

February 11, 2012

Air and Radiation Docket  
Docket No. EPA-HQ-OAR-2011-0542  
Environmental Protection Agency  
Mailcode: 6406J  
1200 Pennsylvania Ave. NW.  
Washington, DC 20460

To whom it may concern,

I have had a chance to review the negative comments relating to the use of *Arundo donax* in "Regulation of Fuels and Fuel Additives: Identification of Additional Qualifying Renewable Fuel Pathways Under the Renewable Fuel Standard Program". These documents reflect a concern that *Arundo donax* has known invasive properties, having been documented in riparian ecosystems, coastal waters and floodplains. As a component of our current research efforts focus on the vegetative reproduction of *Arundo donax*, the potential for invasiveness of this crop is something we have thought about.

*Arundo* was originally introduced in the U.S. during the 1800's for erosion control along drainage canals. Unfortunately, this use for soil stabilization in aquatic regions reflected early human mismanagement and lack of knowledge regarding the plant, and has contributed to the current invasiveness issues. Problems have arisen due to the ability of *Arundo* to propagate vegetatively from rhizomes and stems, and the plantings in riparian habitats, where high environmental disturbances/soil erosion conditions caused by flooding, flowing rivers, etc., have catalyzed the fragmentation and transport of the plants from one location to another. However, while numerous studies of *Arundo donax* have focused on riparian habitats, this riparian focus also suggests that for terrestrial habitats, invasiveness is much less an issue. This was also indicated from results obtained during a recent weed risk assessment<sup>1</sup>.

The objections did not comment on the fact that *Arundo donax* shows a widely-reported lack of seed and seedling production<sup>2,3</sup>, which may be due to disruptions in both ovule and pollen developmental pathways<sup>3</sup>. Hence, inability to produce seeds represents a significant inhibitory mechanism to plant dispersion, and is not a contributing factor to the spread of the plant in the natural habitat. This is a positive trait for this plant, unlike other described weedy invasives. In a study of *Arundo donax* spreading inside and outside of flood zones, Boland<sup>4</sup> indicated that movement via fragmentation, rhizomes and layering occurred in the flood zone. However, it was also noted that in drier sites outside of the flood zone, *Arundo* spreading was less dynamic, with slow expansion and similar stand appearances from year to year. These results further suggest that the invasive characteristic is dependent on site, and if careful site selections are made to avoid riparian zones, and sites are managed, invasiveness can be avoided.

Due to concerns regarding riparian habitat colonization, efforts at control and eradication have been made. *Arundo* control can be mediated via stem cuttings and whole plant excavation<sup>5</sup> and herbicide treatments, such as 3%-5% glyphosate foliar sprays, are efficient and consistent methods for the killing of *Arundo*<sup>6</sup>. Reports on the use of insect biocontrol agents have also generated promising results<sup>7</sup>.

In assessing the objection documents, and additional scientific literature, I believe that the concerns expressed about invasiveness, while relevant for riparian zones, are over stated for other sites. It is apparent that the indiscriminate plantings carried out in the past have negatively impacted on the beneficial uses and potential of this crop for the development of U.S. energy self-sustainability. We would expect that *Arundo* growers, like other farmers, would need to assess their site for suitability to grow the crop. Riparian habitats would be designated as inappropriate and high risk for the crop. Furthermore, best practices for management, as required by the growing States, which would eliminate risk of spread if followed. Furthermore, and worst case, the evidence is present that the plants can be killed by herbicide, or a combination of cutting with herbicide. The recent report by Virtue<sup>1</sup>, while stressing the weed risk of *Arundo donax* in riparian habitats, also indicated that in non-flooding areas, *Arundo* has minimal lateral spread and humans represent the highest dispersal agent threat. He also provided several guidelines to be used for risk management<sup>1</sup>, which should allow manageable containment of *Arundo*, and the development of a viable *Arundo donax* industry. Some of his key guidelines include:

**Location of plantings outside of riparian habitats;**  
**The establishment of containment and buffer zones;**  
**A survey for and control of any escapes; and**  
**Adequate harvest, transport and processing checks.**

Adherence to proposed guidelines would facilitate the growth of *Arundo* as a low-risk weed bioenergy crop in terrestrial habitats.

Sincerely,

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<sup>1</sup>Virtue JG, Reynolds T, Malone J, Preston C, Williams C. 2010. Managing the weed risk of cultivated *Arundo donax* L. Proceedings of the Seventeenth Australasian Weeds Conference, pp. 176-179.

<sup>2</sup>Bell G. 1994. Biology and growth habits of giant reed (*Arundo donax*). In NE Jackson, P Frandsen and S Douthit, eds. *Arundo donax* Workshop. Riverside CA. pp. 1-6.

<sup>3</sup>Mariani C, Cabrini R, Danin A, Piffanelli P, Fricano A, Gomarasca S, Dicandilo M, Grassi F, Soave C. 2010. Origin, diffusion and reproduction of the giant reed (*Arundo donax* L.): a promising weedy energy crop. *Ann Appl Biol* 157:191-202.

<sup>4</sup>Boland JM. 2006. The importance of layering in the rapid spread of *Arundo donax* (Giant reed). *Madroño* 53(4):303-312.

<sup>5</sup>Lowrey J, Watson J. 2004. Tamarisk and *Arundo* control on Cache Creek. In Proceedings of the California Weed Science Society. San Jose, CA: California Weed Science Society, pp. 82-83.

<sup>6</sup>Spencer DF, Tan W, Lio P-S, Ksander GG, Whitehand LC, Weaver S, Olson J, Newhouser M. 2008. Evaluation of glyphosate for managing giant reed (*Arundo donax*). *Invasive Plant Science and Management* 1: 248-254.

<sup>7</sup>Wood M, Flores A, McGinniss L, Peabody E. 2007. Lassoing wicked weeds of the west. *Agric Res* 55: 16-19.