

# BULBS

**Bulletin of the International Bulb Society**



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## Bulbs

The Bulletin of the International Bulb Society

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COVER PHOTO  
*Hymenocallis coronaria* by Beth Young

# First Words

*Tony Palmer* – Editor

My apologies for being late again. Just when I thought that everything was going smoothly we lost Eric Watts, our layout person. We are hopefully back on track again with Carol Longley of Longley Printing, also here in Auckland which makes it easier for me to communicate with her. I am working simultaneously on Volume 5 No.1 so that we can publish that on time. Once we have caught up it will be much easier to get our publication out promptly from then on, which will give our advertisers greater confidence and will mean that topical news and announcements will not be hopelessly out of date.

Certainly lack of copy has not been a reason for our tardiness. Little in the way of arm-twisting has been needed to persuade authors to produce a wide range of excellent articles on their favourite topics. In this issue we join John Bryan on his travels to Holland and England, in particular his visit to Keukenhof Gardens with their unparalleled displays of bulbs. We sweat with David Fenwick as he builds a South African garden in Barbados of all places. Mark McDonough dazzles us with the seemingly endless colour variations he has produced from *Allium flavum* subsp. *tauricum*. A persuasive argument for the horticultural merits of romuleas is presented by Robin Attrill from the UK and Kevin Preuss waxes lyrical on spider lilies, which have become one of his major passions. *Hymenocallis coronaria* growing in its natural habitat adorns our front cover. This picture was taken by Beth Maynor Young, who kindly gave us permission to use it. I was really blown away when I first saw it, as I had never seen a photo of these beautiful lilies in the wild and I had no idea of how or where they grow. It is certainly magical. I highly recommend a visit to Beth Young's website at <http://www.cahabariverpublishing.com/>

As usual we have several shorter articles as well. Dirk Wallace writes on using smoke to enhance seed germination and Rachel Saunders has assembled the experiences of a number of people growing bulbs in raised beds. I'm still a little unclear as to just what effect the seemingly draconian legislation requiring a phytosanitary certificate for all seeds imported into the United States has had. Anecdotal evidence would suggest that maybe it has not been as dramatic or negative as many

people feared and that moves are afoot to make the law more sensible. In this issue Bill Richardson (Australia) and Rachel Saunders (South Africa) tell us what the rules and regulations in their respective countries are for plant and seed imports/exports. I'd be interested to get an update on all this from someone in the US – volunteer?

Lisa Flaum continues with her book review column. In this issue she tackles John Bryan's 2nd edition of *Bulbs*, as well as *Spring Blooming Bulbs*, a Brooklyn Botanic Garden handbook, and *Growing Bulbs Indoors*, by P.J.M. Knippels.

There are a couple of topics I would like to include in future issues if there is sufficient interest. The first, suggested by a contribution from David Fenwick in the *News from England* article, is to get some feedback on how your growing of bulbs is affected by climate change. Whether or not you believe in global warming as a permanent phenomenon, it is hard to deny that we are experiencing a warming at the moment. In Auckland, for example, we rarely get frosts now which is in distinct contrast to when I came here 35 years ago. Trees such as *Michelia doltsopa* which were semi-deciduous then are now evergreen. How does all this impact on your bulbs? We are finding that winter flowering species, for example, are starting into growth a little bit earlier every year, which is a bit annoying for a mail order nursery!

I would also like to start a section where readers can share with us combinations of bulbs, or bulbs with other plants, that have been particularly successful in terms of colour, flowering times, or compatibility of heights, form, foliage etc. If you have a good photo to convince us then so much the better, but this is not a requirement!

Any contributions you have, no matter how small, should be emailed to me at [adpal@ihug.co.nz](mailto:adpal@ihug.co.nz)

or sent to

12 Kelly Road  
Oratia  
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New Zealand.

# World News, Views and Events

From England . . .

## A New Beginning at Colesbourne Park

*John M. Grimshaw*

**Gardens Manager, Colesbourne Gardens**

A few months ago I left Holland and moved back to England and a new job here at Colesbourne Park, in the Gloucestershire Cotswolds not far from Cheltenham. It is a famous snowdrop garden, but the plan is now to restore it to something approaching its horticultural splendour in the days of Henry John Elwes (b. 1846), who gardened here 1890–1922.

Henry John Elwes (HJE) was a giant in British horticulture and his gardens here were justly famed for the diversity of plants grown. As a well-to-do country gentleman he had both the resources and time to devote himself to his passions – ornithology, big-game hunting, butterfly collecting, farming, forestry and horticulture. His numerous trips abroad

(he never spent an unbroken year in England after the age of 17) enabled him to pursue all his interests in natural history at once, and plants came home with the trophies. His most famous collection was made in western Turkey in 1874: a 'magnificent

new snowdrop, as he told the family back home – *Galanthus elwesii*. It was only one of numerous species to bear his name: *Aconitum elwesii*, *Fritillaria elwesii*, *Hippeastrum/Rhodophiala elwesii* are others. His great interest was in bulbous and monocotyledonous plants, and in 1880 he published (with J.G. Baker as co-author) the massive folio *Monograph of the Genus Lilium* with magnificent hand-coloured plates. At the peak of his gardening life he was accounted to have had the finest collection of bulbous plants in the world, grown in a range of greenhouses and the open garden. He was one of the first to breed *Nerine sarniensis*, and the Colesbourne nerines were the very best of their time. (The collection persisted until the 1960s, but then the greenhouse collapsed one winter night and they were all frozen by morning.)

After inheriting the Colesbourne estate he became interested in trees, seeing forestry as a valuable land use on the high and rather cold Cotswold hillsides hereabouts, where farming, then as now, is rather marginal. Frustrated at not finding much information about the potential of many



***Galanthus* 'S. Arnott'**

Photo John Grimshaw.



***Galanthus* 'Lord Lieutenant'**

Photo John Grimshaw.

species of trees, he set about accumulating it and in 1900 commenced a project that led to the publication of the seven volume epic *The Trees of Great Britain and Ireland* between 1905–1913. With the assistance of the botanist Augustine Henry, Elwes studied every tree likely to be capable of producing timber in the British Isles; in the herbarium, in gardens and arboreta, and in the wild if required. In the British Isles alone he ‘wore out two motor cars,’ but he also went to Chile to study monkey puzzle trees (*Araucaria araucana*) in the wild, and to Taiwan to see the great forests there. Among the most interesting aspects of the book is its enumeration of the finest specimens of each species then growing, but in fact there are rather few survivors of these a century later. As part of his research he planted numerous trees around the estate and the arboretum here is an important feature of the park and garden, with many magnificent mature trees.

HJE was too busy in later life to write much about his gardening activities – as a young man he had contributed frequently to the gardening press – so we really do not know what he was growing here. The main account is a chapter written by E.A. Bowles for the posthumously compiled ‘autobiography,’ in which there are mere hints at the plantings and the plants. But a list of his favourite genera is useful: *Paeonia*, *Crinum*, *Yucca*, *Fritillaria*, *Arisaema*, *Kniphofia*, *Lilium*, *Crocus* and *Iris* in the open; under glass, favourites were *Hippeastrum* and *Cyrtanthus*, as well as the nerines, succulents and orchids. *Eremurus* was his main subject for breeding among hardy plants. In many ways this skeletal information is more useful than detailed accounts, because we might feel obliged to follow those more precisely: we use the expression that we are restoring the garden ‘in the spirit of H.J. Elwes’ plantsmanship’. A full restoration would in any case be almost impossible: the house he knew, a vast Victorian mansion, is gone, as are the greenhouses, and the staff!

After HJE died his collection was dispersed by sale or died of neglect and the garden disappeared under the exigencies of agricultural depression and war. About 20 years ago, however, Carolyn Elwes, wife of the current Henry Elwes, began to take an interest in snowdrops and discovered that many had survived under the brambles and shrubs that had grown up. She amassed a good collection of cultivars, and discovered several exceptional seedlings amongst the survivors. With a lot hard work the clumps were split up and spread around, giving unrivalled masses of choice cultivars. The

many thousands of heads of *Galanthus* ‘S.Arnot’ in a huge patch present an incredible sight, and their scent perfumes the air around them on a warm day. The display has been enjoyed by over 5500 visitors this year, most of whom came during our two open weekends in mid-February!

But there is very little besides snowdrops and trees; filling the gap is my task! We’ll use the woodland areas to make a low-maintenance wild garden, with daffodils and wild flowers in the grassy spaces. A new woodland garden will be created, in which we can grow choicer species in controllable conditions, and the formal garden around the house will be upgraded. It’s a challenge, but the Elwes family and I hope that within a few years Colesbourne will be firmly back on the horticultural map.

*If anyone has any bulbs they can spare, John will be only too pleased to find a home for them –*  
Ed

## **Coping with adverse weather in the UK**

*David Fenwick*

Here in the UK, as in other places in the world, we are suffering freak weather conditions, and this has greatly effected the way I grow South African bulbs outdoors, even in the warmer south-west of the country. The problem here is that we pick up a lot of rain off depressions from the Atlantic. It has been predicted that with global warming we may well have five times the normal amount of rain, in the next 50 years. The lower light levels associated with this will make it near impossible to flower many winter rainfall species outside. However this isn’t the main problem which will be when these rain bearing depressions mix with polar air, bringing snow and sudden drops in temperature. This means that the soil temperature will drastically fluctuate and the topsoil will freeze solid, and deeper and on far more occasions: apparently a condition the South Africans call Black Frost. On discussing this objectively with Jaco Adendorff, a young, enthusiastic South African bulb collector who visited the garden here a couple of years ago we came up with the following ideas.

That growing groundcover plants or hardier spring flowering bulbs around less hardy bulbs

would take up any excess water from around the bulbs and would protect them from frost. Species so far tested for this include *Osteospermum jacundum* and hardier hybrids such as 'Cannington Roy', *Eragrostis curvula* (seed invasive), *Helichrysum petiolatum*, *Pelargonium grossularioides*, and clipped *Lampranthus* which can be used as an annually planted sacrificial cover as it can be direct struck from cuttings from a small number of overwintered stock plants each spring. Clipping thickens these plants and thus helps with frost protection if they are grown on a flat surface.

Other ideas were to plant bulbs much deeper than books suggest. Many South African species are naturally found growing very deeply to avoid frosts and predators such as rodents and baboons. Here I have had good success planting some *Crinum* down to depths of over 24 inches,

*Crocsmia* to 5 – 6 inches, and *Watsonia* to 12 inches. Down at these depths the soil temperature is more stable and thus bulbs are better protected from dormancy breaks due to freak days of warmer weather. Other measures to take could be to plant under mature or semi-mature, semi-evergreen open shrubs such as *Buddleja*, thus giving both wind and frost protection at the same time. Apparently *Veltbeimia* grow in similar locations in their habitat and can take temperatures down to -5C, and this was proven here last year. However having good drainage is crucial or else the deeper planted bulbs will sit in water, but I have found most established *Crocsmia* and *Kniphofia* hybrids tolerate this very well. The only problem is when you come to lift something, and crinums for example, become almost impossible to dig.



**Planting and groundcover.**

Photo  
David  
Fenwick

## UK Bulb News In Brief

John Carter of Rowden Gardens, Tavistock, Devon, has been awarded full NCCPG National Collection status for his entire Water Iris collection.

Dick Fulcher NCCPG National Collection Holder of *Agapanthus* and Diane Rowe NCCPG National Collection Holder of *Dierama* gave presentations on their collections at the IPPS conference in Plymouth late last year.

David and Colleen Fenwick NCCPG National Collection Holders of *Crocasmia* have been invited to Norwich, Norfolk, to officially open a *Crocasmia* Heritage Garden in the city in August 2003. Plants for this garden are being provided by nurseries and the public and the invitation reflects the contribution David and Colleen Fenwick have made in conserving and researching this genus. Nearly 40% of all *Crocasmia* were bred in Norfolk from 1895 to the present day. The garden marks the adoption of *Crocasmia* as the city flower, and it is hoped that the garden will raise the awareness of the genus locally and assist in their conservation. *Crocasmia* 'Lucifer' which is perhaps the most frequently sold and sort after *Crocasmia* was raised and bred by Alan Bloom of Bressingham Gardens, Norfolk in 1966.

For further information visit [www.theafricangarden.com](http://www.theafricangarden.com)

## From South Africa . . .

### The import & export of seeds and plants into and out of South Africa

*Rachel Saunders*

Rod and I run a mail order seed company, so most of our experience is with seeds. However, we do export plant material in the form of tissue culture lines and cuttings as well.

#### Export of Material

To export seeds, we require a licence issued by the Cape Nature Conservation Department. This licence is valid for 5 years at a time, and it allows us to sell "protected flora". At present there are no further restrictions as long as the species are not listed on CITES Appendix 1. This list includes seeds of species such as certain Aloes, cycads, etc, but does not include any bulbous or cormous plants. If I want to sell seeds of these species, I need a CITES permit, also issued by the Cape Nature

Conservation Dept. The only question that is asked on the permit is where we obtained the seed, and if this is legal ie. from plants legally in a collection (not from the wild), then the permit is issued. We live in Cape Town so we fall under the Cape Nature Conservation legislation. At the moment each province in South Africa has different legislation, with some far more restrictive than others. This will probably be changed in the near future so that each province uses the same legislation.

