GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Triadica sebifera***

Triadica sebifera 简体中文 正體中文 **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Euphorbiales	Euphorbiaceae

Common name tallow tree (English), Chinese tallow (English), chicken tree (English), vegetable tallow (English), popcorn tree (English), Florida aspen (English), Chinesischer talgbaum (German), candleberry-tree (English), white waxberry (English), boiré (French), arbre à suif (French), árbol del sebo (Spanish)

Synonym
Triadica sinensis , Lour
Croton sebiferum , L
Stillingia sebifera , (L.) Michx
Sapium sebiferum , (L.) Roxb
Excoecaria sebifera , Müll. Arg

Similar species *Populus spp.*

Summary Triadica sebifera is a tree in the Euphorbiaceae family which typically reaches a maximum height of 15m at maturity. It is adapted to a variety of disturbed sites and a wide range of soil conditions. Triadica sebifera aggressively displaces native plants and forms monospecific stands within decades of its appearance. It is also able to alter nutrient cycles by enhancing productivity in ecosystems by the addition of nitrogen and phosphorous from the rapid decay of its leaves which produce tannins. Triadica sebifera is shade, sun, drought, flood, freeze and salt tolerant and is also suspected of reducing nesting habitat for a variety of avian species. Management of this species is an arduous process and not suitable for all infested sites.

view this species on IUCN Red List

Species Description
Bogler (2000) states that, \"*T. sebifera* is a tree in the spurge family (Euphorbiaceae). At maturity it typically reaches a maximum height of 15 m. Its bark is reddish-brown with wide fissures and narrow ridges, and it often peels off vertically in narrow strips. The branches, which begin relatively low on the trunk, are typically long and drooping. The twigs are slender and waxy. The simple aspen-like leaves are alternate and deciduous, broad rhombic to ovate, 3-8cm long and 3-6cm wide, and have a smooth margin. Leaf bases are wide-rounded, and the leaf blade terminates in a gradually tapering tip. The upper leaf surfaces are medium to dark green, and the lower somewhat paler. Leaf veins are yellow and conspicuous on both surfaces. Petioles are 2-5cm long, with 2 swollen glands on the upper side immediately below the leaf blade. At the base of each petiole is a pair of stipule-like appendages approximately 3mm long. In autumn, the leaves turn yellow, orange, and scarlet (Godfrey 1988). *T. sebifera* is monoecious (i.e. it produces separate male and female flowers on the same plant). The flowers are greenish-yellow in terminal spike-like inflorescences up to 20cm long. The staminate (male) flowers occur in clusters at the upper nodes of the inflorescence, and the pistillate (female) flowers are solitary, located on short branches at the base of the spike. Each pistillate flower has a three-lobed ovary, three styles, and no petals. Fruits are three-lobed, three-valved capsules about 1-2cm long and 2cm wide. As the capsules mature, their colour changes from green to nearly black. The capsule walls fall away and expose three globose seeds with a white, tallow-containing covering. Seeds usually persist on the plants for several weeks. In North America, the flowers typically mature April-June and fruit ripens September-October (Godfrey 1988).\"

Notes
Bogler (2000) states that, \"The specific name \"sebiferum\" means wax-bearing. The common name \"Chinese tallow tree\" refers to its 1,500 year history of being used as a seed-oil crop in Asia, while \"popcorn tree\" refers to its persistent, white fruit. The author also states that, \"*T. sebifera* has milky white sticky sap which may act as a skin irritant or as a diarrhetic (other members of the spurge family also frequently contain toxins).\"

