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# Invasive Species Compendium

Detailed coverage of invasive species threatening livelihoods and the environment worldwide

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## Phyllostachys aurea (golden bamboo)

### Toolbox

#### Horizon Scanning Tool

(<https://www.cabi.org/HorizonScanningTool>)

#### Mobile Apps

([https://play.google.com/store/apps/dev?id=8227528954463674373&hl=en\\_GB](https://play.google.com/store/apps/dev?id=8227528954463674373&hl=en_GB))

#### Country Pest Alerts

(<https://www.plantwise.org/KnowledgeBank/pestalert/signup>)

### Datasheet

#### Phyllostachys aurea (golden bamboo)

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## Summary

### Last modified

19 November 2019

### Datasheet Type(s)

Invasive Species

### Preferred Scientific Name

Phyllostachys aurea

### Preferred Common Name

golden bamboo

### Taxonomic Tree

Domain: Eukaryota

Kingdom: Plantae

Phylum: Spermatophyta

Subphylum: Angiospermae

Class: Monocotyledonae



### Summary of Invasiveness

*P.aurea* is a highly invasive running bamboo native to Southeast China but is now widespread globally and especially problematic in Australia and North America. This woody, rhizomatous perennial grass r...

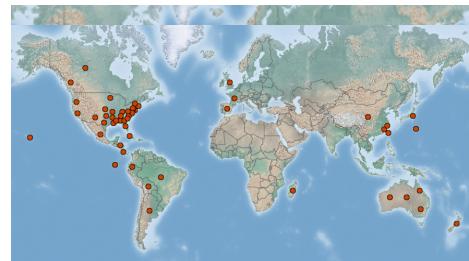
(datasheet/42072#toPictures)

More information

(datasheet/42072#toPictures)

More...

(datasheet/42072#tosummaryOfInvasiveness)



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## Pictures

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Picture	Title	Caption	Copyright
	Habit	Phyllostachys aurea (fish-pole bamboo, golden bamboo); habit. Often planted but usually regretted. It would be one of the worst weeds in the USA, except it seldom, if ever, produces seed. Georgia, USA.	©James R. Allison/Georgia Department of Natural Resources/Bugwood.org - CC BY 3.0 US
	Stems	Phyllostachys aurea (fish-pole bamboo, golden bamboo); stems. USA. September 2003.	©Chuck Bargeron-2003/University of Georgia/Bugwood.org - CC BY 3.0 US
	Stem and nodes	Phyllostachys aurea (fish-pole bamboo, golden bamboo); stem and node details. USA. September 2003.	©Chuck Bargeron-2003/University of Georgia/Bugwood.org - CC BY 3.0 US
	Compressed internodes	Phyllostachys aurea (fish-pole bamboo, golden bamboo); compressed internodes of golden bamboo on some random canes.	©Caryn Rickel/Institute of Invasive Bamboo Research
	Foliage	Phyllostachys aurea (fish-pole bamboo, golden bamboo); foliage. USA.	©James H. Miller/USDA Forest Service/Bugwood.org - CC BY 3.0 US
	Infestation	Phyllostachys aurea (fish-pole bamboo, golden bamboo); infestation. Note person for scale. Georgia, USA. July 2005.	©David J. Moorhead-2005/University of Georgia/Bugwood.org - CC BY-NC 3.0 US
	Invasive habit	Phyllostachys aurea (fish-pole bamboo, golden bamboo); invasive habit.	©Caryn Rickel/Institute of Invasive Bamboo Research

## Identity

### Preferred Scientific Name

Phyllostachys aurea Carrière ex. Rivière & C. Rivière

### Preferred Common Name

golden bamboo

### Other Scientific Names

Phyllostachys bambusoides var. aurea (Carrière ex. Rivière & C.Rivière) Makino

Phyllostachys meyeri var. aurea (Carrière ex. Rivière & C.Rivière) Pilipenko

Phyllostachys reticulata var. aurea (Carrière ex. Rivière & C.Rivière) Makino

### International Common Names

**English:** fish-pole bamboo

**Spanish:** bamboo amarillo; bambú amarillo

### Local Common Names

**Brazil:** bambú japonesê; bambu-amarelo; bambu-brasileiro; bambu-mirim

**China:** ren mian zhu

**Cuba:** bambucito

**France:** bamboo jaune

**Indonesia:** pring uncue

**Japan:** hotei-chiku

**Vietnam:** trus vafng

### EPPO code

PLLAR (Phyllostachys aurea)

