

BULBS

An International Bulb Society Quarterly

Volume 2 No 3

Sept/Dec 2000

International Bulb Society

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BULBS

The quarterly publication of the International Bulb Society

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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: BULBS@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).

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Contact Robert Turley and simply ask to join the Bulb Forum: RMTurley@aol.com

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Come to Chicago!

“IBS International Bulb Symposium”
Weekend of May 5th & 6th

Friday May 4th

Social Hour for early arrivals 6pm-7pm

Saturday May 5th

Breakfast

Welcome President Robert Turley
Slide Presentation Dr Dave Lehmillier Crinum

Break

Lecture Floris Barnhoorn Hadeco
Slide Presentation John Reed Daffodils

Door Prize Contest

Lunch

Slide Presentation Dr Alan Meerow Alstroemeria
Slide Presentation Boyce Tankersley The Republic of Georgia

Break

Slide Presentation Glenn Stokes Cannas
Slide Presentation Dr Harold Koopowitz Conservation of Bulbs

Break (cash bar)

Rare Bulb Auction

Awards Banquet Herbert Medal Presentation
Slide Presentation Dr John Grimshaw Wanderings of a Bulb Lover

Sunday May 6th

Breakfast

Slide Presentation Dr John Grimshaw Galanthus
Slide Presentation Dr Jim Shields Lycoris
Slide Presentation Kathy Andersen Miniature Daffodils

Break

Slide Presentation Dr Alan Meerow The New Liliaceae
Workshop* Dr Harold Koopowitz Bulb Propagation & Twin Scaling

Registration: by 4/10 \$125, after 4/10 \$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-IBSChicago, 307 Calle Sonora, San Clemente, CA, 92672 or email Batlette@home.com

Or sign up at the IBS web site: www.bulbsociety.org/ *Separate fee. See form page 17.

REGISTRATION FORM - PAGE 17 OF THIS ISSUE

EDITORIAL

Color is here!

Here is the long awaited color BULBS. The subsequent issue, March of 2001, is also on its way to you now. It is somewhat difficult with an all-volunteer small staff to meet a quarterly deadline but now we are over the hump of incorporating color into BULBS I believe that the goal of publishing four issues per year will be met beginning this year.

New Article Series

We are publishing a new series of articles for the beginning bulb enthusiast called "Bulb Basics", written by free-lance gardening writer Carol Wallace. The first of the series begins in this issue and explains microclimates. Carol will treat each topic in the series more thoroughly than the customary articles you may find in gardening magazines. I hope that you enjoy it.

Been There, Killed That

Despite the recent barrage of advice to 'go native', what we all wish most to grow are plants that are uncommon to us, and so, also, uncommon to our immediate geographical area. In short, we all wish to grow non-natives. I encourage you to view the current vogue for native plants with some skepticism. Gardening is subject to the same 'trends' as interior decorating (remember 'Avocado' carpeting and 'Harvest Gold' appliances?), clothing (mini skirts and Nehru jackets), and food (tofu burgers, anyone?).

Resist the crowd, try and grow all the plants you admire, and do not feel guilty! Your garden, both in the ground and in pots, is your own private world. Be bold! Be daring! Read all you can, and keep trying different things. Enjoy your hobby and keep it exciting through experimentation. I recently came across a reference to advice from Vita Sackville-West about trying the same plant in several locations. This is sound advice for bulbs, too. Try them where you want them, where you think they may grow best, and even where you think they may not grow well. Do not be daunted by an occasional fatality. Not every bulb in nature lives either. It is my great hope that BULBS Magazine will help you to grow what you covet most.

Second Annual IBS Members' Meeting

Our second annual Members' meeting will be held in Chicago the first weekend of May, 2001. Information about this spectacular event can be found in this issue on page 1. The registration form is on page 17. Register early! You may register by snail mail, our web site www.bulbsociety.org/, email Batlette@home.com, or phone (949) 369-8588.

Everything on page 1, with the exception of the bulb propagation workshop, is included in the registration fee as well as all breaks and meals through Sunday morning. The workshop will be lecture, demonstration, and hands-on. It will cover various forms of bulb propagation including twin-scaling. The workshop fee is \$25 and includes lunch on Sunday. The workshop only has room for 24, so HURRY!

Our webmaster, Kelly Irvin, has posted additional information including lodgings choices on our web site www.bulbsociety.org/.

See you in Chicago!

C Craig, editor

BULBS

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September/December 2000

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PHOTO CREDITS

We gratefully acknowledge the following persons who generously contributed their own photographs to this issue of BULBS: Dr. Jack Elliott, Rod and Rachel Saunders, Tony Palmer, Jim Shields, and Kathy Andersen.

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.

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1/2 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).

COVER ARTWORK

The photographs on our front and back cover were very generously donated for our use from the private collections of Jack Elliott and Rod and Rachel Saunders. Front Cover: *Gladiolus Carmineus* Back Cover: *Fritillaria Raddeana*.

CLIMATES AND MICROCLIMATES

WHAT THEY SAY ABOUT THE BULBS I CAN GROW

by Carol Wallace

Most of the plants that we grow began as species native to a certain area of the world, one with a climate that is ideal for that plant. In a different set of climate conditions that same plant may fade away or run rampant.

Some plants love humidity and so languish in arid climates. Some need several weeks of cold to perform well and bloom, others wilt at the first breath of cold. Some take so long to enter their bloom cycles that in short summer areas they may never flower. For success with our plants we need to find the right plant for the right place. And the right place is one that mimics the native growing conditions of the plant in question.

Tools such as climate zone maps and heat zone maps help us to determine what the plant's native habitat was like and therefore whether we have a good chance of providing it with similar growing conditions. The use of microclimates may allow us to lengthen the list of things we can grow.

USDA CLIMATE ZONES: WHAT THEY CAN AND CAN'T TELL YOU

When we say a particular bulb is "hardy to zone 5," what does that tell you about it? Not much, really. Your zone rating is only an estimate of the average low temperature in your area. The hardiness rating of a particular plant gives us an idea of the average low temperature it can withstand before freezing to death.

A plant's hardiness range, saying that a plant is hardy from zone 5 to zone 7 for example, is a more useful rating because it not only describes a plant's sensitivity to cold, but also tells us what areas are likely to be too warm for it to perform well.

Most good gardening books and catalogs include a USDA climate zone map. There are also maps for China, Australasia, Europe, Africa and Canada. Find your hardiness zone and you will know the lowest average winter temperature that your area is likely to experience. If a plant can't deal with that, and it's a plant you can't live without, then you need to consider taking special measures. But merely knowing about USDA hardiness zones is not enough to ensure that your garden is a success.

Seattle, Washington and Savannah,

Georgia are both rated Zone 8b because they share the same average low winter temperature. But the summer heat in these areas differs vastly. Heat and many other factors are equally important in determining how well a plant will do in a given environment. So we need other resources.

SUNSET ZONES

Gardeners lucky enough to live in the western United States have a different and better system for describing climate zones. The Sunset Zone ratings are based on length of growing season, the timing and amount of rainfall, winter lows and summer highs, humidity, day length and more. Knowing your area's Sunset Zone will give you a much better idea of how your yard compares to a plant's natural habitat.

Recently Sunset Books published a new book with ratings for the entire United States. While few catalogs and plant care tags use these zones, it's well worth finding your own Sunset Zone, as it will make you aware of most of the important growth-influencing factors in your climate. Add that to what you know about a bulb's native habitat, or of the places it thrives that are similar to your own growing conditions, and you can make an educated guess about which bulbs you can grow successfully.

HEAT ZONES

The American Horticultural Association's new Heat Zone map emphasizes the intensity and duration of hot weather in its classification of planting. The Heat Zone map indicates the average number of days each year when given regions experience temperatures of 86F (30C) or higher; 86F (30C) being the temperature at which many common plants begin to suffer physiological damage.

While some plants die of the cold, others wither away due to heat sensitivity. Those plants native to cold climates may refuse to bloom in regions without long periods of chiling. Knowing the extremes of both heat and cold weather in your climate will help you to make better-informed choices about bulbs that will thrive for you without resorting to drastic measures.

BEYOND CLIMATE ZONES – MICROCLIMATES

A single yard can actually encompass several different climate zones because it has several microclimates. A microclimate is a set of growing conditions. Microclimates are areas created by hills, hollows and valleys, buildings, paving, slopes, proximity to water and more. Those hills or buildings or trees can make enough of a difference to an area to put it in a different climate zone. Or better still, can be used by us to create an environment different enough from our norm to let us try bulbs that at first glance seem unlikely candidates for our yards.

To some extent we can extend the range of our plantings if we study our property and understand the variety of different conditions it offers.

For instance, flat areas with no windbreak will be colder than sloped areas or those sheltered by walls or trees. Bulbs planted by your house's foundation enjoy a microclimate several degrees warmer than those in the yard. Slight hollows in the contour of the land can be frost traps; decimating tender plants that are unharmed only a few feet away.

Walls and houses store and conduct heat and provide shelter from cold, drying winds. Sun reflects off walls and onto the plants. A south-facing wall provides plants with a longer growing season than those in other exposures, and here you can grow plants too tender for other areas of the yard. Do parts of your property lie on a slope? It is warmer at the top and cooler at the bottom because cold air flows downhill. Do you need more cold? Then plant on the shadier north side of a house or wall in the shade. Shaded areas remain cooler and damper longer than those in sun do. (Note: reverse this if you live in the Southern Hemisphere.)

