

NOTES

Expanded Range of the Alligatorweed Flea Beetle (*Agasicles hygrophila* Selman and Vogt) in South Carolina

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INTRODUCTION

The alligatorweed flea beetle, *Agasicles hygrophila* Selman and Vogt, is an important biological control agent of alligatorweed, *Alternanthera philoxeroides* (Mart.) Griseb., in Florida (Bennet, 1977; Buckingham, et al., 1983). Beetles were introduced into the U.S. in 1964 from their native Argentina (Coulson, 1977) but became established no further north than Florida (Maddox, et al., 1971). Alligatorweed flea beetles were later recollected in southern Argentina from a colder part of their natural range than the original collections and released at ten sites in Alabama, North Carolina and South Carolina during 1979 (Buckingham and Boucias, 1982; Buckingham et al., 1983). A survey of the original ten release sites in 1980 found beetles in only one site, a series of small ponds in the Snee Farms housing development in Charleston Co., SC (Buckingham et al., 1983) (Fig. 1).

In July 1980 the Snee Farms population was subdivided and beetles were released at ten sites in an extensive effort to establish *A. hygrophila* in South Carolina (William Melven, pers. comm.). Because only one of the original releases (1979) and none of the secondary releases (1980) were previously known to have resulted in permanent establishment of *A. hygrophila*, there is now a general perception that the alligatorweed flea beetle is poorly adapted to climatic conditions in South Carolina.

We visited three sites in South Carolina in 1983 and 1984 and here document the successful establishment of *Agasicles hygrophila* in at least two sites north of Charleston, SC. We also report on the transfer of South Carolina beetles to sites in North Carolina.

METHODS

Three sites were surveyed qualitatively for presence or absence of *A. hygrophila* by carefully examining individual stems of alligatorweed. The alligatorweed mat at Snee Farms was checked on 18 November 1983, 8 September, 1984 and 10 November, 1984.

A small pond of less than one hectare with a fringing alligatorweed mat of several meters near the Wedgefield Golf Course in Georgetown, Georgetown Co., SC (Fig. 1)

was checked on 10 November, 1984. Another small pond bordering Route 17 in Litchfield Beach, Georgetown Co. approximately 20 km north of Georgetown was also surveyed on the same date (Fig. 1).

DISCUSSION

Adults, larvae and eggs were abundant at all three sites on each of the dates examined. At both the Snee Farms and Georgetown sites the alligatorweed mats were nearly completely devastated, with only a few defoliated stems remaining. The impact of the flea beetle on alligatorweed was obscured by treatments with herbicides at both sites. Banvel and Diquat were applied at Snee Farms in the spring of 1984. Rodeo was used at the Georgetown site in May 1984.

The Georgetown site is a new northern extension of the reported overwintering range of *A. hygrophila* in the United States. The origin of this population is not clear. The beetles introduced to this site from Snee Farms in 1979 were presumed to have died out as no beetles were recovered in 1981. The pond was restocked in May 1982

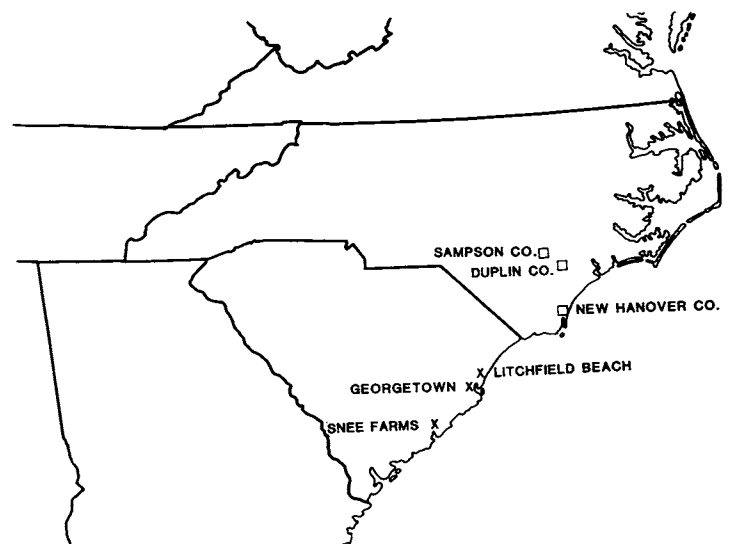


Figure 1. Recovery sites (X) and release sites (□) of *Agasicles hygrophila* in the Carolinas in 1984.

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with beetles from Florida (Jack Whetstone, pers. comm.). The beetles now present in Georgetown may, however, be the result of movement of cold-tolerant beetles from the Snee Farms stock. This explanation seems especially likely since *A. hygrophila* were detected on the Black River 20 km west of Litchfield Beach in 1982 (Jack Whetstone, pers. comm.). The sites of the original 1979 and subsequent 1980 releases should be checked for beetle establishment that was not detected earlier.

The genetic stock of *A. hygrophila* imported from the coldest part of its range in Argentina appears well-adapted to the climate of coastal South Carolina. The Snee Farms population has survived five winters in large numbers.

The flea beetles appear capable of movement over twenty kilometers, as indicated by their appearance at unstocked sites, but they appear less inclined to short-distance movement to alligatorweed stands, even when faced with a depleted food supply. One pond at Snee Farms, within .5 km of other ponds with beetles, has had a healthy stand of alligatorweed but no beetles or feeding damage from November 1983 through November 1984.

The confirmation of an overwintering site less than 100 kms from North Carolina suggests that establishing or artificially selecting an overwintering strain from the stock established in South Carolina may lead to successful control of alligatorweed. During 1984 small numbers of beetles were collected in South Carolina and released into sites in Duplin, Sampson and New Hanover Counties, North Carolina. A laboratory colony was also established for the

purpose of artificially selecting an even more cold-tolerant strain of *A. hygrophila*.

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LITERATURE CITED

- Bennet, F. D. 1977. Insects as agents for biological control of aquatic weeds. *Aquat. Bot.* 3:165-173.
- Buckingham, G. R. and D. Boucias. 1982. Release of potentially cold-tolerant alligatorweed flea beetles (*Agasicles hygrophila* Selman and Vogt) into the United States from Argentina. Misc. Paper A-82-2, U.S. Army Engineer Waterways Exp. Station, Vicksburg, MS.
- Buckingham, G. R., D. Boucias, and R. Theriot. 1983. Reintroduction of the alligatorweed flea beetle (*Agasicles hygrophila* Selman and Vogt) into the United States from Argentina. *J. Aquat. Plant Manage.* 21:101-102.
- Coulson, J. R. 1977. Biological control of alligatorweed, 1959-1972. A review and evaluation. USDA, ARS and COE, U.S. Army Tech. Bull. 1547. 98 pp.
- Maddox, D. M. L. A. Andres, R. D. Hennessey, R. D. Blackburn, and N. R. Spencer. 1971. Insects to control alligatorweed. *Bioscience* 21:985-991.