

# Weed risk assessment



## Brazilian jointvetch

*Aeschynomene brasiliana*

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Note: information is still being collected for this species.  
Technical comments on this document are most welcome.

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Front cover: *Aeschynomene brasiliana*

Photo: Kendrick Cox, Department of Employment, Economic Development and Innovation

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# Summary

*Aeschynomene brasiliana* (Brazilian jointvetch) is a perennial legume native to tropical America. It was imported and planted in Queensland in the 1980s and 1990s to investigate its potential use as a new pasture legume. However, forage trials concluded that it was of little value as cattle feed.

*A. brasiliana* is currently invading grassy understoreys in open tropical woodlands near where it was planted at various sites in north Queensland. While there is little doubt that it is an invasive species, its impact appears relatively minor since it does not appear to dominate. Nevertheless, it is still regarded as an undesirable plant that could be competing with native plants and other more desirable pasture plants at low levels.

This study was unable to find evidence that *A. brasiliana* was a major weed anywhere else in the world. However, three congeners (*A. indica*, *A. virginica* and *A. rudis*) are noxious in some states of the United States and a fourth (*A. paniculata*) is considered to be a significant emerging weed in north Queensland.

Currently, *A. brasiliana* exists as very small populations scattered along the east coast of Queensland. Some sites have been subject to control efforts by the Department of Employment, Economic Development and Innovation (DEEDI), co-sponsored by the Meat and Livestock Association.

Climatically, *A. brasiliana* appears well adapted to the seasonally dry tropics of north Queensland. Within this climate zone, it is perhaps best adapted to open, tropical woodland. If allowed to spread, *A. brasiliana* has the potential to become a widespread plant over much of north Queensland's open tropical woodlands.

# Introduction

## Identity and taxonomy

**Species identity:** *Aeschynomene brasiliana* (Poir.) DC (Fabaceae—also Papilionaceae/ Aeschynomeneae)

**Common names:** Brazilian jointvetch, pega pega

**Synonyms:** *Aeschynomene biflora* (Miller) Fawcett & Rendle, *Aeschynomene guaricana* Pittier, *Aeschynomene paucijuga* DC. var. *subscabra* DC., *Cassia biflora* Miller, *Cassia houstoniana* Colladon, *Hedysarum brasilianum* Poir., *Hedysarum hirtum* Vell. Conc.

## Description

*A. brasiliana* is a prostrate or decumbent herb with stems to about 2 m tall (generally much shorter). Stems are glandular–hispidulous (bristly and sticky), crisp–pubescent and woody near the crown. Leaves are pinnate, 2–3 cm long, with up to 22 leaflets per leaf (Figure 1).



Figure 1. Compound leaves of *Aeschynomene brasiliana* with yellow flower (photo: Kendrick Cox, DEEDI)

Leaflets are obovate–elliptic to oblong, 5–15 mm long, 3–8 mm wide and sparsely pubescent to glabrous on their upper surfaces. Each inflorescence comprises 1–8 yellow flowers. Pods have 2–5 segments and are crisp–pubescent and also glandular–hispidulous. Each article (pod segment) is about 2.5–3 mm long and 2–3 mm wide. Seeds are dark brown and about 2 mm long and 1–1.5 mm wide. There are 200 000–300 000 seeds per kilogram (Cook et al. 2005).

## Reproduction and dispersal

*A. brasiliana* reproduces from seeds. A high proportion of seeds have hard coats, resulting in lengthy survival times when buried in soil. Soil seed reserves of up to 2000–3000 seeds per m<sup>2</sup> have been recorded after five years (Cook et al. 2005).

*A. brasiliana* appears to have a short-day flowering response, with some specimens (at 21° S) observed to commence flowering in mid to late March (Cook et al. 2005).

The pods are quite sticky and hence can be expected to adhere to cattle and other animals, perhaps resulting in dispersal of seeds (Cook et al. 2005). Pods and seeds are ingested by cattle and as the seeds are hard-coated probably survive passage through the gut.

## Origin and distribution

*A. brasiliana* has a widespread native distribution in tropical America, including:

- North America—Mexico (Jalisco)
- Central America—Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico (Chiapas), Nicaragua and Panama
- Caribbean—Cuba and Trinidad
- South America—Bolivia, Brazil (Amapá, Pará, Bahia, Goiás, Ceará, Rio de Janeiro), Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname and Venezuela (from USDA-GRIN 2008).



