

**Family:** *Ginkgoaceae*

**Taxon:** *Ginkgo biloba*

**Synonym:**

**Common Name:** ginkgo  
maidenhair tree

**Questionnaire :** current 20090513  
**Status:** Assessor Approved

**Assessor:** Patti Clifford  
**Data Entry Person:** Patti Clifford

**Designation:**

**WRA Score 0**

101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?	y=1, n=-1	
103	Does the species have weedy races?	y=1, n=-1	
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	Low
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	Intermediate
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	n
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n

412	Forms dense thickets	y=1, n=0	
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	n
604	Self-compatible or apomictic	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	
706	Propagules bird dispersed	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)	y=1, n=-1	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation:

WRA Score **0**

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**Supporting Data:**

101	2011. WRA Specialist. Personal Communication.	[Is the species highly domesticated? No] No evidence of domestication that reduces weediness.
102	2011. WRA Specialist. Personal Communication.	[Has the species become naturalized where grown?] NA
103	2011. WRA Specialist. Personal Communication.	[Does the species have weedy races?] NA
201	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical] Native range: China - Zhejiang [n.w.]
202	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Quality of climate match data?] Native range: China - Zhejiang [n.w.]
203	1999. Coder, K.D./Warnell, D.B.. Potential allelopathy in different tree species. School of Forest Resources Extension publication FOR99-003. University of Georgia, Athens <a href="http://www.urbanforestrysouth.org/resources/library/Citation.2004-07-15.3616/view?se">http://www.urbanforestrysouth.org/resources/library/Citation.2004-07-15.3616/view?se</a>	[Broad climate suitability (environmental versatility? Yes] "Ginkgo is an early successional pioneer onto open mineral soils in full sun. They establish and grow on disturbed sites within mixed temperate forests. Ginkgo does well where conditions lean toward warm and moist conditions and perform poorly where sites concentrate low temperatures and wind / ice storms. As with most trees, temperature and water availability regimes override most other site constraints. Ginkgo is considered summer drought tolerant. In general, ginkgo requires 90% to 100% sun, moist but well-drained soils, and neutral to acidic soils. Ginkgo requires North American winter hardiness zones of 4 - 8 and North American heat zones of 4 - 8.5. Altitudinal limits are below 6,000 feet above sea-level."
203	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Broad climate suitability (environmental versatility? Yes] Climatic amplitude (estimates) - Altitude range: 50 - 2000 m - Mean annual rainfall: 330 - 2000 mm - Rainfall regime: summer - Dry season duration: 3 - 6 months - Mean annual temperature: 10 - 18°C - Mean maximum temperature of hottest month: 22 - 29°C - Mean minimum temperature of coldest month: -2 - 8°C - Absolute minimum temperature: -20 - -10°C
204	2007. Randall, R.P.. Global Compendium of Weeds - Index [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	[Native or naturalized in regions with tropical or subtropical climates? No] No evidence.
205	2003. Coder, K.D.. Ginkgo: eldest tree survivor. School of Forest Resources University of Georgia, <a href="http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name">http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] "As more seeds became available, and as more trees were planted to supply the royal court, the more seedlings escaped and were cultivated by merchants. Around 800 years ago ginkgo trees were first recorded as part of trade to Japan and Korea. Europeans first saw the tree in Japan in 1691 and noted its unique qualities. Upon further searching through the middle 1700's, Europeans found ginkgo growing in China, Japan, and Korea. Ginkgo was first described botanically in continental Europe in 1712. The Dutch introduced the tree to continental Europe in 1727 near Utrecht. Cultivation in England began in 1754. A botanist and collector named Hamilton planted the first two trees in the United States near Philadelphia in 1784. Both these trees are now gone. The oldest living ginkgo tree in the United States was planted in 1785 or shortly thereafter by the Bartram brothers (famous botanical explorers), also near Philadelphia. A planting fad erupted among upper middle class and wealthy households in the northeastern part of the United States in the early 1800's and again in the 1890's until the first world war. A curiosity and strangeness factor still propels planting ginkgoes around the world – in yards, schools, streets and parks."

