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## Combating *Arundo Donax* and Other Nuisance Grasses

Antonia Wijte

California State University, Long Beach

### Background

**A** *run*do *donax* is a cane-like, towering weed that has gained notoriety for its hearty resistance to chemical spraying and remarkable ability to become the dominant plant in low-lying areas such as the Santa Ana, Santa Margarita, Santa Clara, and Tijuana river banks.

By displacing native plants, *Arundo* and other invasive grasses, such as *Spartina alterniflora*, not only dramatically alter wild landscapes but also displace animal life. The federally protected least Bell's vireo, for instance, cannot nest in *Arundo*.

### The Project

Dr. Antonia Wijte of California State University at Long Beach has conducted studies that show *Arundo* is sensitive to the timing of when

herbicides such as Rodeo are applied. To understand why, it helps to know a little bit about how the plant stores energy and where. Normally, the plant's vascular system stores food throughout the plant—in its leaves, stems and roots—until the plant runs out of nitrogen, a nutrient needed to make nucleic acids, proteins, and enzymes. When this happens, the plant no longer has the nitrogen it needs for cell division and so begins to transport food to root-like structures called rhizomes. Since *Arundo* will not die unless its rhizomes are killed, the ideal time to apply herbicide occurs when the plant's nitrogen levels are depleted and food is being transported into the rhizomes.

### Application

A goal of this project was to examine whether it is possible to measure nitrogen and carbon levels in *Arundo* leaves and then to use these measurements to optimize the timing of herbicide application. Dr. Wijte is conducting similar experiments with two other invasive rhizomatous grasses, *Spartina alterniflora* and *Phragmites australis*.



Dr. Antonia Wijte cuts stands of *Arundo*.  
Photo: California State Long Beach.

At present, she has funding for an outreach program in which resource managers are encouraged to send leaf samples to her lab for nitrogen and carbon analysis. Based on this analysis, she will recommend whether and when to apply herbicide. Instructions on how to take leaf samples can be found at her website.\* Field comparisons have shown that leaf-nutrient analyses significantly improve eradication efforts.

### Cooperating Organizations

Camp Pendleton Marine Corps Base  
Center for Natural Lands  
Management  
Mission Resource Conservation  
District  
San Diego County  
San Gabriel Mountains Regional  
Conservancy

### Presentations

Peck, G.W., and A.H.B.M. Wijte.  
"Temporal variation in the nitrogen



Graduate student Christiana Chen of Cal State Long Beach sprays herbicide on *Arundo* in the Santa Margarita River in Camp Pendleton. Sea Grant research has shown that the optimal time to apply herbicide occurs when *Arundo*'s vascular system is transporting food into its root-like structures. Photo: Antonia Wijte.

carbon ratio in *Arundo donax* L.:  
Herbicide effectiveness." 15th  
Biennial International Conference of  
the Estuarine Research Federation,  
New Orleans, Louisiana, 1999.  
Poster presentation.

Motamed, E.R., and A.H.B.M. Wijte.  
"Optimizing the timing of mechanical  
eradication of *Arundo donax* L.," 15th  
Biennial International Conference of  
the Estuarine Research Federation,  
New Orleans, Louisiana, 1999.  
Poster presentation.

#### Trainees

Peck, George W., M.S. in Biology,  
California State University, Long  
Beach, 1999.

Chen, Christiana, M.S. in Biology,  
California State University, Long  
Beach, anticipated 2002.

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#### For more information:

Dr. Antonia Wijte  
Department of Biological Sciences  
California State University, Long Beach  
Tel.: (562) 985-4917  
Email: [wijte@csulb.edu](mailto:wijte@csulb.edu)  
\*Website: [www.csulb.edu/~wijte/wpbl/arundo.html](http://www.csulb.edu/~wijte/wpbl/arundo.html)

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University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0232  
Phone: (858) 534-4440 Fax: (858) 453-2948 Web site: <http://www-csgc.ucsd.edu>