

Australia/New Zealand Weed Risk Assessment adapted for Florida.

Data used for analysis published in: Gordon, D.R., D.A. Onderdonk, A.M. Fox, R.K. Stocker, and C. Gantz. 2008. Predicting Invasive Plants in Florida using the Australian Weed Risk Assessment. Invasive Plant Science and Management 1: 178-195.

| <i>Abrus precatorius (rosary pea)</i> | | | |
|----------------------------------------------|--------------------------------------------------------------------------------------|---------------|--------------|
| Question number | Question | Answer | Score |
| 1.01 | Is the species highly domesticated? | n | 0 |
| 1.02 | Has the species become naturalised where grown? | | |
| 1.03 | Does the species have weedy races? | | |
| 2.01 | Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high) | 2 | |
| 2.02 | Quality of climate match data (0-low; 1-intermediate; 2-high) | 2 | |
| 2.03 | Broad climate suitability (environmental versatility) | y | 1 |
| 2.04 | Native or naturalized in habitats with periodic inundation | ? | |
| 2.05 | Does the species have a history of repeated introductions outside its natural range? | y | |
| 3.01 | Naturalized beyond native range | y | 0 |
| 3.02 | Garden/amenity/disturbance weed | n | 0 |
| 3.03 | Weed of agriculture | y | 0 |
| 3.04 | Environmental weed | y | 0 |
| 3.05 | Congeneric weed | n | 0 |
| 4.01 | Produces spines, thorns or burrs | n | 0 |
| 4.02 | Allelopathic | n | 0 |
| 4.03 | Parasitic | n | 0 |
| 4.04 | Unpalatable to grazing animals | n | -1 |
| 4.05 | Toxic to animals | y | 1 |
| 4.06 | Host for recognised pests and pathogens | y? | 1 |
| 4.07 | Causes allergies or is otherwise toxic to humans | y | 1 |
| 4.08 | Creates a fire hazard in natural ecosystems | n | 0 |
| 4.09 | Is a shade tolerant plant at some stage of its life cycle | | |
| 4.1 | Grows on infertile soils (oligotrophic, limerock, or excessively draining soils) | y | 1 |
| 4.11 | Climbing or smothering growth habit | y | 1 |
| 4.12 | Forms dense thickets | ? | |
| 5.01 | Aquatic | n | 0 |
| 5.02 | Grass | n | 0 |
| 5.03 | Nitrogen fixing woody plant | y | 1 |
| 5.04 | Geophyte | n | 0 |

| | | | |
|--------------------|------------------------------------------------------------------------------------------------|----|-----------|
| 6.01 | Evidence of substantial reproductive failure in native habitat | | |
| 6.02 | Produces viable seed | y | 1 |
| 6.03 | Hybridizes naturally | | |
| 6.04 | Self-compatible or apomictic | | |
| 6.05 | Requires specialist pollinators | n | 0 |
| 6.06 | Reproduction by vegetative fragmentation | | |
| 6.07 | Minimum generative time (years) | | |
| 7.01 | Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas) | | |
| 7.02 | Propagules dispersed intentionally by people | y | 1 |
| 7.03 | Propagules likely to disperse as a produce contaminant | n | -1 |
| 7.04 | Propagules adapted to wind dispersal | n | -1 |
| 7.05 | Propagules water dispersed | n | -1 |
| 7.06 | Propagules bird dispersed | y | 1 |
| 7.07 | Propagules dispersed by other animals (externally) | n | -1 |
| 7.08 | Propagules dispersed by other animals (internally) | | |
| 8.01 | Prolific seed production | y | 1 |
| 8.02 | Evidence that a persistent propagule bank is formed (>1 yr) | y? | 1 |
| 8.03 | Well controlled by herbicides | y | -1 |
| 8.04 | Tolerates, or benefits from, mutilation or cultivation | | |
| 8.05 | Effective natural enemies present in Florida, or east of the continental divide | | |
| Total Score | | | 16 |