205	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Does the species have a history of repeated introductions outside its natural range? Yes] "G. biloba has been widely introduced outside of its range, mostly for ornamental purposes as a landscape tree, rather than as a source of timber. Its attractive foliage, resistance to pests and diseases and adaptability to urban conditions has resulted in plantings along roadsides, in public parks and in private gardens.  It was introduced to Japan during the seventh to mid-eighth century, and then to European and American countries in the 1700s. It was introduced into the Netherlands in around 1727 (Dallimore and Jackson, 1966), the UK in 1758 (Streets, 1962) and the USA in 1784. G. biloba has also been introduced into Korea, Burma, Germany, Sweden, Denmark, Canada, Italy, France, and Argentina (Zhang, 1992) and many other countries."
301	2003. Coder, K.D.. Ginkgo: eldest tree survivor. School of Forest Resources University of Georgia, <a href="http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name">http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name</a>	[Naturalized beyond native range? No] "Ginkgo can be found in naturalized stands within the mixed species forests concentrated on the lower mountainsides of the Western Tien Mu Shan in Southern Anhui province and in adjacent Western Zhejiang province, West of Shanghai, China. It is unclear if any of the remaining old stands of ginkgo in China are true natives to their sites, or were naturalized and cultivated by man over the last two millennia."
301	2011. Whetstone, R.D.. Flora of North America Volume 2 - Ginkgo biloba. 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Naturalized beyond native range? No] "Seedlings or saplings of ginkgo are very rarely found in the vicinity of planted trees and in fencerows and woods (undocumented reports from Kentucky, New Jersey, New York, Ohio, Pennsylvania, and Virginia), hence the inclusion of the species in the flora. Nevertheless, the species is doubtfully naturalized in North America despite about two centuries of cultivation here."
301	2011. WRA Specialist. Personal Communication.	[Naturalized beyond native range? No] No evidence of naturalization.
302	2007. Randall, R.P.. Global Compendium of Weeds - Index [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	[Garden/amenity/disturbance weed? No] No evidence.
303	2007. Randall, R.P.. Global Compendium of Weeds - Index [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	[Agricultural/forestry/horticultural weed? No] No evidence.
304	2007. Randall, R.P.. Global Compendium of Weeds - Index [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	[Environmental weed? No] The Global Compendium of Weeds lists Ginkgo biloba as an environmental weed. There is no evidence of impacts or control efforts.
305	2003. Coder, K.D.. Ginkgo: eldest tree survivor. School of Forest Resources University of Georgia, <a href="http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name">http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name</a>	[Congeneric weed? No] Ginkgo biloba is the only species in the genus Ginkgo and the only surviving genus in the family Ginkgoaceae.
401	2011. Whetstone, R.D.. Flora of North America Volume 2 - Ginkgo biloba. 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Produces spines, thorns or burrs? No] "Trees to 30 m. Crown somewhat ovoid to obovoid, tending to be asymmetric, primary branches ascending at ca. 45° from trunk. Long shoots faintly striate; spurs thick, knoblike or to 3 cm, gray, covered with bud-scale scars. Buds brown, globose, scales imbricate, margins scariosus. Leaves fan-shaped, glabrous except for tuft of hairs in axils, blades 2--9.5 × 2--12 cm, mostly 1.5 times wider than long, apices cleft to truncate; venation dichotomous, appearing parallel; leaf scars semicircular; petioles channeled on adaxial surface, 2.5--8.5 cm."
402	1999. Coder, K.D./Warnell, D.B.. Potential allelopathy in different tree species. School of Forest Resources Extension publication FOR99-003. University of Georgia, Athens <a href="http://www.urbanforestrysouth.org/resources/library/Citation.2004-07-15.3616/view?se">http://www.urbanforestrysouth.org/resources/library/Citation.2004-07-15.3616/view?se</a>	[Allelopathic?] Seeds or fruit could have a moderate allelopathic effect.
403	2011. Whetstone, R.D.. Flora of North America Volume 2 - Ginkgo biloba. 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Parasitic? No] Not parasitic.
404	2011. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals?] Unknown.
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? No] No evidence of toxicity to animals.