Some countries that we export to require phytosanitary certificates for seeds, and these we obtain from the Department of Agriculture. Depending on where the seeds are going to, the phyto is either an open one simply declaring that the seeds are clean and insect free, or the phyto has to comply with requirements of the importing country. We may, for example, have to have the seeds tested for various diseases.

To export plant material, it really depends on the requirements of the importing country. For example we have exported corms to England, and all that is required is that they are free of soil and have a phyto declaring them insect free.

Tissue culture plants are usually exported straight out of their sterile containers, so they require a phyto only. Our laboratory has been accredited for Australia, so we are able to export tissue culture plants to Australia without any problems.

#### Import of material into SA

Our Department of Agriculture has produced a booklet with 2 lists of plant genera:

- 1) those whose seed may be imported with no restrictions
- 2) those whose seed requires a phytosanitary certificate. For any genera not listed, we need to apply for import permits, and these can take up to a year to be issued. If it is a plant known in horticulture, the permit is issued quickly. If the risks of the plant are not known, the permit may take months as a risk assessment has to be done.

All plant material imported requires an import permit and a phytosanitary certificate. Some genera may not be imported at all, as they are seen as a risk to some sector of our agricultural industry or are known invasive weeds.



# From Australia . . .

## Importing Seeds into Australia

### *Bill Richardson*

Quarantine laws and the white and black list discussions have been topical lately with all the revisions pending that will change the ground rules for exporting and importing seeds and plants. Australian Quarantine laws have always been tight and have been upgraded consistently over the past few years. These laws are necessary and we must stop to consider the serious implications that could occur if the Australian Quarantine and Inspection Service (AQIS) did not administer and control the sudden rush of imports into the country.

Here is an extract of an article posted on the AQIS website: "Imagine surfing the Internet and coming across a great site that offers to mail you the seeds of an exotic plant that would look just fabulous in your garden. You place your order, without realising that you might have taken the first step in the destruction of Australia's native flora and fauna. The proliferation of Internet web sites and discussion groups that post plant and animal products anywhere in the world – without regard for quarantine regulations – is a growing problem for Australia."

Fortunately the AQIS website has a step-by-step guide for potential importers to follow and every one of us who imports seed should make the effort to check out the seeds we are ordering from overseas sources. The guidelines are basically set out as follows:

- Check the "Import Conditions Database" section to see if the product you want to import is allowed and the conditions that apply to it.
- Check with your State/Territory Agricultural Department for any special requirements
- Lodge an Import Permit (often a small fee applies) for a species that hasn't previously been imported into Australia. Species already imported into Australia will not require one. You may need an import permit before you import any nursery stock.
- Then, when products arrive they will be inspected and classified according to risk.

If you buy imported seeds that are confiscated, AQIS will send you: a covering letter; an action notice; a risk assessment form; an AQIS "New Plant Introduction Form". There are a few ways this

matter can be dealt with:

- Do nothing and the seeds will be destroyed after 30 days
- Fill in the "New Plant Introduction Form" and return it to AQIS for assessment
- Send \$42.00 Aus. to have the seeds returned to the sender, or, to be treated and held in Quarantine for 30 days.

A warning is also given about the fines that may be incurred for illegal importations and a note sent to the exporter to let them know of the risks of sending these seed to Australia.

Of the 47,000 high-risk items found by Australian Quarantine officers in mail articles last year, 6500 were seeds or plants. Any one of those plants could have carried pests or diseases into Australia – or it could have become a garden or pasture weed as expensive to control as, say, Paterson's curse, which costs our wool industry \$10 million a year. The total bill for controlling foreign weeds in Australia is more than \$3 billion each year.

The AQIS permitted list of seed is under review. The current list contains more than 5000 plants or plant groups. Up to this year, about 300 species are assessed each year with 56% accepted, 22% rejected and 22% set-aside for further evaluation.

Potential importers are free to provide additional information if they wish to have new species assessed.

Other countries need to be as vigilant as Australia. A recent newspaper article in Victoria raised the issue of a tiny Australian tree-eating bug the size of a pinhead, which is causing mayhem in Los Angeles, USA. It was discovered in California three years ago and has killed as many as 20,000 gum trees in Los Angeles and surrounds. The city has allocated \$5 million dollars to initially cut down 5000 eucalypts but it may cost as much as \$10 million to remove all problem trees. These are hard lessons to learn and import problems can only be contained by strict quarantine laws.

Before ordering seeds or plants from the Internet, make sure you do your bit to protect Australia (or your country) by following the proper quarantine import procedures.

# The Rainbow Color Genesis of *Allium flavum* subsp. *tauricum*

Mark McDonough

All photographs by the author

Alliums are popularly known as 'flowering onions', a reference derived from the fact that true onions (*Allium cepa*) are amongst its ranks, along with consumable allies such as garlic (*A. sativum*), leeks (*A. porrum*), and chives (*A. schoenoprasum*). Pungent vegetable species aside, many hundreds of fascinating *Allium* species offer horticultural appeal for gardeners and bulb-growing hobbyists. They are particularly useful in cold-climate gardens to extend the hardy bulb flowering season past spring, and into the summer months and autumn.

When choosing to grow alliums in the garden, it's useful to become familiar with the genus basics. The "species count" reported in literature is inconclusive, with wide ranging estimates anywhere between 500 to 1000. The disparity is perhaps due to the circumpolar distribution of species throughout the northern hemisphere and the taxonomic challenge such a vast distribution presents. Distilling a consensus opinion of valid taxa from the recently published Nomenclator Alliorum, which is the first comprehensive compilation of known *Allium* species and epithets, I hand-counted a grand total of over 850 species and subspecies. Not surprisingly given the size of the genus; subgenus classifications were created to help organize species into groups of similar taxa. However, there's no need for gardeners to fret over subgenus classifications. Even the taxonomists differ on their status, yet they remain useful in grouping together species of similar visual essence.

One such group of allied alliums is subgenus *Codonoprasum*. This group has true bulbs, bright summer flowers, and ephemeral growth that dries up during late summer dormancy. When in growth, its species generally have narrow foliage forming grassy clumps and sheathing up to 2/3 of the flower stems. Distinctive too are the developing buds enveloped in conspicuous 2-valved spathes which can be strongly veined, sometimes silvery hued, and with long tail-like appendages; these odd structures are often as attractive as the flowers that

eventually spill out. Popularly grown members of this group include: bright yellow *A. flavum*; purple or white *A. carinatum* subsp. *pulchellum* (syn. *A. pulchellum*); and variably colored *A. paniculatum* - the latter acquired more often via misidentification than cultivated intentionally. These onions are popular on account of their modest size, ease of cultivation, and fanciful sprays of small waxy bells that appear during the midsummer heat, long after most bulbs have become mere spring memories. It is from this group that I have chosen a handful of species to embark on a path of active propagation, selection and passive hybridization, with startling results.

Most species and cultivar selections within subgenus *Codonoprasum* grow readily in well-drained, sandy or light loamy soils, always in full sun. Given these conditions they become reliable mainstays in the garden or planter, increasing slowly to develop into floriferous clumps over a few years. Members from this group of alliums are easily grown from seed, producing young flowering plants in just two years, and mature specimens in three to four years. Sown late winter, spring, or even in



**Good silver-stem form of *Allium flavum*.**

summer, the black angular seed germinates readily in about two weeks and the seedlings over-winter outside with ease. In fact it could be said that these alliums seed about too freely, but I've never found them to be a nuisance.

The European *Allium flavum* is perhaps the best-known and widely grown representative from this group of onions. Grown from various seed sources, variation is evident and plants may be shorter or taller than others; with green, gray or silvery-blue foliage; delicate thin stems or heavy thickset growth; and bright lemon yellow flowers although light yellow and chartreuse flower forms are not uncommon. Seed bearing the name var. *minus* or cultivar names 'Minor' or 'Minus' are favorites among rock gardeners, typically producing smaller plants with slender growth, but occasionally producing truly dwarf, semi-prostrate miniatures. The names however should be considered with caution, as Flora Europaea does not recognize them. In the more contemporary publication, the Flora of Turkey, the story of *A. flavum* and its subspecies taxa is more clearly defined. In it, *A. flavum* var. *minus* is validly recognized, not in the Central European sense, but as a small Turkish variety with prominent purple stamens rather than yellow.

Surprisingly, the most exciting variety *A. flavum* subsp. *tauricum* has been absent from cultivation until recent years. It is described as having yellow or almost white flowers, tinged with pink, rose, brown or green, and with purple stamens. In the mid 1980s I received seed from two different sources. At first, the only colors that resulted were light yellow faintly overlaid with pink; distinct yet hardly exciting. I continued cultivating seedling progeny from these plants with the hope some variation would reveal itself. Jerry Flintoff, a fellow Allium aficionado living in Seattle, Washington, sent me a light orange form that appeared among his seedling-grown plants. Quite a color break! This selection has green leaves and stems, with uniquely hued blooms that were indeed a lovely soft orange, and it remains among my favorites to this day. In the years that followed, seedlings from the orange

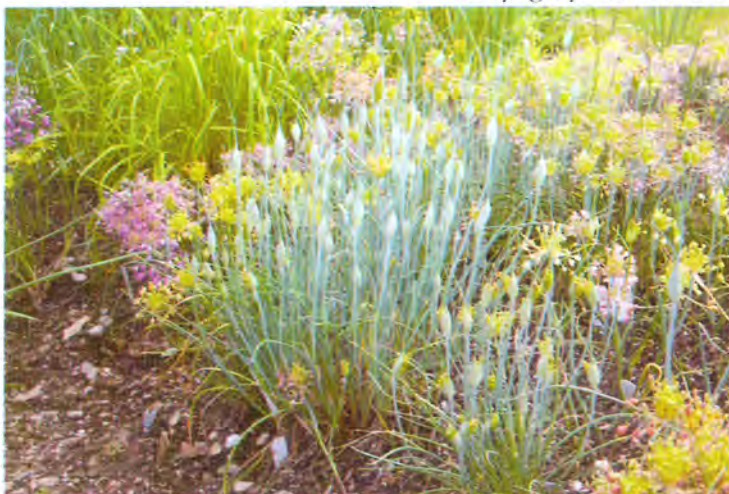
"tauricum" and other good color forms started to show increased color versatility; mostly indescribable pastel shades in the first few years, but occasionally rare color breaks would occur.

One summer, much to my surprise, a dark reddish-orange seedling stood out from the sea of pastel seedlings. Singled out and grown isolated,

the resulting seedlings produced a strong percentage of equally deep yet variable colors. Ten years later, the palette of colors is remarkable. I firmly believe that almost any color is now possible. Equally astonishing is the range of floral and foliar characteristics, running the gamut from dwarf prostrate plants only 3" (7.5 cm) tall through much taller robust plants 14"–16" (35–40 cm) in height. Plants often exhibit thick, hefty gray leaves and



***A. flavum* subsp. *tauricum* 'Truly Faded' beginning to open its florets. Deep lavender pink cultivar 'Lindsay' behind and to the left, and brownish-red 'Boston Baked Beans' in the lower right.**



***A. flavum* subsp. *tauricum* 'Truly Faded' in silvery bud.**

stems that are nearly white with a silvery "bloom" or farinose meal. Plant habit is superior to regular *A. flavum*, with most plants clumping exceedingly well. They are usually about 8" (20 cm) in height, with heavy, semi-decumbent stems, forming literal bouquets of blooms at peak flowering in early July. The hot colors both defy and reflect the July heat.

For the past ten years I have faithfully evaluated each year's seedling crop from open-pollinated *A. flavum* subsp. *tauricum* varieties, singling out and growing on the best colors. I have judged growth

and performance in the garden over subsequent years. In that time, I've become ever more enamored with the possibility of relentless variation and divergence, easily fulfilling one's aspiration for enjoying new and distinctive garden varieties. It shouldn't be this easy! Showcasing just a few notable selections of *A. flavum* subsp. *tauricum* lineage demonstrates the possibilities.

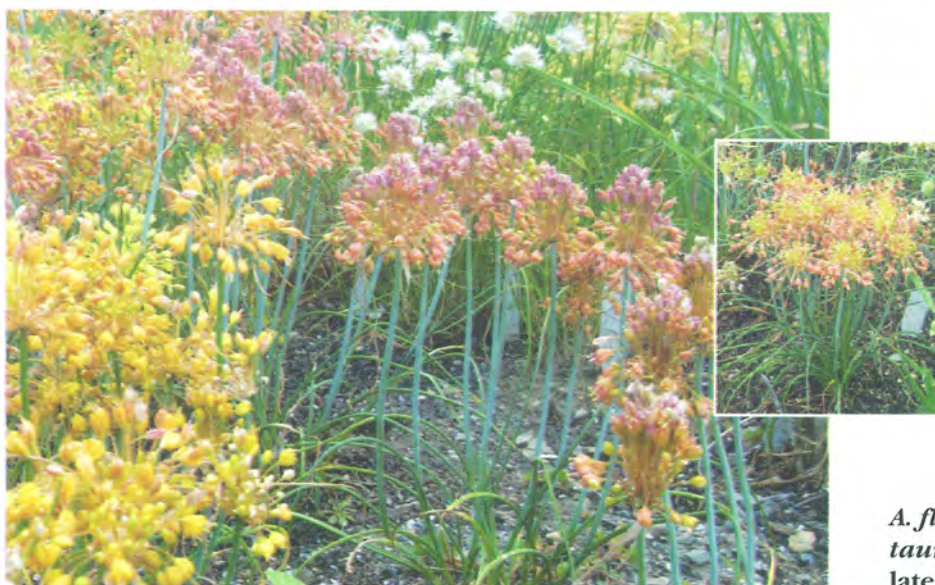
**'Truly Faded'** – In this selection we have many of the best characteristics rolled into one. Growth is thickly set, sturdy, and heavily silvered, producing a forest of frosty blue-white stems topped with conspicuously ribbed, silvery spathes. In bud, the plant is almost as striking as when in flower. Atop each 12" (30 cm) stem, the two, long spathe segments unhinge and recline outwards resembling wispy canoes, spilling many-flowered sprays of lovely faded-rose bells in perfect contrast to the blue-white stems.

