Early Detection
Pest Advisory
2007

Identifying and Managing the Erythrina Gall Wasp

Reporting Suspected EGW Infestations

If you see injury to an *Erythrina* plant that you suspect is caused by the erythrina gall wasp, please note the location and report it to State departments of agriculture, USDA APHIS Plant Protection and Quarantine, the National Plant Diagnostic Network, County Agricultural Extension Agents, or the U.S. Forest Service Forest Health Protection.

For more information:

Sheri L. Smith
Regional Entomologist
U.S. Forest Service
Forest Health Protection
2550 Riverside Drive
Susanville, CA 9613
530-252-6667

Brian L. Strom
Research Entomologist
U.S. Forest Service
Southern Research Station
2500 Shreveport Highway
Pineville, LA 71360
318-473-7235

www.fs.fed.us/r5/spf/fhp *or*
www.srs.fs.usda.gov/4501

Forest Service
Forest Health Protection, Region 5
& Southern Research Station

April 2007

Cover Photo: Closeup of the flower of Erythrina X sykesii *shows the coral color that gives it one of its common names, Coral Tree.*

Adult female wasp photo by M. Tremblay (R. Messing laboratory, Univ. of Hawaii at Manoa); photo of penny comparison by S. Blomquist; all other photos by S. Smith and B. Strom.

U.S. Department of Agriculture
Forest Service
Forest Health Protection, R-5 &
Southern Research Station
Science Update SRS-012

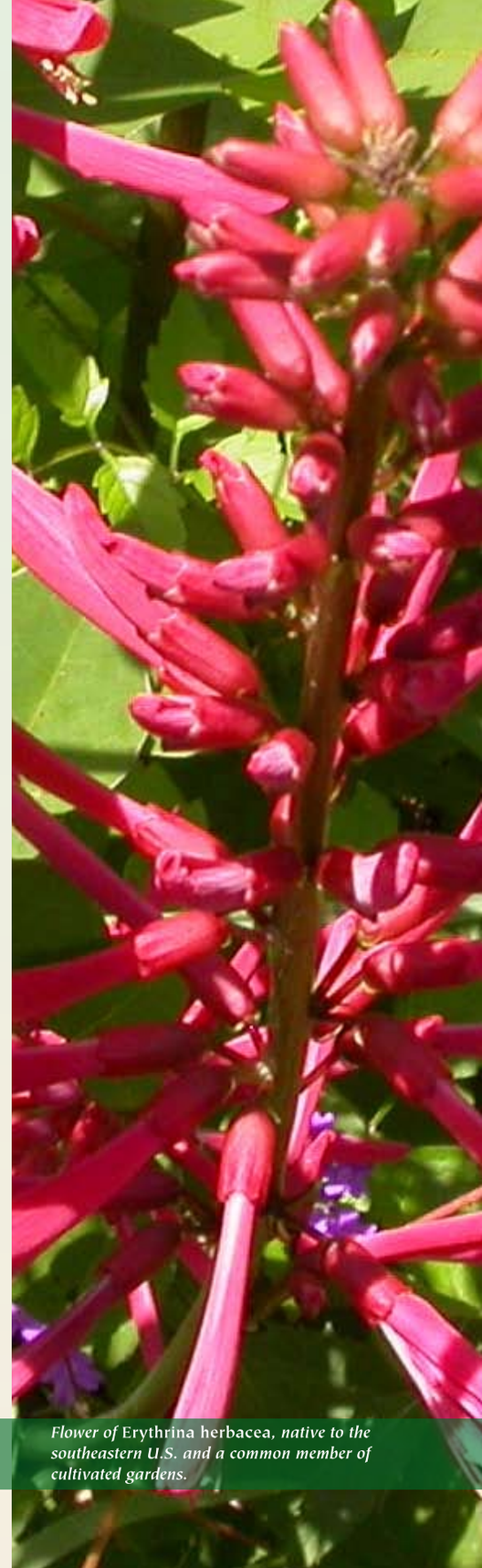
Adult female erythrina gall wasps oviposit into succulent tissues of Erythrina, *leading to galls.*