## Summary of Invasiveness

*P.aurea* is a highly invasive running bamboo native to Southeast China but is now widespread globally and especially problematic in Australia and North America. This woody, rhizomatous perennial grass rapidly forms a dense monoculture, suffocating other native plants and altering the entire ecosystem. As well as having detrimental effects on the environment this bamboo may also damage property and pose as a potential health threat from its harbouring of a fungus responsible for the Histoplasmosis disease. Invasive bamboos are among the fastest growing plants on Earth and one infestation of *P. aurea* can spread as far as 9.3 miles. The spread is rapid in all directions, increasing each successive year (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE); Rickel, 2012 (datasheet\42072#64D2F655-B24F-44BF-BF13-A3449444F0FF)).

It is listed invasive in Australia and Hawaii, and has naturalized or is listed invasive in 273 counties in the USA, including the mid-Atlantic region of the USA, Pennsylvania, Maryland, Virginia, West Virginia, and Georgia. It is reported to be fully naturalized in New Zealand, with infestations forming dense stands, and some invading national parks (Edgar and Connor, 2000 (datasheet\42072#5A1C3A4F-AB30-4B0C-AB03-06297BAC1CFB); USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)). It has been recorded as High Risk in several Weed Risk Assessments (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859); NYPRISM, 2013 (datasheet\42072#D6AFE134-4B95-411B-BE1D-3C136713C39E); PIER, 2016 (datasheet\42072#44B3E3A7-67BB-428F-B7C3-D966DE2733B8)) and following New York State Department of Environmental Conservation listing of the species as invasive it has banned all future sales of *P. aurea* (New York State DEC, 2014 (datasheet\42072#9796EBB0-FF45-431E-9169-CCF0D3E4693A)).

## Taxonomic Tree

Domain: Eukaryota  
Kingdom: Plantae  
Phylum: Spermatophyta  
Subphylum: Angiospermae  
Class: Monocotyledonae  
Order: Cyperales  
Family: Poaceae  
Genus: Phyllostachys  
Species: Phyllostachys aurea

## Notes on Taxonomy and Nomenclature

*Phyllostachys aurea* is an accepted species of the Poaceae family, a member of the grass family (The Plant List, 2013 (datasheet\42072#B9CBEB3F-846C-42BB-81D5-02606F81A351)). There are approximately 76 species within the genus *Phyllostachys* (Ohrnberger, 1999 (datasheet\42072#5557864A-E8AB-45F3-B20E-B30002454EAC)). The Plant List (2013) (datasheet\42072#B9CBEB3F-846C-42BB-81D5-02606F81A351) suggests there are 20 recorded synonyms for *P.aurea*.

The Poaceae family consists of 7 to 10 subfamilies, among them the subfamily Bambusoideae which includes both woody and herbaceous bamboos with approximately 1575 species (Ohrnberger, 1999 (datasheet\42072#5557864A-E8AB-45F3-B20E-B30002454EAC)).

*P. aurea* is commonly referred to as golden bamboo. The specific epithet aurea, refers to the golden colour of old culms and was used by Carrière and later used by A.& C. Rivière to name this species (Ohrnberger, 1999 (datasheet\42072#5557864A-E8AB-45F3-B20E-B30002454EAC)).

*P. aurea* is a woody, rhizomatous perennial grass, which grows to form a dense bamboo forest. The main stem is called a culm. The culm is made up of jointed segments. The rings are called nodes. The sections between the nodes or rings are called internodes.

Golden bamboo has distinct swollen internodes, bunched up together at the bottom of some random canes. This unique trait is useful for certainty in the ID of golden bamboo (McClure, 1957 (datasheet\42072#34C7F4D2-03B1-4A6F-ACFB-113E4A8EA892)). Most canes will have uniformly spaced sections (internodes) as the compressed internode trait only occurs on some canes. Golden bamboo has a slight cupped flare where the sections meet at the nodes (rings). In Japan, the compressed swollen internodes are referred to as deformed stems, and thought to be a reason for the cultivation of the species *P. aurea*, due to the curiosity of the deformed swollen internodes.