**'Cinnamon'** – This is the first named cultivar in the spicy orange color phase A hard color to pinpoint exactly, remaining one of the most appealing selections to date. The foliage is grayish-green, with thick 10" (25 cm) silver stems, wiry recurved rat-tail foliage, and bursts of piquant cinnamon-orange flowers. Once the drooping bells become fertilized, they stand upright at attention and age to a bright rosy color, creating an unlikely yet quaint combination of pink and orange. In fact, most "tauricums" exhibit an intriguing color metamorphosis depending on the age of the bloom which is fascinating to observe as the inflorescences mature over the three or four weeks bloom period.



*Allium flavum* subsp. *tauricum*  
**'Hot Molasses'**.

**'Hot Molasses'** – This selection represents the deepest-hued selection thus far, with drooping bells of a burnt red-orange reminiscent of molasses. The hot floral color spars with the intense, silvery-blue color of the husky 10" (25 cm) stems, offering up an engaging display unrivaled in the "tauricum" genealogy. Unlike most "tauricums" that clump up readily and make floriferous clumps in a few years, this clone grows slowly and is stingy with its bulb offsets. It will undoubtedly be useful as a pollen parent for further selection of dark color, stronger-clumping hybrids in the future.



*A. flavum* subsp. *tauricum* **'Cinnamon'** – late anthesis on left, early anthesis on right.

**'Lemon Cooler'** – Surprising when so many unique color forms appear that I should care to select a yellow cultivar, but this superior plant is captivating with its refreshing clusters of creamy, pale yellow flowers, like just-popped bursts of buttered popcorn. The growth habit is compact, with a tassel of firm, wiry, gray foliage, serving as fitting complement to the fluffy sprays of moonlit blossoms. With unopened chartreuse buds at the center of each flower burst, the color scheme is as refreshing as lemonade on a hot summer day.

A breakthrough in *Allium flavum* subsp. *tauricum* cultivar selection over the years is the appearance of exceptionally dwarf seedlings. This isn't altogether surprising given that subsp. *tauricum* tends to be compact growing, often of very low stature and decumbent growth. But certainly the prostrate stature of some cultivars gives indication that intraspecific hybridization might be responsible. In the 30 plus years I've been growing allium, I've seen quite a few spontaneous hybrids that are generally traceable to the suspected parents.

The rhizomatous alliums for example (subgenus *Rhizirideum*) are especially prone to such promiscuous behavior in the garden, the influence of this or that parent is generally obvious. However, with *Allium flavum*, the influence seems less obvious and perhaps more a result of inherent genetic potential. Even so, I suspect the dwarf "tauricum" selections may have derived from garden hybridization with one or more allied species.



*Allium flavum* subsp. *tauricum*  
'Lemon Cooler'.

**'Taffy'** – There are many "tauricum" seedlings with unusual tan, beige, melon, fawn, or brownish-pink flowers that defy exact color definition; the effect mysteriously alluring – more so than brilliant and brazen. Plants with flowers of craft-paper beige color are amusing, if not utterly inconspicuous in bloom. This selection however shines as one of the very best and most appealing, epitomizing the pastel colors found within the ever-expanding color palette. The growth is sturdy and compact, with powder silver-blue stems and largish spreading clusters of delicious pinkish-tan flower droplets that seem to emit an inner luminance.



*Allium flavum* subsp. *tauricum* 'Taffy'.



***Allium Flavum* subsp. *tauricum* 'Pastel Parasol'**

The cultivar named 'Pastel Parasol' is one of the tiniest and most endearing "tauricum" selections. The gregarious bulbs build into a dense colony of 50-60 bulbs in a few years, producing a frothy mass of sweet little white bells barely tinged with pink, mingling with thready foliage on stems only 3" (7.5 cm) tall. There is a pink-flowered sibling (visible in the upper right corner of the photo) named 'Pink Parasol' that's equally as nice but is a little more sensitive to winter wet and grows less vigorously. Both bloom in late June, one or two weeks before the main flush of "tauricum" flowering; giving further indication that hybridization with *A. sibthorpiatum* or *A. kurtzianum* might be involved.

*Allium sibthorpiatum*, a Turkish endemic, is one of the cutest miniature onions one could ask for. It's easy to grow, reliably winter hardy, and a dependable year-round performer in rock gardens or planters. In July, the tight tuft of foliage erupts with small, few-flowered clusters of pearly pink nodding bells; the whole affair only 2"-3" (5 – 7.5cm) tall. After the flowers become fertilized, they stand at attention and age to a bright raspberry rose color, for a charming two-toned effect that lasts for weeks [see photo on following page].

Just as with *Allium flavum* and its varieties, this species quickly dries up and retreats into a brief

summer dormancy immediately after flowering, leaving behind plentiful crops of seed. In late August or early September, bulbs resprout with fresh, winter-persistent foliage, which is a growth cycle exhibited by all of the *Codonoprasum alliums*.

Of the very dwarf *A. flavum* var. *tauricum* selections, I suspect the source of the low stature to be from garden hybridization with *A. sibthorpiatum*. Specimens of *A. sibthorpiatum* shown in the photograph are growing in a concrete trough, landscaped with rocks and gravel to simulate a miniature alpine landscape. In the same trough,



***Allium sibthorpiatum* at early anthesis.**



*Allium sibthorpiatum* at late anthesis.

several other small *Allium* species are growing, including "tauricum" selections 'Pastel Parasol' and 'Pink Parasol'. Self-sown hybrids have appeared that are very dwarf, appearing intermediate between the two species. One such chance seedling is a tiny white-flowered plant (see photo), growing out from a rocky crevice.

*Allium kurtzianum*, yet another Turkish species, is a rare endemic found only on a couple of mountaintops. As rare as it sounds, it has become fairly well established in cultivation, albeit misidentified as *A. olympicum* (a different species, also endemic to Turkey). With *A. kurtzianum*, we find yet another distinctive variation on a theme with the most notable characteristic being the absolutely prostrate growth habit. The chunky, silvery stems often produce two flower heads per bulb, turning upright at the end to display dense hemispherical heads of fragrant pink blooms, peppered with long protruding stamens and yellow anthers.

I suspect *A. kurtzianum* readily hybridizes with *A.*

*flavum* subsp. *tauricum*. In fact, my collection of *Allium kurtzianum*, once pure and true from the original collection on Mount Ida, Turkey, has given way over the years to promiscuous crossing with *A. flavum* subsp. *tauricum*, so that I can no longer say with certainty that I have the true species any more.

I've observed first hand bulbs imported from England, supplied by a well-known bulb specialist from his own nursery-collected seed (he grew both species in question). Obviously all of the bulbs shipped were hybrids, having the lovely clear pink flowers of *A. kurtzianum*, but with the much taller,



**Tiny white-flowered hybrid seedling, probably *A. sibthorpiatum* x *Allium flavum* subsp. *tauricum* 'Pastel Parasol'.**

upright habit of *Allium flavum* subsp. *tauricum*; quite intermediate between the two species. From similar crosses occurring in my garden, and from seed collected off of these imported hybrids, fine-looking plants with bright pink flowers can be had. The unnamed plant shown [see photo on the following page] is one such possible hybrid with wild medusa tussocks of firm, wiry leaves, whose leaden

**Unnamed  
pink  
hybrid.**



gray color beautifully complements the lively pink flowers.

Over the years these whimsical little onions have brought me great satisfaction. Beginning with steadfast yellows of tried and true *Allium flavum*, a decade and a half of open-pollinated bee-induced hybridization and subsequent selection resulted in a mesmerizing array of colors and plant forms. With each batch of seedlings, a high percentage of unique colors tempt the senses and reward close observation. A new acquisition, which is a putative blue-violet form of var. *tauricum* collected in Greece, fuels the imagination of future progeny yet to come. One doesn't need elite access to the world's botanic institutions, nor a comprehensive scientific collection of species, with which to achieve something different. All that's needed is a sincere interest and unwavering patience to observe, grow, and select the plants you like best, and the results will follow.



**Mixed bed of 2-year seedlings of  
*Allium flavum* subsp. *tauricum*.**



# Some Thoughts on Travels

*John E. Bryan*

All photographs by the author

There are some people who do not like to travel. I cannot understand this attitude. Some people travel all the time and that, too, I find difficult to understand, as the experiences enjoyed when travelling, at least to me, need to be absorbed, thought about and put into perspective. Personally I like to travel overseas at least twice a year visiting certain countries, and then a couple of business trips to see the progress of gardens I am concerned with

I found many years ago that having interesting and interested people with me on my travels makes for a good trip. Consequently I try to assemble such a group and make my journeys all encompassing, rather than just visiting gardens. This means including places of historical and architectural interest, but always gardens as well. I augment the tour by looking at the wildflowers of the country.

Last year I decided to go back to the Netherlands. I used to live in the Hague, while completing my second year of studies after graduating from Edinburgh. Then I worked in the Parks Department, but found time to visit the bulb fields in spring and, way back in the early 50's, made my first visit to the famed Keukenhof Gardens located near Lisse and Leiden. It was to Leiden that Clusius went to be professor of botany when he left Vienna. Taking his bulbs with him, he was the person responsible for the bulb industry being in that part of The Netherlands.

There are some who regard the display of color in Keukenhof as being vulgar. I must admit that the displays are almost overwhelming. Everywhere

you look there is color, with large plantings of tulips and patterns formed by Muscari in numerous shapes, some curved and others circular. Indeed it is as if an artist had used a broad brush on the canvas of the earth, and being a good artist the colors blend one with the other and show off each to advantage. Great skill, knowledge and experience manifest themselves in the planting schemes created.



**Some of the intricate planting patterns at Keukenhof.**

Those of us who have the privilege of designing gardens can learn a lot from noting the forms of



**Bold blocks of color.**

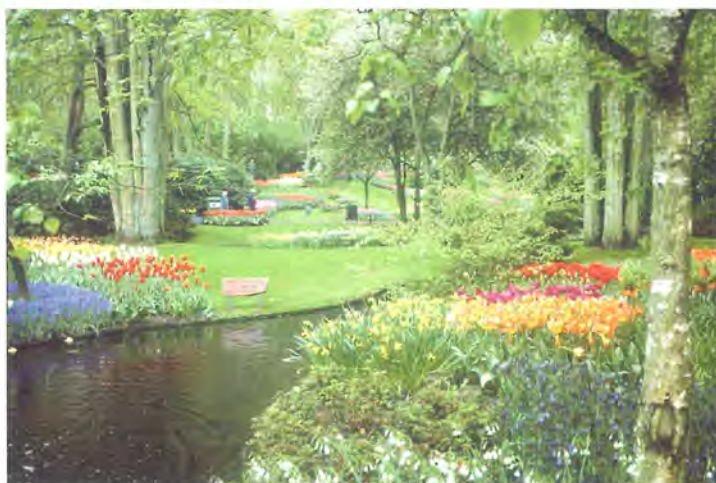


**Tulip 'Big Brother'.**

the beds; the juxtaposition of colors; the variation of heights and the fact that some beds have plants just coming into flower, whilst others are in full

bloom. The patchwork quilt effect is so carefully designed that even when one species has finished flowering there is a sufficient mass of another to attract and please the eye.

At the Keukenhof one of the most important factors in any garden, namely scale, is almost unnoticed. Yet, once noticed, it becomes obvious that the maturing trees, which are mostly *Fagus*



**Maturing trees are a perfect foil for the colorful beds beneath.**



**Beautiful vistas through the trees.**

*sylvatica* and *F.s. purpurea*, are superb foils for the beds beneath them. Azaleas, flowering currants, *Ribes sanguineum*, *Philadelphus*, Lilacs, *Symphoricarpus*, *Spiraea*, *Forsythia*, *Rhododendron* and other shrubs provide ideal backgrounds for the plantings. They contribute to

the overall beauty, but allow the spring flowering bulbs to take center stage.

In the greenhouses can be found summer flowering bulbs such as *Lilium*, *Amaryllis*, *Hippeastrum* and *Alstroemeria* with tuberous begonias amongst them. At Keukenhof new cultivars are on show and the entire garden is an exhibition of the bulb growers latest introductions.

These are mixed with long time favourites such as Crown Imperials, *Narcissus* 'Mount Hood' which is still one of the finest whites available, fritillarias, *Anemone coronaria* in an array of colors, and drifts of *Anemone blanda*. Some may find the display vulgar but I find it exciting, and certainly the thousands of people who visit the garden cannot help but be 'turned on' to bulbs.