One of my gardens is surrounded on three sides by walls. Despite my zone 5b/6a rating, I have been able to grow bulbs rated hardy only to zone 8 in that garden. It is protected from cold winter winds, and gets extra warmth from sunlight reflecting off of the stone walls. Two full zones of extra warmth and protection!

You probably have several microclimates in your own yard. If you get snow watch how it melts quickly in some areas (the sunny ones) and lingers for days in other places. The sunny areas will heat up and also dry out faster than the shady ones.

Keep a watch on your yard and chart the light and shade patterns for different times

of day and the different seasons. Experiment with inexpensive plants before committing to costly collectors' items. With a bit of climate information and attention to the variations in your yard you may find that you can grow a wider variety of bulbs than you ever thought possible.

Online Resources:

Zone maps for the world: <http://www.aroid.org/horticulture/zonemap/index.html>

Find your Heat Zone

<http://www.ahs.org/publications/zipfinder.htm>

The Heat Zone map explained

http://www.ahs.org/publications/heat_zone_map.htm

Download a copy of the Heat Zone Map

<http://www.ahs.org/images/pdf/heatmap.pdf> (Note: you will need Adobe Acrobat to do this.)

Climate Zones for Australia

<http://www.bom.gov.au/climate/environ/design/climzone.shtml>

Climate Zones for Africa

http://www.lib.ohio-state.edu/OSU_profile/bslweb/aclimate.html

Climate Zones for Canada

http://res.agr.ca/CANSIS/NSDB/CLIMATE/HARDINESS/_overview.html

Books and Print Resources

Editors of Sunset Books and Sunset Magazine, The National Garden Book, Sunset Pub Co; ISBN: 0376038608 ; 1997

Heat Zone Map available from the American Horticultural Society



Carol Wallace gardens in northeastern Pennsylvania. She writes a weekly column, Virtually Gardening for Suite101.com at http://www.suite101.com/welcome.cfm/virtually_gardening. After 19 years teaching at University of Scranton she has finally realized her life-long ambition; to be a full time garden writer. The pay isn't much, but the satisfaction is enormous.

IBS INTERNET FORUM

***Moraea* - The Topic of the Week**

by Mary Sue Ittner

The second topic of the week for the IBS Internet Forum this year was *Moraea*, a genus in the family Iridaceae that occurs mostly in South Africa. Peter Goldblatt has "reduced" the genera in the sub-tribe Homeriinae into *Moraea*, but we did not include the "new" *moraesas* in our discussion.

There were mixed experiences growing *Moraea* from seed. Some people had trouble getting seed to germinate, but found that leaving the pot until the second year was helpful as seeds came up then. Others had really good success with seeds. Will Ashburner (Australia) reported on 12 species he had recently grown that were sown outside in a shaded area in the fall and subjected to normal day and night changes in temperature. All germinated. Most came up 3-6 weeks after he sowed them; two that did not were from summer rainfall areas. One of those appeared in 10 weeks and the other in 29.

In past discussions on the forum Rachel Saunders (South Africa) had explained that the fluctuation in temperatures between warm days and cool nights in the fall was probably what was needed for germination.

Once seed germinated, experiences again differed in growing them to flowering. A few species were vigorous and quick to flower and others dwindled each year. Will reported all 12 of his species bloomed in 118-136 weeks. Others wrote it sometimes took 3-4 years before their seedlings flowered.

Moraea seems to be one of those genera that choose to skip a season or more. No one seems to know why or what exactly is going on under the ground when this happens. More than one person has dumped the contents out of an "empty" container, expecting the worst, only to find healthy corms. From the same lot of seeds, some corms will appear while some of their siblings sit the year out. Dirk Wallace (Australia) observed that this genus does not like to be transplanted and therefore the practice of repotting every year might be a possible explanation. Mike Mace (Northern California) accidentally discovered that some of the species he grows seem to appreciate being watered in late summer and having a short dormancy.

A number of people reported greater success, especially in the second year, growing this genus in the ground instead of in containers. Lauw de Jager, who grows 50 different species in France in lattice pots plunged in the ground, believes that the cooler soil temperatures and the more constant humidity promotes better flowering. Tony Palmer (New Zealand), on the other hand, related good results both from growing his in containers in a peat, pumice and pine bark mix and repotting every year. Lauw theorized that Tony must have a very efficient watering system and a way to avoid too high soil temperatures.

Although corms need to be planted in soils with good drainage, it also seems crucial that they get regular water and adequate fertilizer during their growing season. Jim Duggan (Southern California) found that he sometimes had to water twice a week if there was no rain. He was finding improved vigor from a new experiment of lightly fertilizing with each watering. Others add fertilizer formulated for bulbs to their mix when repotting with perhaps some supplemental feeding later in the season. Dirk fertilizes at the start of the season with "bone and blood" and adds a good dose of wood ash either in the potting mix or as a top dressing.

It was observed that some corms are found close to the surface and others pull themselves down very deep. Dirk usually plants 2-3 times the height of the corm when planting in the ground, but a little higher in pots. Since they can pull themselves down, but not push themselves up, he felt planting higher is better than lower.

A few species were of particular interest. A number of people found *Moraea ramosissima* difficult to flower. After flowering, it sometimes split into smaller corms. Will's flowers reliably, and he had not noticed his *moraesas* missing a season either. He admitted he wasn't counting every corm however. Someone else reported the best flowering of many *moraesas* was their first flowering from seed.

Moraea polystachya was once again the subject of much discussion. It has a long blooming season and large flowers that last for days instead of a few hours like some species, making it particularly desirable.



Moraea polystachya

Several people had managed to flower it in two years from seed. Members from colder climates were having success with it in greenhouses. On the other hand, several of us found it was one of the species that could skip one or more seasons. It has only bloomed twice for me in Northern California in ten years, but my bulbs were purchased, not grown from seed.

The experiences in Southern California were mixed. On a visit I was amazed to see that it was a garden weed in Southern California in a coastal garden that received year round water. Southern California member Lee Poulsen had not gotten his to bloom and Jim Duggan had seedlings yet to bloom in 4-5 years from seed. The watering may be the key. Peter Smithers is very successful growing it in the ground in Switzerland where it receives year round water, warm summers, and where last year it bloomed through six weeks of frost every night.

Robert Archer reported that he had been asked to photograph *M. polystachya* in the wild and found it in bloom in various habitats from pure clay to deep red sand. It was blooming in winter, which was the dry time of the year for the areas where he found it. There are some populations that grow in parts of South Africa with winter rainfall and it was expected that if seed could be obtained from those areas the requirements for success would be very different than for seed obtained of the same species from summer rainfall areas.

A few people shared which species grew the best for them. The ones that are easiest for me that I have growing in the ground are *M. aristata*, *M. gigandra*, *M. tripetala*, *M. vegeta*, and *M. bellendenii*. I grow others, but

they do not bloom every year. *M. tricuspidata* bloomed this year after many years absence.

Lauw has regular success with all of the ones I grow and also *M. polystachya*, *M. bipartita*, and *M. polyanthos*. *M. bipartita* looks like a smaller *M. polystachya* and blooms later in the spring. Several of us in Northern California found that until the days got warm the flowers on this species would not open properly. *M. polyanthos* is the last winter growing species to bloom for Lauw with many pale blue homeria type flowers.

Lee Poulsen has had good luck with *M. aristata*, *M. neopavonia*, and *M. villosa*, but like me has not seen *M. loubseri* after a few blooming years.

Mike Mace does well with *M. polystachya*, *M. neopavonia*, *M. loubseri*, *M. aristata*, *M. villosa*, *M. atropunctata*, and *M. barnardii*. He grows his in 8" (20 cm.) pots in full sun in a mix of 50% peat and 50% sand and waters every 5-6 days. In years with high rainfall he has more blooms, but adding extra water in those years without rain does not seem to increase the bloom.

One happy theme is that many gardeners around the world were finding *Moraea aristata* to be easy, especially in the ground. Since it is on the verge of extinction in the wild, it was very satisfying to hear this.

Jim Shields from Indiana is very eager to find moraeas that can be grown in the ground in his colder climate. He has been acquiring seed from the coldest areas of South Africa, mostly summer rainfall, to trial in his garden and had questions about them.

Jack Elliott who gardens in Kent, United Kingdom found the easiest one for him in the garden was *Moraea spathulata*. It lasted 20 years in the garden including 1987 when it was frozen a foot deep for three weeks. He thought it would be the hardiest. In the garden it flowers in summer and never goes completely dormant. Rachel Saunders suggested that Jim use deep containers and to keep these summer growers semi-dormant in winter.

In spite of all the varied experiences a few conclusions can be made based on our discussion. Growing from seed is advised, as is attention to soil requirements and regular watering and fertilization. Planting in the ground may be helpful or at least leaving corms in the same containers for more than one season. Finally, if corms do not show up, they may still be alive and waiting for conditions more to their liking.

