

Progress on the biological control of two invasive aquatic plants, cabomba (*Cabomba caroliniana*) and alligator weed (*Alternanthera philoxeroides*)

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Summary Invasive aquatic plants have diverse social, economic, and environmental impacts and associated high costs of control (Schooler *et al.* 2005). *Cabomba caroliniana* Gray (cabomba) is an introduced submerged aquatic plant that invades lakes, ponds and rivers from tropical to temperate climates throughout the world (Schooler and Julien 2006). *Alternanthera philoxeroides* (Mart.) Griseb. (alligator weed) is an introduced amphibious plant that grows in moist terrestrial habitats and across the water's surface in aquatic environments. Both plants are native to the floodplains of South America and both are serious pests (Weeds of National Significance) in Australia. In addition, both plants are difficult to control because current chemical and physical control methods are not effective, or in some cases may exacerbate the problem by removing competitor species or spreading propagules. It is likely that the only sustainable long-term solution will be biological control (Schooler *et al.* 2005).

Importation of biological control agents already in use against alligator weed in USA began in the early 1970s, which resulted in effective control of alligator weed in aquatic habitats by the beetle *Agasicles hygrophila* Selman and Vogt (Sainty *et al.* 1998). However, the plant was not controlled in terrestrial environments or cool temperate habitats and surveys for effective agents in these habitats began in 2003. We now have a prioritised list of the 10 potential agents and have begun testing the host specificity of these organisms in quarantine. The first two agents, the thrips (*Amylothrips andersonii* O'Neill) and the flea-beetle (*Disonycha argentinensis* Jacoby), were found to be able to use native *Alternanthera* species as host plants and are therefore not safe to release in Australia. We are currently testing the third agent, a gall-fly (*Clinodiplosis alternantherae* Gagne), and preliminary tests indicate that it can complete its life-cycle only on alligator weed. More study is needed on other potential host plants before submitting an application to release this insect for the control of alligator weed in Australia.

Surveys for natural enemies of cabomba began in 2003. Thus far we have identified two potential biological control agents from northern Argentina. These are a stem boring weevil (*Hydrotimeles natans*

Kolbe) and a pyralid moth (*Parapoynx* spp.). We are currently testing the weevil for host specificity in quarantine and are seeking confirmation on the identity of the moth. We expect that the effects of these two potential agents will be complementary if host specificity testing indicates they are safe for release in Australia (Schooler *et al.* 2006).

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