The species are not neglected, but arranged to show off their forms and colors and so arranged that their often subtle beauty is not overshadowed by their grand and great-great-grandchildren. Another lesson for designers of gardens to note.

2002 is a year of the Floriade. Held every 10 years, the exhibition changes location each decade to an area to be developed and remain a park after the exhibition closes. It provides an opportunity for growers to display perennials and annuals, and for innovators in the horticultural world to show features that, in the future, may become quite commonplace.

Clever use is made of space under glass to show glorious flower arrangements to display bromeliads, cacti and succulents and demonstrate to the public the innovations in

propagation, irrigation and various combinations of bricks, tiles and materials which can be used to create attractive paths.

On seeing how certain trees have been trained and pruned, one might wonder just what was the purpose of such work. Standing back from them,

one notices they form an attractive pattern, thereby illustrating that trees can be used artistically. However, it was the use made of sloping planters covering the numerous food vending booths that attracted my eye. The planters contained primulas, pansies, English daisies in shades of pink, red and white, and calendulas to form a



**Innovative sloping planters at the Floriade.**

mound of color. It was as if Jacob's coat had been used to cover the booths. I have not seen such construction before. I have no doubt this innovative design will be copied, modified and become an accepted part of parks in the future.

As one travels through the countryside of the Netherlands, one notes the windmills and the very structured delineation of drainage ditches flowing into larger and yet larger ditches until they in turn empty into canals. On the canals are barges and pleasure boats, often above the level at which you are travelling. One marvels at the ingenuity of the Dutch.

It is hard to appreciate that so much of The Netherlands is below sea level, including the City of Amsterdam, but it is the former bottom of the sea which provides the ideal soil for bulb production. Today many people imagine the tulip and many other bulbs are native to The Netherlands, but their history is fascinating even if grown far from their native habitat.

At the Frans Hals museum in Harlem, I was surprised to see a table strewn with *Hippeastrum*, just lying there and flowering without any soil or moisture. This is the first time I have seen such a display.

Visiting the Invasion Beaches in Normandy,

those of us old enough to remember those days of World War II are awed at just what was accomplished. One appreciates the power of nature to cover and heal the scars of war.

The countryside now faces another invasion as the Himalayan knotweed, *Polygonum polystachyum* has become a nuisance and crowds out the native plants. *Cytisus scoparius*, with the common name of 'Genet' in French, flowers everywhere in poor soil. This common name gave rise to the Plantagenet royal house which occupied the English throne from 1154 – 1485, Henry II to Richard II. The Count of Anjou, father of Henry II, adopted the name as surname. Richard Duke of York c.1460, used to put a sprig of the plant on his helmet. Fascinating how history and plants are often related.

*Allium triquetrum*, the three-cornered leek, can be found in hedgerows and in swathes in open moist areas under trees, where it spreads rapidly.

Despite being almost a weed, the pleasing white flowers nodding in the breeze make an attractive sight. *Arum maculatum* can be found but one often has to look carefully for them. Not so in the fall, when the bright orange red berries are conspicuous.

Look closely in the woods of Normandy and you will see *Convallaria majalis*. I saw quite a number of these fragrant beauties. The flowers of various species of *Veronica* are a delight, but one needs a key to be sure of the species. Other lovely blue flowers are the borage, *Borago officinalis* and *Anchusa officinalis*. How the latter got its common name Alkanet I do not know.

Orchids are always a



***Dactylorhiza majalis.***

show stopper and numerous species of *Dactylorhiza* are commonly seen in spring. These are outstanding plants and can form large colonies. There were a great number of them in Brittany, growing in the hedgerows and in open fields.

Brittany has some wonderful gardens, as along the coastline can be found valleys with very mild micro-climates. Collections of camellias, magnolias and large plantings of *Gunnera manicata* together with species of *Rheum* are attractively planted with the large green foliage of the skunk cabbage. The bulbs of *Polygonatum multiflorum* and *Polygonatum odoratum*, while native plants, are used effectively.

As in Britain, *Rhododendron ponticum* has escaped from gardens and is well established in the countryside, forming very large clumps. If you have the chance to visit Brittany, make sure you spend time visiting the gardens and nurseries. The number of species grown rivals those of England, but the wine is to be preferred!

One does come across *Hyacinthoides non-*



**Bluebells on Dartmoor.**

*scripta* but for whatever reason the countryside does not have the large natural colonies found in England. Most people still call these lovely blue flowers *Scilla*. I was surprised to find an exposed hillside, with no trees in sight, covered with a haze of blue.

This was on Dartmoor – could it be that the bracken, which is not apparent in spring, plays a part later replacing trees?

Some years ago, I came across a lovely stand of *Leucojum vernum* on a bank in a shady lane. This is a rare plant in England, unlike *Galantbus nivalis* which is quite common. *Muscari atlanticum*, a grape hyacinth native to England, can be found if one has some luck. It looks so well growing with the English primrose, *Primula vulgaris*. When I

spotted this combination I thought it had been planted.

*Geranium robertianum* and *G. versicolor* adorn the hedgerows in southern England, their rosy pink flowers standing out much more than *G. phaeum*, the dusky cranesbill. The yellow flowers of *Meconopsis cambrica*, the Welsh poppy, command attention growing alone at the base of a rock, or at the base of a tree, often alongside the road, and often forming very large clumps.

From the cultivated gardens with almost overwhelming color found at Keukenhof, to the rare species found in the gardens in Brittany, and the natural beauty of the wildflowers in the countryside in southern England, there was always much to see and admire.

I often think we do not fully appreciate the flowers which are at home in the hedgerows, the woods and meadows, or even in walls. We ought to give them attention as they are so lovely. I am glad this is the case, as no matter where I travel I can find plants to admire, ponder over and above all enjoy. It is so much fun to open the eyes of my travelling companions to the beauty and grace of both cultivated gardens and those growing without any attention at all. The flora of the world – how great it is.

When one considers the wild flowers growing well without the attention of man, it is a lesson to all gardeners. We are so inclined to feed, water, prepare special soil mixes and coddle our plants, yet so often this is not necessary. When we do give great attention to our plants I feel we also lessen their resistance to problems. They become too soft and their natural growth habits are changed, not to their advantage.

It is often not appreciated by people that the flowers in our gardens grow wild in the countryside of countries, It is for this reason I love to travel to South Africa, where one can see so many of the bulbs flowering in their native habitats. While many of the wild species may lack the flamboyance of their hybridized garden relatives, no one can deny their grace.

There is an undoubted satisfaction enjoyed when one can identify plants. However, I feel sometimes this stands in the way and we lose the undoubted pleasure of simply admitting the beauty of the plants. After over 55 years of working with, writing and talking about plants, I have begun to realize that no matter if we do or do not know the names, the plants are still as lovely. I wonder why it took me so long to arrive at this conclusion.

# The Genus *Romulea* – An Introduction.

Robin P. Attrill

*Romulea* is one of the horticulturally less well known genera of the Iridaceae, comprising around 95 species distributed throughout Southern Europe, Africa and the Middle East. The principal centre of diversity lies within Southern Africa (~70sp), particularly the Western region, with a few species extending to the summer rainfall regions of South Africa, and thence northwards through the highlands of East Africa. A secondary centre of distribution is found in the Mediterranean area, extending from the Canary Islands and Morocco in the west, to the Middle-East. In the literature the entire genus is covered concisely by Innes (1983). The Southern African taxa have been the subject of detailed monographs by de Vos (1972, 1983), and have recently, along with the other sub-Saharan species, been the subject of a synoptic review by Goldblatt and Manning (2001), which includes several recently published taxa.

In structure *Romulea* are cormous perennials, typically producing one or more grass-like basal leaves which are followed by brightly coloured, actinomorphic flowers on short stems. The flowers typically possess a yellow central cup surrounded by brightly coloured perigone segments, which vary enormously in colour within the genus. In general form *Romulea* superficially resembles *Crocus*, and it is sometimes considered to be the 'poor relation' thereof. This is due in part to the presence within the genus of a small number of small-flowered and 'weedy' species such as *R.*

*pratensis*. This article aims to demonstrate that this perception is misleading, with the undesirable species forming the minority, and many others being of great horticultural value and beauty.

## Cultivation

The vast majority of the genus are winter-growers, with the foliage produced during the autumn and winter, followed by the flowers in late winter and early spring. Corms of these should be planted in a very free-draining substrate in early autumn, then watered sparingly until growth is evident. A combination of John Innes No.2 (1 part) with added grit (2 parts) and sieved humus (1 part) is ideal. In general, frost-free conditions are preferable, and excellent light is important to prevent etiolation. As growth proceeds watering is increased until the flowering period finishes, after which the plants are dried off and the corms kept dry during the summer months. Summer baking is not, however, required. In more northern areas, eg the UK and northern United States, the plants are generally best grown under glass whereas in more favoured areas, eg South West USA, Southern Europe and Australia, unprotected planting is the norm. In the latter situation precautionary care should be taken to control unchecked seeding.

Propagation is best effected from seed, which should be sown on the surface of a sandy medium and covered with approximately 1cm of grit. Sowing for the winter-growing species is preferably performed in early autumn when a day/night temperature differential of about 20°C/8°C is ideal for encouraging germination. This typically occurs in 3 to 8 weeks, but in many

cases some or all of the seeds may delay germination until the following, or subsequent, years. The first growing season is crucial; it being important for the seedlings to generate a large



***Romulea sabulosa* growing en masse  
in South Africa.**

Mary Sue Ittner

enough corm to survive the first period of dormancy. This is best achieved by keeping the seedlings in growth for as long as possible in their first growing year. Subsequently corms typically achieve flowering size in two to six years, with two to four years being usual for most species. An alternative to seed is to grow-on offsets, but in many species these are produced rather sparingly.

In the case of summer-growing species the same general planting advice applies but sowing of seed and planting of corms should be performed during the spring.

Transferring plants between the Southern and Northern hemisphere (and *vice versa*) can be problematic due to the asynchronous seasonal growth cycles. With corms it is generally best to plant as soon as acquired and to achieve synchronisation by extended growing seasons. This is usually achieved in two growing seasons. With seed there is no issue, as viability is generally good over extended periods and the seeds can simply be stored and then sown at the appropriate season.

In general the genus is remarkably unaffected by pests and diseases, although aphid attacks can be problematic, particularly when grown under glass. Treatment with an appropriate proprietary pesticide will generally effectively deal with this problem. Unlike *Crocus* the corms tend to receive little attention from rodents, possibly due to their reputed toxicity.

A useful account of the cultivation of this, and related, genera is provided by Mathew (1997) in an excellent reference book that all geophyte enthusiasts should acquire.

### A selection of *Romulea* worthy of cultivation

As previously noted the genus contains a large number of species worthy of cultivation. The following is a brief summary of selected species from each of the three principal areas of distribution.

## Winter-growers from South Africa

### *R. amoena*

*Romulea amoena* is one of the most strikingly beautiful members of the genus. The lustrous red flower with a black and yellow cup gives rise to the local name of Satin Flower in the Bokkeveld mountains of South Africa where the species originates. The plant responds well to cultivation, flowering in March – April in the northern hemisphere. Propagation from seed is more problematic than with some members of the genus, with germination somewhat erratic, and, when successful,



*Romulea amoena.* Bill Dijk

the resulting one year old corms sometimes fail to attain sufficient size to survive the initial dormant period. Despite these drawbacks the spectacular nature of the plant fully justifies these challenges.

### *R. atrandra*

*Romulea atrandra* is, in its nominate form, a very attractive rose-magenta species. Its two other colour varieties, *R. a.var. esterhuyseniae* and *R. a.var. lewisiae* have paler coloured flowers but are equally beautiful. The species is floriferous, grows readily from seed, and is easily maintained in cultivation.



*Romulea atrandra* var. *atrandra.*

Andrew Harvie

### *R. bantamensis*

Whilst the flower of *R bantamensis* is rather small the colour combination of dark markings on a rich purple ground is quite exquisite. The plant is a true alpine, growing in the wild at around 1500M on the Hantamsberg plateau in the Western Karoo. Probably as a consequence of its origin the

conventional germination conditions for the genus do not apply, with a period of chilling assisting the breaking of dormancy. Even when this is done germination is, at best, erratic. Mature plants present no such problems, being readily maintained and occasionally producing offsets.

***R. birta***

*Romulea birta* is an attractive and easily grown yellow flowered *Romulea* with a wide distribution throughout the Northern – and Western Cape provinces of South Africa. Unlike the grass-like foliage of most of the genus, this species possesses unusual winged foliage, with the leaves exhibiting an H-shape in cross section. Propagation from seed



***Romulea birta.*** Tony Palmer

is straightforward with the plants typically attaining flowering size in two to three years.

***R. komsbergensis***

*R. komsbergensis* is an attractive magenta flowered member of the genus, superficially resembling the nominate form of *R. atrandra*. In its floral characters it differs from *R. atrandra* principally by possessing more extensive dark areas in the cup, together with blue tips to the perigone segments. The similarities between these two species have led to a certain degree of confusion in cultivation, with plants



***Romulea komsbergensis.*** Dirk Wallace

of *komsbergensis* frequently being attributed to *atrandra* in collections. The plant is easily grown from seed, typically flowering in three years from sowing, and is readily maintained in cultivation.

