



# NRCS: A repository of plant data

- U.S. Department of Agriculture  
Natural Resources Conservation  
Service  
National Plant Data Team  
(NPDT)



**P**lant **L**ist of **A**ccepted **N**omenclature, **T**axonomy & **S**ymbols

You are here: [Home](#) / [Team](#)

## PLANTS Team

### The Faces Behind PLANTS

---

Click on a name or photo below for more information about a PLANTS team member.



[Kat Anderson](#)



[John Brenner](#)



[Will Farrell](#)



[Mark Garland](#)



[Doug Goldman](#)



[Bert Noel](#)



[Gerry Moore](#)



[Kurt Tometich](#)





© Mark Skinner



- Meeting NRCS field office, customer, cooperator, and public plant information needs
- NRCS strategic database

# NRCS Integrating With Botanical Community

- Working with Flora of North America participants, International Compositae Alliance, Global Gymnosperm Tree of Life Consortium, and others.
- Assisting the community with small grants program for specialists.
- PLANTS follows international plant nomenclature standards (ICBN).
- Linking occurrences with specimens, whenever possible.





# PLANTS Web Site

■ *<http://plants.usda.gov>*

- Focuses on U.S. and its territories
- Directly accessible to traditional & non-traditional clients, cooperators, and the public
- Data continuously updated
- [plants@plants.usda.gov](mailto:plants@plants.usda.gov)



# PLANTS Includes:

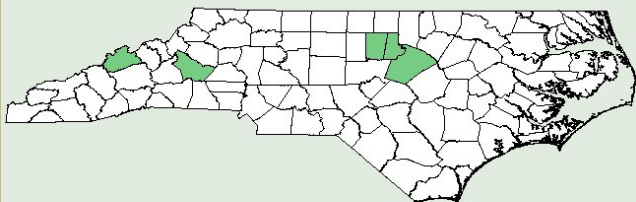
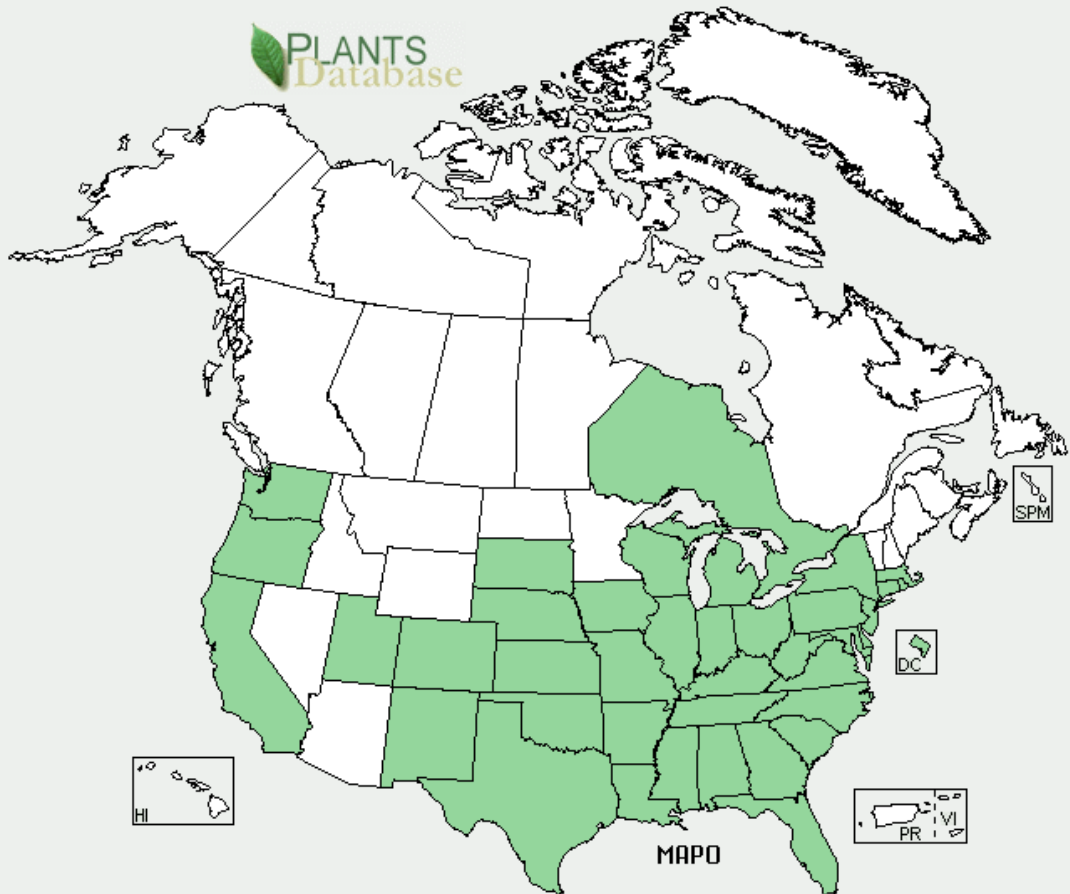
- Names, Checklists, and Classification
- Distribution
- Legal Status
  - Wetland
  - T&E
  - Noxious, Invasive
- Plant guides
- Images & Links
- Culturally significant plants

