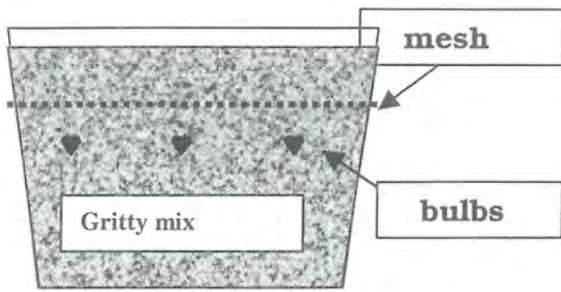


Oxalis on my bench top

I think Michael Vassar's warning of growing them hard is important. It applies whether you are growing them in the open, as in California, New Zealand or Australia, or under glass in colder areas. In all cases, exposure to full light is important. Otherwise you will get drawn, weak plants that do not flower well.

Oxalis bulbs are small. Three to six bulbs in a 6 inch (15 cm) one-gallon pot is fine. A wider pot, but not a deeper one, enhances the overall appearance in bloom.

The figure shows where to plant the bulbs; about an inch below the surface seems to work well for most species.



Oxalis bulbs in a 6-8 inch (15-20 cm) container about 1 inch below surface of mix. Wire mesh is inserted and barely covered.

For some reason, Oxalis bulbs attract rodents and even birds. If, like me, you have difficulties with them, you may want to adopt the protection scheme shown. Mike suggested it and so far it has worked for both of us. I use quarter inch (6 mm) aviary mesh. No animal will get through it! Cover it lightly with mix after planting. It will not affect watering nor will it impede growth.

The planting of bulbs is generally done in late summer, late August in the Northern Hemisphere and February in the Southern Hemisphere (SH). An unusual feature of Oxalis bulbs is the time they start to grow. If kept totally dry for four or five months after they go dormant in spring they may not start to grow until November or December (May or June in SH). If just a single light watering is given to them in summer the starting time for growth is generally in September (March in SH). Under no conditions should more water be given as rotting may result.

Once growth begins they should not be kept dry. In fact, if you underwater them the leaves will turn yellow and the plants will go dormant prematurely. There is no problem with watering generously provided you use a fast-draining mix. In dry, warm autumn or spring conditions they may need water two or three times a week.

Some species start to flower soon after growth begins while others may wait for several months or even until spring ar-

rives. Other than being provided with water and a small amount of fertilizer that is not rich in nitrogen, they need little more than practical attention.

Indoors they must get plenty of ventilation and direct sunlight. Do not cook them with high temperatures and humidity. Avoidance of excessive fertilizer is even more important for bulbs grown indoors.

Aphids will occasionally show up and are easily handled by the insecticide you would normally use. I prefer a systemic insecticide like dilute Isotox, which is less toxic than Cygon and easier to apply than Malathion or a soap, both of which must wet under the leaves to be effective.

None of the (good) species I have grown has set seed when treated as container plants. Other people in California and Australia have confirmed this behavior. That is what makes growing them nearly trouble-free. However, be careful in repotting them. The bulbs will increase in number from year to year, so repotting may be needed to prevent overcrowding. Since the bulbs are small it is not difficult for a few to go astray while repotting them.

In closing this section I must note a somewhat different schedule that some growers in northern Europe employ. Because of poor light conditions and the need to provide temperatures ranging from 45 F (6 C) to 60 F (15 C) in winter, some growers prefer to delay starting the bulbs until early February. Blooming will then begin in April and dormancy will not occur until about three months later.

Incidentally, bulbs grown on such a schedule may miss an entire season if shipped to a grower who prefers to start them in August (February in SH) under the more normal schedule. So, check how the bulbs were grown before you receive them.

Which species to grow?

There are so many handsome species that narrowing the choice is difficult. It is better to try them yourself or to preview them by Internet (e.g. IBS website). Some

of the well-known species include:



Oxalis bowiei (Andrew Wilson)

O. bowiei (intense pink, very large flowers) All forms have vivid, shocking, pink flowers. Some forms may be over 2 inches across. This species is better planted in a deep and wide pot as it produces long underground tubers. Use extra phosphorus and potassium but no nitrogen with this species.

O. brasiliensis (deep pink) is from southern Brazil. It is a winter grower going dormant in summer. In full sun it stays very tight to the ground and the large flowers are spectacular.



Oxalis brasiliensis (Andrew Wilson)

O. fabaeiflora (bright yellow) The flowers were thought to look pea-shaped, thus the name. They are most attractive and the foliage in finger-like.

O. massoniana (orange) This is often the first species to bloom for me and one of the first to go dormant. It is a very low plant – not much over one inch (25mm) tall. It is a most attractive species for filling a wide pot and overflowing the edges.



Oxalis massoniana (Bill Dijk)

O. flava (yellow, striking foliage in some forms) comes in a wide variety of flowers and foliage.

O. luteola (rich yellow, lots of flowers), inclined to be more aggressive than others.



O. luteola var. *maculata* (Bill Dijk)

O. obtusa (yellow, apricot) These grow to about 3 inches (74 mm) with flowers half an inch across, continuing over several months.



O. obtusa (Bill Dijk)

O. purpurea (purple, magenta, white)
This plant can also be found in yellow, grown widely in the UK under the cultivar name 'Ken Aslet'.

O. hirta (vivid pink)



Oxalis glabra (Bill Dijk)

In addition to lovely flowers some species, as indicated above, have the added bonus of attractive foliage. Some of the best are *O. polyphylla* var *pentaphylla* and *O. palmifrons*.

I have acquired many of my present bulbs from the IBS collection offered several years ago. These had been grown from stock brought back from South Africa by Michael Vassar. To this day some of the species, bearing his IBS-sponsored collection numbers, remain unidentified. That may frustrate those who enjoy building a collection of species. However, for those interested primarily in seeing some lovely, no-fuss plants bloom throughout the winter it should not cause you any concern.



Oxalis hirta (Bill Dijk)

None of these species is difficult to grow if given plenty of sun and a light potting mix. Comments about growing them in the ground are intended primarily for those who live in climates where they can be safely planted out and where predators or severe frosts are not a problem. Most will survive in areas where the temperature does not fall below 20F (-7C). In fact they may survive lower temperatures in the ground but the tops will be burnt back.