***R. monadelphica* and *R. sabulosa***

*R. sabulosa* and *R. monadelphica* form a sympatric pair of species bearing beautiful large red flowers, both possessing a restricted range in the Bokkeveld region of Southern Africa. Whilst the two taxa are readily separable in their typical forms, populations exist in which intergrades



***Romulea sabulosa.*** Daryl Geoghegan

showing characters of both species are present, and these are the subject of considerable taxonomic debate. With *R. amoena* they share the colloquial name of Satin Flower, and are also sometimes referred to in textbooks as the Bokkeveld Crocus. In cultivation hybridisation sometimes occurs when the two are grown together. *R. sabulosa* is the more widely grown in cultivation, possibly because it is, in the experience of the author, rather easier to germinate. It common with other larger *Romulea* species the plants may take 4 to 5 years to attain flowering size when grown in higher latitudes (e.g. UK) whereas in more favourable locations (e.g. California) flowering within 2 to 3 years is achievable. A useful illustrated account of experiences with the two species in the latter location is given by Hardman (1998).

***R. tabularis***

The pleasantly scented, lavender-blue flowers of *R. tabularis* are attractive, and are rather reminiscent of the *R. bulbocodium* complex from the Northern hemisphere. The plant is easily grown, germinating readily, and flowering in 2 to 3 years from sowing.



***Romulea tabularis.*** Tony Palmer

### ***R. tetragona***

*R. tetragona* is a smaller flowered species than some but the flowers of both of its subspecies, the rose-pink nominate form and the lilac-pink variety *R. t.* var. *flavandra* are attractive. The species shares the winged foliage of *R. birta*, that of var. *flavandra* being an attractive silvery shade of green, but this is an example of parallel evolution as the two taxa not particularly closely related. This species is easy to grow, with flowering in three seasons from seed readily achievable.

### ***R. tortuosa***

*R. tortuosa* is a most attractive species, and in its best form, var. *tortuosa*, the lovely yellow flowers which possess bold black markings, appear very early, often before the end of December in Northern latitudes. The botanical name refers to the tendency of the leaves to adopt a spiral habit in the wild. In cultivation this feature is usually lost but, interestingly, is retained by the pedicel as the seed ripens. This is another easily grown species, typically flowering in three years from sowing.

In addition to the species described above a large number of other South African *Romulea* are very worthwhile plants, with *barkeriae* (white with dark markings), *diversiformis* (yellow), *ballii* (violet-blue), *montana* (yellow with dark markings), *saldanbensis* (yellow), *subfistulosa* (reddish purple), and *unifolia* (vermillion) worthy of particular consideration.



***Romulea montana.***

Andrew Harvie



***Romulea subfistulosa.***

Andrew Harvie

## **The Mediterranean Species**

Despite being rather less flamboyant than their South African counterparts, a number of the northern species are well worth cultivating, and a selection of these are described below.

### **The *Romulea bulbocodium* complex**

The *R. bulbocodium* species complex has a very wide distribution throughout the Mediterranean region and in consequence exhibits much variation in flower size and colour. The taxonomy of the group is confused, with a multitude of synonyms in existence. The names detailed below are those in wide use in commerce, and are not necessarily strictly valid.

The following four species/subspecies/forms demonstrate the variation of the plant – all are very worthwhile garden plants. *R. b.* 'Knightshayes form' is an attractive deep violet selection, which was grown for many years in the famous Devon, UK garden prior to being more widely distributed. It is much darker in colour than the typical western Mediterranean forms, such as *R. b.* var. *clusiana*, several good forms of which are in cultivation, particularly that which is native to Gibraltar.

***Romulea bulbocodium* growing in natural habitat in Italy.**

Angelo Porcelli



***Romulea bulbocodium* growing with *Allium commutatum* in a narrow strip no more than 2 metres from the sea where they don't get suffocated by other plants.**

Angelo Porcelli



Further east the variable pale variety *R. b. leichtlinii* predominates in which the flowers are white flushed with lilac. In *R. 'malenconiana'*, a particularly lovely form, the flowers are pure white.

All of the above forms are easily grown, and provide an attractive display when flowering in early spring.

### ***R. crocea***

*R. crocea*, a native of Turkey, is unusual in the context of the northern species in that it possesses yellow flowers. In other respects the plant is structurally similar to *R. bulbocodium* and may be conspecific. The plant originates in Turkey, where it occurs at a considerable altitudinal range. Introductions from the higher altitudes tend to do better in cultivation.

### ***R. nivalis***

*R. nivalis* is similar in form to *R. bulbocodium* but is distinguished by its more upright form of growth and its very attractive tricoloured flowers in which the violet perianth segments surround a white edged golden central cup. The overall effect is rather similar to *Crocus sieberi* var. *tricolor*. The plant is native to Syria and the Lebanon and is best grown frost-free, being rather more tender than most *R. bulbocodium* variants.

### ***R. requienii***

This delightful dwarf species, which originates from Corsica and Sardinia, possesses beautiful deep violet flowers. It is easily propagated from seed and responds well to cultivation.



***Romulea  
bulbocodium  
var. clusiana.***

Tony Palmer

## **The Summer-Growing African Species.**

### ***R. autumnalis* and *R. camerooniana***

These two closely similar species, the former being native to the Eastern Cape and the latter, which has a number of synonyms including *R. campanuloides* and *R. thodei*, is found throughout eastern Africa from Ethiopia to the Eastern Cape. Both species are generally pink flowered but each shows considerable variation in shade from magenta to almost white. In cultivation each flowers during the autumn months and both are attractive subjects, particularly when grown in pots.

### ***R. macowanii* var. *alticola***

*R. macowanii* var. *alticola* is an easily grown species which produces its golden flowers freely

during late autumn, a time of year when yellow-flowered bulbs and corms are in short supply. It is one of the hardier species, performing well in the rock garden. Propagation from seed is straightforward, with flowering achievable in 2 to 3 years from sowing.

### **Conclusion**

I hope that the above account will draw attention to what is currently an under-rated genus of plants that really does deserve wider attention. Very few taxa are thoroughly established in horticulture, and many species possess very limited distributions in the wild. The localisation of these species results in intrinsic vulnerability to changes

in land use, and I believe it is important that responsible collection and establishment in cultivation should take place to gain greater understanding of the genus and its conservation requirements.

An additional aspect of the localisation of many species distributions is that a number of species have only very recently been described, and doubtless others await discovery.

In summary I hope that the day will come



***Romulea macowanii.***

Andrew Harvie

when *Romulea*, with its remarkable range of flower colour, is regarded as being on a par with *Crocus*, which also includes 'weedy' species such as *C. tomasinianus*!

### **Selected sources of *Romulea***

The following are useful as sources of *Romulea*, all of which I can personally recommend.

MONOCOT NURSERY: St Michaels, Littleton, Somerton, Somerset, TA11 6NT, UK  
(Seed and corms, principally of Mediterranean species)

SILVERHILL SEEDS: PO Box 53108, Kenilworth, 7745, Cape Town, RSA  
(Seed of S. African species, catalogue online at [www.silverhillseeds.co.za](http://www.silverhillseeds.co.za))

RUST-EN-VREDE NURSERY: PO Box 753, Brackenfell, 7561, RSA  
(Seed and corms of S. African species)

GORDON SUMMERFIELD: PO Box 5150, Helderberg, Somerset West, 7135, RSA  
(Seed and corms of S. African species)

JIM & JENNY ARCHIBALD: Bryn Collen, Ffostrasol, Llandysul, SA44 5SB, Wales, UK  
(Seed of selected Mediterranean and S. African species)

In addition to the above society seed distribution schemes including those of IBS, the Botanical Society of South Africa, the Indigenous Bulb Association of South Africa, the Alpine Garden Society and the North American Rock Garden Society can be productive sources of material.

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### **Biography**

Originally from the Isle of Wight, Robin Attrill currently gardens in Essex, UK with particular interests being *Leucocoryne*, *Oxalis* and *Romulea*. Additional botanical interests include *Paeonia*, cultivars of *Papaver orientale*, *Pelargonium* species, and a wide range of 'monocots'. His favourite plants are *Galanthus nivalis*, *Romulea bantamensis* and *Paeonia rockii*, whilst his least favourite are double-flowered *Galanthus* cultivars! Wider interests comprise the flora and fauna of the Isle of Wight, particularly the birds, dragonflies and hoverflies.

# Growing Bulbs in Raised Beds

Rachel Saunders, Jana Ulmer,

Mary Sue Ittner and Lauw de Jager

In May this 2001 the International Bulb Society had a discussion on their Bulb Forum on growing bulbs in raised beds in the ground, rather than in pots. The discussion was started by Jana Ulmer, and was taken further by Mary Sue Ittner and Lauw de Jager.

Jana reached a point where she could no longer look after her large bulb collection which was grown in pots. If her interest in bulbs was to continue, something had to change - not only were the bulbs "dwindling", but she no longer enjoyed moving pots depending on the weather, the time of year, etc. She therefore decided to make beds in the garden and to move her collection into the ground. The beds were about 1.25 x 4 meters in size, and the ground was excavated to 0.75 meters deep. The hole was lined with wire mesh to keep the gophers (similar to moles) out, and refilled with a mix of native soil, a "raised bed mix" (similar to potting mix but heavier) and some organic soil amendments such as bone meal. The beds were made of treated timber, and on top of the timber she made a grid with nails and strung string between the nails to make planting "boxes". The boxes varied in size depending on what she wanted to plant in them - larger for Amaryllids (30 x 30cm) and smaller for Irids (20 x 20cm). When she planted the bulbs she tried to arrange them so that each square bordered on a different genus so that if she wanted to dig up one species, the bulbs/corms would be easier to tell apart. She planted the bulbs in autumn, and shortly after winter set in, the birds discovered her smorgasbord and began uprooting the plants, so she had to cover the beds with aviary wire attached to frames. Jana lives in California and on very cold nights she threw blankets over the tops of the frames to protect the growing bulbs. The results in the first spring were wonderful - she had better growth from all species, and more flowers than she'd ever had in the pots. Many of the South African bulbs grown from seeds bloomed for the first time and the Californian species (eg. *Calochortus*) responded just as well. She speculated that this was possibly due to the increased root run, better soil temperature and moisture levels, or a better soil mix. The real question is, however,

what will happen next winter and spring, and the one after that? Already Jana is seeing that certain species have "wanderlust" and are encroaching on their neighbour's territory, and some of the late flowering species are struggling as she planted them amongst early flowering species which require less water later in the season. She also found that she still needs to keep a good eye on seed development in the beds to prevent unwanted seeds from falling into other areas.

Mary Sue's raised beds, made 9 or 10 years ago, are lined with hardware cloth, and although she started off with octagonal beds, she has now also gone to rectangular ones which she finds easier to plant in. She made a few mistakes which she discovered too late:

- if you plant many species of the same genus close together in the same bed, you will never be able to separate them again! She has *Moraea aristata*, *M. gigandra*, *M. bellendenii* and some others all planted close to each other, and although they all bloom every year, she cannot lift the thousands of little corms as she cannot tell them apart!
- don't plant "thugs" in the beds as they will take over - *Lachenalia bulbifera* and some of the *Babiana* species are in this category.
- be careful to plant taller things at the back and shorter species in front, otherwise you will never see the short ones in bloom.

In addition, Lauw warns:

- keep at least 30cm between each planting
- systematically gather all the seeds each season
- do all transplanting, dividing, rouging etc immediately after collecting the seeds and before dormancy has set in, as the plants are easier to find
- protect your bulbs well against predators such as moles.

Both Mary Sue and Lauw mentioned mulch. Mary Sue used gravel when she first started, and now she finds that not only are her beds very rocky, but she has difficulty digging plants out as the gravel gets in the way. She is now mulching with bark, and Lauw uses bark, straw, wood chips or compost. The mulch helps in temperature control, prevents

erosion of the beds, and inhibits weed growth. Both of them also mentioned growing ground covers during summer, and then letting the bulbs come through in autumn and winter. Mary Sue is experimenting with a native Californian vetch (a legume) which grows on the bare ground, then dies back as the bulbs start to come through. After the bulbs have bloomed and started to die back, the vetch starts growing again and blooms (yellow or pink) over the dying bulb foliage. She now wonders whether the vetch will eventually become a problem, and I wonder if the nitrogen in the soil will become too high. Lauw feels that perhaps a ground cover should be an annual that one can destroy, perhaps by burning, in early autumn.

Both Mary Sue and Lauw found that genera such as *Gladiolus*, most *Moraeas*, *Babiana*, *Hesperantha*, *Tritonia* and *Watsonia* were particularly happy in the soil, whereas *Geissorhizas* did better in pots. Amaryllids seem to thrive in the ground, and this is useful as their pots tend to be the biggest and heaviest to move around.

All three of these people live in Mediterranean climates where there is no need to keep the rain off in summer and no need to protect against freezing cold winters. People in summer rainfall areas could experiment with summer growing and winter dormant species in beds, and it would be interesting to hear some of their results.