A pure planting of *P. aurea* can be identified with ease and certainty by the culms. Stems and branches are green when plants are young but turn golden yellow with age. Branches occur in uneven pairs with a groove called a sulcus (Arnold Arboretum, 1946 (datasheet\42072#00A9136A-7E7D-4631-92E5-33AB106E0882); Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)). They can grow to a maximum height of 11.8 m tall and are tolerant of colder temperatures (reportedly up to -20°C) (Arnold Arboretum, 1946 (datasheet\42072#00A9136A-7E7D-4631-92E5-33AB106E0882); Young and Haun, 1961 (datasheet\42072#115B268B-28F7-4190-9B7D-5E796DD5837A); Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE); EDDMapS, 2016 (datasheet\42072#96C4E384-BB8C-497C-A56E-90297EB06914)). The diameter of the culms can reach 15 cm but are usually 9 cm or less depending on the age of the stand. Each year the culms will emerge thicker (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)). The length of the rhizomes increases each successive year. In a mature stand the rhizomes may spread 4-7.6 m underground each year (Young and Haun, 1961 (datasheet\42072#115B268B-28F7-4190-9B7D-5E796DD5837A)). Spread is rapid in all directions by the interconnected dense underground rhizome system. A single golden bamboo clump can produce rhizomes spreading 9.3 miles in its lifetime (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)).

*P. aurea* is an evergreen, even though leaves change each year later in the spring. The old leaves fall off and are gradually replaced with new leaves (McClure, 1957 (datasheet\42072#34C7F4D2-03B1-4A6F-ACFB-113E4A8EA892)).

Flowers and seeds are rarely produced. Although spreading by seed is unlikely, it cannot be ruled out completely (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

## Plant Type

Grass / sedge

Perennial

Seed propagated

Vegetatively propagated

Woody

## Distribution

Native to Southeast China *P. aurea* has been in cultivation for some time in Japan, Europe and South America (McClure, 1957 (datasheet\42072#34C7F4D2-03B1-4A6F-ACFB-113E4A8EA892)). It is now widely distributed, especially in North America, with reports as far north as Vancouver and British Columbia in Canada. It has escaped cultivation in Hawaii and Oahu (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)) and is documented as established in Taiwan, Australia, New Zealand, Mexico, Ecuador, Honduras, Costa Rica, Brazil, Argentina, Bolivia, Spain, the UK and Madagascar (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

*P. aurea* is listed invasive in Australia, Hawaii, and has naturalized or is listed invasive in 273 counties in the USA, including the mid-Atlantic region of the USA, Pennsylvania, Maryland, Virginia, West Virginia, and Georgia. It is reported to be fully naturalizing in New Zealand, with infestations forming dense stands, and some invading national parks (USDA APHIS, 2012).

The distribution in this summary table is based on all the information available. When several references are cited, they may give conflicting information on the status. Further details may be available for individual references in the Distribution Table Details section which can be selected by going to Generate Report.

Continent/Country/Region	Distribution	Last Reported	Origin	First Reported	Invasive	Planted	Reference
<b>Asia</b>							
China (datasheet/108398)	Present						
-Fujian (datasheet/108670)	Present		Native		Not invasive	Natural	Ohrnberger, 19 <sup>c</sup> (datasheet\4207 E8AB-45F3-B20E B30002454EAC)
-Hong Kong (datasheet/108678)	Present		Introduced		Not invasive		PIER, 2016 (datasheet\4207 67BB-428F-B7C3 D966DE2733B8 <sup>b</sup> )
-Zhejiang (datasheet/108699)	Present		Native		Not invasive	Natural	Ohrnberger, 19 <sup>c</sup> (datasheet\4207 E8AB-45F3-B20E B30002454EAC)
Japan (datasheet/108467)	Present		Native				Oviedo Prieto et
-Bonin Island (datasheet/108759)	Present		Introduced				PIER, 2016 (datasheet\4207 67BB-428F-B7C3 D966DE2733B8 <sup>b</sup> )
Taiwan (datasheet/108590)	Present		Introduced		Not invasive	Planted	Ohrnberger, 19 <sup>c</sup> (datasheet\4207 E8AB-45F3-B20E B30002454EAC)
<b>Africa</b>							
Madagascar (datasheet/108498)	Present		Introduced				USDA-APHIS, 20 <sup>a</sup> (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
<b>North America</b>							
Canada (datasheet/108388)	Present						
-British Columbia (datasheet/108654)	Present		Introduced				Gucker, 2009 (datasheet\4207 199B-4A57-9B0F 0F75323A67DE)
Mexico (datasheet/108513)	Present		Introduced				USDA-APHIS, 20 <sup>a</sup> (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
USA (datasheet/108597)	Present						

