

Chinese Tallowtree [*Triadica sebifera* (L.) Small]

Victor Maddox, Ph.D., Postdoctoral Associate, Mississippi State University
Randy Westbrooks, Ph.D., Invasive Species Specialist, U.S. Geological Survey
John D. Byrd, Jr., Ph.D., Extension/Research Professor, Mississippi State University



Fig. 1. Young Chinese tallowtree and leaf(inset). Fig. 2. Chinese tallowtree with yellow inflorescences. Fig. 3. White fruit on Chinese tallowtree.

Introduction

Problems Caused

Chinese tallowtree [*Triadica sebifera* (L.) Small][Syn. *Sapium sebiferum* (L.) Roxb.; *Stillingia sebifera* Michx.] is a deciduous to evergreen tree introduced around 1850 as a seed oil crop. It is native to China, Japan, and Korea, but commonly grown in the U.S. as an ornamental for its yellow flowers, red fall foliage, and unusual white fruit, which gave it the name popcorn tree. Currently, it has escaped from cultivation in at least nine southern states. This invasive plant can tolerate a wide range of environmental conditions from saline to freshwater flooding, shade to full sun, acid to alkaline soils, and from wet to droughty soils. It can establish dense, solid stands, crowding out native plant species and producing little food value for animals. Characterized by rapid growth and prolific seed production, it is an extremely competitive invasive plant.

Regulations

Chinese tallowtree is listed as a state noxious weed in Florida, Louisiana, Mississippi, and Texas, but is not considered a federal noxious weed. It is possibly still planted in certain states as an ornamental or for honeybee pollen. Once introduced into a landscape and mature enough to produce seeds, it quickly spreads into surrounding landscapes. If allowed to perpetuate, control can be difficult and expensive. Between 1998 & 2004, the Florida Dept. of Environmental Protection Bureau of Invasive Plant Management spent nearly \$1 million treating Chinese tallowtree in north & central Florida.

Description

Vegetative Growth

Chinese tallowtree generally grows to between 30 and 40 feet tall, but can reach over 50 feet. In the southeastern United States it is deciduous. Leaves are simple, alternate and smooth (Figure 1). The foliage is bright green in summer, often turning fiery red in the fall.

Flowering

Chinese tallowtree is a monoecious tree, with drooping, yellow tassels of insect pollinated flowers in the spring (Figure 2) followed by white fruit in the fall (Figure 3). The white fruit can persist throughout the winter and are thought to be poisonous. Seed production can be heavy, averaging around 100,000 per tree. Seedlings have tremendous vigor.

Dispersal

Despite being poisonous, fruit can be spread by birds and other wildlife. Water also disseminates fruit as evident by seedlings germinating on floodplains. Chinese tallowtree is still cultivated throughout the south and human dispersal can still facilitate invasions in and around residential areas.

Spread By

Chinese tallowtree can be spread by birds and other animals, water, and humans.

Habitat

Chinese tallowtree is an early successional species, and often emerges to dominate forested areas and utility rights of way following clearing. It can reduce the number and variety of native species in a location to alter the ecosystem structure and function. It has converted areas in southern Texas from herbaceous coastal prairies into closed canopy forest within 10 years. Trees can be injured by early hard freezes. Aside from temperature, Chinese tallowtree can tolerate a wide range of environmental conditions from saline to fresh water flooding, shade or full sun, acid to alkaline soils, and wet to droughty soils.

Distribution

US

Since its introduction into the southeastern United States, Chinese tallowtree has spread rapidly. It is widely planted in the southern United States as an ornamental and as a pollen crop for honey production. The full extent of its cold hardiness is not known, but it has escaped from cultivation in Zone 7 and seems to be progressing northward.

Mid-South

Chinese tallowtree occurs in Alabama, Arkansas, Louisiana, and Mississippi. It is most prevalent in the southern areas of these states, but seems to be gradually invading northward.

Control Methods

Biological

No known biological controls are widely utilized for Chinese tallow tree control.

Chemical

A variety of herbicides have been successfully used to control Chinese tallowtree (Table 1). These products can be applied in a variety of methods that include low (less than 40 gallons per acre) and high volume (greater than 40 gallons per acre) foliar sprays, frill treatments (also known as hack and squirt), basal bark (herbicide is mixed with diesel, kerosene, or other bark penetrant and surfactant and applied to stems less than 4 inches in diameter), and cut stump (undiluted herbicide is applied directly to a freshly cut stump). Several of these treatments may also damage other desirable plants, so they should be applied carefully and selectively. With all foliar treatments, a nonionic surfactant should be added to the spray solution at ¼ to ½ percent by volume. Basal applications are made to the entire lower 12 to 20 inches of the main stem with either diesel fuel or a basal bark oil as the carrier and are effective on main stems 6 inches in diameter or smaller. Basal treatments are most effective when applied just prior to bud break. Cut stump applications are made to the outer cambium layer of stumps immediately after cutting. Frill applications are made by cutting the bark and cambium layer of the stem and applying the herbicide to the cut area.

Mechanical

Hand removal may be possible for smaller infestations, although treating cut stumps with herbicides will assist with preventing regrowth. Seedlings can often be pulled up in wet soil. Early detection and eradication is important, since larger infestations may require aerial herbicide applications, or massive ground operations.

Physical

Chinese tallowtree will tolerate a wide range of environmental conditions. Physical controls are not widely used for the control of Chinese tallowtree.

More Information

Chinese tallowtree is in the Euphorbiaceae Family. There are approximately 100 species of *Triadica Loureiroi* worldwide. Few woody Euphorbiaceae species are native to the southeastern United States. One other species of tallowtree may be cultivated in the United States [*Sapium japonicum* (Sieb. & Zucc.) Pax & Hoffm.], but is apparently not as hardy or widespread.

References

- Chinese Tallow Task Force. 2005. Chinese Tallow Management Plan for Florida, Sept. 2005. Florida Exotic Pest Plant Council, Fort Lauderdale, FL 33307.
- Florida Department of Environmental Protection. Chinese tallow (*Sapium sebiferum*). Florida DEP, Bureau of Invasive Plant Management, Tallahassee, FL 32399.
- USDA, NRCS. 2007. The PLANTS Database (<http://plants.usda.gov>, 5 September 2007). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Herbicide	Method	Rate
2,4-D+2,4-DP	High volume	1 to 1.5%
	Basal, cut stump, frill	3 to 4% in diesel or oil
Escort (clopyralid)	Low volume	1 to 3 oz
	High volume	0.5 to 2 oz
Arsenal (imazapyr)	Low volume	2 to 6 pt/A or 2%
	Frill or soil application	2%
Arsenal AC (imazapyr)	Low volume	1 to 3 pt/A or 1%
	Frill or soil application	1%
Krenite (fosamine)	Low volume	1.5 to 6 gal/A or 30%
Velpar (hexazinone)	Soil application	2 to 4 gal
Garlon 4 (triclopyr)	Low volume	2%
	Basal, cut stump, frill	20% in diesel or oil
Garlon 3A (triclopyr)	Low volume	2%
	Basal, cut stump, frill	20% in diesel or oil
Pathfinder II (triclopyr)	Basal, cut stump, frill	Ready-to-use

Table 1. Chemical Control Methods for Chinese Tallowtree.

Dr. Victor Maddox
MSU Geosystems Research Institute
Box 9555, Mississippi State, MS 39762-9555
(662)325-2313, vmaddox@gri.msstate.edu
www.gri.msstate.edu