One point that no one mentioned is how they

keep the beds clean of diseases and pests. We are also growing many of our bulbs in the ground, and we are finding that we have to lift the bulbs periodically and sterilise the beds in some way. This becomes particularly important if one is growing a large number of similar species; for example, we have a bed full of *Zantedeschias*, and another full of *Ixias*. This year the *Zantedeschias* are showing signs of fungal rot, and we will have to lift them all this summer and treat them as well as the beds. The *Ixia* species seem very susceptible to rust and this is gradually spreading to the *Gladiolus* species as well, so we obviously need to start some control measures. This probably does not differ much from disease control in pots, but it is simpler to re-pot one container of bulbs than to empty an entire bed and replant it. Another factor in growing the plants in the ground is whether they require sun or shade. In California the summers are probably cooler than our summers in Cape Town, and we are finding that if we grow the bulbs under 40% shade, they respond better than in full sun. The plants do not become lanky under this shade level, and their moisture requirements are less than in sun.

In conclusion, many of the winter growing South African geophytes do well in the ground, and for people with large bulb collections, perhaps this is the way to go.

*Moraea aristata*



# Spider Lilies for the South

Kevin D. Preuss

All photographs by the author, except where noted

## Introduction

Those who have grown spider lilies, as they are commonly called in the Southern United States, know the treasures they bestow on a summer's eve when the elegant, long-tubed, white flowers open and the variously scented nectar wafts through the breeze. The distinctive character is the floral cup, or corona, which is where the name *Hymenocallis* - Greek, meaning "beautiful membrane"- comes from.

The New World genus *Hymenocallis* Salisbury (Amaryllidaceae), recognized as a distinct genus since 1812, is composed of roughly 70 to 80 species with plenty of room for debate. Such a large genus provides a plethora of species for cultivation under an array of conditions from aquatic to xeric. The native habitats range from Indiana, Kentucky, Virginia, south to the Carolinas, Georgia, Florida, Alabama, Louisiana, Texas and Mexico where the genus explodes. The majority of the species occur in Central America and radiate down into the northern portions of South America (Venezuela, Guyana, and Brazil) as well.

The three closely related genera (once classified as *Hymenocallis*) *Elisena*, *Ismene*, and *Leptochiton* replace *Hymenocallis* in the Andean regions. For practical purposes when referring to hybrids in this article, the genera *Elisena*, *Ismene*, and *Leptochiton* are recognized under the genus *Hymenocallis* in a broad sense, but they are distinct groups and are not the true spider lilies. This is not a taxonomic review, although the current and reasonable trend set a few years ago by Meerow and Snijman recognizes each group as distinct genera; together the four genera comprise their tribe Hymenocallideae. The taxonomy of the group seems in flux continuously.

## Habitats

In the United States, *Hymenocallis* populations most often occur in or on the margins of wetland ecosystems (marshes, lakes, rivers, forested swamps, wet prairies). Less often they occur in dry woods (*H. galvestonensis*), flatwoods (*H. henryae*), or in disturbed sites such as pastures and roadside

ditches where some populations of *H. palmeri* and *H. galvestonensis* can be found. Coastal dunes provide a home for *H. latifolia* var. *keyensis*, found on Bahia Honda key in Florida. They are most spectacular when found blooming on many rivers and spring runs in the Southeast, such as the Cahaba lilies (*Hymenocallis coronaria*) on the Cahaba River in Alabama



***Hymenocallis coronaria* on the Cahaba River.** Photo by Beth Young

and the spider lilies (*H. rotata*) on the Santa Fe River of northern Florida.



***Hymenocallis rotata*** Gilchrist County, FL.

A few of the southeastern US species are listed as threatened or endangered and are protected in more than one state at the state level. Spider lilies

are commonly cultivated throughout most of their range and are grown in many tropical parts of the world. They do make excellent cut flowers, even if short lived. A few of the tropical species do hold their flower for a few days, however.

In the South the most commonly found cultivated species are *H. caymenensis*, *H. latifolia*, *H. littoralis*, *H. liriosome*, and *H. 'Tropical Giant'*.



***Hymenocallis caymenensis.***

The name "Tropical Giant" is thought to have been given to a "wastebasket group" under one collective name for the many large clumps of spider lilies commonly cultivated throughout the Gulf states - these have large, broad leaves with many small-cupped flowers.



***Hymenocallis choctawensis.***

Other species native to the South East United States such as *H. caroliniana*, *H. galvestonensis*, *H. rotata*, *H. choctawensis*, and the smaller sized species *H. traubii*, *H. duvalensis*, *H. henryae* and *H. palmeri* are all more than suitable for cultivation.



***Hymenocallis duvalensis* -  
Alachua  
County, FL.**

These species are more hardy and may be grown under temperate conditions if provided protection from extended freezes. However, successful cultivation of most *Hymenocallis* species requires particular knowledge of the species, and at least a little bit of information regarding its habitat. When dealing with plants of the genus *Hymenocallis*, locality information, if available, may be more important than the species name attached to the plant, especially as the taxonomy of the group is unstable.

Spider lilies, Dixie lilies, alligator lilies, or Cahaba lilies are grown both in gardens and pots. Seasonally wet locations in the yard or garden with partial shade provide a suitable environment to grow the bulbs in the ground. Once established in the landscape, a colony will flower for weeks, with flushes of new blooms replenishing the fading ones. Although spider lilies may be successfully grown in containers, they enjoy the freedom to pull themselves down into the ground.

If you choose to grow the plants in pots, large pots or tubs are recommended for clumps of mature bulbs. Tub can hold large clumps and provide ample water. Some of the new plastic pots are like tubs, but more decorative and have a plug on the bottom that can be removed in the colder winter months when some species prefer to be dry. When using standard pots, a saucer placed underneath the pot will help retain a sufficient water supply. There are several new lines of pots with self-contained water reservoirs and a couple of types have performed well in growing seedlings of *H. duvalensis*, *H. rotata*, *H. palmeri*, *H. traubii*,



***Hymenocallis tubiflora.***

*H. choctawensis*, and *H. coronaria*, all of which are semi-aquatic to aquatic species.



*Hymenocallis palmeri* - Desoto County, FL.

Several of these species are fine candidates for the water garden. Since many species thrive in at least semi-aquatic conditions, most are easily grown when wet conditions are provided. Plants that remain in standing water should be periodically drained and allowed to dry out, in part at least. It is important to note that while several species are aquatic in their native habitats, they do, however, dry off when the water levels recede and some may even experience dormancy.

When using pots or tubs, it would appear that most species are better suited in larger sized ones. A general observation has been that the plants will reach an overall larger stature in larger pots or tubs. Granted, these can be untidy at times, in particular when plants begin to shed their leaves, but the unsightliness is well worth the mass of blooms in the preceding months.

The tropical species such as *Hymenocallis arenicola*, *H. littoralis*, *H. caymensis*, *H. tubiflora*, *H. speciosa*, etc., are well suited for cultivation in the southern portions of Florida and Texas and some points in between where frost exposure is not prolonged. The tropical species are excellent greenhouse plants as well, but can become cumbersome due to their larger sizes.

The numerous Mexican species present a little more of a challenge to the gardener. Collectively, the Mexican species are more diverse in their range of habitats than are their northern counterparts. The

Mexican species vary in habit from xeric to aquatic. The arid climate of parts of Mexico and increased elevation make it rather difficult to replicate environmental conditions in the Southeastern United States. The Mexican species and hybrids ought to be increasingly grown on the West Coast of the United States and in Australia, as well as many locations in Southern Europe. Clay pots and a more porous medium is recommended for growing the xeric species.

The species of Andean genera of the tribe Hymenocallideae generally do poorly in the deep southeastern United States, when cultivated under hot, humid conditions. Thus, their hybrids do not perform well in the hot humid climate of the South. Both species and hybrids do better when grown in the drier and higher elevation climates of California, South Africa, and parts of the Mediterranean and Australia. These plants may replace spider lilies in the landscape in northern Georgia, western Carolinas, Kentucky, and as far north as southern Ohio.

*Hymenocallis* hybrids are not commonly cultivated and just a few are readily available to the bulb market. For the most part, hybrids have been developed from the *Ismene* and *Elisena* groups\*. As for hybrids of true *Hymenocallis* (excluding *Elisena*, *Ismene*, and *Leptochiton*), breeders such as, to mention a few individuals, Thad Howard, Luther Bundrant, Len Woelfle and James Bauml have made progress in hybridizing numerous species of Mexican *Hymenocallis*. Most are not available commercially, however. Those hybrids and crosses of Mexican species will not be addressed



*Ismene amancaes*.

here. Both *Hymenocallis* x 'Hispaniola' and *H.* x 'Invicta' are selections from the cross of *H. traubii* x *H. imperialis*. *Hymenocallis* x 'Pirate Queen' is the resulting chosen clone selected from *Hymenocallis traubii* x *H. liriosome*. A hybrid of unknown parentage labeled as *H.* x 'Indian Queen' was given to me back in 1998, but has not yet flowered. There is plenty of room for progress and improvement of spider lily hybridization.

Many hybrids that are available, such as *H.* x 'Buckeye' (*H. longipetala* x *H. liriosome*) - a more hardy clone, and Bundrant's *H.* x 'Excelsior' (*H. traubii* x *H. narcissiflora*) involve *Ismene* or *Elisena* in their backgrounds. Both genera readily cross with each other and *Hymenocallis*, leading many to classify species of both *Ismene* and *Elisena* as *Hymenocallis*, which is legitimate when including the genus *Leptochiton* as well.

This blooming season of *Hymenocallis* species has finally inspired me to establish a *Hymenocallis* breeding program, focusing primarily on species from the SE US and tropical regions in the hope of obtaining hybrid selections that will perform well under hot, humid conditions. Some of the characteristics bred for are smaller plants with increased numbers of flowers; increased recurrent blooming cycles; coloration (green) in the tepals with yellow in the center of the corona; and to reduce the aquatic

nature found in some parent species. Successful crosses so far have involved various combinations of simultaneously flowering species *Hymenocallis rotata*, *H. palmeri*, *H. choctawensis*, *H. caymensis*, *H. tubiflora*, and three different forms of *H. latifolia* - including *H. latifolia* var. *keyensis* and also an undetermined seedling from the Yucatan Peninsula.

In the summer of 2002, I crossed *Leptochiton quitoensis* with an undetermined *Hymenocallis* species (*H. latifolia*?) from the Yucatan and one



***Leptochiton quitoensis* –Ecuador.**



***Hymenocallis* sp. from Yucatan, Mexico.**

pod with 12 brownish colored seeds was produced. However, the seeds did not appear fully mature, as compared to *L. quitoensis* self-pollinated produced seeds. Surprisingly, after one month the seeds began to germinate. In the reciprocal cross, pollen of *L. quitoensis* was placed onto a few pistils of *H. choctawensis* from Dothan, AL, but was rejected.

*Hymenocallis* are one of the most easily cultivated amaryllids in the South. Spider lilies have the potential to be widely cultivated in many of the milder climates throughout the world. Today's international bulb market offers a wide array of species of all groups, although most are limited in availability. Growing various combinations in the



garden will provide blooms of various magnificent spider lilies from March through at least November in warmer parts. The sheer elegance and variously scented perfumes of their flowers, which are so commonly visited by long-tongued moths in the evenings, are truly enjoyable in most any setting.

\* FOOT NOTE – The first reported *Hymenocallis* hybrid was *H. x 'Spofforthiae'*, a cross between *H. narcissiflora* x *H. amancaes* made by William Herbert, (which under the recognized classification is *Ismene calathina* x *Ismene amancaes*). That hybrid and Arthington Worsley's *H. x 'Festalis'*, a cross between *H. narcissiflora* x *H. longipetala* [*Ismene calathina* x *Elisena longipetala*] were a platform for other

breeders' works. The Dutch bulb company van Tubergen's replication of Herbert's first cross provided the industry with *H. 'Sulfur Queen'*. Len Woelfle produced a few other named selections of that same cross, the most prominent being *H. 'Pax'*. Len Woelfle made the reverse cross of 'Festalis', using *H. longipetala* as the seed parent and *H. narcissiflora* as the pollen and the resulting selection was named 'Fiesta'. *H. 'Festalis'* was backcrossed on *H. narcissiflora* to get *H. 'Advance'*. Another combination of the South American genera *Ismene* and *Elisena* came from Len Woelfle's cross of *H. amancaes* and *H. longipetala* which produced his "Dancing Dolls" line with selections such as *H. 'Ballerina'* and *H. 'Dancing Doll'*.

Kevin Preuss, 35 years old, has from the University of Florida, a Master of Science in Horticulture/Botany and Bachelor of Science in Botany. Although his formal training was in plant systematics, growing amaryllids has become his passion.

In addition to recently establishing Amaryllis Plus Bulb Company, a certified nursery propagating and offering mostly New World amayllids, Kevin is also an adjunct Field Biology instructor at St. Petersburg College.



**An unidentified *Hymenocallis* sp. collected from Guatemala by Dr. Robert Dressler.**

# An English Bulb Gardener

## Reflections of a New Experience and the creation of an African Bulb Garden

If someone saw your garden on the internet, liked it, and had an interest in the plants that featured on it, and then asks by e-mail if you can help them do the same. What would your reply be?

Probably, certainly, or no, most definitely not, but an answer could also depend on: where the garden was; its intended size; workforce; available funds; and what local and natural resources were available. On asking for more details I received the reply, "I'm Charles Lindsay Bolden CBE QC, an IBS member. I'm gardening on Barbados and want an African Garden". At the time I can honestly say that I didn't know how I felt, but I can say for sure that the thought of it was most appealing. Not because it was on Barbados which is somewhere I had not been, but more for the thrill of creating an African Garden on a much larger scale than my own - initially over an acre in size. As an African bulb fanatic and professional horticulturalist / landscaper in limbo, pardoning the pun, just how could I refuse! All I needed was permission from my wife.



