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Cassia fistula and *Delonix regia*

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Cassia fistula

Every June my phone starts ringing. From all over campus, the questions come. Everyone wants to know the name of the beautiful tree with the chains of bright yellow flowers.

Cassia fistula L. or ‘golden shower tree’ is a show stopper when in bloom. The 30' tall graceful tree produces yellow 3" flowers that hang in clusters 12 to 18" in length. Typically bloom occurs just after leaf drop in May, so that for several weeks the naked tree is covered with long yellow chains, each with a dozen or more flowers.

Also known as ‘Indian laburnum’ or (in Thailand) ‘lantern tree’, *Cassia fistula* is slender, to 40 feet high, with moderate to fast growth. On the UA campus, our specimen grows about 5-8 ft per year. A member of the Fabaceae family, thus related to the spiny, dull legumes of the southwest deserts, *Cassia fistula* is definitely not from around here. This tree has a relaxed tropical look, with pinnately-compound leaves up to a foot in length, each shiny leaflet 4" long.

The dark brown cylindrical

‘bean pods’ can be 2 feet long, and add to the unusual appearance. Pollination is achieved through bees which can cover the tree during bloom. Because the campus lacks a cross-pollinating donor, pods do not form on this specimen.

Frost-tender and evergreen, it is adapted to USDA zones 9.5 and warmer. However, the tree on UA campus is thriving in a protected microclimate with a west-facing exposure. In Tucson (zone 9) the leaves renew each June after the spectacular bloom. As it matures, hardiness may increase. During the winter of 2003-04, this tree sustained nearly complete defoliation on consecutive nights of 19 and 20 degrees F. However, we are hopeful that stem die back will be minimal.

Adapted to most soils, this species appreciates the heat, but not the drying winds of the southwest. Moderate watering in the summer, along with a shady root zone, has allowed the UA ‘golden shower tree’ to prosper.

Recently many of the plants within the large group of cassias were re-classified

as *Senna*. This is a botanists’ fine point, but nonetheless, this species is still called by *Cassia*. Native to India and Malaysia, it has spread throughout the Pacific tropics. Several nurseries/growers in Florida list it as available. Honolulu’s ‘rainbow shower’ tree, familiar to visitors, is a hybrid between this species and *C. javanica*.



Cassia fistula

Known for years as “purging cassia”, *Cassia fistula* is currently advertised/marketed as an effective astringent, purgative/laxative, and is used for colic and flatulence. The active part used in medicine is the fruit or pods, which are pounded to release the sweetish pulp.

In the last 10 years, there has been an increased interest in biological and medicinal potential of many members of Fabaceae. Researchers have evaluated *Cassia fistula* for anti-bacterial properties (wound healing), as a cough suppressant, and for its potential to restrict or protect against nematodes. A recent literature search resulted in articles testing *C. fistula* as a potential marker for evaluating air pollution levels, as a possible agent to remove heavy metals from waste sites, and as a source of potassium in adult diets.

This striking tree is just one of dozens of trees introduced to the University of Arizona campus by Warren Jones. Warren remembers bringing seeds from central Mexico during the 1980’s. Germination and culture occurred at the UA greenhouses at the Campbell Avenue Farm. Seeds are similar to those of many other hard-coated legumes; germination is enhanced if seed coats are softened or scarified.

The *Cassia fistula* is a campus favorite at the University of Arizona. Its protected site beside the Nugent building includes both a warming wall and a shady root zone. This combination seems to be perfect: it is thriving on the UA grounds, and its beauty has earned it the reputation as the tree that stimulates the most phone calls in late May and early June.



Cassia fistula

Delonix regia

Any one who’s traveled in the tropics knows this tree. Royal flame tree, royal poinciana, flamboyant - it goes by many names. *Delonix regia* (Boj. ex Hook.) Raf. is typically seen in frost-free climates (USDA Zone 10b). How could one be living in Tucson (USDA Zone 9, 2500 ft elevation)?

A member of the Fabaceae, royal poinciana could be compared to a red Mexican bird of paradise on steroids! Beginning in May, it is covered with bright red flowers, some of them 3-4" across. The flowers have the typical Caesalpinioideae structure, with one larger petal (the banner) and 10 stamens. The upper petal has streaks of yellow and white, and the stamens are prominent and curve slightly downward. Flowers last for several weeks, and the blooming period in Tucson continues through August. When covered with its red flowers, the tree looks like a scarlet umbrella.