Figure 2. Native distribution of *Aeschynomene brasiliana* (data from the Global Biodiversity Information Facility 2008)

## History of introduction into Queensland

Five accessions of *A. brasiliana* were planted at c. 44 sites in Queensland to evaluate the species' potential usefulness as a new pasture legume. Original seed stock was believed to have originated from Brazil and Columbia (CPI database and QPastures database, unpublished).

## Status in Australia and Queensland

The Queensland herbarium holds 13 records for this species in Queensland—11 of these are from cultivated specimens (10 are from South Kennedy, collected from Mackay DEEDI, and one from an experimental plot west of Nebo). The remaining two records are noted as being ‘doubtfully naturalised’, one from a garden at Mareeba DEEDI and one from Wide Bay.

*A. brasiliiana* has been planted for research purposes in the Northern Territory in at least two areas mentioned in a report by Cameron (2001), viz. the Darwin area (which includes Berrimah Agricultural Research Station) and the Northern Coastal Upland areas (which include the Coastal Plains Research Station and Beatrice Hills Research Station).

At several sites in north Queensland, *A. brasiliiana* has escaped from grazing trials to invade nearby grassy understoreys within open tropical woodlands (Figure 3). While it does not appear to dominate these sites or cause major problems, its persistence within this natural ecosystem, combined with its low value as a pasture plant, means that it is generally considered undesirable. Hence, the current impact of *A. brasiliiana* is considered relatively minor and localised, being restricted to small areas of the state in close proximity to where it was planted as a potential forage species. If allowed to spread, however, this plant is predicted to establish over a much larger area of the state (as discussed overleaf).



Figure 3. *Aeschynomene brasiliiana* invading a grassy understorey within open tropical woodland in north Queensland (photo: Kendrick Cox, DEEDI)

## Preferred habitats

Climatically, *A. brasiliana* is adapted to seasonally dry tropical areas. While it can persist in areas with an annual rainfall ranging from 650 to 2200 mm per year, it appears best suited to areas with 800–1000 mm per annum (Cook et al. 2005; FAO 2007). Within its native range, it occurs from about 23° N in Mexico and Cuba to about 23° S in Paraguay, at both low and high altitudes (up to about 3000 m) in the tropics, but only at low altitude in less tropical areas. Hence, most collection sites have an annual average temperature in the range 24–27 °C, and less in the extreme upland tropics (Cook et al. 2005).

Within its native range, *A. brasiliana* has been recorded ‘along roadsides, in brushland, savannah and open pine-oak woods’ (Cook et al. 2005). While this study was unable to find more detailed descriptions of this species’ preferred habitat within the published literature, it seems reasonable to conclude that this species is adapted to open habitat types (more or less full sun), including savannahs and other open woodlands. Field observation of this species’ successful invasion of open tropical woodlands in north Queensland supports this conclusion.

*A. brasiliana* prefers sandy soils of near neutral pH and tends to grow particularly well on friable, sandy-surfaced soils. However, it can persist on other well-drained soils with hard-setting surfaces (Cook et al. 2005). *A. brasiliana* can tolerate short-term waterlogging but does not persist in areas subject to prolonged inundation (Cook et al. 2005).

## History as a weed elsewhere

This study was unable to find evidence that *A. brasiliana* was a major weed anywhere else in the world. However, three congeners (*A. indica*, *A. virginica* and *A. rudis*) are noxious in some states of the United States and a fourth (*A. paniculata*) is considered to be a significant emerging weed in north Queensland. *A. indica* is recorded as a dominant weed of crops in parts of Asia, particularly Thailand (TNC 2008).

## Uses

*A. brasiliana* is used as a pasture legume to enhance poor quality grassland. It has no value for cutting systems due to the sticky nature of its stems and seed pods (Cook et al. 2005).

*A. brasiliana* tolerates regular defoliation but is generally not well accepted by cattle, particularly during its first growing season. However, cattle that have grazed it during winter or the dry season tend to eat it more readily the following growing season. Field observation in north Queensland suggests that its palatability is comparable to that of *Stylosanthes scabra*. *A. brasiliana* sheds its leaves during the dry season, but cattle have been observed to ‘lick up’ fallen leaves from the ground.