The screenshot shows the USDA Natural Resources Conservation Service (NRCS) PLANTS Database website. The header includes the USDA logo and the NRCS logo. Below the header is a navigation bar with links for Home, About PLANTS, Team, Partners, What's New, NPDC, Help, and Contact Us. The main content area is divided into several sections:

- Search:** A search box with a "Name Search" label and a "Go" button. Below the search box are links for "Scientific Name", "State Search", "Advanced Search", and "Search Tips".
- PLANTS Topics:** A list of topics including Alternative Crops, Characteristics, Classification, Culturally Significant, Distribution Update, Fact Sheets & Plant Guides, Plant Materials Publications, Threatened & Endangered, Invasive and Noxious Weeds, and Wetland Indicator Status.
- Image Gallery:** A link to "25,000+ Plant Images" and a link to "Submit Your Images to PLANTS".
- Download:** Links to "Complete PLANTS Checklist", "State PLANTS Checklist", "Symbols for Unknown Plants", "Grazing and Spatial Analysis Tool (GSAT) List", and "PLANTS Posters".
- Related Tools:** A link to "Crop Nutrient Tool".
- You are here:** A breadcrumb trail showing "Home/".
- Introduction:** A paragraph stating "The PLANTS Database provides standardized information about the vascular plants, mosses, liverworts, hornworts, and lichens of the U.S. and its territories."
- Plant of the Week:** A section featuring a photo of a white oak tree, the text "White oak Quercus alba L.", and a link to "Click on the photo for a full plant profile."
- Spotlight:** A section with a photo of a yellow flower and the text "Submit Your Photos. Contribute your photos to PLANTS! We are looking for accurately identified submissions of 100 or more images, preferably with supporting information including date and location."
- Update PLANTS Distribution Maps:** A section with a map of the United States and the text "You can help update PLANTS state and county distribution records by contributing your information to the Distribution Update module."
- PLANTS Posters:** A section with a photo of a yellow flower and the text "Dress up your home or office with PLANTS Posters featuring lovely plants such as small-worlded pogonia (Isotria medeoloides) and red columbine (Aquilegia canadensis). Our seven printer-friendly posters can be downloaded in two formats (8.5" x 11" or 11" x 17"), and printed at home or at your local print shop."
- NPDC Product Catalog:** A link to "NPDC Product Catalog (PDF; 976KB)".
- I Want To...:** A list of user actions including "See a list of the plants in my state", "Learn about the wetland plants in my region", "Learn about all the endangered plants of the U.S.", "Learn about noxious and invasive plants", "Search for and view images of plants", "Read and print abstracts about important conservation plants", "Download data or posters", "Contribute plant distribution information to PLANTS", "Get ecological descriptions of sites from around the country", and "Choose plants for particular land conservation purposes".
- I Want Help:** A list of help topics including "Introduction to PLANTS", "Frequently Asked Questions", "Citing the PLANTS Database", "Intellectual Property Statement", "Contribute Your Photos to PLANTS", "Update PLANTS Distribution Maps", and "Search the Web Site".