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| Outcome | Reject* |
|----------------|----------------|

*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. *Conserv. Biol.* 18: 360-368.

| section | # questions answered | satisfy minimum? |
|----------------|-----------------------------|-------------------------|
| A | 7 | yes |
| B | 10 | yes |
| C | 15 | yes |
| total | 32 | yes |

Data collected 2006-2007

| Question number | Reference | Source data |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.01 | | cultivated, but no evidence of selection for reduced weediness |
| 1.02 | | |
| 1.03 | | |
| 2.01 | | |
| 2.02 | | |
| 2.03 | Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu. | "Native to tropical Africa and Madagascar to tropical Asia, eastward to Australia and in the Pacific to the Tuamotus" |
| 2.04 | Francis (2003) USDA Forest Service, International Institute of Tropical Forestry (http://www.fs.fed.us/global/iitf/pdf/shrubs/Abrus%20precatorius.pdf). | "on all drainage classes except very poorly drained" |
| 2.05 | Francis (2003) USDA Forest Service, International Institute of Tropical Forestry (http://www.fs.fed.us/global/iitf/pdf/shrubs/Abrus%20precatorius.pdf). | "Humans have been responsible for the long-distance transport that has resulted in the current pantropical distribution." |
| 3.01 | 1. Kairo, Ali, Cheesman, Haysom, and Murphy (2003) Invasive Species Threats in the Caribbean Region. Report to the Nature Conservancy. 2. Wagner, Herbst, and Sohmer (1999) Manual of the flowering plants of Hawai'i. University of Hawai'i Press/Bishop Museum Press, Honolulu. | 1. Naturalized in the Caribbean 2. "widely naturalized", including Hawaii |
| 3.02 | | no evidence |
| 3.03 | Holm (1979) A Geographical Atlas of World Weeds. John Wiley and Sons. | Reported as a common weed of agriculture in India and Puerto Rico, and present as a weed in the Dominican Republic, Honduras, Jamaica, western Polynesia, and the U.S. |
| 3.04 | Kairo, Ali, Cheesman, Haysom, and Murphy (2003) Invasive Species Threats in the Caribbean Region. Report to the Nature Conservancy. | Considered naturalized and invasive in the Bahamas. |
| 3.05 | | no evidence |
| 4.01 | Padua, Bunyapraphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. | no description of these traits |
| 4.02 | | no evidence |
| 4.03 | Padua, Bunyapraphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. | no description of this |
| 4.04 | Francis (2003) USDA Forest Service, International Institute of Tropical Forestry (http://www.fs.fed.us/global/iitf/pdf/shrubs/Abrus%20precatorius.pdf). | "These plants can be controlled by heavy grazing" |

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| 4.05 | 1. Weber (2003) Invasive Plant Species of the World. CABI Publishing. 2. Padua, Bunyaphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. | 1. "The seeds are extremely poisonous to livestock and humans." 2. "Abrin [the toxic compound in <i>A. precatorius</i>] is one of the two most toxic substances of plant origin known" |
| 4.06 | Padua, Bunyaphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. | "The most serious disease of <i>A. precatorius</i> in Indonesia is <i>Rhizoctonia solani</i> , a fungus that causes stem rot. Witches broom disease caused by a mycoplasma-like organism has been reported on <i>A. precatorius</i> in Taiwan." |
| 4.07 | 1. Weber (2003) Invasive Plant Species of the World. CABI Publishing. 2. Padua, Bunyaphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. | 1. "The seeds are extremely poisonous to livestock and humans." 2. "Abrin [the toxic compound in <i>A. precatorius</i>] is one of the two most toxic substances of plant origin known" |
| 4.08 | | no evidence |
| 4.09 | | |
| 4.1 | Francis (2003) USDA Forest Service, International Institute of Tropical Forestry (http://www.fs.fed.us/global/iitf/pdf/shrubs/Abrus%20precatorius.pdf). | "In Puerto Rico, crab's eye [<i>A. precatorius</i>] grows...on all drainage classes except very poorly drained and on soils of all textures and parent materials." |
| 4.11 | Weber (2003) Invasive Plant Species of the World. CABI Publishing. | "a slender twining or trailing woody vine" |
| 4.12 | Weber (2003) Invasive Plant Species of the World. CABI Publishing. | "This deep rooting plant has trailing and climbing shoots that smother native shrubs and small trees with a dense curtain of branches, impeding their growth and reproduction." |
| 5.01 | | terrestrial |
| 5.02 | USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. | Fabaceae |
| 5.03 | Allen and Allen (1981) The Leguminosae: a Source Book of Characteristics, Uses, and Nodulation. The University of Wisconsin Press, Madison. | <i>A. precatorius</i> widely reported to be nodulated. |
| 5.04 | Francis (2003) USDA Forest Service, International Institute of Tropical Forestry (http://www.fs.fed.us/global/iitf/pdf/shrubs/Abrus%20precatorius.pdf). | "Crab's eye [<i>A. precatorius</i>] produces a tap and lateral root system with abundant fine roots." |
| 6.01 | | |
| 6.02 | Padua, Bunyaphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and | "When untreated, the germination rate is about |