Lifecycle Stages
Bogler (2000) states that, \"In the southern United States, *T. sebifera* initiates growth in February, and flowers from March through May. Fruits ripen from August to November. Trees generally live 15-25 years with a potential maximum age of 100, though rootstocks may live much longer (Jubinsky 1995). *T. sebifera* can begin flowering and fruiting when the plant is one meter tall or approximately three years old (Jubinsky 1995). In the southern U.S., catkins appear from March to June. The flowering strategy of *T. sebifera* is called dichogamy, involves differential flowering times and requires two subpopulations, but ensures cross-pollination (Bruce *et al.* 1997). This characteristic contributes to the high genetic diversity observed within stands of the species (Conway 1997). *T. sebifera* plants have tremendous reproductive potential. They may reach reproductive age in as little as three years, and in greenhouse experiments, seedlings flowered in their first year of growth. Trees can remain productive for 100 years. Tree stumps have the ability to resprout, and roots fragments can readily develop shoots (Conway 1997).\"

Uses
Bruce *et al.* (1997) state that, \"*T. sebifera* seeds are used for a variety of products including soap, candles, and oil. This species was introduced to the United States in the late 1700s. The Bureau of Plant Industry (U.S. Department of Agriculture) established plantations of tallow along the Gulf Coast in the early 1900s to study its feasibility as an agricultural crop. At this time it became a popular ornamental.\" Rogers and Siemann (2004) state that, \"rapid growth, colourful autumn foliage, abundant flowers and seeds rich in oils have encouraged extensive planting of Sapium.\"
Conway *et al.* (2002) report that, \"*T. sebifera* also drives some ecosystem-level processes by denitrifying soil and accelerating litter decomposition (Cameron and LaPoint, 1978 ; Cameron and Spencer, 1989).\"

Habitat Description
Bogler (2000) states that, \"*T. sebifera* is adapted to a variety of disturbed sites and a wide range of soil conditions (alkaline, saline, or acid soils). It does best in alluvial forests, on low alluvial plains, and on rich leaf-molds, preferring well-drained clay-peat soils.\" Siemann and Rogers (2003) state that, \"*T. sebifera* tends to grow in wetter sites and both species have the potential to grow rapidly. It rapidly invades grasslands that are only slowly invaded by native woody species (Smeins *et al.* 1992; Harcombe *et al.* 1993).
Jubinsky and Anderson (1996) state that, \"Surveys conducted by Florida's Department of Environmental Protection demonstrate the increased spread of *T. sebifera* into disturbed and undisturbed, upland and wetland sites, with one large wetland site south of Gainesville, Florida having more than 10,000 *T. sebifera* trees that have become naturalized. Over half (57%) of Florida's counties now have naturalized populations of the tree.\"

Reproduction
T. sebifera is insect pollinated and bird dispersed (Siemann and Rogers, 2003). Renne *et al.* (2002) state that, \"*T. sebifera* resprouts when injured, can reproduce by suckering and has a depauperate (poorly or imperfectly developed) herbivore and pathogen load. The authors further observe that in coastal South Carolina, an individual plant can produce more than 100 000 seeds in a year and c. 40% of the seed crop is effectively dispersed by at least 16 bird species from distinct guilds.

Nutrition
T. sebifera grows rapidly in full sunlight and is able to establish under closed canopies. Growth experiments indicate that in full sunlight, *T. sebifera* grows more rapidly than Carolina ash (*Fraxinus caroliniana*) and southern red oak (*Quercus falcata*), and equaled the rates of growth of American sycamore (*Platanus occidentalis*, known for its rapid growth rate in full sun). *T. sebifera* prefers a mean air temperatures of 12.5° to 30.1°C and an annual precipitation of 13 to 37 dm. Average minimum temperatures must be above -12° to -15°C. *T. sebifera* is a subtropical to warm temperate plant, hardy and able to withstand light frosts, but unripened twigs are susceptible to frost injury. It typically occurs at elevations of 0 to 800 m.*T. sebifera* is tolerant of flooding in fresh, brackish, or saltwater. The trees survive flooded conditions by producing hypertrophied lenticels and adventitious roots. In saline water, *T. sebifera* seedlings can survive up to 6 weeks, although rates of growth become negatively impacted (Bogler, 2000).