Continent/Country/Region	Distribution	Last Reported	Origin	First Reported	Invasive	Planted	Reference
-Alabama (datasheet/108796)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-Arkansas (datasheet/108797)	Present		Introduced		Invasive		EDDMapS, 2016 (datasheet\4207 BB8C-497C-A56 90297EB06914)
-California (datasheet/108799)	Present		Introduced		Invasive		EDDMapS, 2016 (datasheet\4207 BB8C-497C-A56 90297EB06914); (datasheet\4207 67BB-428F-B7C; D966DE2733B8'
-Connecticut (datasheet/108801)	Present		Introduced		Invasive		EDDMapS, 2016 (datasheet\4207 BB8C-497C-A56 90297EB06914)
-Delaware (datasheet/108803)	Present		Introduced		Invasive		EDDMapS, 2016 (datasheet\4207 BB8C-497C-A56 90297EB06914)
-Florida (datasheet/108804)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-Georgia (datasheet/108805)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-Hawaii (datasheet/108806)	Widespread		Introduced		Invasive		PIER, 2016 (datasheet\4207 67BB-428F-B7C; D966DE2733B8'
-Kentucky (datasheet/108812)	Present		Introduced		Invasive		USDA-NRCS, 20 (datasheet\4207 3DEB-40EC-A21; B010233BF592)
-Louisiana (datasheet/108813)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-Maryland (datasheet/108815)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-Minnesota (datasheet/108818)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-Mississippi (datasheet/108820)	Present		Introduced		Invasive		USDA-NRCS, 20 (datasheet\4207 3DEB-40EC-A21; B010233BF592)
-Missouri (datasheet/108819)	Present		Introduced		Invasive		EDDMapS, 2016 (datasheet\4207 BB8C-497C-A56 90297EB06914)

Continent/Country/Region	Distribution	Last Reported	Origin	First Reported	Invasive	Planted	Reference
-New Mexico (datasheet/108827)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-New York (datasheet/108829)	Present		Introduced		Invasive		NYPRISM, 2013 (datasheet\4207 4B95-411B-BE11 3C136713C39E)
-North Carolina (datasheet/108822)	Present		Introduced		Invasive		EDDMapS, 2016 (datasheet\4207 BB8C-497C-A56 90297EB06914)
-Oklahoma (datasheet/108831)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-Oregon (datasheet/108832)	Present		Introduced		Invasive		PIER, 2016 (datasheet\4207 67BB-428F-B7C1 D966DE2733B8)
-Pennsylvania (datasheet/108833)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-South Carolina (datasheet/108835)	Present		Introduced		Invasive		EDDMapS, 2016 (datasheet\4207 BB8C-497C-A56 90297EB06914)
-Tennessee (datasheet/108837)	Present		Introduced		Invasive		USDA-NRCS, 20 (datasheet\4207 3DEB-40EC-A211 B010233BF592)
-Texas (datasheet/108838)	Widespread		Introduced		Invasive		Texasinvasives, (datasheet\4207 4A01-4D42-A1C 5E5DDF93321E)
-Virginia (datasheet/108840)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-West Virginia (datasheet/108844)	Present		Introduced		Invasive		USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)

### Central America and Caribbean

Costa Rica (datasheet/108402)	Present		Introduced				USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
Cuba (datasheet/108405)	Present		Introduced		Invasive		Oviedo Prieto et USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
Honduras (datasheet/108451)	Present		Introduced				USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)