IBS GLOBAL REPORT

UK News

The last 'News' was mainly of the AGS Bulletin in which plants from the Shows were discussed. The latest Bulletin details all the plants that received Awards from the Joint Rock Garden Plant Committee that meets at the RHS Shows and most of the AGS and SRGC Shows. Among the award winners were some exciting bulbs, and several of them are illustrated to the usual high standard.

A First Class Certificate was awarded to *Pleione Shantung* Grex 'Ducat' a most beautiful citrus-yellow orchid with dark red markings on the lip, very similar to its parent *P. forrestii* but somewhat darker in colour. It is a wonderful plant for the Alpine House.

Several interesting species of *Crocus* were shown to the Committee, one of the most popular being the small deep orange-yellow *C. gargaricus* subsp. *gargaricus*. This spring-flowering species has very small bulbs and grows best in woodland or peat bed conditions, well-drained with abundant humus and always moist. The subspecies *herbertii* also received an Award of Merit at an earlier Show in Scotland. The main feature in which this differs is that it is stoloniferous.

An AM was also awarded to the autumn-flowering *Crocus caspius* with large white flowers with orange-yellow throat and anthers. This grows on or near the shores of the Caspian, an area with wet summers, and it also seems to grow best without any dry period.

Two rare species received a Preliminary Commendation. The first was an exquisite form of *Crocus minimus* named 'Bavella' This is a very distinct bicolor with pale purple inner segments and very dark violet-purple outer segments without any feathering. It also differs from the type in having white anthers. One would expect this to be a good garden plant when stocks become available for experiment.

The year's greatest crocus was undoubtedly *C. mathewii* 'Brian Mathew' found eight years ago in the Taurus Mountains of S.W. Turkey, and is gradually being increased. The perianth segments are creamy white but the basal third of each is darkest violet with feathering outwards. It is a wonderful colour combination. This is closely allied to *Crocus asumaniae*, and there is some doubt whether the specific name will be retained. I hope so.

Alliums seem to be enjoying a vogue at present. A striking new species is illustrated here, *Allium nevskianum*, which was awarded a PC. It is native to Pamir-Alai on steep rocky slopes. The blue-green leaves are up to 25cm (10in) long and each bulb produces a single scape 10-20cm (4-8in) high, spotted with purple. The flower heads are circular, 4-12cm (2-5in) wide, purplish pink, the individual flowers have narrow segments to 12mm long and white styles. It is said to be easy as a pot plant in gritty loam-based compost, but it has probably not yet been tried in the garden.

The idea of double *Rhodohypoxis* flowers may not appeal to everyone but *Rhodohypoxis* 'Kiwi Joy' has attractive deep red flowers looking remarkably like double miniature roses. It first arose in Terry Hatch's nursery in New Zealand and in view of the ease of propagation of *Rhodohypoxis* it should be available before too long.

The best colour forms of *Corydalis solida* are much in demand, and until recently 'George Baker' with terra-cotta flowers has been the most readily available of the 'reds'. 'Zwanenburg' was given a well-deserved PC in late March. This was a selection from the Prasil Strain and has even better flowers of a fine luminous red. It is sadly a little slower to build up than 'George Baker' but it is sure to become popular eventually.

Tulips are not often exhibited but *Tulipa kurdica* appeared in late March and also received a PC. It is a very dwarf plant allied to *T. humilis*, native to Iran, with vivid red flowers on stems of only 3-4cm (1-2in), with a dark almost black blotch at the base of each segment. It is apparently increasing quite freely and might be a useful garden plant in very well-drained soil in full sun.

Fritillaria eduardii belongs to the *F. imperialis* group but it is a shorter and more slender plant with glossy green leaves scattered up the 60cm (24in) stem and forming a whorl around the flowers. These are bright orange and more flaring than those of *F. imperialis* so that one sees its large white nectaries. It is an easily grown pot plant but unfortunately it does not seem to increase or to set seed, so it is likely to remain scarce.

This is a particularly interesting issue of the Bulletin for the bulb enthusiast.

BULBS OF SOUTHERN AFRICA

Rachel and Rod Saunders

"Bulbs", that loose term that we all use to cover plants with true bulbs, corms, rhizomes or tubers, are extremely well represented in Southern Africa, and particularly in the SW Cape and Namaqualand. Some of our bulbs are already well known in horticulture - one only has to think of *Sparaxis*, *Freeseias*, *Gladiolus* and *Clivia*, but many are still relatively unknown and at present are only grown by collectors.

To give you some idea of the wealth of the flora in Southern Africa, a few brief statistics:

One of the reasons for this huge floral diversity is the wide range of environmental conditions found in Southern Africa; altitudes from sea level to 3,400m (11,000 ft), desert to sub-tropical forests, a wide variety of soil types, and either winter rain, or summer rain, or both. The areas that are particularly rich in geophytes are Namaqualand, the SW Cape and the high altitude grasslands of Natal.

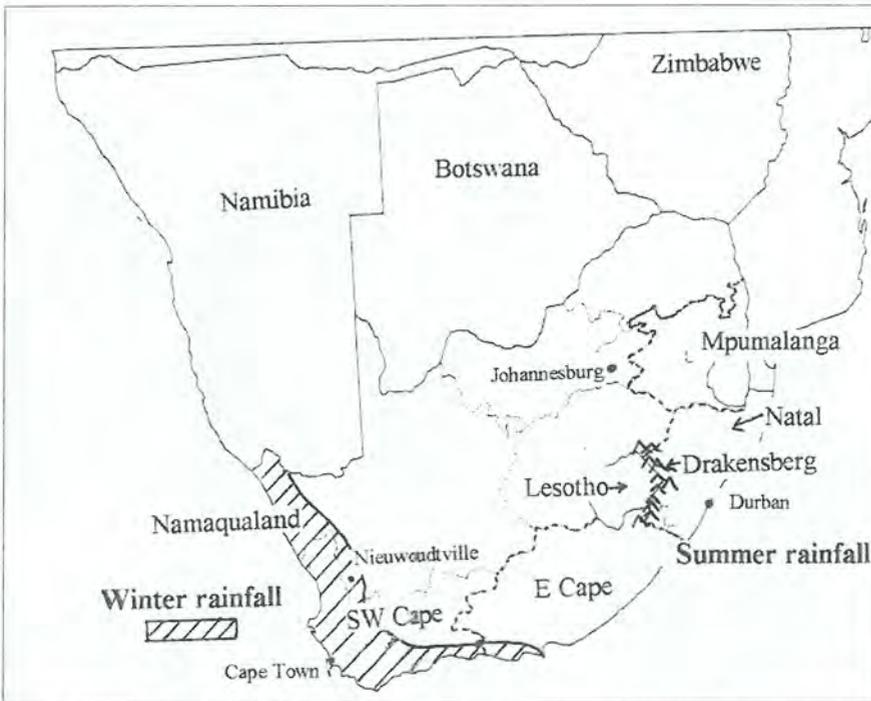
Summer rainfall areas of Southern Africa

Perhaps we should start with the summer rainfall area and its bulbous plants. Firstly, the climate. Most of Southern Africa falls into

this area - a region characterised by variable amounts of rain, mainly in the form of violent thunder storms, in s u m m e r . Innumerable times have we been walking in the grasslands of the Drakensberg, Lesotho or Mpumalanga, identifying and photographing plants, with little clouds in the bright blue sky gradually building up into big thunder clouds. Suddenly, often with great rapidity and very little warning, the towering white clouds turn black,

lightning flashes across the sky, and we flee for cover! The rainfall varies from 250mm (10in) in the Northern and Western areas to greater than 800mm (32in) in Natal and the Eastern Cape, and it all falls from late spring, through the summer, tailing off in autumn. Winters vary from dry and cool (along the Natal coast) to bone dry and icy cold with snow (Drakensberg, Lesotho and the Eastern Cape).

The bulbous plants from these areas are either deciduous and thus avoid the dry cold



- There are about 20,000 species of plant in Southern Africa, in an area about the same size as the Eastern USA. Of these, over 3,000 are geophytes (excluding orchids).

- There are 8,600 species in the SW Cape, an area equivalent to 1/3 the size of Britain or 1/3 of California. Of these, about 1,800 are bulbous or cormous plants.

- There are 2,300 species in the Cape Peninsula, an area of 470km² (an area smaller than London) of which about 300 are bulbous or cormous.

winters by going dormant, or evergreen if they come from better- watered more protected habitats on the Natal or Transkei coast for example. Examples of evergreen species would include some of the *Agapanthus* and *Nerine* species, all the *Clivia* species, all the *Kniphofias*, *Dieramas* and *Aristeas*, and a few of the *Cyrtanthus* species. It is not strictly true to say that all these species come from protected habitats. One only has to see fields of *Dieramas* or *Kniphofias* flowering high in the grasslands of the Drakensberg to see that some of the evergreen species cope very well with cold conditions. However, generally speaking, many of the evergreen species would require some protection from severe frosts. It is also important to remember that the winters are cold but dry, and this is vastly different to cold and wet conditions.



Hesperantha luticola

The summer rainfall deciduous species include a wide range of genera and families.

- Iridaceae such as *Gladioli*, *Moraea* and *Hesperantha*;
- Amaryllids like *Crinum*s, *Boophone*, *Brunsvigias* and some *Nerines*;
- *Scillas*, *Eriospermums*, *Eucomis*, *Ledebourias*, *Ornithogalums* and *Albucas*, just to name a few.