General Impacts
Siemann and Rogers (2003) state that, \"*T. sebifera* aggressively displaces native plants and forms monospecific stands within decades of its appearance in a prairie (Bruce *et al.* 1997). In the Gulf Coast, much coastal prairie has been converted to *T. sebifera* woodland thickets (Bruce *et al.* 1997). In prairie habitats *T. sebifera* competes with herbaceous species. Ideally, the native and alien species would be congeners, but *T. sebifera* is the only member of its genus in the Gulf Coast of Texas. Lack of herbivory may be responsible for *T. sebifera*'s unusually high performance and invasiveness.\" The authors claim that typically native seedlings are browsed by vertebrates more frequently than *T. sebifera* seedlings.
Bogler (2000) states that, \"*T. sebifera* is able to alter nutrient cycles. It may enhance productivity (or encourage eutrophication) in ecosystems by the addition of nutrients (mainly nitrogen and phosphorous) from the rapid decay of its leaves (Cameron and Spencer 1989). These leaves produce tannins, but it is unclear if *T. sebifera* produces other allelopathic compounds that may interfere with the germination of native North American species (Conway, 1997). Further, the presence of *T. sebifera* seems to favour non-native arthropods (Miller and Cameron, 1983) that may also negatively impact the native ecosystem.\"
Renne *et al.* (2002) state that, \"Heavy *T. sebifera* use by some species may adversely affect others\". As an example the authors observe that European starling (*Sturnus vulgaris*) populations, which are limited by the availability of food in winter, are likely to increase in response to *T. sebifera* seed availability. Starlings which compete with cavity-nesting birds for nest sites may reduce red-headed woodpecker (*Melanerpes erythrocephalus* see in IUCN Red List of Threatened Species) and red-bellied woodpecker (*Melanerpes carolinus*) populations and as nest site availability limits the population growth of cavity-nesting birds, further increases in *T. sebifera* numbers could negatively affect this guild of birds by providing abundant food for their competitors.
Rogers and Siemann (2004) observe that, *T. sebifera* loses very small amounts of leaf area to herbivory in the USA and its advantage over native plants is assumed to be partially due to a low pest load. *T. sebifera* has evolved a reduction in defense allocation and an increase in allocation to growth and/or reproduction in response to the absence of herbivores (Siemann & Rogers 2001, 2003).
Jubinsky and Anderson (1996) state that, \"*T. sebifera* is shade-, sun-, drought-, flood-, freeze, and salt-tolerant, as shown in recent experiments. These and other characters, such as its adaptability to a wide range of soils and its ease of dispersal *via* birds, water, and humans, suggest that this introduced species has a high risk potential as an invasive plant outside of cultivation.\" Rodgers and Parker (2003) state that, \"*T. sebifera* can tolerate shade and will grow through existing canopies (Jones & McLeod, 1989).\" Brooks *et al.* (2004) states that, \"*T. sebifera* can overtop and suppress the growth of understory coastal prairie species in North America, reducing the continuity of highly flammable surface fuels and thus the frequency of fire (Grace, 1998).\"

Management Info
Bogler (2000) states that, \"As with all prolific invaders, the key is to successful control is to prevent new infestations or to control them as soon as possible. *T. sebifera* has a high degree of reproductive vigor, a wide range of adaptability, and few pests and predators. It produces a large number of viable seeds that are readily dispersed by birds and by water, and which germinate at high rates in a wide range of conditions. If controlled during the early stages of invasion, the potential for successful management is high. The potential for large-scale restoration of wildlands where *T. sebifera* has become established, is probably low.\"
For details on management of this species including preventative, physical, biological and chemical control download our pdf file on *management information*.

Pathway
T. sebifera has been extensively planted and propagated for ornamental purposes (Bogler, 2000).*T. sebifera* is grown for its high biomass and energy value (Bogler, 2000).

Principal source: Bogler, 2000 Element Stewardship Abstract for *Sapium sebiferum*

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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[1] MARTINIQUE
[1] SRI LANKA
[11] UNITED STATES

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General information

ITIS (Integrated Taxonomic Information System), 2004. Online Database *Triadica sebifera*
Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
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