About the Author

Andrew Wilson gardens in the northern part of San Diego County (in southern California) on 5 acres of gently sloping land very near the Pacific Ocean shoreline. His wife, Beatrice, grows orchids in shade houses close to their home.

Andrew has several interests in addition to bulbous plants. These include native California perennials and Proteas (succulent-like upright shrubs from dry, sandy areas of South Africa and Australia with very unusual-looking flowers), Australian trees, shrubs and (his latest) succulents from anywhere, as long as they can be planted out.

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BULB BASICS:

BULBS, CORMS, TUBERS, & RHIZOMES

by Carol Wallace

Not All 'Bulbs' Really ARE

You probably have seen specialized catalogs that sell "only bulbs." They're lying.

Well, not actually lying. They are stretching the truth a bit because most people tend to call any plant that has something solid to grow out of, instead of a mass of fibrous roots, a bulb. And since most people understand this without even thinking much about it, the term "bulb" has become a shorthand term for a multitude of growth systems including corms, rhizomes and tubers.

I can hear you asking it – why do we care what the differences are if everyone already knows to look in a bulb catalog for plants that don't have fibrous roots? And I'll admit that you can have a lovely garden full of healthy plants without getting down to the nitty-gritty differences among them. But actually knowing how a corm differs from a bulb or rhizome can tell you a lot about how the plant will reproduce itself. And it can also help you to find the best way to store those that will be tender in your climate zone. Not only that but you will sound like a really knowledgeable gardener if you can differentiate among them. So grow your plants better and win at Trivial Pursuit simply by taking the time to figure out which food storage system is which.

So let me take the time to acquaint you with the differences between bulbs, corms, tubers and rhizomes so that you can be a knowledgeable gardener who will be able to determine easily how to care for your many different 'bulbs'.

TRUE BULBS

True bulbs are defined as the thickened underground storage organ of a group of perennials that include the ever-popular daffodils and tulips. But there is one bulb with which most of us are very familiar, and that is the onion. When you cut into an onion you see layers upon layers of 'flesh' that form the bulb. Most bulbs have a pointy top (think onion) and a flatter bottom, which has some

hair-like roots growing out of it. This bottom area from which the roots emerge is called the *basal plate* of the bulb. These layers are storing food for the next year's bloom.

Some bulbs have a papery cover over the fleshier insides. This is called a tunic. On the onion you have the papery brown skin – just as you see it on the tulip, which is related to the onion. In fact, if you run out of onions but have some spare tulip bulbs handy you can substitute them in your recipe. Daffodils also have a brown tunic, while the hyacinth's tunic may be purple or white. These tunics function like little jackets for the bulb, keeping the inner layers from drying out. We call the bulbs that have tunics *tunicate*. If it resembles an onion then you are dealing with a tunicate bulb.



Scilla (sp) bulb

Some bulbs are different than onions in that they are formed out of loosely formed scales – more like a head of garlic. Lilies are like this. Bulbs formed by overlapping scales are known as *umbricate* bulbs. Lily bulbs are much more fragile than their tunicate relatives, lacking that outer layer of protection.



Narcissus 'Erlcheer' with daughter bulbs

Bulbs reproduce themselves by division. Every once in a while at the grocery store you will see a round onion with a flatter, smaller onion growing attached to it. True bulbs reproduce themselves in exactly the same way. The bulblets, as these new divisions are called, form on the side of the bulb's basal plate. In some species bulbs the 'mother' bulb withers and dies, leaving room for the daughter bulbs to grow and prosper. Some bulbs also increase through seed – but we will save that for a discussion on bulb propagation.

CORMS

Corms can look a lot like bulbs – although they are usually smaller. And instead of having scales, the corm has an enlarged solid stem to store its nutrients as opposed to the scales a bulb uses. So if you cut open a corm you will not see the layers that you see in a bulb. A corm is usually round-ish in shape, whereas the true bulb can be quite irregular. Some plants that grow from corms are gladiolus, freesias and crocus.



Watsonia corms with tunics intact

Corms also have tunics, but if you look closely at that tunic you will see that it has a fibrous or netted pattern covering it. They also have a basal plate that is the base from which the stem will grow. If you're not sure which is up when planting corms, look for that basal plate. However, should you mistakenly plant one upside down the stem will find its way to the surface – it just may take it a bit longer.



new Watsonia corms growing on top of the old, withering mother corm

As the flower starts to emerge from the corm, the corm itself begins to shrivel. This is because the emerging flower and foliage

is using up the corm's entire supply of nutrients. But while it is busy shriveling and sending up shoots it is also forming new corms, either on top of or next to itself. These cormlets usually will bloom the following year, although the cormlets of a few plants such as gladiolus may take up to three years to reach blooming size.



new Crocosmia (sp) corms growing from mother bulb with their particular tunics

If you need to dig and store the corms of tender plants first trim off any visible foliage to within a few inches of the corm, then carefully dig them up. Brush off the soil and allow them to cure for several weeks in a nice, dry place with good air circulation. When they are dry and the foliage is shriveled, cut or twist that foliage off and store your corms in something that will allow the air to get at them, such as the mesh bags that onions come in, or even old nylon stockings. Store them in an area where the temperature remains between 35F to 45F until it's time to plant again in spring.

Both bulbs and corms can withstand drought fairly well, snuggling deep underground and not poking above the surface until conditions are favorable for blooming. They prefer well-drained soil and may rot if conditions are too damp. Spring blooming bulbs and corms start to absorb nutrients in autumn while the summer bulbs gather nourishment through summer and appear after the extreme heat of summer is nearly done.

RHIZOMES

A rhizome is a large, fleshy, underground, modified plant stem that grows hori-

zontally under the surface of the soil. Along the rhizome's surface various growing points emerge, which will then send up foliage and flowers. Cannas, gingers, bearded Iris, and calla lilies grow from rhizomes, as do the invasive type of bamboo. So do many varieties of lawn grass. The rhizome creeps along sending up more and more growing shoots – which is why planting instructions often call for them to be spaced very generously.