Gladiolus pritzellii

The list is long and the list of habitats occupied by these species is equally long. Probably one of the richest habitats is the grassland, and this is also unfortunately one of the most threatened habitats. The rolling well-watered grasslands with higher rainfall, cooler misty summers and fertile soil are ideal for pine plantations, and that is what they are all becoming to the detriment of all the native flora. Areas where one could once see sheets of *Kniphofias* or *Watsonias* in flower after a fire, and *Eucomis*, *Dieramas* and *Gladioli* flowering among the grass, are becoming fewer and fewer.

The habitats occupied by geophytes vary from the rich soils in deep shade (*Clivias*) to marshy swampy grasslands (*Nerines* and *Kniphofias*) to well-drained mountain slopes (*Dieramas* and *Gladioli*) to hot bushveld flats (*Ledebourias* and *Eriospermums*) and to high misty mountain tops (*Eucomis*, *Galtonias*, *Agapanthus*).

Growth pattern and seed germination

The deciduous geophytes in these areas break dormancy in early spring once the weather begins to warm up. They grow and flower during spring and summer, and go dormant as the temperature and rainfall begin to drop in the autumn. During the cold dry winters when the danger of grass fires and frost damage are high, the bulbs are dormant and protected under the soil. These

species are probably amongst the easiest of the Southern African bulbs to grow, as they are relatively frost hardy (due to dormancy), and they grow during the warm moist summers, conditions which are easy to duplicate.

- Seeds of these species are best sown in spring when conditions are warm and moist.

- The best growing medium is 2 or even 3 parts medium-grained river sand to 1 part well-rotted compost. Do not try to duplicate the natural growing medium of the plant. If they grow in clay in the wild, they will not necessarily grow in clay in a pot! The most important factor in the growing medium is that it must be well-drained.

- Some of the species come from areas with cold winters, and the seeds of these species may benefit from cold treatment as described below.

- Sow the seeds in a seed tray, water them once, then cover the tray with plastic and put it into the refrigerator for 2 or 3 weeks. Bring



Brunsvigia herrei

the seed tray out into the warmth, uncover it and water again. Germination should commence within a few days to a week.

- The seedlings should then be dried off when the weather cools down in autumn, and they will go dormant during the winter. In general it is a good idea to keep the little plants growing for as long as possible to ensure that the bulbs are big enough to withstand dormancy.

The evergreen species should be treated in a similar fashion, but they require some rain all year (less in winter), and many would require protection from frost.

Winter rainfall areas of Southern Africa

And now to the winter rainfall geophytes in the SW Cape and Namaqualand. The climate in these areas is Mediterranean; cool to cold wet winters and hot dry summers. The rain falls from autumn, through the winter, to spring and is often accompanied by snow in the high mountains. Cold fronts come sweeping in from the northwest, heralded by strong gale force winds, and followed by rain which may fall for several days. Rainfall varies from 100mm (4in) in the far northern Cape, to 1500mm (60in) in the mountains around Cape Town. At lower altitudes the temperature rarely falls below freezing, whereas in the higher areas, frost and snow occur regularly. Summers are characterised by warm to hot dry



Brunsvigia marginata

days (25 - 40°C; 80 - 105°F) often

accompanied by a south east wind which may bring mist and some rain to the southern mountains. The plants growing in these areas have adapted or evolved to cope with this "reversal" of climates, and their main growth occurs in late winter and spring when the temperatures are warming up and the moisture levels are still high. The geophytes generally are deciduous, with a few exceptions; two species of *Agapanthus* and the *Aristea* and *Dilatris* species are evergreen and manage to survive the summers with their lack of rain and high temperatures. The deciduous species break their dormancy when the high summer temperatures begin to abate, often several weeks before the first rains fall. Some species such as the Amaryllids, a few Irids, *Polyxena* species etc., flower during this period (early autumn), often before they have produced any leaves (hysteranthous). Most species, however, wait until spring, when they burst into a riot of colour. Then, their growth cycle complete, they produce seed and go back into dormancy in preparation for the hot dry summer.

In the SW cape, the number of geophytes is huge. The Fynbos area has over 1,400 species, the highest concentration in the world.

Iridaceae is the fourth largest family in the area with about 40 genera and over 600 species. The diversity of plant growth forms, leaves, flower shapes and colours, is amazing, varying from species such as *Daubenya* and *Massonia* with large completely prostrate leaves and flowers at ground level, to crocus-like *Romuleas*, large flashy *Gladioli*, and the extraordinary flowers of *Gethyllis* and *Haemanthus*. The range of habitats is just as wide - from the semi-desert of the Richtersveld (in the Northern Cape) to the well-watered mountain slopes near Cape

Town, to the arid high escarpment around Nieuwoudtville and Sutherland. Soils are nutrient poor acid sands, to hard stony clay, to rich neutral to alkaline doleritic soils.

Growth pattern and seed germination

Cultivation of the deciduous winter growing bulbs is trickier than the other geophytes, unless one happens to live in a Mediterranean climate! They tend not to be cold hardy, and they do not, on the whole, like summer rain. This means that in very cold areas they will require protection while they are growing, they may need additional light, and they also need to be sheltered from summer watering. They therefore do not survive well in the garden (unless it is a Mediterranean climate garden), and need to be cultivated in pots or containers.



Gethyllis campanulata

- Seeds of these species are best sown in autumn, when the day temperatures are about 22°C (72F) and the nights less than 10°C (50F). The seeds require this fluctuation between day and night temperatures to stimulate germination. So do not sow your seeds and place them in a constant temperature glass house because they

will probably not germinate!

- The potting medium should be the same as described for the summer rainfall bulbs. Again, good drainage is the most important feature.

- Keep them moist through the winter and spring, and start to dry them off when the summer temperatures begin to rise. Keep the pots dry and protect them from intense heat during the summer.



Gethyllis varhynsdorp

Winter-growing Amaryllids

I am not going to bore you with long lists of Cape bulbs, as those are available elsewhere. I would rather elaborate on one family of those plants which is often overlooked, and that is the winter growing Amaryllids. Some of these genera are well known. Many of you will be familiar with *Crinum*s, *Nerines* and *Amaryllis belladonna*, the "March Lily" as it is known in South Africa, or "Naked Ladies" in California! However, what about the winter rainfall *Gethyllis*, *Hesseas*, *Strumarias*, *Haemanthus* and *Brunsvigias*?

All of these plants have a true bulb, many of which are poisonous and are used medicinally (not a contradiction!). All are dormant in summer when one is totally unaware of their presence. Then, in mid-summer (for *Gethyllis*) and early autumn (for the other genera) (March or April in the southern hemisphere), a flower spike is pushed up out of the hot hard-baked soil. The flowers vary in shape and size:

- *Hessea* and *Strumaria* produce an umbel of erect or pendulous star-shaped pink to white flowers.

- *Haemanthus* have a flower resembling a paint brush (a very tight umbel of more or less upright flowers surrounded by large "bracts") varying in colour from white to red.

- *Brunsvigias* have small to large umbels of white to red flowers on a sturdy spike, similar to a football on a stick.

- And *Gethyllis* have single extremely fragile delicate white or pink often fragrant flowers at or just above ground level, attached to the inferior ovary (below the soil surface) by a delicate "tube".

Often while walking in the hot dry mountains in the height of summer, one comes across big patches of these beautiful *Gethyllis* flowers, which appear far too fragile for their harsh surroundings. As the flowers are single, it is essential that the whole population flowers at the same time for cross-pollination to occur. How is this organised? How do the plants know that this is the week to flower and that all their neighbours will be flowering? It is thought that slight changes in atmospheric pressure may stimulate the plants, and even if no rain falls, a cold front far off in the Atlantic Ocean south of the Cape may trigger simultaneous emergence of the buds from the ground. Another mystery (to me!) is how these seemingly fragile flower buds manage to push their way through the rock-hard dry soil and emerge looking fresh and beautiful!

The flowers of all these Amaryllids last for a few days to a week or two, and then, either disappear (*Gethyllis*) or form seeds. *Haemanthus* seeds are encased in a fleshy berry, whereas *Brunsvigia*, *Hessea* and *Strumaria* have dry capsules with rounded fleshy seeds inside. In *Brunsvigia*, the entire umbel enlarges, and in all three genera, the ripe umbels detach from the bulb and are blown away by the wind, spreading seeds as they tumble across the landscape.



Hessea monticola



Geissorhiza tulbaghensis

Haemanthus berries are either eaten by animals and the seeds distributed that way, or they simply fall to the ground and dry out in the sun, distributing their seeds at the base of the parent plant.



Babiana pattersonii.

In *Gethyllis*, the flower simply wilts in the hot sun and disappears. The underground ovary then begins to enlarge and in autumn the sausage-shaped fruit is gradually pushed out of the ground. The fruit is fleshy, aromatic (smelling like custard apples with slight overtones of vanilla) and tasty, and it varies from the size of one's little finger to a large sausage of up to 8cm (20in) long, filled with small seeds in a jelly. The fruits smell very sweet, but the taste is surprisingly not so sweet. Distribution is either by the fruits being eaten, or by the flesh drying out and the seeds being dropped where they fall, at the base of the mother plant. Man has discovered a good use for the fruits. If they are steeped in brandy they make a delicious and medicinal alcoholic drink called "kukumakranka brandy". The name "kukumakranka" is an old Hottentot name for all *Gethyllis* species and it has persisted as a well-known and well-used common name.