Cook et al. (2005) noted two accessions as ‘promising’ from a pasture viewpoint.

Promising accessions	Country	Details
CPI 92519, CIAT 8253	Australia	From Rio Grande do Norte, Brazil (6.5° S, 160 m asl, rainfall 650 mm)  Selected as an alternative to <i>Stylosanthes scabra</i> —similar adaptation
CPI 93592, IRFL 2009	Australia	From Mato Grosso do Sul, Brazil (21.25° S, 300 m asl, rainfall 1550 mm)  Slightly earlier flowering and heavier seed set than CPI 92519; also more viscid plant parts, less palatable and greater weed threat

Yields in grazed pastures may be as low as 100 kg of dry matter per hectare. However, estimated yields from pure stands grown under ideal conditions are in excess of 5000 kg of dry matter per hectare (Cook et al. 2005).

## Pest potential in Queensland

*A. brasiliana* has been recognised as a potential weed in north Queensland, mainly because it provides little value as a source of cattle fodder and since it has spread away from where it was originally planted to invade surrounding tropical woodlands.

This plant loses its leaves early in the dry season, produces abundant long-lived seeds and is poorly utilised by cattle. Hence, there are few impediments to its proliferation and spread. After becoming aware of this plant's attributes, pasture scientists decided to seek its control.

Climatically, *A. brasiliana* appears well adapted to the seasonally dry tropics of north Queensland. Within this climatic zone, it is perhaps best adapted to open, tropical woodland (savannahs). A prediction of this species' potential range is provided in Figure 4.

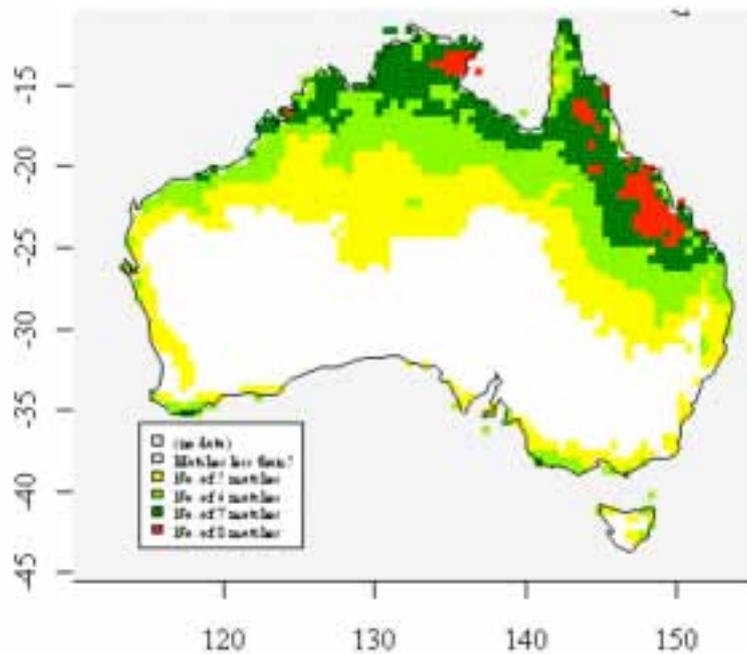


Figure 4. Potential range of *Aeschynomene brasiliana* in Australia, as predicted by PC CLIMATE modelling software (red areas indicate most suitable climate, dark green areas have lower climate suitability, light green and yellow are marginally suitable and white is unsuitable)

Based on an assessment of the plant's climatic and habitat preferences, it has the potential to become a widespread invasive species over much of north Queensland's open tropical woodlands. While it may not dominate any particular site, it is of little economic value and might interfere with natural ecosystem processes and perhaps compete with other more desirable vegetation, albeit at low levels.

## Control

*A. brasiliana* is damaged by botrytis stem rot caused by *Botrytis cinerea*, which is most pronounced in specimens grown to produce commercial seed crops (since development of the disease is favoured by flowering and the moist conditions that often prevail at flowering time) (Cook et al. 2005).

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