That same tendency also makes rhizomatous plants quite easy to propagate. All you need to do is cut the rhizome into pieces, making sure each segment has at least one growing tip as well as some roots. The roots, of course, are on the bottom of the rhizome and the growing tips on top – and this is usually very evident. As your rhizome gets older the core of it may become woody and will send up few stems – if any. That's always a sign that the plant needs to be divided – just discard the woody portions.



*fibrous-rooted rhizomatous
Dianella tasmanica*

Unlike bulbs and corms, which need to be planted deeply to protect them from the

elements, rhizomes are planted just below the surface of the soil. That is why in cold weather areas they need to be dug and stored – they are too close to the surface to be protected from the elements.

If you must dig and store your rhizomatous plants do it after the foliage has been killed by the first frost. Cut the stems down to a few inches and then dig the rhizomes out of the ground. If you accidentally nick them in the digging, allow them to sit out in the sun for a few days (or indoors, if things turn really cold) to allow a scab to form over the cut. You can also dust the cut with Comet cleanser to protect it from bacterial infection. Just let them dry in a frost-free location for about two weeks before storing.

Rhizomes are not only easy to plant and propagate, they also store easily. Just put them into shallow boxes and keep them in an area that is about 45F to 50F.

TUBERS

The most famous tuber of all is the potato. As you may have seen, a potato grows larger without producing offsets of any kind. Instead they send up eyes – which are where the foliage and flowers originate. Caladium, colocasia, cyclamen, anemones and tuberous begonias grow from tubers – and those tubers are single pieces with multiple growth points. The tuber stores the plant's food and then shrivels as new tubers form around them. With these the tuber functions as a vast, swollen underground stem full of nutrition.

There is no basal plate on a tuber, which means that eyes can and do sprout all over it. Each of those eyes is a growth point, so when dividing you want to have at least one eye per piece that you plant. A tuberous begonia for instance, is a round, flat thing with buds growing from the top and roots (not always easily seen) from the bottom. To divide these you simply cut the tuber into pieces, making sure that each piece has an eye. Replant these immediately.

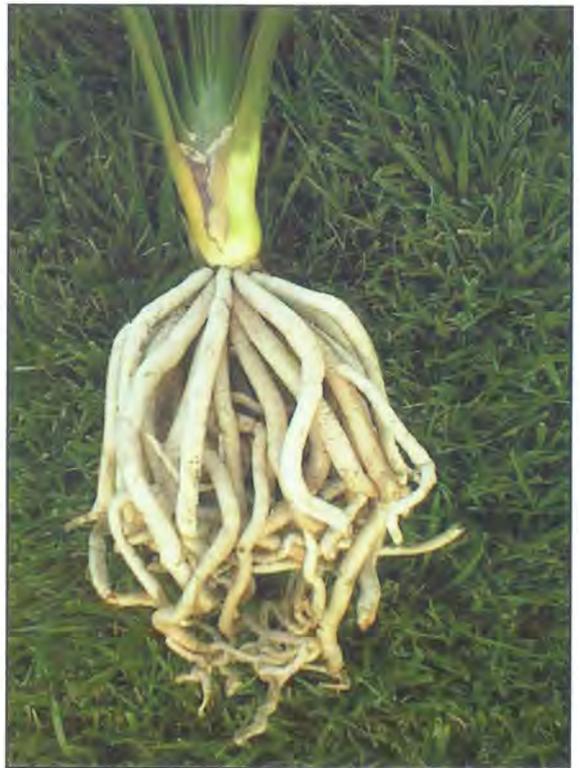
To store tubers, trim back the foliage, leaving from 2-3 inches still attached to the plant. Let them dry out in a frost-free spot for 2-3 weeks, then shake off the soil and remove the dried stem. Most tender tuberous rooted plants like storage temperatures between 45F and 55F. However, Caladium

prefers a warmer temperature of 60F while resting.

Most rhizomes and tubers, as you may have noticed, are planted close to the surface of the earth. Unlike bulbs, most tubers can and do flourish in moist conditions. Because they are so close to the top, they are not very well insulated against cold weather conditions, and so most need to be dug and stored in cold weather areas. Or they can be grown in containers and simply brought in for winter. They can then be replanted after danger of frost has passed in the spring.

TUBEROUS ROOTS

Then there are plants that are tuberous-rooted, which is different from a plant that grows from a tuber. These include dahlias, daylilies, alstroemeria and gloriosa lily. With these the main growing point is a stem with eyes. The difference is that where most bulbs, corms, etc. have fibrous roots, the roots of these plants are swollen and fleshy. These tubers resemble miniature sweet potatoes to me. The nutrients for these plants are stored in these fleshy roots rather than in the enlarged stem portion of the plant.



fleshy roots of Clivia miniata

When you look at a dahlia, for instance, you will see that it has a stem portion, and that there are a number of swollen roots that radiate outward from that stem. If you look carefully at the stem you will see small growing tips or eyes. In order to successfully divide a tuberous-rooted plant you need to make sure that each division has at least one eye as well as some of the tuberous roots. A tuber without the eye will not grow.

To store tender tuberous-rooted plants, wait until after the first light frost, digging carefully to avoid injury. Leave any soil attached to the tuber and simply pack them in layers of between 2 and three inches of vermiculite, peat moss, sawdust or wood shavings. Keep them in a place with average temperatures of between 45F to 55F.

SUMMARY

Tubers, rhizomes, and tuberous-rooted plants are best divided in spring, just prior to replanting. Bulbs and corms, on the other hand, will practically divide themselves when being dug. So simply paying attention to

what the plant seems to want is one clue as to how to deal with it.

Bulbs and corms are planted deeply, which affords them protection from the elements. They tend to prefer excellent drainage and dry summer conditions, wanting moisture mainly in their growing season.

Rhizomes and tubers, on the other hand, are planted shallowly, thus having little protection from harsh weather. Most tend to be much more tolerant of poor drainage and wet conditions than are bulbs and corms. In fact, the Denver Botanical Gardens has a daylily named 'Corky' growing as a water plant for many years, showing exactly how moisture-tolerant a tuberous-rooted plant can be. Colocasia and Callas are also sometimes used in ponds or bogs. These same conditions would spell imminent death to a tulip or daffodil bulb.