Erythrina Gall Wasp

Quadrastichus erythrinae

The erythrina gall wasp (EGW) was first detected in the U.S. on Oahu, HI, in April 2005. It was found on the remaining Hawaiian Islands in less than six months and now seriously threatens survival of native coral (wiliwili) trees in Hawaii's dryland forests. The wasp was detected in South Florida in October 2006, further demonstrating its invasive capabilities and confirming the expectation that arrival to the U.S. mainland was imminent. Native and non-native *Erythrina* (coral trees) throughout North America and Mexico should be considered threatened; EGW populations increase rapidly and result in severe galling and defoliation. Tree mortality has been observed within one to two years. Identifying how this gall-forming insect is spread and developing methods for early detection and rapid response are crucial to limiting host mortality.

Galling of Erythrina *results in leaves and petioles being heavily injured, causing disruption of physiology and leading to defoliation and death.*



Flower of Erythrina herbacea, *native to the southeastern U.S. and a common member of cultivated gardens.*

Galling on leaf surface caused by EGW.

More severe injury results in death of new tissue, including leaves and shoots.

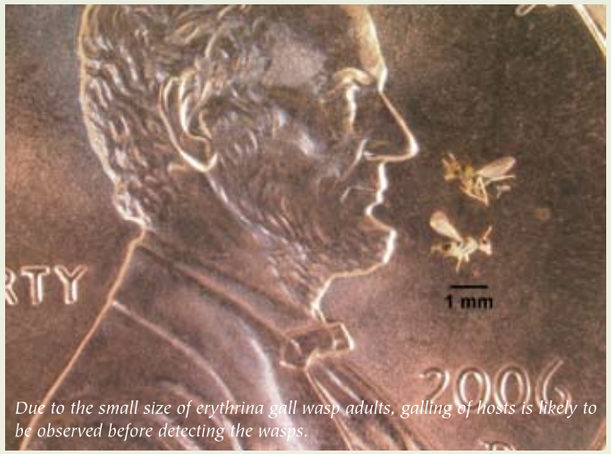
Leaves and shoots become severely deformed and die.

E. sandwicensis, *endemic to Hawaii, may succumb to infestation by EGW.*

Identification, Biology, and Host Range

EGW adults are very small, about 1 millimeter in length; consequently, host injury (galling and defoliation) is generally detected before adult wasps are observed. Adult females are slightly larger than males and are more yellow in color. Females can produce hundreds of eggs, preferring to oviposit in young, succulent tissues, primarily leaves and petioles. Oviposition to adult emergence requires about 21 days and infestations may be well developed before the presence of EGW is realized.