405	2011. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, <a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>	[Toxic to animals? No] No evidence of toxicity to animals.
406	2003. Coder, K.D.. Ginkgo: eldest tree survivor. School of Forest Resources University of Georgia, <a href="http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name">http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name</a>	[Host for recognized pests and pathogens? No] Ginkgo has few primary pests and shares key stresses with all other trees – water availability in the growing season. Ginkgo is tolerant of air pollutants at low to moderate levels. Seeds are susceptible to fungal attack.
406	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Host for recognized pests and pathogens? No] "There are few serious diseases of <i>G. biloba</i> . Seedling rot and damping off can occur, although silvicultural practices, such as correct shading, irrigation, loosening soil, thinning, covering with straw along row gaps or earthing up, are helpful in preventing its occurrence (Shi, 1989; Zhu and Shi, 1990; Zhang, 1992).  <i>G. biloba</i> is attacked by some insect pests, such as termites ( <i>Reticulitermes chinensis</i> , <i>Odontotermes formosanus</i> , <i>Macrotermes barneyi</i> and <i>Copotermes formosanus</i> ), <i>Pammene</i> spp., <i>Caligula japonica</i> , <i>Scirtothrips dorsalis</i> , <i>Cryptothelea variegata</i> . Termites attack stems and branches, and can be effectively controlled by spraying mirex into insect holes. The other insect pests are mainly defoliators, and are normally controlled with chemicals, such as dichlorvos, trichlorfon, or dimethoate, by removal of pupae in winter or capturing larvae. Some natural enemies, such as the parasitoids from the genera <i>Trichogramma</i> and <i>Telenomus</i> , are very helpful in some cases."
406	2011. Ohio State University. Ginkgo biloba. Ohio State University, <a href="http://hcs.osu.edu/hcs/tmi/plantlist/gi_iloba.html">http://hcs.osu.edu/hcs/tmi/plantlist/gi_iloba.html</a>	[Host for recognized pests and pathogens? No] Ginkgo Family, being virtually free of disease and pest problems.
407	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Causes allergies or is otherwise toxic to humans? ] "This botanically unique tree is highly prized for its unusual secondary metabolites contained in the leaves. For example, among others, it contains a number of highly oxidized terpene trilactones (ginkgolides, bilobalide) which, together with some flavonoids, are considered to be responsible for the pharmacological activities of standardized leaf extracts. These have vaso- and tissue-protective action (Loggia et al., 1996), and cognition-enhancing and anti-ageing activity, including stress-alleviating and neuroprotective/neurotrophic effects. All these properties support the therapeutic applications of <i>G. biloba</i> extracts against cerebral insufficiency (Krieglstein et al., 1995; Curtis-Prior et al., 1999) and impaired peripheral blood circulation.  Most research concerning <i>G. biloba</i> leaf extracts has focused on three important effects on the human body: improved circulation (including microcirculation in capillaries); antioxidant protective functions against oxidative cell damage from free radicals (Pietri et al., 1997); and blocking platelet aggregation (blood clotting) effects that are related to the development of cardiovascular, renal, respiratory and nervous system disorders (Li et al., 1998b).  In Chinese traditional medicine, the leaves are still used as a tea to treat respiratory problems such as asthma and bronchitis, hearing loss, coughs, tuberculosis, poor circulation, memory loss, gonorrhea, stomach pains, skin diseases and anxiety."
407	2011. Kwant, C.. The Ginkgo pages. <a href="http://kwanten.home.xs4all.nl/index.htm">http://kwanten.home.xs4all.nl/index.htm</a>	[Causes allergies or is otherwise toxic to humans? Yes] "Because of the presence of butyric acid, the fleshy layer produces an odour similar to rancid butter upon decay. Its tissues may cause nausea or skin eruptions (dermatitis) in man. The inner tissues are palatable (gametophyte and embryo). The seed coat also contains small amounts of urushiol, an allergen that only on contact with the skin is responsible for poison oak and poison ivy contact dermatitis in sensitive people so when gathering the ripe fruits wear rubber gloves. "
407	2011. Whetstone, R.D.. Flora of North America Volume 2 - Ginkgo biloba. 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Causes allergies or is otherwise toxic to humans? Yes] Oils from the outer coat are known to cause dermatitis in some humans.
408	2011. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? No] No evidence of being a fire hazard.
409	2003. Coder, K.D.. Ginkgo: eldest tree survivor. School of Forest Resources University of Georgia, <a href="http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name">http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name</a>	[Is a shade tolerant plant at some stage of its life cycle? No] Ginkgo requires 90% to 100% sun.