So knowing a bit about exactly what that thing you are planting is called can give you many clues about what to expect from it as well as how to store and propagate it, and where it will be happiest growing.

IN MEMORIAM

Jim Robinett, 1943-2001

Submitted by Mary Sue Ittner

Jim Robinett, who, with his wife Georgie, at one time operated the Robinett Bulb Farm in Sebastopol, California, died in April after a period of increasing health problems. Jim had become interested in bulbs in his late thirties starting with South African bulbs and then expanding to bulbs found in the western states of North America, especially California and Oregon. Although he was employed in computer sciences and software engineering, Jim spent much of his free time with Georgie looking for bulbs in the wild, learning to identify them, collecting seed, and finally growing them from seed. It was always important to them that wild populations be protected and they were very careful to take only a small amount of seed and then only from healthy populations. Eventually this shared interest led to them starting their own business selling bulbs and seed.

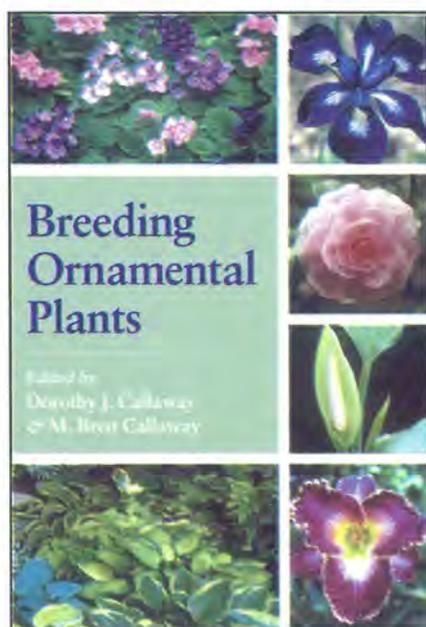
In the last several years Jim and Georgie became the editors of *Mariposa*, the newsletter of the **Calochortus Society**. Readers were treated to interesting discussions and Jim's beautiful photographs of calochortus, most photographed in the wild.

I began my love affair with California bulbs by buying a few new species each year from the Robinetts starting with the ones they described as easy, and after finding that to be true, branching out to others more difficult. As my collection expanded I began to share extras with others. I'd like to think that this same thing happened all over the world where his bulbs or seed went and that every spring and early summer when they bloom there will always be a living flower memorial to Jim.

WELL VERSED: Seeds, Seeds, Seeds

by Lisa Flaum

I admit it, I love seeds. I belong to half a dozen gardening organizations, not for the journals, but for the seed exchanges. Then, there are seed catalogs, oh my! So, for all of my comrades-in-germination, here are some fine books to while away the hours as you wait for your seeds to sprout.



Playing with Mendel

If you are interested in doing some plant breeding of your own, get a copy of ***Breeding Ornamental Plants***, edited by Dorothy J. Callaway and M. Brett Callaway. The idea is a commendable one: experienced hybridizers provide the vital information for a variety of different ornamentals. The reader can then begin his or her own breeding program, armed with the basics. The Callaways wrote two introductory chapters, then gathered essays from specialists in the different genera. Elise Havens authored the chapter on narcissus, Alan Meerow the one on hippeastrum (oddly titled "Breeding Amaryllis"). Other authors of interest to geophyte growers include Currier McEwen (Siberian Iris), R.J. Henny (Aroids), and Peter Shalit (Gesneriads). Popular herbaceous and woody

plants are also included.

The opening chapter, on genetics, was perhaps too short for the material covered.

However, a clear understanding of meiosis is probably not necessary for plant breeding. The authors say, "Quantitative genetics can be a daunting subject to those not fond of statistics." True. If it doesn't interest you, go through quickly and on to the other chapters. Interested parties will find additional reading listed at the end of the chapter.

The next chapter, on practical matters, is terrific and has everything from program objectives to planting distance, labelling and record keeping. A summary of the *International Code of Nomenclature for Cultivated Plants* is included as well, so you can name your lovelies. Read this chapter closely, there's a lot of good advice!

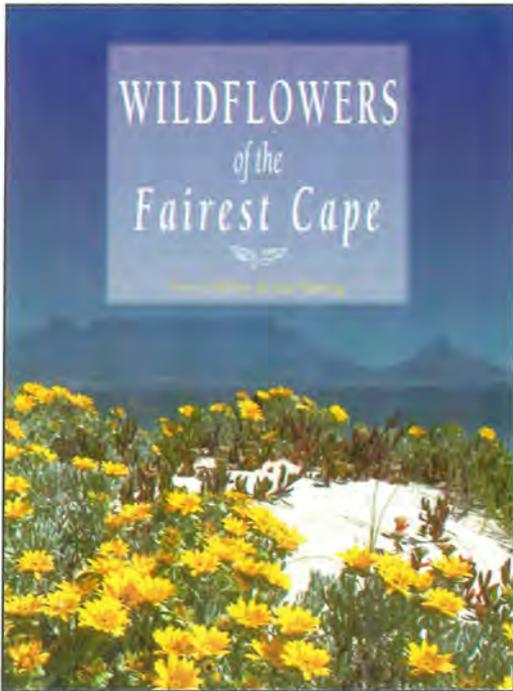
The genera-specific chapters all have the same framework. History, breeding materials, traits and objectives, hybridization, propagation, and resources. The amount of detail varies among the authors. Mrs. Havens combines the history of daffodil breeding with the best breeding lines for specific traits, but provides no discussion of how different traits may interact. Dr Meerow, however goes into a lot of detail, including diploid, triploid and tetraploid breeding, new species, and color interactions. Both writers left me with the confidence to begin, though.