# State & County Distribution

- Complete state coverage for vascular plants
  - PR/VI & DC included
  - Pacific Basin islands being integrated
  - North America north of the U.S. included
- County level for vascular plants
  - Completeness varies by state
  - Gap filling underway
  - MD being completed
- Distribution based primarily on specimens and literature





# Gallery

- Browse photos, or
- Select using a query form
- View by name or thumbnail
- Links to Plant Profile

You are here: [Home](#) / [Image Gallery](#)

## Image Gallery

The PLANTS Gallery emphasizes photos and line drawings of U.S. plants but also contains many cultivated or foreign taxa.

### 1. Enter Search Criteria:

Select by name, Symbol, or group:

Scientific Name

Wildcards are permitted;  
\* for multiple characters,  
\_ for single characters.

Select by Category:

All

Dicot

Fern

Green alga

Select by Growth Habits:

All

Forb/herb

Graminoid

Lichenous

Select by Duration:

All

Annual

Biennial

Perennial

Select by U.S. Nativity:

All

Select by Wetland Status:

All

2. View and Sort by:

View by:

Text List

Sort by:

Scientific Name

Select by Image Type:

All

Select by Artist:

All

A.K.

Al Schneider

Alfred Schotz

Select by Copyright Status:

All

Select by Image Location:

All

0.5 miles S. of Pioneertown, CA

0.5 miles SE of Pioneertown, CA

1 mile N. of Green Valley, San Bernardino Natl

Select by State Distribution:

All

Alabama

Alaska

Arizona

Select by Citation:

All

Barnes, T.G., and S.W. Francis, 2004. Wildflowe

Britton, N.L., and A. Brown, 1913. An illustrated

Herman, D.E., et al., 1996. North Dakota tree h

You are here: [Home](#) / [Image Gallery](#) / [Image Gallery Results](#)

## Image Gallery

### Gallery Images for Scientific Name = *maclura pomifera*

Matching images = 16: 13 photos, 3 line drawings
















Click on a thumbnail image or name below to view the PLANTS profile with standard sized images and links to additional large and publication-quality images (when available).

View by:  Sort by:

--25 per page  and  Scientific Name

< Previous | Page 1 of 1 | Next >

Go to page  1

 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>
 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>
 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>	 <p><i>Maclura pomifera</i> osage orange</p>

Nearly 50,000+  
Images



# PLANTS: Searches

- Name search
  - Scientific name
  - Common name
  - Symbol
- State search
  - More specific
- Advanced search
  - Very specific
  - Access nearly all data

USDA United States Department of Agriculture  
Natural Resources Conservation Service

PLANTS Database

Home About PLANTS

You are here: Home/

The PLANTS Database provides the vascular plants, mosses, of the U.S. and its territories.

**Plant of the Week**

Search  
Name Search  
maclura pom  
Scientific Name Go  
State Search  
Advanced Search  
Search Help  
PLANTS Topics  
Alternative Crops

# Fact Sheets & Plant Guides

- Ca. 900 species available as doc or pdf files
- Explains how to utilize, establish, manage, & maintain
- Includes culturally significant information
- Plant Materials & NPDT partnership



## Plant Guide

### OSAGE ORANGE

*Maclura pomifera* (Rafin.) C.K. Schneider  
Plant Symbol =MAPO

Contributed by: USDA NRCS Plant Materials Center  
Manhattan, Kansas



Fruit and leaf of Osage orange plant from the PLANTS Database website. Photo by Jeff McMillan.