409	2011. Ohio State University. <i>Ginkgo biloba</i> . Ohio State University, <a href="http://hcs.osu.edu/hcs/tmi/plantlist/gi_iloba.html">http://hcs.osu.edu/hcs/tmi/plantlist/gi_iloba.html</a>	[Is a shade tolerant plant at some stage of its life cycle? No] Full sun to partial sun.
410	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] Soil and physiography <i>G. biloba</i> can grow on a range of soils, such as acid, neutral and alkaline, and grows best on deep, moist and fertile sandy loams with good drainage. It grows poorly on infertile soils in rocky, mountainous areas. It does not tolerate saline or flooded soils.  Soil descriptors - Soil texture: light; medium; heavy - Soil drainage: free - Soil reaction: acid; neutral; alkaline - Special soil tolerances: infertile - Soil types: alluvial soils; cambisols; clay soils; limestone soils; red soils; sandy soils
410	2011. Ohio State University. <i>Ginkgo biloba</i> . Ohio State University, <a href="http://hcs.osu.edu/hcs/tmi/plantlist/gi_iloba.html">http://hcs.osu.edu/hcs/tmi/plantlist/gi_iloba.html</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] " Prefers moist, deep, sandy soils in full sun, but is very adaptable to stressful situations, including poor soils, compacted soils, various soil pHs, heat, drought."
411	2011. Whetstone, R.D.. Flora of North America Volume 2 - <i>Ginkgo biloba</i> . 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Climbing or smothering growth habit? No] Trees to 30m.
412	2011. WRA Specialist. Personal Communication.	[Forms dense thickets?] Unknown.
501	2011. Whetstone, R.D.. Flora of North America Volume 2 - <i>Ginkgo biloba</i> . 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Aquatic? No] Terrestrial. Tree.
502	2011. Whetstone, R.D.. Flora of North America Volume 2 - <i>Ginkgo biloba</i> . 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Grass? No] Ginkgoaceae.
503	2011. Whetstone, R.D.. Flora of North America Volume 2 - <i>Ginkgo biloba</i> . 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Nitrogen-fixing woody plant? No] Ginkgoaceae.
504	2011. Whetstone, R.D.. Flora of North America Volume 2 - <i>Ginkgo biloba</i> . 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Tree.
601	2011. Whetstone, R.D.. Flora of North America Volume 2 - <i>Ginkgo biloba</i> . 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Evidence of substantial reproductive failure in native habitat? No] "In China <i>Ginkgo biloba</i> is either extinct in the wild or drastically restricted in range. The species is reported to occur naturally in remote mountain valleys in China's Zhejiang province (C. N. Page 1990). Persistence of trees planted about dwellings, however, when no trace of the dwellings remains, complicates discerning the status of such trees. Most, if not all, ginkgoes exist only in cultivation."
602	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Produces viable seed? Yes] "Germination tests in moist sand have revealed germination rates of 32-85% and that cold stratification for 30-60 days increases germination. Recent research indicates that the embryo is well-developed at the time of dispersal and that the seed coat only contributes to winter dormancy. Scarification and soaking seed in water beforehand also enhance germination rates. "
602	2011. Ohio State University. <i>Ginkgo biloba</i> . Ohio State University, <a href="http://hcs.osu.edu/hcs/tmi/plantlist/gi_iloba.html">http://hcs.osu.edu/hcs/tmi/plantlist/gi_iloba.html</a>	[Produces viable seed? Yes] Propagated by cuttings and by seed.
603	2011. Whetstone, R.D.. Flora of North America Volume 2 - <i>Ginkgo biloba</i> . 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Hybridizes naturally? No] Monotypic genus.