The Seedlist Handbook, presently compiled by Mabel Harkness, covers information on plants offered through the seed exchanges of the Scottish Rock Garden Club, the Alpine Garden Society, and the North American Rock Garden Society. Data has been collected since 1971 and the second addition covers year up to 1990. Each species, or cultivar, gets one line. Abbreviations give you the type of plant, its height in inches, a short description of the flowers, geographic origin and a link to the reference used. For instance, looking up *Crocus cambessedesii*, I find that it is a corm, 3" tall with pale lilac flowers, is native to the Balearic Islands and can be found in more detail in Patrick Syngé's

Collins Guide to Bulbs 1961. I like having a copy to take into the garden, but *The Seedlist Handbook* is also available on the internet at <http://listserv.rifm.org/harkness/seedlist.cfm>

Need a Color Catalog?

The Cape Floral Kingdom contains over 9000 plants, more than 6000 of which are endemic to the area. Over 17% are bulbous, the largest bulbous percentage of the 6 floral kingdoms. These statistics are from ***Wildflowers of the Fairest Cape***, by Peter Goldblatt and John Manning. The authors' intent, as stated in the preface, "is to share...our affection for this remarkable corner of the world" and "to encourage an understanding and appreciation of the flora". They succeed admirably with a book that is part travel guide and part field guide.



Goldblatt and Manning treat their readers to six vicarious wildflower trips along the western coast of South Africa. Where to go, when to go and what you are likely to see are all included, as well as a map with all six areas and schedule of peak bloom. Then come photographs of 649 species, followed by descriptions of the species, their common

names, flowering times and habitat/distribution. The pictures are almost all first rate, with only a few that seem underexposed. They are presented three to four on a page. Since the book is fairly big, the photos are large and clear. The plants are arranged by family and originally I found this awkward. The answer is a guide to plant families at the beginning of the photo section. The reader keys out a flower to family level, and then knows what pages to search. Its fun to know what characteristics link plants in a family and, as the authors point out, "The excitement that comes from a true understanding of the processes of identification and plant classification is reward in itself."

"Wildflowers" is a little large and heavy to use as a walking field guide, but would be valuable for car trips. It also makes an excellent color supplement to the Silverhill Seeds catalog.

Quick References

Two other goodies are *The Bernard E. Harkness Seedlist Handbook* and *Seed Germination Theory and Practice*. Both are older volumes and pack a lot of information into just a little space.

Seed Germination Theory and Practice by Norman Deno. Dr. Deno is a retired professor of chemistry. He became interested in finding the optimum way to germinate seeds of many species, and has published the results of his experiments in three volumes. Dr. Deno looked at dry and moist storage, temperatures of 70F and 40F and dark and light. He found that some seeds require cycles of warm and cool periods, or absolutely need dark or light, or are greatly helped by gibberellic acid-3. His books are self

(Continued on page 28)

HARDY BY LUCK OR JUDGEMENT

A Personal View of Bulb Hardiness by David Fenwick

What is a Hardy Bulb?

After searching extensively in many gardening books I was surprised to find that many glossaries declined any definition of the word 'hardy'. 'Hardening off' was there but as for a definition of 'hardy' it took a long time to find one. When I did find one it certainly gave me a cause to write more.

'Hardy' – This term is applied to plants of all kinds, which will pass safely through an average winter out of doors.

This definition obviously raises more questions than it answers because it regards hardiness as a collective property, rather than an individual one. And it doesn't fully relate to the specific conditions that one might be able to provide. One must take the word 'hardy' to be a general term for a collection of plants found to be hardy in cultivation within a given location. By location I mean in terms of county or state, country or continent. But we must certainly not allow a generalisation to sway our judgement with regard to what bulbs it is possible for us to grow.

General observations relating to hardiness for your particular conditions can be made by visiting local gardens and by studying the natural environment and its flora in your area. Information can also be found in books and nursery catalogues and by contacting local nurserymen. Many factors exist that determine hardiness. What can be considered to be hardy, and hardiness itself, may relate more to the conditions that we as gardeners can provide than what is presently known and considered the divine, and therefore over-generalised, rule.

Bulb Types

It is extremely difficult to classify bulbs in terms of hardiness in such a manner that a complete novice can understand, however one way of looking at this is to divide bulbs into the following categories.

- Those that have been highly commercialised and are commonly found at local nurseries, garden centres and hypermarkets, and are proven to be completely hardy in the areas where

they are sold. Those that we may consider to have borderline hardiness and are often referred to as half-hardy or tender bulbs, which may prove hardy given the right cultural conditions to suit its specific requirements.



Freesia laxa - hardier than predicted

- The many species and hybrids that are relatively untried and untested under garden conditions in cultivation; where only trial, error and persistence may prove a species to be hardy under specific conditions and circumstances.

Definitions

My own definition of a hardy bulb reads something like this: "A bulb that has been grown outdoors for numerous years in a specific locality having been given favourable conditions to sustain it."

We all have the power to change our own individual cultural conditions and environment to cater to the specific needs of various groups of bulbs. This may lead to prove a plant hardy in a given location and under specific conditions therefore extending the range of species we can grow.

Consideration

Every garden is unique; as unique as every species of bulb that exists. When designing our gardens we must consider numerous factors before deciding what to plant and where to plant it.

Firstly we must consider what benefits we want to get from our gardens and whether we want a low maintenance garden or a plantsmans' paradise. We must then look at the garden's geography including climate, aspect and topography. Lastly we must look at the important factors of shelter, soil type, drainage, and cultivation within that garden.

Shelter

Shelter is one of the most important considerations in designing and planting any bulb garden, and we must provide it if it isn't there. Indeed the first plantings in any new garden should be trees and shrubs and these should be planted to protect from both strong prevailing winds and winds from colder directions. A mixed screen could be planted consisting of quick growing species of say birch and conifers which will give a 50% permeable wind screen, and this could be used to nurse a slower more ornamental shelter that may be slower to establish.

One must also remember to provide shelter close to walls because when a wind hits a wall it tends to speed up and become quite destructive as it rushes over the top and curls down the opposite side. Walls or rather the foot of them, and especially sunny ones, are often ideal places to plant less than hardy bulbs. This is an important consideration when growing bulbs in an urban environment with lots of surrounding houses. To solve this problem, shrubs, trees or climbers can be planted against the wall to maximise the hardiness of any bulbous subject grown.