Ixia versicolor

All Amaryllid seeds have the extremely short viability of a few weeks. In nature the seeds start to germinate almost immediately on ripening, whether conditions are favourable or not. This leads to an extremely high mortality rate, as many of the little seedlings simply shrivel up and die in the heat. The seeds all ripen in autumn when the first winter rains can be expected, but these are unpredictable and may be delayed by one or even two months. So the tiny seedlings may have to survive several weeks without any moisture at all, and many of them don't. At the same time as the seeds ripen,



Geissorhiza corrugata

the leaves of the parent plants emerge, and the plants then begin to grow. Growth normally continues all through the winter and spring, and they retreat back into the soil early in summer.

The leaves of the different Amaryllid species also vary considerably:

- *Brunsvigia* (the winter rainfall species) leaves tend to be large and flat on the ground.



Lapeirousia pyramidalis regalis

- *Hessea* and *Strumaria* may have narrow or broad, erect or prostrate leaves of variable size.

- The leaves of many *Gethyllis* species are spirally twisted or coiled like a watch spring and extremely attractive. In some *Gethyllis* species, the leaves emerge from a "neck" or sheath called a cataphyll that may be beautifully marked. We call this the "Afrolook" - a wild head of spiral hair emerging from a narrow neck! Some species have green leaves, some grey and some silvery and hairy.

Cultivation of Amaryllids

Most Amaryllids respond well to cultivation in big, deep pots in well-drained soil. These are easily grown from seed. Fresh seed is sown on the surface of the soil



Lachenalia congesta

(uncovered) and is kept moist. Within a few days a root is pushed down into the soil, followed by a shoot and leaf. Many species then put all their energy into forming a bulb, so that by the end of the first growing season, the bulb is already well-formed and the seedling can survive its first dormancy. It is an advantage to keep the seedlings growing as long as possible so that the bulb is a reasonable size. When the seedling shows signs of going dormant, stop watering and place the containers in a cooler place. Watering once or twice through the summer



Androcymbium striatum

will not harm the plants, as long as the soil is sharply drained and the bulbs do not become water-logged. As soon as the weather begins to cool down again in autumn, commence watering again.

Summary

In conclusion, many of the wonderful bulbous plants of Southern Africa are plants well worth cultivating, either in the garden or in containers. Most of them are not difficult, but one must ask a few questions before simply planting them in a pot, watering them, and expecting them to flourish!

- Where do the plants come from?
- When should the seeds be sown; spring, autumn, or immediately?
- Are they deciduous or evergreen? (This determines their watering regime and requirements)
 - When do the plants go dormant?
 - What size pot do they require?
 - What soil should be used, and should the seeds be covered with soil when sown?



Galaxia fugacissima

If one takes all these questions and answers into consideration, one is likely to be successful in growing and flowering at least some of the geophytes of Southern Africa.



Babiana nana

Rod is a horticulturist, and worked as a municipal horticulturist for many years in city parks, botanic gardens, etc. His last formal employment was 10 years at Kirstenbosch Botanic Garden in Cape Town running the botanic garden nursery. Rachel has a PhD in microbiology, and worked for 12 years in a university research lab. About 7 years ago both of them gave up their jobs and bought a small mail order seed business, which has taken over their lives! They sell seeds of native South African plants of all sorts, and spend most of their time collecting and sourcing seeds, cleaning seeds, and finally mailing them all around the world. Rod and Rachel live in an old house in a suburb of Cape Town, and have a garden full of plants of all sorts, including hundreds of bulbs in containers.



Rod and Rachel Saunders

International Bulb Society
International Symposium 2001 Registration
Chicago, Illinois, May 5-6

Registration for the Symposium includes all meals for Saturday and breakfast on Sunday at the Chicago Botanic Garden. Registrants are to arrange their own transportation and accommodation. **Please fill out this form and return to the IBS. Registration at the door will be \$175.**

_____ is/are in my party, so I am paying \$125/person -or- \$150 late = \$ _____
I/we would like to attend the Bulb Propagation Workshop (\$25/person)* = \$ _____
***Subject to availability (24 persons maximum)** TOTAL = \$ _____

MAILING ADDRESS

Name: _____
Address (line 1): _____
Address (line 2): _____
City: _____
State: _____
Zip Code: _____
Telephone: _____
E-mail Address: _____

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

BILLING ADDRESS FOR CREDIT CARD PURCHASES (if different from mailing)

Name (as appears on card): _____
Address (line 1): _____
Address (line 2): _____
City: _____
State: _____
Zip Code: _____

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, if not using a credit card, and send to:

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

For further inquiry, contact Ms. Craig at 949-369-8588, or via e-mail at treasurer@bulbsociety.org. If you wish to fax this registration, please first contact Ms. Craig for details.

INTERNATIONAL BULB SOCIETY NEWS

Meetings Meetings Meetings

I first sought out and joined IBS in order to attend the meetings. I was very excited at the prospect of meeting and getting to know others who shared my obsession with bulbs. Alas! I soon discovered there were no meetings. No meetings? Nooo meetings? Well! We'll just see about this, I thought.

Since Robert Turley became our new president in January of 1999 and reorganized IBS by forming a new board of directors, one of our most important goals became initiating meetings where members might come together and share their common love of bulbs. We began to achieve this goal in May of 2000 with The 'Spring 2000 Bulb Fling in Lake Charles, Louisiana. We now have many meetings throughout the year; both formal and informal. The following listing is the line up for meetings scheduled throughout 2001 at the present time.

Regional Get Together - February 19th - Golden Gate Park, San Francisco, CA

Clivia Conference - March 10th & 11th - Huntington Botanical Gardens, CA

BULBORAMA 2001 - April 21st & 22nd - LA County Arboretum, Arcadia, CA
For information and registration, see inside back cover this issue.

Chicago Symposium - May 5th & 6th - Chicago Botanic Garden, IL
For information and registration, see page 17 this issue

Regional Meeting Pacific Bulb Society - Tentatively scheduled for late May - San Clemente, CA. Contact: Cathy Craig, email-Batlette@home.com (949) 369-8588

Regional Reception - September 14th - Kirstenbosch Botanical Gardens, Cape Town, South Africa. Contact: Jim Shields, email: Jshields@indy.net, +1-317-896-3925.

Members To The Rescue... Bulb Rescue, That Is

In September, members of the IBS email forum were informed that Les Hannibal was

selling his home of 50 years and moving to a retirement community. Les has devoted most of his life to the study, collection, and cultivation of *Amaryllis belladonna*. He was concerned that his collection of these bulbs might be forever lost and invited interested parties to come up to the Sacramento suburb of Fair Oaks to dig and collect for distribution the best of his bulbs. There was soon a move underway to rescue the bulbs; a group was shortly formed from the IBS bulb forum members to rush to the rescue of these plants.

Over an October weekend my husband, John, and I drove up to Sacramento to join the other volunteers, armed with shovels, forks, bags and boxes. The trip is just under 500 miles one way and we arrived in Fair Oaks close to midnight on the Friday, then got up and drove across the river to Les' house arriving at 10am Saturday for the dig. Roy Sachs was already there, very intense and digging like some gopher gone mad. Les was on the scene supervising, directing, and generally acting like a helpful mother hen. His daughter, Dorothy Williams, spent her entire day following Les around with a little stool, encouraging him to sit down, rest, and not overtire himself. This proved to be an exercise in futility!

Jana Ulmer and Kyle Herbold arrived next, followed by Mike Mace. We spent little time talking and socializing; it was all too apparent that if we didn't get our act together and dig the bulbs and harvest the seed, we wouldn't get it done.

Speaking for myself, I found the digging a lot easier than I had anticipated due to the bulbs only being neck-deep and growing in quite loose soil. The slope behind Les' house is under quite heavy shade from trees and was also much more gentle than I had expected, so it was no problem keeping one's footing and not a single one of us tripped and rolled down the hill to the river and freeway below. Dorothy had very kindly 'tagged' the plants she considered best as they bloomed. That is all we dug too; but there were plenty.

Everyone took the dug bulbs back to their respective homes in their respective vehicles. John and I must have left with close to 500

A. belladonna bulbs, many *Iris wattii* (the 'climbing Iris'), some Nerines, a couple of Crinum, and thousands of *A. belladonna* seeds. We managed to arrive home just before 6pm on Sunday.

The plant material collected was tested for virus in the plant pathology laboratories of the California Department of Agriculture in Sacramento, and distributed to interested parties by the Bulb Exchange (BX). Thanks to all who participated and a special thanks to Patty Colville who came and helped me pack those orders that went out directly from my home!

Membership Rates

The board of directors has approved the increase of membership dues effective 1/1/01. Our dues have not increased in a decade but our membership benefits have increased explosively in the last two years with the addition of BULBS, two Seed Exchanges a year, the ongoing Bulb Exchange (through the IBS email forum), and the IBS email forum itself. Also we have the Book Store discounts via our web site, the ability to accept credit and debit card payments, and an annual IBS members meeting now! Lots of changes; lots of new benefits for becoming and remaining an IBS member.