### **And we thought he was there to work!**

As one can imagine a lot of e-mails were sent across the Atlantic, and thousands of bulbs and seed were donated to the project from my own

## in Barbados

*David Fenwick*

All photographs by the author

collection here in the UK, which includes the National Collections of *Crocasmia*, *Chasmanthe* and *Tulbaghia*, or were purchased from both wholesale and retail sources. Indeed wherever possible local suppliers in Devon and Cornwall in England were used to ensure phytosanitary requirements could be met. Many bulbs were also obtained from other fellow National Collection holders, such as *Agapanthus* from Richard Fulcher at Pine Cottage Plants, and *Dierama* from Diane Rowe. It was decided at an early stage that the plants and seed collected for export should travel in three main shipments, with the shipments being of ever increasing size and diversity.

By the time of flying to Barbados in March 2002, over 150Kg of bulbs had been amassed in readiness for propagation and planting. Each shipment had to have its own Import Permit from the Ministry of Agriculture in Barbados, together with the appropriate UK phytosanitary certification. Labelling, numbering, counting and cataloging was an absolute nightmare because of the sheer number of species and the number of bulbs. The Barbados Ministry for Agriculture stated that because the South African bulbs and plants were of UK origin, they only had to be pest, disease and soil free. Achieving this may sound easy, but when you live in a small house with a kitchen no bigger than a postage stamp; washing, preparing and drying 2-3,000 bulbs or more per shipment is enough to drive anyone crazy, especially one's wife. It is also surprising just how many toothbrushes and pairs of scissors you get through in the preparation process. For instance 1000 *Agapanthus* seedlings were obtained in 7cm square pots and most were potbound, which made the job more difficult. These took two people, 2 days to prepare and their eventual weight for sending was just 24Kg.

I went to Barbados knowing as much about the island as a person who watches the odd holiday program now and again. The first contrast I noticed with the UK was obviously the airport as the only comparison I could make to Gatwick, London, was the plane I had left in some eight hours before!

After such a long flight I was relieved to meet my friend and host, Charles Lindsay Bolden, Vice-President of the Barbados Senate and owner of the Ayshford Ratite Gardens where I was to stay and help develop the garden. My quest for knowledge started as soon as we left the airport. Travelling back to the gardens we passed large fields of sugar cane, and hedgerows that contained at least a few familiar plants, such as *Setcreasea*, and the African aliens of *Sansevieria* and *Leonurus*, both of which I had shipped and intended to plant. Through the city of Bridgetown and outlying villages, coconuts and bananas replaced my equivalent, apples and pears, and varieties of *Hibiscus* and *Bougainvillea* were commonplace. The best surprise was the number of cycads that were grown, and some were seen of very large size. Perhaps the weirdest sight, having been on the island for just an hour, was the sight of a lone *Thuja plicata*, a cold temperate conifer, which was well out of place but alive and surviving in the tropics. It seemed quite ironic that in England and elsewhere we all strive to create our own garden paradise, and that whilst in paradise we'd be seeking to create something quite foreign and alien.

I spent the first few days adjusting to the higher heat and humidity, and deciding where to site the new garden. On being asked about the climate I replied, "It's just like working inside a tropical greenhouse in the UK, only that they don't build them on slopes". Being enthusiastic and working at a UK pace in 34 degrees of heat and 100 percent humidity sapped the stamina very quickly for a few days. However, two suitable garden locations were found for the new African Garden. One was quite far from the plantation house and consisted of a large open field. The other was closer to the house, and beside an already existing rose garden. The first area, the large field, had good and deep

soil, but there were no definite boundaries to use, and the site was far enough away on the 50 acrea estate as to create both security and management problems. The second area had distinct boundaries but most of its topsoil had already been used elsewhere. However its aspect and topography suggested it was by far the best site for the garden for it had some shade around its boundary and was a south-west facing hillside, which was ideal for terracing and creating the beds that would be needed.



**The favoured site.**

All the soil and stone had to be imported, and this included around 200 tonnes of soil and a similar amount of stone. Stones measuring 15 inches (38cm) in diameter were used for walling, and pieces to one and a half metres (5 feet) in diameter



**That's more like it.**

were used for the construction of the rock terrace.

The type of stone posed a significant problem, as the natural and most common stone on the island is coral rock, which is very sharp, highly alkaline and of irregular shape. Its only advantage is that it can be relatively soft. With very few planes, flat pieces are rarely come across, and it can be very difficult to use as a walling stone for this reason. A very good eye is needed. Fortunately, walling with them and creating a third of an acre of terrace was very similar to using the harder Devonian limestone with which I was only too familiar. The only initial problem was in developing a kind of sign language between myself and a local Bobcat driver, who was to move and place the heavier stones. Very few people involved in the construction industry on the island have any experience of creating gardens. All I can say, is "Well done John", and thank him for his patience.

The most contrasting thing to UK and temperate horticulture has to be the soil husbandry, as techniques used in Barbados are markedly different. The soil pH, that you would expect to be alkaline, is indeed very variable, even over small areas, and due to salt contamination. Soil consists mainly of a mixture of a very sticky clay, coral sand and grit. That which was imported could only be described as very lumpy, and its structure the strongest I have ever experienced during my horticultural career. You don't tread on a lump of soil in Barbados and hope to break it up as you'll break your leg on the first attempt. In Barbados you have to irrigate constantly and allow the sun to heat the wet clods and break them up over several days. Even when the soil is wet there are still problems, as it can easily turn a six foot man into one seven foot or more, by the amount that sticks to his wellies. Fortunately, soils tend to be free draining because of their perfect structure and thus they dry out very quickly in both the heat of the day and the easterly trade winds.

Soil preparation is critical for growing a wide range of plants on Barbados and here my first thoughts were that there might be copious amounts of organic matter in the form of coir compost that one could use. However, there was nothing of the sort and the only source of organic matter existed in the form of home made compost, mostly made from the cutting of elephant grass which can achieve eight feet in height. Regular mulching and soil enriching would be vital due to the high rate of breakdown as a result of the high heat and humidity. All of the peat and compost that is used on the island is actually imported from as far afield as the

UK and Ireland, and it is over three times the price so is used sparingly. Horticultural tools and sundries are also very expensive – if you can get them. An average wheelbarrow costs about ninety pounds (\$135US); a toilet seat nearly sixty pounds (\$90US); and on asking for a garden sieve the reply was either "What's that" or "No, sorry". A very suitable form of plastic shopping basket was found I am glad to say, and fortunately the local and very palatable rums were much cheaper in comparison. The answer to this was, "if you cannot buy it, design it", for there are some very skilled craftsmen on the island. We asked a carpenter to produce large landscaping rakes, and from a rough sketch he made what turned out to be any landscapers dream rake: a four foot head made of green heart with purple heart tines, and with a six foot lighter pine handle.

Getting back to the garden and its plants, a collection of bulbs, succulents, shrubs and seeds numbering well over 400 varieties had been amassed prior to my visit. Aloes, Proteas, Zantedeschia, Amaryllis, Eucomis, Crocosmia, Chasmanthe, Agapanthus, Dierama, Tulbaghia and Crinum were just some of the genera, but no-one knew with any certainty what would do well, what would die, or what could become weeds, but for sure it would be pessimistic to say that 'nothing' would grow as some regions of South and Southern Africa do have a very similar hot and humid climate with little seasonal change. We remain optimistic and regard our approach somewhat as a trial. Our intention was to propagate many South African bulb species from seed as these would mature quickly in the heat and humidity and would be most cost effective in relation to their import and size of area to be planted. The other benefit would be that seedlings could be selected for how well they perform, and the best selected for propagation and eventual planting. What was found, and very quickly, was that the climate on Barbados is a propagators and cut flower growers dream. Most plants are propagated with ease, and growth, including flowering, is achieved very quickly. However, some bulbs such as *Chasmanthe*, flowered profusely within weeks of planting, but growth and flowering was so quick that the bulbs never had a chance to build up reserves or even offset. Therefore in some cases bulbs might have to be grown to flower from annual sowings rather than relying on perennial plantings as we do in cooler latitudes.

The design, landscaping and propagation stage was completed in a little over three weeks. Another three weeks, a month later, was arranged

**Author in shaded nursery area.**



for the planting and yet more propagation. Designated beds were constructed, and arranged by climate zone, so that the more familiar temperately grown South African species were placed in beds encircling the area, and under some shade. The more tropical genera were included in its centre, along with a large African succulent collection which was planted on the terrace, with some of the smaller species of bulbs. At the top of the terrace an African hut was planned which, covered with *Gloriosa*, will provide shade during the heat of the day, and some amazing vistas across the garden. Wherever possible, paths were also designed to allow for wheelchair access between the beds. The initial planting of the garden was completed in June 2002 but it is expected to take a few years for the garden to mature, as many young *Strelitzias*, including the species *S. reginae* and *S. nicholae* have been planted, together with *Proteas*, *Leucadendron* and other shrubby genera.

Further theme gardens and projects are planned for the old cane plantation at Ayshford by its owner, and some thirty acres have been dedicated for future development as gardens. Ayshford not only has the potential to become the largest garden on the island, and a major tourist attraction in its own right, but it also has the potential to employ many local

people and facilitate new careers and new horticultural industries, skills and training through it's eventual botanical diversity and the use of resources that its development will create.

Ayshford Ratite Gardens is not just a garden, as its name suggests, but ostriches are also reared for their meat which is prepared, cooked and served on site at the ostelry restaurant. Ayshford also caters for weddings and other functions and provides cabaret and guided tours for local islanders and those new to the island, or who arrive as part of a cruise. Indeed, both the local population and visitors are well catered for in a very relaxing atmosphere. So don't let anyone tell you that Barbados is just sun, sea, sand and coconuts. It's much more than this. Further information on Ayshford and the development of its gardens can be found at [www.caribbeanostrich.com](http://www.caribbeanostrich.com).

I returned to the UK several pounds heavier after being well fed, looked after and entertained by my charming and most grateful hosts, who I must thank for the opportunity and wish every success for the future.

# Book Reviews

*Lisa Flaum*

**Bulbs 2nd edition** John Bryan, Timber Press 2002  
ISBN 88192 529 2 \$89.95 US.

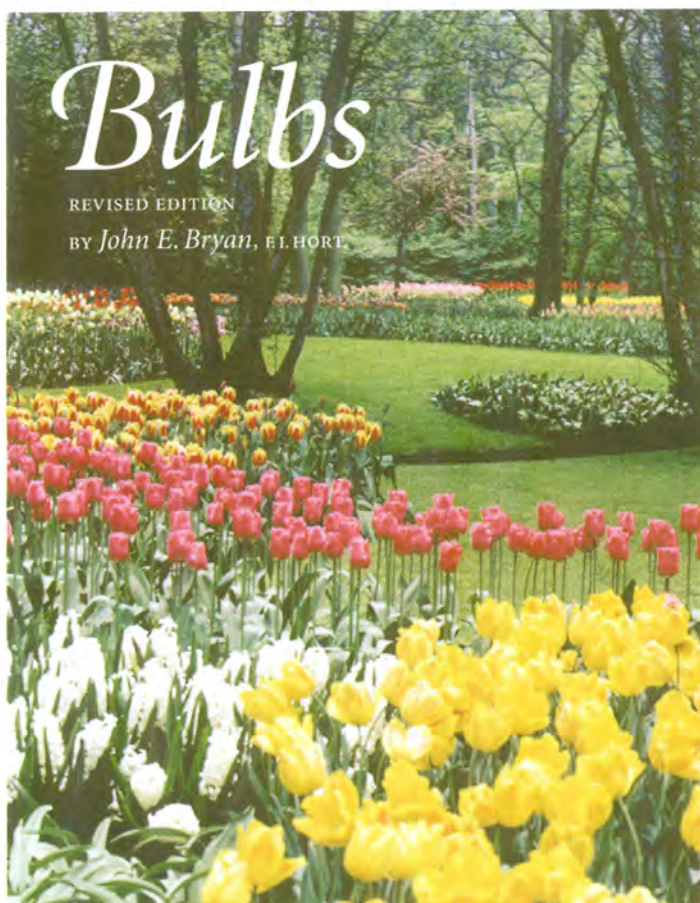
At 534 pages of text and another 350 or so odd color plates, the author's belief that more bulbs are described in this volume than in any other is certainly correct. Nevertheless, it is frustratingly lacking. Mr. Bryan says that many genera have been added. "Certain of them have not been regarded as bulbs even in the broadest sense." Certainly, *Hemerocallis* is not generally regarded as a bulb and I am not sure why it made the cut when *Raubia* did not, or what makes *Sanguinaria canadensis* bulbous, but not *Claytonia virginica*. Descriptions for most species are very brief, and, for large genera such as *Allium* and *Zephyranthes*, provide little to separate the various species, even when they are listed. In the instance of *Allium*, the author took his species list from Mathew's *A Review of Allium* Section *Allium*, so if it wasn't there, it isn't here. Frustrating if you are looking up onions from Janis Ruksan's catalog!