Crinum x powellii 'Album' protected by a south wall and gravel mulch

One must also realise how bulbs grow in the wild in their endemic state because bulbs often are surrounded by or growing through other types of vegetation such as grasses, sub-shrubs, herbaceous plants, etc. These companions often provide them with the shade, shelter and support they require. In their native habitats this is referred to as a microclimate, but similar microclimates can be artificially created within our own gardens to our bulbs benefit. It is often as simple as planting a hardier, taller protecting plant on the windward side of bulbs with marginal or suspect hardiness.

Microclimates are often overlooked in gardens and they occur everywhere; even within the short distance between one plant and its neighbour. It is all about finding the right bulb for the right spot and to accomplish this we must use all the resources at our disposal. For it is the knowledge that we seek and gather for ourselves that will help us understand the relationships between hardiness and the plants in our gardens.



Closeness of planting affords protection

Soils

The best soil for the culture of a general range of bulbs is of a good structured friable loam, which usually contains equal parts of sand, silt and clay. Unfortunately all soils are different and their content can vary greatly within a garden, even a small garden, as can drainage. Soils within the same garden can remain damp or wet in low spots or near streams or house guttering; while remaining dry in very sunny spots or under trees.

Heavier soils can be opened up and made more suitable for bulbs by digging in well-rotted organic matter, sand and gravel. Sandy soils can be improved by adding either loam or again well-rotted organic matter, which also aid water and nutrient retention. When planting in heavier soils a fine layer of grit or gravel can be placed below the plant or bulb to allow extra drainage around its roots and the bulb itself.

Effects of Frost

Frosts, cold temperatures and draughts are other important factors to consider. In frosty areas it is very important to discover just where in the garden they persist and where they quickly disperse. Frost may melt quickly in sunny sites or in drier protected sites like those under the shelter of shrubs and trees. It is also important to discover how deeply frosts penetrate the soil as bulbs may then be planted deeper to avoid the frost.

In more vulnerable sites, deeper planting than is normally recommended may prove the key to hardiness because the soil temperature will be less liable to fluctuate at a greater depth. Therefore the dormancy of a bulb may not be suddenly and prematurely broken by an unexpected and unseasonable rise in temperature.

Mulches

Where frosts are a perpetual problem, attention may be given to providing insulation by way of mulching.

Mulches can be organic, inorganic, or in the form of a living groundcover.

Organic mulches can be in the form of well-rotted manure, compost from the compost heap, wood ash, straw, woodchips or cocoa shells. The latter two I don't actually use but these may have a greater significance; for their brown surface coloration may stop the freezing of foliage resting upon it and as they decompose they darken which may help retain heat within the soil.

It must also be remembered that the decomposition of organic matter will release a certain amount of heat to the soil. Inorganic mulches such as sand, chippings or gravel will mimic the scree conditions found in alpine or maritime areas. A living groundcover is a method I favour most for the protection

it affords and its aesthetic quality. It will also provide an extension to the flowering season within the same space, which is especially important in smaller gardens. The finding of the most suitable companion plant for the bulb that is planted is the biggest problem and this isn't always as easy to resolve as it would seem. The *plant or plants chosen do not have to be evergreen as some deciduous herbaceous plants, such as hardy Geraniums, are ideal because their dead winter foliage will afford approximately the same amount of protection as shallow organic mulch.*

In Conclusion

We must look at our gardens very closely and continually throughout their maturing process and note any change in the growing conditions for as a garden matures conditions do change. More shelter is provided as trees mature and as trees grow what was once a damp patch may now be a dry one because of their increased water requirements, for example.



Approximately 60 species of bulbs are growing in the area of this picture.

Changes in conditions can obviously reflect on what is suitable to plant and what is not. But an understanding of the changes that happen within our own gardens and how we take advantage of them is what will reward us and enable us to increase the range of species we can grow.

To this end we must dedicate time to finding out from where our bulbs originated in the wild and the conditions in which they

a week at the rate of 30 ends to 4 litres of water. Remove the filter ends first. This spray will kill scale insects and mealy bug.

Onion Spray

Chop up one large unpeeled onion. Place in a blender with one litre of water and blend on a slow speed, to a milky consistency. This is useful for use on aphids and red spider mites.

Pepper Sprinkle

Any kind of pepper sprinkled on wet leaves will protect them from caterpillars.

Pure Soap Spray

Dissolve 225 grams of pure laundry soap in 9 litres of water. This will kill most pests on your plants. Allow it to dry on plants and then hose it down the next day with clean water.

Red Pepper, Garlic and Onion Spray

Chop an unpeeled onion and a head of garlic. Simmer the onion and garlic with 15 ml (1 tbsp) cayenne pepper in about 1.5 litres water for 20 minutes. Cool the mixture, pour into a jar, seal, and stand for six weeks and strain into bottles. To use, mix 15 ml (1 tbsp) of this mixture with 750 ml water. Add a little soap solution. Use as a general pest spray as well as for caterpillars. Note: Do not allow this to come into contact with eyes or skin.

Rhubarb Spray

Simmer one kilo of rhubarb leaves in a covered pot for 30 minutes. Do not use an aluminium pot. When cool, mix with a little pure soap, enough to keep a permanent lather. The use of rainwater will increase the effectiveness as some salts present in mains water can reduce the strength of the oxalic acid content. This is effective against aphids, beetles, caterpillars and pear and cherry slugs. Fortunately, it won't harm bees. The spray can also be used for powdery mildew.

Wood Ash

Sprinkled around plants, it is a deterrent to many pests, including slugs and snails. It contains elements that irritate and insects are reluctant to cross the barrier. Ensure you do not leave gaps.

Wormwood Spray

Simmer 225 (8 oz) wormwood leaves in 2

litres water for half an hour. Stir, strain and leave to cool. Dissolve 5 ml (1 tsp) soap flakes in 500 ml (17 fl oz) hot water. Combine this with the wormwood water and spray plants frequently at the height of the caterpillar season. A strong wormwood tea, cooled and poured on the tracks of slugs and snails will deter them.