Membership rates effective 1/1/01:

1 year

US members \$40

International members \$45

Int'l Air Mail +\$5

2 years

US members \$75

International members \$85

Int'l Air Mail +\$10

3 years

US members \$110

International members \$125

Int'l Air Mail +\$15

New SX Director: Dell Sherk

Beginning mid-2000 we have a new Seed Exchange Director. Dell Sherk, who also currently runs the IBS Bulb Exchange, is now a board member and the new director of the IBS Seed Exchange. Welcome Dell, and thank you for already completing the first successful SX distribution and for expanding our SX to twice per year.

Curator: Marvin Ellenbecker

Marvin has become the newest member of the IBS board of directors under the title of curator. He is currently housing and inventorying the Doran Collection bulbs. The bulbs collections under the care of IBS was recently moved to Santa Ana by Herb Kelly (our Director of Awards) and by Marvin himself. This move entailed a tremendous expenditure of work and the donation of a vast amount of these gentlemen's personal time. Thank you both from all of us at IBS and welcome onto the board, Marvin.



Marvin Ellenbecker

FRITILLARIA *by Jack Elliott*

Asiatic Species

A large number of *Fritillaria* species are native to Turkey and surrounding areas, where the climate is generally more extreme than in Europe. Winters are very cold and dry with temperatures as low as -30C, and summers are hot and dry, with most of the rain in spring and autumn. This continental climate resembles that of parts of N. America, Australia, and central Europe, and their cultivation is easier there than in the UK and in milder and wetter areas elsewhere. Contrary to expectation many of these species can be grown in the open garden in the UK and all of them can be cultivated readily under cold glass which protects them against excessive wet in both summer and winter.

We owe most of the species grown today to the remarkable collecting efforts of Paul Furse in 1959 and through the 60's, and to the collectors who followed in his footsteps later.

In addition to the Middle Eastern species there are a few growing further East in Iran, Afghanistan and Russia, with a similar climate, and a further group from the Himalayas, and from China and Japan, where growing conditions are very different, and which I will consider later.

Turkey and Surrounding Areas

As the species from this area generally share a similar climate I have subdivided them mainly according to their appearance. As with the European species there are a number that are particularly easy to grow.

Tall and Easy

Several of the taller species from this area are surprisingly successful in the garden if they are given excellent drainage by adding plenty of grit or coarse sand to the beds, and if irrigation during their dormant period can be kept to a minimum.

F. acmopetala

This is one of the easiest of all fritillarias to grow, attaining up to 40cm (16in) in height, with a few broad leaves at the base and narrowly lanceolate grey-green leaves up the stem. The flowers, usually solitary, are large nodding pale green bells with the segments reflexed towards their tips and a characteristic narrowing just above the tips. The colouring can vary but in the most



Fritillaria acmopetala

attractive forms the inner segments are dark brown, giving a striped effect to the whole flower. It increases rapidly by the formation of small bulbils, which can be planted separately like seed and will mature a little more quickly than seed.

F. elwesii

Very similar in habit to the last this has even narrower leaves and very slender flowers with dark brownish purple inner segments and pale green outer. *F. latakiensis* closely resembles it but the inner and outer segments are both brownish purple. Both species have proved easy with *F. elwesii* quickly forming a substantial colony.

F. olivieri

This Furse collection from Iran is uncommon in gardens but seems easy to grow. It attains about 30cm (12in) high and has broad glossy green leaves at the base with narrower leaves up the stem and a whorl of three above the flower. The flowers are large, one to three to a stem, deep green with a brown edge to the segments.

F. uva-vulpis

Another freely increasing and easily grown species that was introduced by Paul Furse and has been widely planted ever since. It

has glossy dark green leaves and 20-30cm (8-10in) stems bearing one to three deep chocolate rather narrow flowers, tipped with yellow. It does not always produce its small flowers very freely for the amount of leaves.

F. minuta

Is very similar to the last but differs in having flowers of an unusual shade of brick red. It was introduced by Paul Furse as *F. carduchorum*, a name now applied to a different species. It is very easy in a pot but also seems to grow well in the garden and increases freely.

F. orientalis

This species from the Caucasus is so similar to the European *F. tenella* that it hardly needs describing again. I have not grown it myself but it is said to differ only in having slightly larger blackish purple flowers on its 30-45cm (12-18in) stems.



Fritillaria latifolia var. *nobilis*



Fritillaria olivieri

***F. latifolia* and its allies**

These are very similar to the European *F. tubiformis* and *F. t.* var. *moggridgei*, and have very large broad bells for the height of the plant.

F. latifolia

In this species the flowers are purplish red with darker chequering. The type plant is often offered by trade sources and is considerably larger, and perhaps a little coarser than *F. tubiformis*, but it has a variety *nobilis* which is a superb dwarf. Unfortunately it is slow to increase.

F. aurea

This is the Turkish equivalent of *F. tubiformis* var. *moggridgei*, bright yellow heavily spotted with black. It differs in flowering very early in spring and in freely producing small bulbils. How one wishes that others of this group did the same! *F. collina* is a species from the Caucasus that is very similar to *F. aurea*. It flowers much later and has even brighter colouring, a deeper yellow with darker black spots, but again slow to increase.



Fritillaria carica

The yellow and green species

There are several rather small species which are very easy to grow in pots and would be well worth attempting outside in areas with dry summers. These vary in colour from a glaucous green that matches the leaves to a very appealing bright yellow.

F. bithynica

The easiest of this group, it increases freely by small to medium-sized bulbils. Its height varies from 10-20cm (4-8in) and it has broad very glaucous blue-green basal leaves with narrower leaves up the stem and a whorl of three above the flowers. These are usually solitary but occasionally two to a stem, yellowish green in colour and conical in shape.

F. alfredae

The flowers of this species are similar in colour but it is a taller and much more slender plant with very narrow leaves. Its subsp. *glaucoviridis* is very different. It is similar in habit and leaves to *F. bithynica* but with narrow flowers of exactly the same blue-green colour as the leaves.

F. chlorantha

This tiny species was introduced by Paul Furse and has remained uncommon since its introduction thirty years ago. Although not difficult in the Alpine House it is very reluctant to increase. It is only about 5cm (2in) high with two broad glossy green leaves and solitary bright green 2cm (3/4in) long flowers with yellow stamens

F. carica

I think this is one of the most beautiful of the small fritillaries, with slightly glaucous dark green leaves, broad at the base and narrowing up the stem, and bright yellow nodding bells tinged with green towards the base. It is a common plant at the early Shows of the Alpine Garden Society, and one of the most exquisite plants to grow in an unheated house. *F. sibthorpiana* is very similar, and the two have been confused, but it has slightly larger flowers and fewer stem leaves.

F. forbesii

A delightful very slender species to 20cm (8in) high with very narrow rather upright glaucous leaves and narrower flowers than those of the other yellow species with their segments more recurved at the tips.

F. minima

I have always found this a frustrating little plant to grow in the alpine house, never more than about 5cm (2in) high and with very small brownish yellow flowers with strongly recurving petals. I would love to grow it well, especially as it brings back great memories of one day on a flower hunting holiday in Eastern Turkey. We walked up from a high pass to the East of Lake Van through meadows full of tulips and 'small brown' fritillaries and several mysterious euphorbias, to a point where our coach was a mere speck below, and there amid the rocks and melting snow were scores of plants of *Fritillaria minima*, not the squinky creature I grew at home but a fine species looking very like *F. carica* but with glossy green leaves.

Small brown species

In the mountains around Lake Van we saw several of these small species with mainly brownish flowers, which will never have a lot of impact in the garden but make attractive pot plants.

F. armena

The tiniest of the group, this closely resembles the green *F. chlorantha* except in colour which is a deep reddish brown. *F. zagrica* differs from it in having more glaucous leaves and the dark brown flowers tipped with deep yellow. It is remarkable how many species have flowers with this combination of chocolate brown and deep yellow.

F. caucasica

The earliest introductions of this species by Paul Furse were only about 8cm (3in) high

with small deep brown flowers larger in size than those of *F. armena* but constricted a little towards their tips. Subsequent introductions seem more vigorous with larger flowers lacking the constriction at the mouth and up to 15cm high.

F. pinardii* & *F. assyriaca

These two similar species have very narrow flowers with brownish-purple segments that recurve at their tips. The inside of the bells is greenish yellow and shows up on the recurved tips, and in *F. pinardii* forms a pale stripe between the segments. *F. assyriaca* is usually a taller plant, to 15cm (6in) high, with narrower leaves.

***F. crassifolia* and allies**

This is an important group, most of which were introduced by Paul Furse in the early 60's although their nomenclature has changed since those days. The smaller species are fine pot plants which benefit from a dry period in summer. The variable *F. hermonis* subsp. *amana* grows well in the garden in drier areas, and forms small to medium-sized bulbils around the parent bulbs.