Likewise, controversial plants seem to move about at will. The author gives *Amphosiphon* and *Androsiphon* sections of their own, even though both have been placed in *Daubenya*, for ease in discussing their cultural requirements. The lively renaming of these plants is noted under each heading. Yet *Cooperia*, which is kept separate by Thad Howard in 2001, is listed only a synonym for various *Zephyranthes* species, with a brief remark about its previous existence as a separate genus.

The photographic quality is also uneven. With 1171 color photos, there were sure to be a few average ones, but there are altogether too many that are blurry, or poorly colored. Likewise, there are those that seem unnecessary, such as a pot of

dormant *Brunsvigia josephinae*, and 3 pages of daylily cultivars (though none of the species are discussed). Some photos were flipped after the captions were written, so that upper left is really upper right.

There are, however, many genera and species in this book that a reader is not likely to encounter



elsewhere. *Proiphys*, for instance, from Australia and *Radinosisiphon leptostachya* from southern Africa. How about *Stenanthium*, from Mexico north to Canada, and an island off the coast of Siberia? I would like to have seen photos of these. There is a large section on species *Caladiums* that was great fun to read.

The synonym lists are useful, and I enjoyed

browsing through Appendix A, the Families of Bulbous Plants. *Bulbs Around the World* was a little frustrating, listing the genera, as it did, sometimes under a country and sometimes under a geographic heading. Plants were listed only under their principal location, so that the Republic of Georgia has only 2 genera and Europe has no cyclamen and no alliums. The bibliography is lengthy and the index of common names is grand.

There is some advantage in having so many plants described in one book. Certainly, Mr Bryan's love of bulbs comes through loud and clear. It is very like an encyclopedia though; handy for looking up something if you don't need to know it in any great depth. The gardener already obsessed with bulbs who has the slightest tendency toward buying books, has probably already amassed a library that will provide more practical growing information than this book. The photos of more unusual species are great, but there are not enough of them. At \$89.95 US, this is probably too expensive for most gardeners. Check it out at your local library first.

**Spring Blooming Bulbs.** Brooklyn Botanic Garden Handbook #173 ISBN 1 889538 54 X \$9.95 US.

Part of the Brooklyn Botanic Gardens's 21st Century Gardening series this, like its predecessors, is a collection of essays by different authors, followed by an "encyclopedia" of recommended plants. The articles are quite good. In particular, C. Colston Burrell (Spring-Bulb Design Primer), discusses contrasting shapes and blending colors, as well as the use of shrubs, perennials and annuals. Not only does he present a fair number of planting schemes but his ideas are presented in such a way as to spark many more. Very good for those of us who buy a bulb because we like the color, then end up planting it just where it is most likely to clash with the original inhabitants.

Also good is the article on containers as an extension of the garden. This is not forcing, but designing small "beds", complete with a succession of bloom, that can be used as focal points or to bring flowers to a place (concrete steps, for instance) where they would not otherwise be able to grow.

Unfortunately, the encyclopedia portion doesn't always live up to the promise of the essays. Some of the hardiness recommendations make bulb catalogs seem positively cautious and invasiveness is often ignored and occasionally referred to as "will naturalize". Of the 50 selected genera, there are both delightfully unusual selections (*Tecophilaea*

and *Hermodactylus*) and rather odd ones (*Anemonella*, *Cardamine* and *Dodecatheon*).

The photographs, both closeups and distance views, are excellent. They do a fine job of illustrating the writers' comments and are generally well captioned.

**Growing Bulbs Indoors** P.J.M. Knippels, A. A. Balkema 1999 ISBN 90 5410 467 8  
\$29.00 US.

This book is a gem. Mr Knippels likes to grow the more unusual bulbs, and has had little success in finding cultural information pertinent to European windowsill cultivation. This book is full of his hard won experience growing bulbs native to South Africa and South America, mainly Chile. No tulips, no crocus, just lots of southern hemisphere geophytes of the sort that northern gardeners occasionally acquire and usually kill.

After chapters on cultivation (including winter and summer storage) and pests, the book is an A-Z list of genera with introductory notes on several species, followed by the cultural information in chart form. Mr. Knippels has devised a system which is easily learned and provides immediate gratification, something gardeners just aren't used to. The chart, arranged by months, tells at a glance whether the plant should be dormant, in leaf or in flower; how much water, if any, it should be receiving; how deep it should be planted; whether it flowers with or without leaves, and how difficult it is to grow. Wow!

The bibliography is packed with references; the glossary is short and to the point; and there are lists of genera by cultivation difficulty as well as by ornamental value. The photos, though few, are generally good. This book's only fault is that its not long enough. I can only hope that, as more and more southern hemisphere bulbs become available to northern gardeners, Mr Knippels will keep growing and write a second edition!

*Lisa Flaum lives outside of Waterloo, IL, with her husband, children, dogs, cats, and assorted plant-eating wildlife. Present enthusiasms include Crocus, Allium, Crinum and Zephyranthes, as well as many perennials. A 3 acre garden provides lots of room to experiment.*

# Smoke Treatment, and Germination of Australian Natives

*Dirk Wallace*

Yackandandah, Victoria, Australia

In fire-prone floras, particularly those of Mediterranean climate zones, fire has been shown to be crucial for the germination of seed from a wide variety of taxa. Habitat burning is an important cue, for fire-sensitive species, in triggering germination. For many of these taxa, germination under controlled conditions has been difficult (to near impossible!) using conventional treatments, other than excised embryo culture or special pre-treatments including hormonal applications.

Following the discovery that smoke stimulated germination of the rare South African plant *Audouinia capita*, much research into this phenomenon has been carried out around the world for the conservation of such rare species, and for the many uses in land management and nursery production.

Research by Dixon et al. (1995) has shown that smoke is a key principle in breaking seed dormancy in a wide variety of native Australian species. Though this study has concentrated on Western Australian plants, general principles have emerged regarding the benefits of smoke for germination:

- Smoke can promote earlier and more uniform germination under controlled greenhouse and laboratory conditions.
- Smoke enables germination in species previously thought difficult or impossible to germinate by conventional means.
- Smoke substantially promotes germination in species with otherwise low levels of germination.
- The promotive effect of smoke is independent of seed size and shape and plant life form, i.e. whether annual, perennial, herbaceous, seeder (fire sensitive) or resprouter (fire tolerant).
- Aerosol smoke, smoke dissolved in water and solids (activated clays, sand particles) that have been smoked have all been effective in promoting seed germination.
- High doses of smoked water can inhibit

germination of many species. All the experiments tend towards low doses of smoked water followed by normal watering, as per standard seed raising methods.

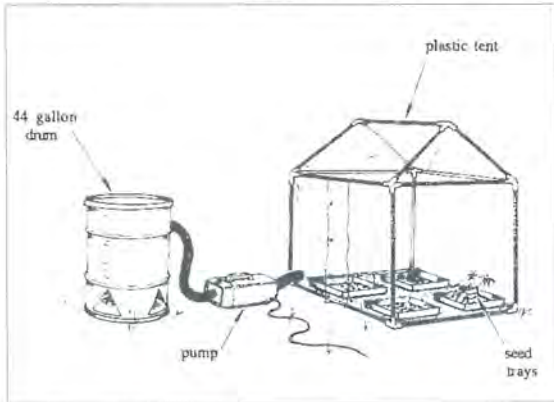
- Germination over time in response to smoke varies amongst taxa.
  - a. Control (unsmoked) and smoked seed attained final germination at the same rate, eg. *Conostylis* species.
  - b. First seedling emergence occurred earlier in smoked seeds.
  - c. Control germination was limited to the first week or so whereas smoked seed continued to germinate over a longer period.
  - d. Difference between control and smoked treatment became apparent only after several weeks.
- Seed that does not respond to smoke treatment includes that of species in *Persoonia* and drupaceous Epacridaceae (those species with large, woody fruits, compared to small-seeded species which do respond positively to smoke). These groups have been extensively investigated to determine possible barriers to smoke entering the seed but all attempts to scarify the seed mechanically or with acid have not been effective in improving germination, *Persoonia* has been found in other studies to respond to gibberellic acid treatments, suggesting that factors involved in seed dormancy in this species may require other dormancy-breaking mechanisms for germination to proceed.

## Methods of Applying Smoke

Sown seed trays or whole seed are placed on an open-mesh, two-tiered frame in a sealed plastic tent approximately 2m x 2m and 1.4m high. Smoke is generated by slow, controlled combustion, in a 200 litre drum, of a mixture of fresh and dry leaf and twig material from a range of plants. Prunings of native species are usually used so as to emulate the natural smokes likely to occur after a wildfire



in bushland habitats. *Melaleuca* has been found to readily produce smoke. The drum is fitted with an inlet through which air is pumped at the rate of 60-100 litres per minute, and an outlet is connected to a 1.5 metre long pipe. A 2 metre length of flexible, stainless steel exhaust piping approximately 50 mm in diameter is then connected to the plastic enclosure. This ensures that the smoke is injected towards the roof of the tent and is therefore spread throughout the tent.



**Treating seeds with smoke.**

After smoking for 60 minutes, trays are transferred to the glasshouse and watered carefully for the first 6-10 days to ensure that the soluble promoter in smoke comes in contact with the seeds, but is not washed through the mix before reacting with the seed. Watering is then continued as for normal germination.

Seeds can also be direct-smoked. In this instance, seed is laid out in a single layer in trays. The trays are smoked for 60 minutes in the fumigation tent (as described above) and the air-dried seed is then sown or stored dry until required. Unlike smoke applied to soil containing sown seeds, smoked seeds can be watered, as would be normal practice.

### Smoked Water

Smoked water can be useful for direct priming or pre-germination of seeds prior to sowing. Application of smoke via water has the advantage of not requiring the use of the smoke tent and the convenience of priming seeds at will. Smoked water primed seeds may germinate better than those in smoked seedling trays. This process allows the handling of large quantities of seed such as is required for land restoration or automated seed-sowing devices.

Smoked water is produced by drawing smoke produced from the combustion drum operating as

for aerosol smoke, through a 20 litre container of water. Smoke bubbling is done for approximately 60 minutes and the resultant solution is frozen until required.

Seed is soaked for 12 hours in a 10%, 9:1 water: smoke-water solution. The seed is then sown, or dried for sowing as required. Seeds treated with smoked water can be watered normally after smoking. Although this method has been shown to be useful for a number of native species, caution is recommended, as seed of some species can degenerate if soaked in water for prolonged periods. Also, pre-germination as a horticultural practise for seed of Australian native plants requires some experimentation to ensure that the process is applicable. In some cases, pre-germination can lead to a decline in seed quality and viability. It is therefore recommended that species to be treated in this way should be tested for tolerance to imbibing and drying treatments. (With seeds that are prone to degeneration during soaking, it is useful to bubble air – as from a fish tank aerator – through the water during soaking).

### Habitat Germination Studies

Smoke-fumigation treatments can be applied directly to habitat sites. For a range of species, germination will happen in 6 to 8 weeks after treatment.

Smoke is generated as above and applied to sites where excess leaf litter and larger plants have been removed to prevent 'shadowing' of the soil from smoke. Tents of 5 m x 1 m x 40 cm high are erected over the sites and smoke is pumped in for 60 minutes. Best results are achieved if smoking is done in summer to early autumn so that wash-down of the smoke factor coincides with the onset of the first rains (for temperate regions of Australia). Smoking undertaken at other times of the year appears to yield less germination for taxa that respond to summer/autumn smoking.

### Further Reading

Dixon K.W, Roche S and Pate J.S (1995). *The promotive effect of smoke derived from burnt native vegetation on seed germination of Western Australian plants*. *Oecologia* 101: 185-192

### Acknowledgments

This article is derived from information by Dr. Kingsley Dixon and Shauna Roche.

Dr Kingsley Dixon is Assistant Director and Shauna Roche is a research botanist at Kings Park and Botanic Garden, West Perth, Western Australia.

## Appendix

### Germinating Australian Native Geophytes with Smoke

**Anigozanthos (Haemodoraceae)** – Some species are easy to grow from seed, and others will germinate erratically. Smoke treatment will improve results of some species, including *A. humilis* & *A. manglesii*.

**Blancoa (Haemodoraceae)** Propagation from seed is usually difficult and unreliable. Smoke treatment may be successful with some species.

**Burchardia (Liliaceae)** – Smoke treatment enhances germination. Western Australian species give very low germination without smoke treatment.

**Conostylis (Haemodoraceae)** – Smoke treatment has been successful with some species (e.g. *C. neocymosa* & *C. setosa*) and may have potential with other species.

**Dianella (Liliaceae)** – Germination results can be erratic for some species, especially *D. revoluta*. Smoke treatment significantly increased results for *D. revoluta* and may enhance results of other species.

**Patersonia (Iridaceae)** – Most species have low viability, especially West Australian species. Smoke treatment significantly improves results for all species.

**Thysanotus (Liliaceae)** – Some species are difficult to grow from seed and have poor results. Smoke treatment improved germination for *T. multiflorus* and may be successful with other species.

**Tricoryne (Liliaceae)** – Very difficult to grow from seed. The seed appear to have high viability, yet poor germination usually results. Smoke treatment may be worth trying!

### References:

Ralph, Murray (1997) – “*Growing Australian Native Plants from Seed*”

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