604	2003. Coder, K.D.. Ginkgo: eldest tree survivor. School of Forest Resources University of Georgia, <a href="http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name">http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name</a>	[Self-compatible or apomictic ? No] Dioecious. Approximately 0.5% of male ginkgoes will generate some isolated female flowers and seeds (monoecious).
604	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Self-compatible or apomictic ? No] Dioecious species.
605	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Requires specialist pollinators? No] Flowers are wind-pollinated.
606	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Reproduction by vegetative fragmentation? ] Vegetative propagation by cuttings; air layering; grafting; tissue culture.
606	2011. Shepperd, W.D.. Ginkgo biloba L. In The woody plant seed manual. U.S. Forest Service, <a href="http://www.rngr.net/publications/wpsm/genera/g/at_download/file">www.rngr.net/publications/wpsm/genera/g/at_download/file</a>	[Reproduction by vegetative fragmentation? Yes ] Ginkgo is also capable of reproducing vegetatively.
607	2003. Coder, K.D.. Ginkgo: eldest tree survivor. School of Forest Resources University of Georgia, <a href="http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name">http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name</a>	[Minimum generative time (years)? 3+] Female trees reach sexual maturity at 20-40 years of age.
607	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Minimum generative time (years)? 3+]Ginkgo begins bearing seed at 30-40 years old.
701	2011. WRA Specialist. Personal Communication.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] No evidence of unintentional dispersal.
702	2003. Coder, K.D.. Ginkgo: eldest tree survivor. School of Forest Resources University of Georgia, <a href="http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name">http://www.urbanforestrysouth.org/resources/library/ginkgo-eldest-tree-survivor/file_name</a>	[Propagules dispersed intentionally by people? Yes] "As more seeds became available, and as more trees were planted to supply the royal court, the more seedlings escaped and were cultivated by merchants. Around 800 years ago ginkgo trees were first recorded as part of trade to Japan and Korea. Europeans first saw the tree in Japan in 1691 and noted its unique qualities. Upon further searching through the middle 1700's, Europeans found ginkgo growing in China, Japan, and Korea. Ginkgo was first described botanically in continental Europe in 1712. The Dutch introduced the tree to continental Europe in 1727 near Utrecht. Cultivation in England began in 1754. A botanist and collector named Hamilton planted the first two trees in the United States near Philadelphia in 1784. Both these trees are now gone. The oldest living ginkgo tree in the United States was planted in 1785 or shortly thereafter by the Bartram brothers (famous botanical explorers), also near Philadelphia. A planting fad erupted among upper middle class and wealthy households in the northeastern part of the United States in the early 1800's and again in the 1890's until the first world war. A curiosity and strangeness factor still propels planting ginkgoes around the world – in yards, schools, streets and parks."
702	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules dispersed intentionally by people? Yes] G. biloba is a typical multipurpose tree, widely cultivated for nut production, timber and as an ornamental.
703	2011. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence of produce contaminant.
704	2011. Whetstone, R.D.. Flora of North America Volume 2 - Ginkgo biloba. 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Propagules adapted to wind dispersal? No] "Seeds obovoid to ellipsoid, yellow to orange, 2.3--2.7 × 1.9--2.3 cm."
705	2011. WRA Specialist. Personal Communication.	[Propagules water dispersed?] Unknown.
706	2011. Whetstone, R.D.. Flora of North America Volume 2 - Ginkgo biloba. 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Propagules bird dispersed? Yes] "In the flora area seeds of ginkgo, minus the fleshy outer coat, have been found beneath various species of trees up to 150 m from the nearest seed-producing ginkgo. The dispersal agents were almost certainly birds, possibly crows. A cache of ginkgo seeds, in association with scats of raccoons [ Procyon lotor (Linnaeus), family Procyonidae], was found in a tree crotch about 50 m from the nearest source of the seeds."
707	2011. Whetstone, R.D.. Flora of North America Volume 2 - Ginkgo biloba. 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Propagules dispersed by other animals (externally)? No] "Seeds obovoid to ellipsoid, yellow to orange, 2.3--2.7 × 1.9--2.3 cm." [no means of external attachment]

708	2011. Whetstone, R.D.. Flora of North America Volume 2 - Ginkgo biloba. 2: .Efloras.org, <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=200005235</a>	[Propagules survive passage through the gut? Yes] "In the flora area seeds of ginkgo, minus the fleshy outer coat, have been found beneath various species of trees up to 150 m from the nearest seed-producing ginkgo. The dispersal agents were almost certainly birds, possibly crows. A cache of ginkgo seeds, in association with scats of raccoons [ <i>Procyon lotor</i> (Linnaeus), family Procyonidae], was found in a tree crotch about 50 m from the nearest source of the seeds."
802	2002. Liang, Y./Sun, W.Q.. Rate of dehydration and cumulative desiccation interacted to modulate desiccation tolerance of recalcitrant cocoa and ginkgo embryonic tissues. <i>Plant Physiology</i> . 128: 1323-1331.	[Evidence that a persistent propagule bank is formed (>1 yr)? Recalcitrant seeds.
802	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)?] Seed storage orthodox.
802	2011. Shepperd, W.D.. Ginkgo biloba L. In The woody plant seed manual. U.S. Forest Service, <a href="http://www.mngr.net/publications/wpsm/genera/g/at_dow_nload/file">www.mngr.net/publications/wpsm/genera/g/at_dow_nload/file</a>	[Evidence that a persistent propagule bank is formed (>1 yr)?] "A stratification period of 30 to 60 days at 5 °C before planting has been recommended (Ponder and others 1981), however 1 to 2 months of warm stratification before cold stratification is also advised to allow seeds to fully mature (Dirr and Heuser 1987; Willan 1985)."
803	2011. WRA Specialist. Personal Communication.	[Well controlled by herbicides?] Unknown.
804	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] Ability to sucker, self-prune.
805	2011. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)?] Unknown.