

Cane Grass Control

In natural areas where non-target damage is a concern, cane grasses can be controlled by cutting the culms down to the ground, removing the stems from the site, waiting for the culms to resprout to a height of about 12-20 inches, and spraying the sprouts with 10% ROUNDUP Pro. In areas where prescribed fire can be employed, the sprouts can be similarly treated several weeks after burning. Treating Burma reed after wildfires or prescribed burns is the most cost effective control measure. If non-target damage is of no concern (such as along roadsides) the plants can be sprayed with 2% ROUNDUP Pro without prior cutting. Follow-up treatments may be necessary. If the grasses are growing in wetlands, an aquatic herbicide such as RODEO should be used.

For resource managers who would like to keep abreast of current management options and techniques for the control of exotic grasses, the Florida Exotic Pest Plant Council (EPPC) has formed an Exotic Grasses Task Force. For information concerning meeting dates and times, contact Joe Maguire, Miami-Dade Park & Recreation Department, Natural Areas Management, at (305) 257-0933.

Where non-target damage is not a concern, cane grasses can be controlled by cutting the culms and treating the re-sprouts with a herbicide. Photo by S. Demetropoulos.



Arundo the World in (*at least*) Eighty Ways

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*His tears run down his beard, like winter's drops
From eaves of reeds*

(The Tempest, v. 1)

In the case of giant reed (*Arundo donax*), it is very telling that Shakespeare found dripping reeds evocative of sorrow. This plant has been very useful for many, but brings tears of frustration to many natural areas managers around the world.

Arundo donax is a giant among plants in many ways. Its shoots grow to monstrous heights, reaching 20 feet. Its flower spikes come only in double XL, although seed are often infertile. The perennial rootstocks thicken to resemble Hulk Hogan's thighs (author, pers. obs.). Also, single giant reed colonies can spread from these roots to completely overwhelm areas several acres in size. When arundo densely fills areas, wildlife uses are curtailed as native plant communities are displaced. Also, tremendously dense shoots prevent entry by all but the smallest critters.

Giant Reed Takes Giant Steps

Arundo has apparently been gigantically popular with the human species since nearly the dawn of time. About as soon as people started migrating around the globe, they

starting moving it from its native Mediterranean shores. Its popularity continues into our own times. On a planetary scale, millions still use it for roofing material, medicinal, and agricultural applications. Most have introduced arundo by rhizome propagation, although plants have reportedly been grown from Asian seed (Hoshovsky, 1995).

During southern California's colonial period arundo was planted widely for erosion control, windbreaks, and ornamental purposes. The plant did so well that by the 1820s *Los Angeles* were using it for a roof-thatching material - a purpose it has filled in the Old World for thousands of years.

This reed has culture, too. Since ancient times music has come from arundo's piping canes. Early musicians used arundo to fashion simple pipes. Today, it provides the finest material for reeds for woodwind instruments. No modern material has been found to be superior for this use (Hoshovsky, 1995).

Arundo extracts have found their way into the human pharmacopeia as well. It has reportedly been used to counter cancer, treat hyper- and hypotension, as an agent for diuretic, sudorific, and antilactogogic actions (whatever those are), and to treat syphilis (Hoshovsky, 1995).

But, there are many that curse giant reed's very exist-



Giant reed (*Arundo donax*) has escaped in California, Florida and Hawaii. The showy flowering plume is pyramidal. Seeds are often infertile. Photo by Mike Bodle.

ence. Numbering among these are almost every wetland property manager in southern California, many southwestern states, and Hawaii (Doucé, 1993). They report giant reed to be a giant pain in their morasses since it spreads very well in wetlands and waterways, even without producing fertile seed. Its growth can yield more than eight tons per acre (dry weight) of only above-ground plant portions (Hoshovsky, 1995)!

Fee, Fi, Fo, Fum; Giant Reed Grows Well for Everyone

In North America, arundo is reported from the mid-Atlantic states, westward through the Midwest and Southwest, California and Hawaii. Maui is the epicenter of Hawaiian reports. Viable seed production has not been proven in Florida, but colonies persist from abandoned sites, continually enlarging by outward rhizome encroachment (Wunderlin, 1982).

Florida EPPC has not included arundo in its 1997 invasive species list, yet Californians rank it an invasive weed of the highest order. Long-term costs were projected at \$4.5 million to rid the Santa Ana River watershed of arundo (Douthit, 1993). Welcome, but unexpected, assistance in this effort has arisen because a Tacoma, WA business has committed to pay \$30 per ton to harvest arundo for various end-products including furniture, food sweeteners, and car wax.



Arundo -The leaves of giant reed occur alternately along the stem in a flat plane. Photo by Mike Bodle.

(CalEPPC News, Fall 1997).

