Tennessee's Silent Invader Chinese Tallow Tree *Triaca sebifera* (L.) Small

Benjamin L. Reichert
Graduate Student
The University of Tennessee
Department of Forestry, Wildlife and Fisheries
April 23rd, 2014 12:20 PM
PBB 160

Outline

- Introduction
- Current Knowledge/Issues
- Future Directions

Introduction

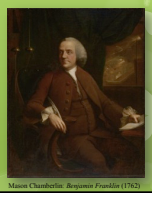
- Invasive species degrade ecosystems (Kettenring & Adams 2011)
  - Replacing native vegetation (Bruce *et al.* 1995; Randall & Marinelli 1996)
  - Reducing native species diversity (Bruce et al. 1995; Randall & Marinelli 1996)
  - Negative effect on wildlife (Bruce *et al.* 1995; Randall & Marinelli 1996)
- Change environmental characteristic
- Impede restoration in the habitats they dominate (Kettenring & Adams 2011)

The Republic of China Distribution

http://upload.wikimedia.org/wikipedia/commons/9/92/China_blank_map.svg

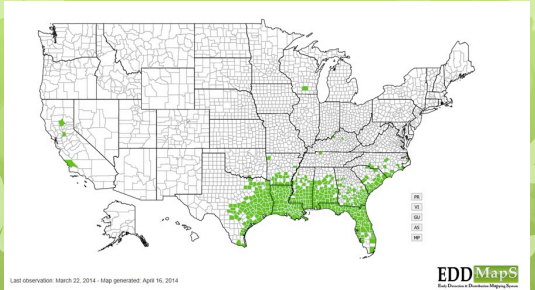
Introduction

- Benjamin Franklin (1772)
  (Bell, 1966)
- U.S. Department of Agriculture (1920-1940)
  (Miller *et. al*, 2010)
- Ornamental tree
  et al., 1997)



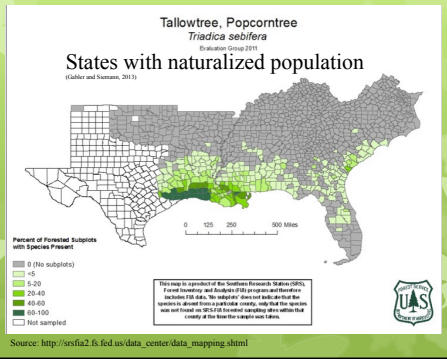
Mason Chamberlin: *Benjamin Franklin* (1762)

The United States of America Distribution



EDDMapS. 2014. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org/; last accessed April 23, 2014.

The Chinese tallow tree southeastern U.S.

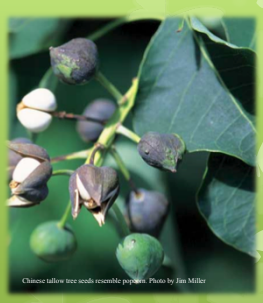


Source: http://srsfia2.fs.fed.us/data_center/data_mapping.shtml

Introduction

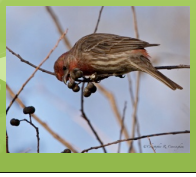
Common Names
(Meyer, 2011)

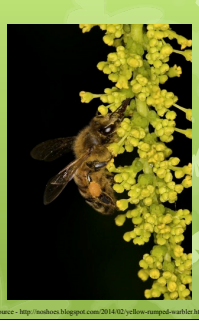
- Tallow tree
- popcorn tree
- Florida aspen
- chicken tree



Chinese tallow tree seeds resemble popcorn. Photo by Jim Miller

Introduction





Source - http://noshoes.blogspot.com/2014/02/yellow-rumped-warbler.html

Current Knowledge

Invasive species degrade ecosystems

- Competitive superiority (Lin *et al.* 2004)
- High root-sprout capabilities (Bruce et al. 1997)
- Prolific seed production (Jubinsky and Anderson 1996)
- Broad moisture tolerances

http://farm7.static.flickr.com/6014/5971360738_26dcfeaf29.jpg

http://media-cache-ak0.pinimg.com/736x/df/cc/53/dfcc5387a323bdeee6224ef0e66afa2c2.jpg

Current Knowledge

Change environmental characteristic

- Most abundant species (Bruce et al., 1995; Nowak et al., 2005; Harcombe et al., 1999; Rudis et al., 2006)
- Chinese tallow monocultures (Bruce et al. 1997)
- Soil nutrient cycling (Yang et al. 2013)
- Habitat modification (Knopf 1994)

Picture source: http://www.oilseedcrops.org/wp-content/uploads/2012/04/chinese-tallow-3.jpg

Future Directions

The following research topics need attention

- Allelopathic properties
- Movement of naturalized Chinese tallow trees along an urban to rural gradient.
- Biological control for Chines tallow tree invasion

References

Bell, M.I. 1966. Some notes and reflections upon aletter from Benjamin Franklin to Noble Wimberly Jones, October 7, 1772. Ashantilly Press, Darien, Geogia, USA.