**Alternate Names:** bodark, hedge apple, horse-apple, naranjo chino, hedge, and Bois d' Arc.

**Uses**  
Historically it was used by Native American tribes to produce wooden bows thus the French name bois d' arc or 'wood of the bow'. Large scale use of the tree for hedges was first proposed in the 1850's by John A. Wright, editor of the *Prairie Farmer* and his friend professor Jonathan B. Turner (Smith and Perino, 1981). Professor Turner was convinced that Osage orange was the perfect plant to fence the prairie. By 1855 Osage orange made fencing entire prairie farms practical, and the practice had spread rapidly throughout the prairie states to most of the eastern states. Then the invention of woven and barb

biodiesel fuel. Fuel properties of the methyl ester of *Maclura pomifera* were found to be very similar to the values set forth by the American Society of Testing and Materials (ASTM) for petroleum diesel (No. 2) by Saloua et al. in 2009. Smith and Perino (1981) noted that a potentially important economic use for Osage orange is in the proteolytic enzyme found in the fruit. These enzymes break down proteins into peptides and amino acids for use in cheese making, meat tenderization, clearing and chill proofing beer, and other industrial and commercial uses. Phytochemicals from plants have been extensively studied for their antioxidant activities. The intake of antioxidant-rich diets has been associated with reduced incidence of chronic diseases such as cancer and cardiovascular diseases. Tsao et al. (2003) studied the two predominant isoflavones, osajin and pomiferin, in Osage orange for their antioxidant activity. Pomiferin was found to be a strong antioxidant comparable to the antioxidant vitamins C and E. Osajin showed no apparent antioxidant activity. Although Osage orange is not a human food source, it is considered to be safe and, therefore, a potentially good source of antioxidant nutraceuticals and functional food ingredients.

#### Status

Osage orange is a pioneering species forever invading exposed mineral soils, particularly overgrazed pastures and abandoned crop fields. Other tree species frequently found in these areas include: *Juniperus virginiana*, *Robinia pseudoacacia*, *Gleditsia triacanthos* and *Crataegus* sp. Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

#### Weediness

Osage orange has the potential to invade areas abused by poor management and the over grazing of range or pasture land. The plant may become weedy or



# Culturally Significant Plant Information

## Assisting Native American Clients



from CalPhotos

Cultural Uses  
Documentation  
Description  
Adaptation  
Establishment  
Management  
Sources  
References



**Technical Notes in progress:**  
**#1 Traditional Ecological Knowledge: An Important Facet of Natural Resources Conservation**  
**#2 Indigenous Uses, Management, and Restoration of Oaks in the Far Western United States**  
**#3 Prairies and Wetlands of Coastal Washington, Oregon, and California: Their Native American Uses and Management**

# Promoting Plant Materials Information



- PLANTS and Plant Materials (PM) Integration
  - PM Web site
  - Fact Sheets & Plant Guides

# Plant Identification



National Plant Data Center  
Wetland Monocots

Compiled from several sources by Dr. David Bogler, Missouri Botanical Garden, under contract to USDA  
NRCS NPDC

[Instructions, Information, Disclaimers and Policies](#)

**DRAFT beta**

- 1. Aquatics growing in or on water
- 2. Aquatic submerged
- 3. Aquatic emergent
- 4. Aquatic leaves floating
- 5. Aquatic fresh water
- 6. Aquatic marine
- 7. Terrestrial
- 8. Herbaceous
- 9. Woody
- 10. Trees or shrubs
- 11. Lianas or vines
- 12. Pseudostem from leaf bases
- 13. Epiphytes
- 14. Saprophytes lacking chlorophyll
- 15. Annuals
- 16. Perennials
- 17. Rhizomes present
- 18. Rhizomes aromatic
- 19. Bulbs
- 20. Corms
- 21. Tubers
- 22. Prop roots
- 23. Stolons or runners
- 24. Roots contractile
- 25. Roots aerial or adventitious
- 26. Roots with velamen
- 27. Sap clear
- 28. Sap milky
- 29. Sap red or orange

All Taxa:

- [Acoraceae](#)
- [Agavaceae](#)
- [Alismataceae](#)
- [Alliaceae](#)
- [Amaryllidaceae](#)
- [Aponogetonaceae](#)
- [Araceae](#)
- [Arecaceae](#)
- [Asparagaceae](#)
- [Asteliaceae](#)
- [Bromeliaceae](#)
- [Burmanniaceae](#)
- [Butomaceae](#)
- [Cannaceae](#)
- [Colchicaceae](#)
- [Commelinaceae](#)
- [Costaceae](#)
- [Cymodoceaceae](#)
- [Cyperaceae](#)
- [Dioscoreaceae](#)
- [Eriocaulaceae](#)
- [Flagellariaceae](#)
- [Haemodoraceae](#)
- [Hanguanaceae](#)
- [Heliconiaceae](#)
- [Hemerocallidaceae](#)
- [Hyacinthaceae](#)
- [Hydrocharitaceae](#)
- [Hypoxidaceae](#)
- [Iridaceae](#)
- [Juncaceae](#)
- [Juncaginaceae](#)