Arundo does best in wet sites and along freshwater riparian corridors where soils are permanently saturated. Its spread can be strongly inhibited in dry sites. In many western states, and particularly California, arundo poses the primary threat to stability of many riverine sites. Colonies of giant reed send shoots outward creating very dense impenetrable thickets along entire river shorelines and floodplains. Offsets float downstream, infesting entire river courses with plant propagules until riparian habitat is overwhelmed throughout entire river systems (Bell, 1993). Tall, vertical shoreline stands of arundo provide less shade along watercourses than former communities of overhanging willow / cottonwood riparian scrub. Water temperatures and aquatic plant productivity both increase (usually increasing algae growth), inducing changes in fundamental dissolved oxygen and water chemistry (Iverson, 1993).

The typically very dense stands of arundo also cause expensive headaches for waterway managers. In many arundo-infested waterways, safety and water management are seriously impaired by thousands of tons of channel debris consisting mostly of arundo canes, rhizomes, and leaf litter. Strong flows during flood events rip arundo from riverbanks creating downstream jams of arundo at bridges and water control structures. The combined pressures of this



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debris and high flows can seriously threaten the integrity of structures in riparian corridors (Doucé, 1993).

Ecologically, total displacement of riverside habitat would be bad enough, yet the results may broaden further and shift the driving influences of arundo-dominated ecosystems. Succession in pristine riparian sites areas in southern California is primarily influenced by water level effects. After arundo overwhelms these sites, fire replaces water levels as the primary successional influence. Drier, denser stands of arundo provide much more fuel than native Californian riverside plant communities. When fire occurs, native plants are destroyed by fires of greatly increased intensity (Bell, 1993; Scott, 1993).

Back in Florida, arundo is flourishing in at least 19 of Florida's 67 counties, from the Panhandle to Miami (Wunderlin et al., 1995). In Bay and Gulf Counties, it has been seen in a few upper reaches of coastal bayous, spreading densely - probably from nearby plantings - along disturbed canal edges, and apparently able to tolerate somewhat brackish water (author, pers. comm. with K.C. Burks, Fla DEP).

Dumbo's Delight

Very recently, arundo has been propagated on a rather grand scale in order to flesh out the plantings at Disney's new Animal Kingdom theme park in Orlando. Elephants in particular, along with other newly-resident ruminants, reportedly exhibit profound preferences for arundo in their diet. Disney planners aim to keep giant reed from escaping from their new animal husbandry pleasuredome. They have recorded geo-positions of all arundo plantings, placed them away from natural watercourses, and plan to keep watchful eyes on the plant's progress (author, pers. comm. with W. Andrew, Disney Corp.).

Never Say Never

It's always difficult to predict exactly what threats, if any, non-native plant introductions pose, both in the immediate and distant future. A majority of introduced plants have not posed any problems even after generations of use. But, exceptions can really kill ya. Several exotic fig trees (*Ficus* spp.) didn't produce seed in Florida until their complementary exotic wasps subsequently made their ways here too. Now, the wasps faithfully fertilize the figs so well that seedlings are reported as far afield as birds and wildlife care to defecate.

Hydrilla has shown a truly disgusting ability to overtake Florida's lake habitats. And yet, all the hydrilla in Florida consists purely of female clonal populations. This aquatic giant has pounded Florida waters without setting a single seed. Indeed, this all-girl hydrilla team has been able to win over more than 100,000 acres of public waters.

Kudzu, another seemingly asexual immigrant, has recently shown an unexpected ability to produce seed in North America (see "Bad News on the Kudzu Front" box). This has occurred long after kudzu became recognized as a serious pest plant and also long after southern towns stopped electing Kudzu Queens to extol the plant's supposed benefits.

Will kudzu problems be worse now that seed may be dispersed? Probably not, since Uncle Sam did all he could to

Bad News on the Kudzu Front

Kudzu (*Pueraria lobata*) colonies in southern Illinois were found to be producing large quantities of viable seed last summer reports Bill McClain of IL Division of Natural Heritage. The vines are deciduous but survive the winters even this far north. The fruits do not split open as readily as those of some other legumes but when Dr. John Ebinger collected seeds, rinsed them in Clorox solution, scarified them, and put them in a petri dish on a damp paper towel, 100% germinated. There are also a few unverified reports that kudzu was found producing seed at a few sites in the southeast last summer. It had been thought that kudzu rarely if ever produced seeds in North America, presumably because it required a specific insect pollinator that had not become established here. Failure to produce seed was presumed to be preventing kudzu from becoming even more widespread and invasive. Apparently something has changed. Bill and John Ebinger expect to have a manuscript on kudzu in Illinois ready for submission to a journal early in 1998. (Source: John Randall, Stewardship News, The Nature Conservancy, Arlington, VA)

plant it as far and wide as possible early this century. Will other plants that aren't already established from Connecticut to Texas (like kudzu) truly naturalize at some future date? Many may not, but some non-natives have been seen to change their stripes. Only time will tell if arundo will ever induce tearful winters drops from future Floridians.

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