Although *Delonix regia* is native to Madagascar, its seeds have traveled the world, and the species is now quite common throughout the tropical climates. It is found lining streets in some of the world’s most beautiful places, and most vacationers are familiar with its beauty. Many people think it is native to the Caribbean, since a few of its names (flamboyant, peacock flower) originated there. Other people swear they’ve seen it in the wild in Mexico, or on mountain sides in Hawaii. Both of these observations are probably correct.

In the Pacific, one study group (Pacific Island Ecosystems at Risk – PIER) is monitoring *Delonix regia* occurrence through different islands. They’ve determined that occasionally it is somewhat invasive, capable of forming monotypic stands that exclude other species. The invasiveness would naturally depend on climate and other factors such as ornamental use. Other authors who’ve noted its mild tendency to spread say “who cares – it’s so beautiful!”

Normally royal poinciana is a broad spreading tree, 30 to 40 feet high and much wider than it is tall. However, the UA's specimen is taller than it is wide. Hidden from view most of the time, it delights students and staff when the canopy shows its scarlet flowers above some greenhouses.

Professor Emeritus Warren Jones had started seeds of several tropical species in the mid 1970's, and he asked permission to install the trees into a protected campus site. He was given a south-facing space near to the College of Agriculture greenhouses, where greenhouse irrigation filtered through the gravel, and steam from the heaters provided warmth all winter. No one thought the trees would live very long. But this site has protected the famous UA *Delonix regia* from frost through its 30 winters.

Two smaller individuals are suffering in more exposed sites, and one new seedling may not have survived 2003's 19 and 20 degree lows. It is clear that "up against a south facing wall" is the place for tropical trees.

This tree even has elegant leaves. They are lacy and fernlike, twice-pinnate, and 12-20" long. Bright lime green, they are striking even when the tree is not in flower. In regions that have a pronounced dry winter season, the species is deciduous during the dry months. In southern Florida, it is partly so. The UA's royal poinciana typically sheds most of its leaves.

With no partner to provide pollen, the UA tree does not bear fruit. Two or more trees are necessary for cross pollination (and the other trees on campus have not flowered yet). Pollinators vary depending on where the trees grow: bees, small birds, and other generalist critters. Fertilized flowers are followed by long dark brown "bean pods" – sometimes up to 2 feet long and 2" wide – hockey sticks hanging in the trees! When dry, the seeds

loosen and the pods rattle.

The previously-mentioned greenhouse walkway has been named "Magic Alley" since so many tropical trees, that would otherwise be damaged by frost, are thriving here. The Campus Arboretum has participated in the planning process for the Chemistry Building Expansion, with the result that all the trees in "Magic Alley" will be protected during the construction process.

Although royal poinciana can be propagated vegetatively with tip cuttings, seed propagation is more efficient (and has a better chance of success). The seeds are speckled, rather like a fava bean. Typical of most hard-seeded legumes, germination of royal poinciana seems to improve with scarification.

At this time students are working to germinate and grow out seedlings of several of the rarer trees on the University of Arizona campus. The Desert Legume Program has provided seeds and greenhouse space. The effort will increase the number of individuals that are noteworthy, as well as replace trees that are not living up to their potential or that are in jeopardy in some way.

The University of Arizona's

Delonix regia is just one of hundreds of species that thrive on the grounds. We hope it continues to delight us with its scarlet flowers for years to come.

A little history

During the 1960's, 70's and 80's, the University of Arizona in Tucson became the "proving ground" for dozens of arid tolerant species. In an effort to evaluate them for use in urban landscapes, Warren Jones, Professor Emeritus of Landscape Architecture installed trees and shrubs from around the world onto the UA Campus. The results of his lifelong dedication are the basis of the book "Landscape Plants for Dry Regions" which he co-authored with Charles Sacamano (Fisher Books, 2000.) Just as importantly, the UA Campus is now the home of over 400 species of trees, and at least that many shrubs, from arid climates on all continents. The University of Arizona Campus Arboretum has been established for the purposes of preservation, education, and enhancing this extensive collection. Please visit our web site at <http://arboretum.arizona.edu>



Delonix regia

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Delonix regia

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Staff and Volunteers in Action

Thank You, Desert Legume Program Advisory Board!

The Desert Legume Program Advisory Board membership personifies a spirit of professional work experience and strong advocacy for our work. Issues relevant to DELEP's progress were discussed at the February 6, 2004 Advisory Board Meeting. Since the program's earliest days volunteers have been prime movers in establishing our seedbank, plant propagation, and care for our living collection of plants. They have provided greenhouse experience, field tools and labor, plus volumes of literature for our library. Since its first meeting on January 27, 1995 our advisory board has allowed a different manner of volunteering to positively effect the Desert Legume Program. We thank current and past board members for their spirited interest and commitment in working with us, toward the achievement of program goals.