Fritillaria hermonis subsp. *amana*

F. crassifolia* ssp. *crassifolia

An easily grown rather variable small species with alternate grey-green leaves wider towards the base, and usually solitary flowers on 7-10cm (3-4in) stems. These are widely bell-shaped, yellowish green with heavy brownish chequering. It increases well by means of medium-sized bulbils, unlike its other subspecies. *F. c.* ssp. *kurdica* which is

remarkably variable in colour and degree of chequering between green and brown. I had some twenty forms of it from Furse collections and no two of them were identical, although seedlings from them are usually quite similar to the parent. Although readily raised from seed there is little vegetative increase. This is also true of the two tiny subspecies *hakkarensis* and *poluninii*. The former has several broad green basal leaves and almost stemless pale green upturned bells with faint darker tessellation. The latter is a very unusual and attractive plant with wide open greyish green flowers on 5cm (2in) stems with green veining, protruding yellow anthers, and very prominent nectaries similar to those of the *Rhinopetalum* group.



Fritillaria crassifolia subsp. *poluninii*

F. hermonis* ssp. *amana

This is an easy and vigorous plant for the garden or cold greenhouse, which was originally collected by Furse as the Lebanon form of *F. crassifolia*. It is much taller and more vigorous than that species and increases freely by small bulbils. It is variable but generally has grey-green leaves and flowers of similar colour with minimal tessellation on stems to 20cm high. A remarkable form of this species was collected in South East Turkey (Photo by E.K.Balls) and is sometimes offered under his name. It has glossy pale green leaves and 4cm (1 1/2in) long bell flowers only just above ground level on short stems. They have green outer segments and brownish inner, giving a distinct striped effect.

F. kotschyana is very similar to *F. hermonis amana*, differing in having its flowers heavily chequered with brown, and a smooth rather than papillose style. *F. whittallii*

is also similar but the flowers are a very pale green with very well marked brownish tessellation. These two species have only recently become widely grown but they promise to be potentially good garden plants.

Odds and Ends

A few other interesting species do not fit comfortably into the above groups.

F. michaelovskii

Maybe some growers would class this among the easy species for the garden but that has not been my experience. It is certainly one of the most beautiful with its small stature and large bells with a marked contrast between the deep purplish brown upper part and the deep yellow lower. It is evidently easily propagated in Holland as it is common and inexpensive. I have seen good clumps of it in the Czech Republic but rarely in the UK. It is an easy plant under glass. Poor forms are sometimes offered with no clear demarcation between the brown and the yellow, possibly hybrids with *F. kurdica*.



Fritillaria michaelovskii

F. reuteri

An uncommon slender species to about 20cm high, collected by Furse, with much narrower flowers of the same colouring as *F. michaelovskii*, but frequently more than one to a stem. It is relatively untried in the open

but as its habitat is very similar to that of *F. olivieri* it might do well in the garden.

F. alburyana

This looks wonderful in the mountains of Turkey at the edge of the snow-melt, with its huge widely-open deep pink bells, but it has never proved easy in cultivation. It is occasionally seen in reasonable condition at AGS Shows but the best plants I have seen have been growing in the open garden in gritty raised beds. It seems to need cool conditions, otherwise the buds abort.

F. straussii

This interesting species is a source of some personal sorrow as it has become an uncommon plant and yet when it was first introduced by Paul Furse I was able to build up a good stock and give some away. Sadly in the 1982 winter I had a lot of near-flowering-size bulbs in deep plastic containers, which froze completely for several weeks in February and all were lost.

It is an unusually leafy plant with broad glossy green leaves up the stem and in a whorl above the brownish red bell flowers, usually several to a stem.

Central and Eastern Asiatic Species More easy plants

Several large and easily-grown species emanate from this area and are popular in gardens. As the climate is generally continental they should do well even in areas with more extreme winters.

F. persica

This is a popular species for its attractive whorls of greyish green leaves and for its spectacular spires of many nodding purple bells on long pedicels. A selected clone 'Adiyam' is one of the best, very robust up to 1m (3ft) high with particularly dark flowers. I still have bulbs from original collections from Paul Furse, which are less vigorous and only seem to flower well after a hot summer, but their foliage is always an asset in the garden in spring and summer.

F. imperialis and allies

An ever-popular plant in its various colour forms this is too well-known to describe here. I have never had a garden in which it thrives to perfection for it does seem better in some gardens than others. A rich well-drained soil in full sun should suit it. *F. eduardii* is a very attractive species, which I have only grown recently. It is not quite so vigorous and its

fine orange flowers are more open in shape than those of *F. imperialis*. *F. raddeana* is similar in habit and foliage to *F. imperialis* but it is a slightly shorter and more slender plant and the flowers are a lovely shade of greenish cream



Fritillaria raddeana

F. pallidiflora

I think this is the most satisfactory of all species to grow from seed. It is a fine plant to 30cm (12in) high, with exceptionally broad very blue leaves and heads of outstandingly large nodding bell-flowers in a soft shade of cream which is very effective in the partially shaded conditions it likes. Furthermore it will flower within two years, or certainly three, from seed, among the quickest of any species.

F. sewertzovii

This is frequently put in the monotypic genus *Korolkowia*. It is a little doubtful whether it should be included among the 'easies', as it is generally grown under glass,

at least in the UK, as it comes into growth early and the buds may be damaged by frost. I grew it for several years in a sunny raised bed and it survived and flowered, so it is certainly worthy of trial. Its habit is similar to that of *F. persica* but the flowers are much larger and fewer, and their segments recurve towards their tips. The colour is variable between shades of green and purple, often with a grape-like bloom.

F. walujewii

Another that cannot be considered easy yet, but included because it comes from the right area, this has only recently come into cultivation and signs are hopeful that it will prove growable. It has very narrow whorled or opposite leaves, the upper extended into tendrils, on 30-50cm (12-16in) stems. There are usually one to three large flowers to a stem, purplish pink in colour, with greenish tessellation.

Rhinopetalum Group

These fascinating plants are native to Afghanistan and Soviet Central Asia and are not easy to grow in the UK, possibly because our summers are not sufficiently hot and dry. However they are exceptionally beautiful and well worth growing in pots under glass, where they can be kept dry during their dormancy. All have flattish or conical flowers, often with the tips of the segments recurved, and their nectaries at the base of the segments are very deep so that they protrude from the back of the flower.

F. bucharica

The easiest and most readily available. It has greyish green leaves and a raceme of up to ten conical flowers on a 15-20cm (6-8in) stem. These are white with a faint tinge of green. They usually set seed freely and flowering plants are quite easily raised, to give a useful stock with which to experiment in the garden, at least in areas with hot dry summers. *F. stenantha* is the easiest of the pink-flowered species, a little shorter than *F. bucharica* and usually with fewer flowers, with conspicuous purple nectaries. These are a good deep pink in the best forms, with few markings, but may be little better than off-white. *F. gibbosa* is similar but with more open flowers, usually a good pink in colour and with definite darker tessellation. *F. karelinii* differs little except in the shape of its seed capsules which are unwinged. *F. ariana* is a beautiful little rarity with clear unmarked pink more conical flowers on stems that rarely exceed 8cm (3in).



Fritillaria gibbosa (see previous page)

Himalayas & China & Japan

Among the long-established Asiatic species there remain to be described a handful from the Himalayas and from China and Japan. During the last few years several new species have been introduced, mainly from China but as their nomenclature is very uncertain and growers have little experience of them, I will confine myself here to the old favourites.

F. roylei* and *F. cirrhosa are two species from the Himalayas which have been in

cultivation for a long time but have never been very successful as garden plants. Like many plants from this area they do not tolerate hot dry summers well, and are best grown in peat bed or similar conditions with abundant humus, and kept moist at all times. *F. cirrhosa* can grow to 50cm (20in) in good conditions with one to five flowers to a stem. The leaves are very narrow, green, in whorls up the stem with the uppermost extended into tendrils. The 3cm (1 in) long bell-shaped flowers vary in colour between deep green with a few darker spots to pale green heavily chequered with chocolate brown. *F. roylei* has much broader glaucous leaves without tendrils, and very large cream-coloured flowers. In my experience it has been more difficult to grow in the arid South of England.

***F. thunbergii* (syn. *F. verticillata* var. *thunbergii*)**

This is an excellent garden plant native to China and Japan.

Although it has a reputation for failing to flower I have found it flowers regularly once it has made a good established clump. It has very narrow whorled or opposite leaves on 50cm (20in) stems, the uppermost with tendrils, and a raceme of up to eight straw-coloured flowers with greenish tessellation. It can be grown in sun or partial shade and should be planted deeply. *F. verticillata* is a similar species but the leaves are more widely spaced up the stem and the flowers are larger.

***F. japonica* var.
*koidzumiana***

In contrast to the last this Japanese species is one of the smallest, and although it remains uncommon it has been grown successfully in a peat bed. It grows best, like so many Japanese species, in moist humus-rich soil, and resents excessive heat in summer. It is a very dainty species to 8cm (3in) high, with a few lanceolate leaves, the uppermost in a whorl, and one or two widely open white bells with a faint darker chequering

F. camschatcensis

This is an appropriate species with which to conclude, as it grows both in Eastern Asia, in Kamschatcha and Japan, and in Western North America, thus linking the Asiatic species with the colorful species of North America, a possible future subject for an article.

It is well-known, striking, and, given the right conditions, an easy plant to grow. It does best in humus-rich soil in partial shade, and should be kept moist at all times. It then spreads gently by small offset bulbils and produces stems to 45cm (18in) with whorls of light green glossy leaves, topped by heads of one to six large nodding almost black flowers, among the darkest of any plant.