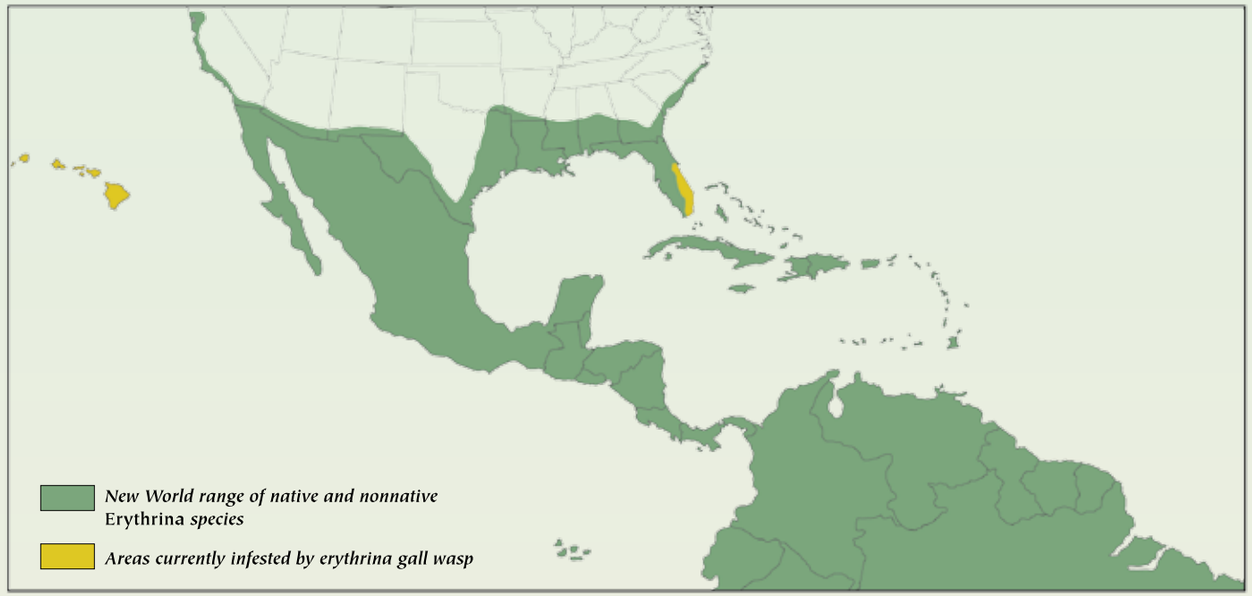
Currently, *Erythrina* species are the only known hosts for EGW. About 115 species of *Erythrina* have been described, with at least 49 being confirmed as hosts. Differences in galling severity have been observed among *Erythrina*, with *E. variegata* appearing to be the most preferred.



Due to the small size of erythrina gall wasp adults, galling of hosts is likely to be observed before detecting the wasps.

Spread

EGW was first described as a new species in 2004 from specimens in Asia. Since then, it has moved more than 10,000 miles to other locales including China, Guam, American Samoa, Hawaii, and Florida. Most initial detections on the Hawaiian Islands were on nonnative *Erythrina* near airports. The first detection in Florida was at the Miami Metro Zoo, where multiple species of *Erythrina* are cultivated. Local and long-range spread are likely due to wind, humans, travel, and commodities trading (e.g., infested plants), particularly by infested leaves hitchhiking in nursery stock containers. Wasps land indiscriminately on clothing and automobiles and may be observed under and near infested trees.



Potential Impacts

Potential impacts are serious for *Erythrina* species and their habitats. Plant vigor declines from sequential defoliation and mortality may be observed in one to two years. *Erythrina* are important to native cultures and are keystone species in many tropical and sub-tropical ecosystems. Coral trees are cultivated for their showy flowers and countless numbers exist as high-value ornamentals. The decline and loss of these culturally, ecologically, and aesthetically important species has been devastating. EGW in Hawaii has resulted in the costly removal of thousands of dying, hazardous street trees in Honolulu and the death of many native *E. sandwicensis*.

Two native *Erythrina* exist on the U.S. mainland—*E. herbacea* and *E. flabelliformis*. *E. herbacea* is widespread throughout the southeastern U.S. and *E. flabelliformis* is found in arid environments in Arizona and New Mexico. The neotropics are a center of endemism for *Erythrina* and 24 species are native to Mexico. The majority of these species appears susceptible to EGW and should be considered at risk.

Given its rapid spread and the severe injury it causes, EGW poses a serious threat to native and ornamental *Erythrina* in North America.

Management

Early detection of EGW may offer managers the widest array of options, however, effective management strategies are still being developed and evaluated. Eradication techniques (e.g., pruning and tree removal) have not been successful. Evaluations of systemic insecticides (primarily imidacloprid) and biological control agents in Hawaii are ongoing. Movement of infested *Erythrina* plant parts should be avoided. Surveys of *Erythrina* plants in high risk areas (e.g., airports, nurseries and botanical gardens) should be conducted, and managers and homeowners should be educated to recognize visual symptoms. Yellow sticky traps deployed in *Erythrina* trees may aid in detection of adults.

Yellow sticky-traps are available commercially and can be used to monitor for erythrina gall wasp adults. Wasp identification should be completed by qualified personnel.