White Cedar Spray

Place white cedar leaves in a bucket. Cover with boiling water. Put the lid on the bucket. Steep until cold. If the liquid isn't pale brown, you need more leaves. Don't inhale the steam and don't store it. Keep away from children. This will kill most pests.

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grew. Only then will we be able to ascertain just where and how we may grow them in our own gardens; thus increasing the likelihood of them being hardy with us.

The Author

David Fenwick lives in Plymouth, England. His garden aptly called 'The African Garden' is just 17m x 15m in size and is dedicated to the culture of over 60 Southern and South African bulbs. More than three-quarters of his collection exists outdoors. Overcoming sudden frosts, high winter rainfall, low light levels and gale force winds are just a few of the problems he has relating to bulb hardiness. By using various techniques he has been able to cultivate many bulbs that many wouldn't even consider hardy in his area.

David has his own Bulb Gallery on the internet of plants he grows in his garden. His website can be found at: <http://theafricangarden.netfirms.com/>

Acknowledgements- A definition of 'hardy' - The Popular Encyclopedia of Gardening.

Book Reviews (Con't from page 24)

published (at Kinko's) and require some patience to master. There is a lot of information in them, though. The worst thing is the lack of alphabetic organization. Although each volume is alphabetized, a plant could be in any one of the three volumes. For those with internet access, this can be overcome by using Tom Clothier's Taxonomic Index. Tom also has a lot of his own data listed. Go to <http://www.anetchi.com/~manytimes/page52.htm> and follow the links.

Breeding Ornamental Plants by Dorothy J. Callaway and M. Brett Callaway, Eds. Timber Press, USA 2000 \$34.95 USD ISBN 0-88192-482-2

Wildflowers of the Fairest Cape by Peter Goldblatt and John Manning. Red Roof Design, South Africa 2000 Timber Press, USA 2000 ISBN 0-620-24787-8

The Bernard H Harkness Seedlist Handbook second edition, Mabel G. Harkness. Timber Press, USA 1993 \$29.95 USD

Seed Germination Theory and Practice Norman C. Deno 139 Lenor Dr. State College, PA 16801 USA
Vol 1 \$20 postpaid anywhere in the world.
The First Supplement \$15 postpaid
The Second Supplement \$15 postpaid

EN GARDE!

By Roy Sachs

Helping Nature Using Home Made Insecticides

Bill Richardson, who is guest writer for the column this time, is a grower of South African species of bulbs, especially *Ixia*, but he's "willing to have a go at just about anything." Organic gardening is another interest.

He's a teacher/trainer/ course designer in Gippsland, Victoria, Australia, working with unemployed people. At present, he teaches computer studies, how to access the internet, job searching, desktop publishing, life skills and personal development. He has structured and delivered horticulture courses as part of the training project.

He has dabbled in bee keeping, worm farming, organic gardening, basic garden design and permaculture. He is president of the local FM Radio station in West Gippsland, where he presents a weekly gardening program, two jazz programs a week, and a program called "The Job Market". He specialises in close-up photography of *Ixias* and *Liliums*

As members on the IBS Bulb Robin Forum we have discussed many methods of controlling pests and the use of chemicals to protect our precious plants from insect attack, but the question of using dangerous chemicals is always an issue in our gardens.

Our personal choice could be to not use chemicals at all. If a more natural method of control is possible, should we consider this? If we help nature, will it reward us with more beautiful flowers and healthier plants?

Some reasons to try organic and alternative methods in place of chemical poisons could be that:

- Members of the family may be allergic to certain chemicals.
- Chemicals are generally not good for our health, or they are not good for our pets.
- There are good insects in the garden that are beneficial and it would be wise to protect them.
- We should consider natural methods as a healthy alternative to chemical sprays.

I have researched Australian growers and authors for their thoughts on pest control

and here is a brief compilation of some of them for your consideration:

Australian bulb grower Bruce Knight, in his 1987 publication *Lachenalia for Australia* said, "If use of insecticide or miticide is necessary, bear in mind that some sprays may cause more damage than the pests they are designed to control - not only by the burning of leaves or the marking or distortion of flowers, but also by their effect on garden ecology, the environment and possibly the gardener."

The publication *Flower Power in the Australian Bush and Garden* quotes: "Also, gardeners often kill the useful insects in the garden when they spray insecticides, making it easier for aphids and scale to breed quickly."

Furthermore, quotes from *Natural Gardening and Farming in Australia* state that: "When it is remembered that most agricultural chemical pesticides - particularly the chlorinated hydrocarbons - can persist in the soil for hundreds of years and concentrate in the food chains, then really, there are no safe levels of such chemicals. Every means possible must be used to develop alternative, natural methods of coping with insect and disease problems." - "The first thing to recognise when discussing plant protection from insect attack methods, is that plants themselves are not defenceless, but have their own means of defence against being eaten by insects." and, "Natural pesticides are present in many plants and can contribute up to 10 per cent of a plants dry weight."

Jeffrey Hodges even suggests that these "so-called harmless methods" such as the ones suggested here, can do damage as well. He states: "It is a problem, however, with the snail or grasshopper or whatever attacks a young seedling, as it invariably destroys the whole thing! So what I try to do is to physically protect young plants from such attacks. This can be rather simply achieved by covering the most susceptible plants with flowerpots - or plastic cordial bottles cut in half - overnight for three or four weeks, un-

til they are large enough to handle being nibbled a little. Alternatively, spreading around fresh grass clippings, wood ash or sawdust can discourage snails and slugs for a week or two. And, of course, there is hand collecting."

Then, there is the issue of what we kill when we use pesticides. *The New Gardener Plant Doctor* states that: "Knowing which insects and other creatures are on your side makes sense; these creatures will help you keep pest levels down without any effort on your part. Some creatures are essential to the plant's productivity or ability to produce - pollinating insects such as honeybees, for example. Others are important in controlling pests; some larger creatures, such as bandicoots, birds, frogs, echidnas and lizards (in Australia) eat pests that live close to or on the ground. Insect-eating birds also help to control garden pests at shrub and tree height. The numerous beneficial insects include ladybirds and their larvae, lacewings and their larvae and ground beetles. Even commonly found wasps and ants are of use as they prey on many insect pests. Spiders and centipedes too will help to keep pest levels down as they catch and consume insects that could damage plants."