Conclusion

In this account I have tried to cover briefly the *Fritillaria* species most likely to be available. Some are readily obtainable from trade sources, many more can be found on the seed lists of the Societies and Seed Collectors, and a few are probably only in the



Fritillaria verticillata

collections of enthusiasts, who do their best to build up stocks for distribution in the future.

There is great scope for gardeners to increase the number of species they grow, especially from seed, and to experiment with their cultivation in a wider range of gardens in different climates around the world.

The International Bulb Society, Inc. (Donation form, Page 29)

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GROWING BULBS INDOORS

Knippels, P.J.M. 90 5410 467 8
1999, 25 cm, 118 pp. EUR 27.50 / \$29.00 / £18

This richly illustrated book describes more than 40 genera and 200 species, ranging from plants that beginners can grow with ease to those that form a challenge for experienced growers. In a practical way the author explains which species can be grown and how they are tended. In addition, practical information on propagation, diseases and differences in growing summer and winter plants is supplied.



This valuable information, based on the author's experience, distinguishes this work from the various books on bulbous plants.

Peter Knippels has been growing succulents and bulbous plants on the windowsills of his house for many years. He has contributed various articles on these plants and their cultivation to journals dealing with succulents and bulbs.

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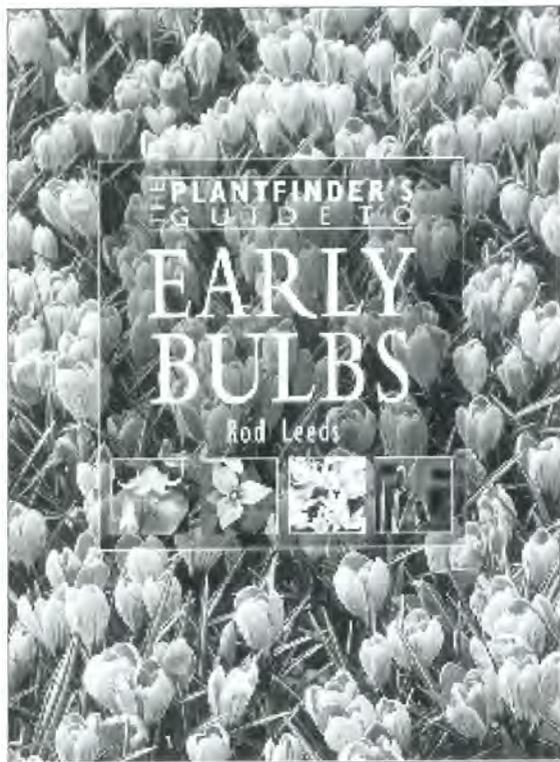
WELL VERSED

SPRING IS IN THE AIR

by Lisa Flaum

Since I have always lived in a place with cold winters, spring is a very big deal for me. Every tree is checked for swelling buds, every clump of bulbs for the first sign of growth. All the new blooms are admired, until there are so many that all I can see is the colors. As spring winds down, bulb catalogs start arriving, and, references and memories in hand, I start making selections for the next season. This year, I had two excellent new books to help.

First One Up



The Plantfinder's Guide to Early Bulbs by Ron Leeds, is probably going to cost you money. Not, mind you, in its initial price, but in the money you will spend adding new and wonderful bulbs to your collection. Mr Leeds' bulb growing experience is broad and he has shared it generously. The effect on the reader is a desire to grow bulbs not always readily available in commerce and the

confidence necessary to give them a try.

The opening chapters include brief biographies of a few past bulb growers, a guide to the types of geophytes, a short, pithy discussion of microclimates, and labeling and cultivation. In his chapter on where to plant bulbs, Mr Leeds describes siting and planting a Christmas bed. He suggests species and cultivars to plant for bloom at the tail end of the year. *Cyclamen coum*, *Galanthus caucasicus* cultivars, *Narcissus minor* 'Cedric Morris', to name just a few. There are sections on naturalizing and rock gardens, raised beds and pots.

Then on to propagation. This chapter has detailed descriptions of all sorts of vegetative methods, but lacks any photos or diagrams. I would really like to see a picture of hyacinth bulblets growing in the wound left by scraping out the basal plate. I know it should work, but a picture would make me feel better about trying.

On to the meat of the book, an alphabetic listing of early flowering bulbs. This is the chapter that cost me so much money this year, and will no doubt continue to do so.

Mr Leeds has grown an amazing number of plants including *Bellevalia forniculata*, with "possibly the most stunning blue flowers of any plant", 7 species of *chionodoxa*, 9 species of *colchicum* (in spring?!) and lots of *corydalis* and *erythroniums*. There are irises and *leucojums*, *massonias* and *merenderas*, *haemanthus* and *herbertias*. USDA hardiness listings are not mentioned, but Mr Leeds describes his garden's general climate in the preface. Under each species, he delineates its exact growing conditions. For instance, there is *Fritillaria roylei* "A good plant for a shady humusy border" and *F. raddeana* "A raised bed suits the cultural requirements, possibly a cold one to make it flower a little later in the capricious springs of temperate climates."

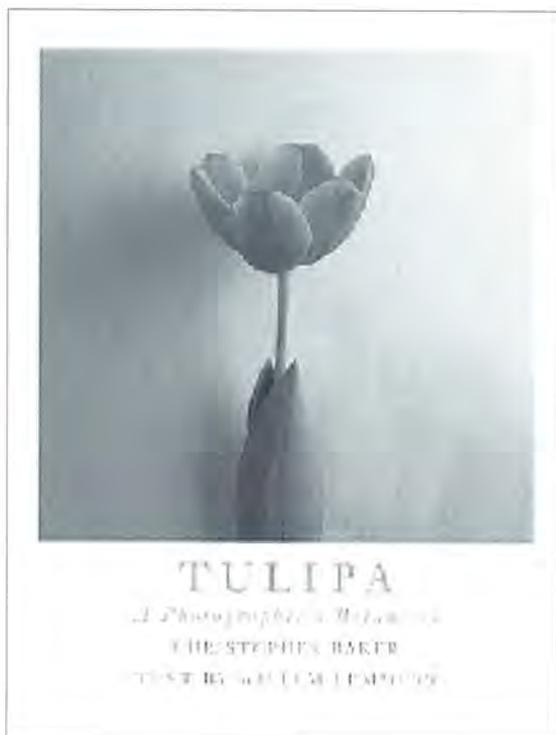
As if the descriptions weren't enough, there are photographs - lots and lots of photographs. There are photos of the open garden, studies of individual plants and blossoms. Even photos of plants that have been dug from the ground and washed clean of soil, so we can see the roots.

Not all of these bulbs will be easy to track down, which could frustrate the beginning

grower. The more advanced gardener will find many new species to try. The text is very readable, with enough detail to be helpful without being overwhelming. All in all, this is a wonderful book.

Possibilities of the Tulip

I was taught that tulips are bedding plants, used for a bright splash of spring color and that it was pointless to plant fewer than 100 bulbs. Christopher Baker has changed my mind. He sees each separate flower as a thing of wonder, and he has the photographs to back up that claim.



Tulipa, A Photographer's Botanical, contains 329 color plates of individual flowers from species through representatives of each of the groups. Every single photo is excellent, bringing out both the intriguing shapes and glorious colors of the tulip. Some he has chosen to photograph just as the bud opens. Others have reached that blousy state of relaxation that is just a step from dropping petals to the ground. And the colors! 'Negrita' is described in one catalog as plum colored. Mr. Baker shows a flower of bright clear plum, with a soft white center and steel blue streaks. 'Pink Jewel' seems almost to have a hint of violet and the parrot tulip, 'Green Wave', alight with shades of green, yellow and pink, is positively opulent. Some of my favorites are

here, such as 'Prinses Irene' and 'Attila'. Then there are the ones I've never heard of and now must search out. For instance, 'Brilliant Star', the Christmas tulip, red with an outer base of green edged in yellow and 'Red Wing' and 'Swan Wings', two fringed tulips to encourage the birds to return. How about 'Francoise' a white triumph tulip flamed with yellow? The photos are arranged by blooming time, which is useful if you want to plan a succession of bloom. It makes it harder to track down a specific cultivar, though, if you don't know its affiliation.

While the photographs are reason enough to own this book, there is more. Wim Lemmers, child of tulip growers and a retired grower himself, has written an enlightening essay on commercial bulb production in the 20th century. He also added descriptions and histories of each of the tulip classes and brief histories of many, many cultivars - more than are photographed.

There is a wealth of historical information in this book, but none on cultivation. It is large enough and beautiful enough to be a cocktail table book, but will also get a lot of use as a reference. Baker has created a worthy successor to the illustrated botanicals of centuries past.

The Books

The Plantfinder's Guide to Early Bulbs

by Ron Leeds.

In the US: Timber Press

ISBN 0 88192 443 1

In the UK: David & Charles

ISBN 0 7153 0805 X

Tulipa: A Photographer's Botanical

by Christopher Baker.

Artisan Publishing -

A Division of Workman Publishing

ISBN 1-57965-122-4 \$65.00 US

(The Timber Press title may be ordered through the IBS Bookstore at 30% discount)

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