Bruce, K.A., Cameron, G.N. and Harcombe, P.A 1995. Initiation of a new woodland type on the Texas coastal prairie by the Chinese tallow tree (Sapium sebiferum (L.) Roxb.). Bulletin of the Torrey Botanical Club 122:215-225.

Bruce, K.A., Cameron, G.N., Harcombe, P.A. and Jubinsky, G. 1997. Introduction, impact on native habitats, and management of a woody invader, the Chinese tallow tree (Sapium sebiferum (L.) Roxb). Natural Areas J., 17:255–260.

Gabler, C.A. and Siemann, E. 2013. Rapid ontogenetic niche expansions in invasive Chinese tallow tree permit establishment in unfavourable but variable environments and can be exploited to streamline restoration. Journal of Applied Ecology, 50, 748-756

Harcombe, P.A., Hall, R.B.W., Glitzenstein, J.S., Cook, E.S., Krusic, P., Fulton, M. and Streng, D.R. 1999. Sensitivity of gulf coast forests to climate change, Vulnerability of coastal wetlands in the southeastern United States:climate chane research results (ed. By G. Gunterspergen and B.A. Varain), pp. 45-66. USGS, Belvoir, Virginia.

Jubinsky, G. and Anderson, L.C. 1996. The invasive potential of Chinese tallow-tree (*Sapiem sebiferum* Roxb.) in the southeast. Castanea 61, 226-231

Kettenring, K.M. and Adams, C.R. 2011. Lessons learned from invasive plant control experiments: a systematic review and meta-analysis. Journal of Applied Ecology, 48, 970–979.

Knopf, F.L. 1996. Prairie legacies – pirds. IN: F.B. Sampson and F.L. Knopf (eds). Prairie Conservation. Island Press, Washington, DC.

Miller, J.H. 1995. Exotic plants in southern forests: their nature and control. In: Street, J. E., ed. Herbicide-resistant crops: a bitter or better harvest; 1995 January 16-18; Memphis, TN. In: Proceedings, Southern Weed Science Society. Champaign, IL: Southern Weed Science Society; 48: 120-126.

Miller, J.H. Chambliss, E.B., and Loewenstein, N.J. 2010. Tallowtree, Popcorntree In: A Field Guide for the Identification of Invasive Plants in Southern Forests. General Technical Report SRS-119. United States Department of Agriculture, Forest Service.

Meyer, R. 2011. *Triadica sebifera*. In: Fire Effects Information System. U.S. Department of Agriculture, Forest Service,Rocky Mountain Research Station, Fire Sciences Laboratory. Online: http://www.fs.fed.us/database/feis/

Nowak, D.J., Smith, P.D., Merritt, M., Giedraitis, J., Walton, J.T., Hoehn, R.E., Stevens, J.C., Hitchcock, D. and Holtcamp, W. 2005. Houston's regional forests: structure, function, values. Texas Forest Service, Houston, Texas.

Picture Sources

Chamberlin, M: *Benjamin Franklin* 1762. Source: Philadelphia Museum of Art, Philadelphia, Pennsylvania

EDDMapS. 2014. Early Detection & Distribution Mapping System. The University of Georgia - Center for Invasive Species and Ecosystem Health. Available online at http://www.eddmaps.org/; last accessed April 23, 2014.

Miller, James H.; Chambliss, Erwin B; Oswalt, Christopher M. 2008. Maps of occupation and estimates of acres covered by nonnative invasive plants in southern forests using SRS FIA data posted on March 15, 2008. [Available only on the internet: http://www.invasive.org/fiamaps/ Date accessed: April 23, 2014]

Miller, J. 2013. Chinese tallow tree seeds resemble popcorn. Photo by Jim Miller. http://www.srs.fs.usda.gov/compass/2013/07/16/chinese-tallow-tree-in-the-south/

Questions???