"In most instances it is both environmentally and socially desirable to take a balanced view of pests and diseases rather than develop what might be termed a 'spray happy' mentality. The presence of a pest, and even the presence of some diseases, does not mean it is essential to apply an insecticide or fungicide. In some cases low levels of pest and disease organisms will be insufficient to cause serious damage to bulbs and can be tolerated." This statement is from James Hitchmough's *Garden Bulbs for Australia and New Zealand*.

It is obvious that the use of chemicals will not cure all problems and all of these facts are worth serious consideration, whatever country we live in:

- Chemical sprays can kill an infestation, but constant spraying can lead to the pests building up a resistance to the chemical. Pest control in the garden can be handled by using basic integrated management practises.
- It is evident that we should monitor plants on a regular basis and select

an appropriate control.

- Not all insects are pests and if chemical sprays are excessively used, beneficial insects will also be destroyed.
- Identify these good insects in your garden and encourage their presence. Use natural controls rather than chemical sprays to protect these insects.

Some beneficial insects are:

- The larvae of ladybird beetles; they feed on aphids, scales and mites.
- Hover fly larvae, which prey on aphids, caterpillar larvae and eggs.
- Praying mantis, which feed on insects.
- Predatory mites, which feed on harmful mites.

Birds that feed on soil insects such as cockchafer and underground grass caterpillars and on moth and butterfly larvae, are also beneficial.

Less than 1 per cent of garden insects are actually pests.

Insects play an important role in our gardens and we ignore them on an everyday basis until they threaten our plants in some way. Ants, earwigs, thrips, mealybug, slugs, snails, scale insects, caterpillars and aphids are just a few that we encounter. In my garden for a plague of Harlequin bugs, it was suggested that instead of using a chemical spray that I knock them off into a bucket of hot water. It was quite a task to collect as many as possible. Eventually, they disappeared. That was about five years ago and they have never returned. I assume they didn't like the hot water! It is often our experience that chemical cures are not always necessary.

The author has collected a selection of natural remedies, listed below, using herbs and plant products. After you try them, let us know the results or, share with us your own methods, so that others may benefit also.

Chilli Spray

Use fresh or dried chillies and blend one cup of dried or 2 cups of fresh chillies with two cups of water. Spray fresh. This will kill caterpillars.

Chilli and Wormwood Spray

Blend one cup of chillies and one cup of

wormwood with one cup of water. Then, add five cups of water and bring to the boil. Allow this to stand for one hour. Strain and bottle. This can be sprayed on plants and garden beds to repel possums, rabbits, snails and slugs. It also kills aphids, bean fly and white fly.

Note: Do not allow the chillies or this mixture to come into contact with eyes or skin.

Comfrey Foliar Food

Before using the Comfrey flowers, cut the leaves and pack them into an old bucket or something similar with holes in the bottom. Place a plate or a tin lid on top and weigh it down with half a brick.

Put a plastic plant pot in an old basin and stand the bucket on the pot. After three weeks, there should be a quantity of brown fluid in the basin. Strain this and then bottle it.

Spray plants in the proportion of 15 ml (1 tbsp) comfrey liquid to 1 litre water and a few drops of liquid detergent. Put the remaining contents of the bucket on the compost heap.

Homemade sprays may be stored safely for up to one month, providing they are in sterile, glass, and screwtop containers.

Glass bottles or jars may be sterilised by placing them in cold water and bringing them to the boil then simmer for 30 minutes. Allow the bottle or jar to cool in the water before using.

Correct labelling is essential. Include the date of making and the ingredients on the container and keep them in a safe place out of the reach of children and animals.

Coriander Spray

Boil equal parts of coriander and water for ten minutes. Strain and bottle. This is suitable for spider mites and aphids.

Elder Leaf Spray

Simmer 500 grams of Elder leaves in 3.5 litres of water for 30 minutes. Replace water lost as steam. Strain and bottle. This is a general pesticide suitable for aphids, caterpillars, thrips and black spot.

Feverfew Spray (tea)

Pour boiling water over fresh or dried feverfew flowers and steep until fragrant. This can be used on a wide range of insect pests.

it is said to be good for migraines - drink one cup every morning as prevention.

Garlic Spray (1)

Soak four garlic cloves for several days in one litre of cold water and then blend. This will kill ants, caterpillars and cabbage worms. A stronger brew can be made by using hot water and adding several red peppers, ground up, and adding two tablespoons of pure soap to help the spray stick. Use spray when solution has cooled.

Garlic Spray (2)

Chop 85 g garlic. Don't bother to peel it. Soak it in 2 tablespoons of mineral oil for 24 hours. Add 600 ml water to which 7 grams of soap has been dissolved (or as soapy a solution you can make). Strain and store in glass not metal, away from the light. Dilute with ten times the amount of water to begin with; then makes it stronger if it isn't effective. The smell isn't as bad as you would expect and it doesn't linger when sprayed.

Garlic spray can be used as a general insecticide in a wide range of situations, but its effect is variable. Very effective sometimes not at all at others. Possibly harsh, arid conditions make it less effective. Remember that it is not a contact poison and must be eaten to be effective.

General Insect Spray

Crush three unpeeled heads of garlic and 90 ml (3 fl oz) liquid paraffin. Place in a bowl, cover and leave to stand for 24 hours. Melt 15 ml (1 tbsp) grated, oil-based soap in 500 ml (17 fl oz) hot water. Blend the garlic mixture with the soap mixture. When cooled, strain into a glass jar or bottle and seal. Keep it in the refrigerator. To use, dilute about 20 ml (4 tsp) of this solution in 2 litres (4 pints) of cold water. Spray fortnightly.

Marigold Spray

Cover Marigold flowers (the French marigold not the English calendula flowers) with boiling, soapy water and leave overnight. Strain and this can be used for Aphids.

Milk Spray

Dissolve 500 grams of dried milk in 4 litres of water and spray directly onto the leaves showing signs of virus diseases.

Nicotine Spray

Soak cigarette or cigar ends in water for

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