- When used on-line:
  - Links to PLANTS Profile
  - Links to glossary through Google
- Can be downloaded and used in the field
- Use any character to start identification process



# Wildlife Habitat Values

- Integrated into Plant Profile where available
- Provides wildlife habitat ratings by plant species for animal groups
- About 1000 plant species covered.



## Wildlife Habitat Values:

*Maclura pomifera* (Raf.) C.K. Schneid.

Source	Large Mammals		Small Mammals		Water Birds		Terrestrial Birds	
	Food	Cover	Food	Cover	Food	Cover	Food	Cover
Gee	Moderate							
Martin			Minor				Minor	

[Wildlife Habitat Values](#)

Gee, K.L., M.D. Porter, S. Demarais, F.C. Bryant, and G.V. Vreede. 1994. *White-tailed deer: Their foods and management in the Cross Timbers*. Ardmore.

Martin, A.C., H.S. Zim, and A.L. Nelson. 1951. *American wildlife and plants: A guide to wildlife food habits*. Dover Publications, New York.

# Plant Characteristics

- Compiled for 2,500+ conservation plant species
- 100 characteristics
- Can be used as a filter in the **Advanced Search**
- These data support other applications

Characteristics	
<small><a href="#">About PLANTS Characteristics</a> <a href="#">Conservation Plant Characteristics Data Definitions</a> <a href="#">PLANTS Characteristics species list</a></small>	
<b>Conservation Plant Characteristics</b>	
<i>Maclura pomifera</i> (Raf.) C.K. Schneid. osage orange MAPO	
<b>Summary</b>	
Duration	Perennial
Growth Habit	Tree, Shrub
Native Status	L48 (N), CAN (I)
Federal T/E Status	
National Wetland Indicator	UPL, FACU
<b>Morphology/Physiology</b>	
Active Growth Period	Spring and Summer
After Harvest Regrowth Rate	
Bloat	None
C:N Ratio	High
Coppice Potential	No
Fall Conspicuous	No
Fire Resistant	No
Flower Color	Green
Flower Conspicuous	No
Foliage Color	Green
Foliage Porosity Summer	Dense
Foliage Porosity Winter	Porous
Foliage Texture	Coarse
Fruit/Seed Color	Orange
Fruit/Seed Conspicuous	Yes
Growth Form	Single Stem
Growth Rate	Moderate
Height at 20 Years, Maximum (feet)	20
Height, Mature (feet)	35.0
Known Allelopath	No
Leaf Retention	No
Lifespan	Long



# Agency Working Lists

- NRCS State Grazing Lands & Spatial Analysis Tool (GSAT) List
  - Can contain any plant symbol in PLANTS
  - Uses State common names
  - Input by State PLANTS Coordinator
- NRCS State Plants List
  - State plant list comparable to State PLANTS Checklist except with state common names.
  - State common names input by State PLANTS Coordinator.



# Related Applications Accessible Through PLANTS

- Crop Nutrient Tool
  - Augments Agricultural Waste Management Field Handbook
- Ecological Site Information System
  - Plant & soil data for natural areas, providing a standard for planning.



# Future Improvements To PLANTS

- Web Services
- Pollinator Conservation Information
- Phytoremediation Information
- Cover Crop Information
- Gap Filling and Added Data & Images
- Increased Distribution Linked to Specimens
- Pacific Basin Distribution
- Notes fields with cultural info, nomenclatural issues.





# Visit the PLANTS Web site

- USDA  
Natural Resources  
Conservation Service  
National Plant Data Center

- <http://plants.usda.gov>