As individuals, the Desert Legume Program volunteers come from a spectrum of dynamic professional lives. Their works range from farmers to nurses, engineers, lawyers, authors, teachers, and government professionals. Collectively they are a synergistic think-tank, which offer suggestions for use in our daily operations. The local group has always been one of the most important advocates of our work. Volunteers have come to us from local and domestic groups, and

several have international work experience. They have been financial supporters of DELEP, since it's inception in 1988. Your support for our work and endowments, as evidenced by your response to our twice-yearly appeal letters, is greatly appreciated and is a significant part of our operating budget, today. We thank you, too, for being a part of DELEP.

Matt Johnson spent the first few days of March at our Yuma fields. He reports that the continued removal of the lowest tree limbs in those fields has allowed the farm staff there to begin using mechanical weed control. We thank them for their work. The relatively cool, wet, and windless days during his visit allowed Matt to use our weed-burning tool to eliminate small remaining weedy areas. Those conditions permit a near-perfect environment for DELEP's weed control efforts, including the use of contact herbicides. The propane burner allows safe effective removal of weeds under tree canopies that cannot be easily removed with machinery. Weeds within a short radius of plants are manually removed. Those fields have now been thriving for thirteen years, and weeds have become less problematic as the large plants shade the unplanted field areas. Woody "volunteers" and woody-stemmed weeds, after being cut to ground level,

are also nicely controlled using the burner. Matt collected seed pods from a few of the species during the trip. Several dozen specimens there have been productive over the past 6 to 8 years.

Our condolences to Yuma volunteer Gail Culver on the passing of her husband, John Payne, this past January. Gail and John have been hardworking volunteers for DELEP since December of 2000.

The winter in Tucson was cool with some needed rain, and by mid-March the days were mostly reaching into the 80s. During the middle of the month, Adam and I transported all of the plants from the greenhouse to the shade houses. Before too long, many of the plants that we grew for Boyce Thompson Arboretum and the Wallace Desert Gardens will be transported to those respective locations. A few more specimens for our West Campus field will be planted there, this year. Our largest nursery specimens are the trees for the University of Arizona Campus Arboretum plantings. We have cared for several *Acacia xanthophloea* ("Fever trees"), *Pithecellobium dulce* ("Manila tamarind"), *Acacia sieberiana*, *Dombeya rotundifolia*, *Acacia crassifolia*, and *Erythrina* spp. for the Campus Arboretum during the past year.

During the past few months, volunteers Karl May and Wayne

MacGowan have given us a nice weekend break. They have both cheerfully cared for our greenhouse plants, over the weekends. Now our nursery collection has moved outdoors, and both Karl and Wayne have indicated their willingness to help us by working on Saturdays through the summer months. Thanks, guys!

Volunteer sessions take a summer break, from June to August each year. I expect to call on volunteers at least once this summer for a regular seed-cleaning session. New seedpod collections continue

through the summer, creating a situation where it becomes hard to keep up with the amount of seed processing required when the sessions resume in autumn. Another idea I have is to organize a volunteer week during the summer, when you can stop in on any day that is convenient, to help with a wider variety of projects. Feedback from our local volunteers will be appreciated. The two remaining spring volunteer sessions will be on April 14th and May 12th.



Faidherbia albida in Yuma field (MBJ)

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Note publication schedule change:
We regret to inform our readers that due to funding constraints, *Aridus* will be published three times a year rather than four.



Adam Ryan moving the nursery collection. (KC)

Tree
Logo
Here

Opportunities for Participation

DELEP's bulletin *Aridus*, is published three times annually to stimulate interest in desert legumes, to inform our readers of DELEP's activities, and to encourage support for DELEP's programs. Manuscripts related to legumes are welcome and should be mailed to the editor for review. Subscriptions are complimentary and are available by contacting the DELEP office. *Aridus* is published quarterly by The University of Arizona on behalf of The Desert Legume Program.

Financial support for DELEP comes from contracts, grants and contributions from private industries, government agencies and individuals.

To Contribute: Send a check, payable to U of A Foundation/ DELEP, or call the DELEP Office concerning a pledge, a restricted gift, or estate planning.

Desert Legume Program
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Dedicated volunteer labor is an integral component of DELEP. Our volunteers come from many backgrounds and work on a variety of projects including wild seed collecting, seed processing, organization of special events, and office work.

To Volunteer:
Telephone our offices
(520) 318-7047) or email
kcoppola@ag.arizona.edu.



Haematoxylum brasiletto trunk, Yuma, Arizona (MBJ)

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