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| | poisonous plants 1. Backhuys Publishers, Leiden. | 40% in 18 days." |
| 6.03 | | |
| 6.04 | | |
| 6.05 | Ramirez (2004) Ecology of pollination in a tropical Venezuelan savanna. Plant Ecology 173: 171-189. | <i>A. precatوريوس</i> is bee-pollinated. |
| 6.06 | | |
| 6.07 | | |
| 7.01 | | |
| 7.02 | 1. Padua, Bunyaphatsara, and Lemmens, eds. (1999) Plant Resources of South-East Asia. No. 12. Medicinal and poisonous plants 1. Backhuys Publishers, Leiden. 2. Francis (2003) USDA Forest Service, International Institute of Tropical Forestry (http://www.fs.fed.us/global/iitf/pdf/shrubs/Abrus%20precatوريوس.pdf). | 1. " <i>A. precatوريوس</i> is often cultivated in Java as an ornamental... <i>A. precatوريوس</i> is sometimes cultivated for its medicinal uses or for the sweetening properties of the leaves" 2. "Humans have been responsible for the long-distance transport that has resulted in the current pantropical distribution." |
| 7.03 | | no evidence |
| 7.04 | Weber (2003) Invasive Plant Species of the World. CABI Publishing. | fruits are pods 2-5 cm long, seeds are oval and 6-7 mm long |
| 7.05 | | no evidence |
| 7.06 | Weber (2003) Invasive Plant Species of the World. CABI Publishing. | seeds are dispersed by birds |
| 7.07 | | no evidence of any means of attachment |
| 7.08 | | |
| 8.01 | 1. Weber (2003) Invasive Plant Species of the World. CABI Publishing. 2. Francis (2003) USDA Forest Service, International Institute of Tropical Forestry (http://www.fs.fed.us/global/iitf/pdf/shrubs/Abrus%20precatوريوس.pdf). | 1. "It produces seeds prolifically"; 3-8 seeds per pod 2. "Seeds are produced in abundance." |
| 8.02 | Allen and Allen (1981) The Leguminosae: a Source Book of Characteristics, Uses, and Nodulation. The University of Wisconsin Press, Madison. | "The occurrence of 9 distinct cell layers in the seed coat accounts for its impermeability to water and other solvents" [hard-seeded legume] |
| 8.03 | Langeland and Stocker (2001) Control of non-native plants in natural areas of Florida. University of Florida, IFAS Extension, SP 242 (http://edis.ifas.ufl.edu/pdf/FILES/WG/WG20900.pdf). | "Treat base of vine with 10% Garlon 4. Site must be revisited several times to pull seedlings...All methods listed have been found effective under certain circumstances." |
| 8.04 | | |
| 8.05 | | |