Continent/Country/Region	Distribution	Last Reported	Origin	First Reported	Invasive	Planted	Reference
<b>South America</b>							
Argentina (datasheet/108359)	Present		Introduced				USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
Bolivia (datasheet/108379)	Present		Introduced				USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
Brazil (datasheet/108381)	Present		Introduced			Planted	USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
Ecuador (datasheet/108416)	Present		Introduced				USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
-Galapagos Islands (datasheet/108700)	Present		Introduced				PIER, 2016 (datasheet\4207 67BB-428F-B7C; D966DE2733B8)
<b>Europe</b>							
France (datasheet/108429)	Present		Introduced		Invasive		PIER, 2016 (datasheet\4207 67BB-428F-B7C; D966DE2733B8)
Spain (datasheet/108421)	Present		Introduced				USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
UK (datasheet/108431)	Present		Introduced				USDA-APHIS, 20 (datasheet\4207 9BCA-4A30-BD2 C5745CD14859)
<b>Oceania</b>							
Australia (datasheet/108362)	Present						
-New South Wales (datasheet/108620)	Widespread		Introduced	1962	Invasive		USDA-NRCS, 20 (datasheet\4207 3DEB-40EC-A21; B010233BF592)
-Queensland (datasheet/108621)	Present		Introduced	1984	Invasive		AVH, 2016 (datasheet\4207 DE6F-4EEB-A9EF 5B789422859E); (datasheet\4207 67BB-428F-B7C; D966DE2733B8)
-Western Australia (datasheet/108625)	Present		Introduced	2003			AVH, 2016 (datasheet\4207 DE6F-4EEB-A9EF 5B789422859E)

Continent/Country/Region	Distribution	Last Reported	Origin	First Reported	Invasive	Planted	Reference
New Zealand (datasheet/108528)	Widespread		Introduced		Invasive		PIER, 2016 (datasheet\420767BB-428F-B7C3D966DE2733B8)



## History of Introduction and Spread

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*P. aurea*, commonly known as golden bamboo, is a giant temperate timber bamboo native to Southeast China. It was the first species of *Phyllostachys* to be successfully introduced into the USA by George H. Todd, a grower at Montgomery in 1882. Mature culms were used for fishing poles and walking sticks (Young and Haun, 1961 (datasheet\42072#115B268B-28F7-4190-9B7D-5E796DD5837A)).

Additional introductions into the USA occurred in 1914 by the United States Department of Agriculture with plants from the Centro Agricola at Bahia, Brazil obtained through V.A.Argolla Ferrao. These were under Plant Introduction No. 38919.

Some introductions into the USA were obtained from seeds from L'Hermitage, Mons, Belgium. These were from Jean Houzeau de Lehaie and were under Plant Introduction No. 55975. Plants were also obtained from the Royal Botanic Garden Kew, England, Plant Introduction No. 75153.

Earlier introductions of this species were made by private individuals, like George H. Todd in Montgomery, Alabama, who planted a 10 acre plot (McClure, 1957 (datasheet\42072#34C7F4D2-03B1-4A6F-ACFB-113E4A8EA892)).

In many areas extensive infestations have been documented with rapid spread and reported as highly detrimental (EDDMapS, 2016 (datasheet\42072#96C4E384-BB8C-497C-A56E-90297EB06914)).

A clone covering one acre was documented as naturalizing on a steep hillside in Kailua, Oahu, Hawaii. The infestation originally planted as a single ornamental planting has now spread to invade an entire hillside (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)). The footprint of *P. aurea* is astonishing as the speed of invasion increases each successive year, with the stage of invasion increasing dramatically over time (Rickel, 2012 (datasheet\42072#64D2F655-B24F-44BF-BF13-A3449444F0FF)).

## Introductions

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Introduced to	Introduced from	Year	Reason	Introduced by	Established in wild through		References
					Natural reproduction	Continuous restocking	
Australia		pre 1962	Horticulture (pathway cause) (datasheet/109038)		Yes		AVH (2016) (datasheet\42072DE6F-4EEB-A9EF-5B789422859E); I (2016); Weeds of (2016)
Hawaii	China	1882	Horticulture (pathway cause) (datasheet/109038)		Yes		PIER (2016) (datasheet\420767BB-428F-B7C3-D966DE2733B8)
USA	China	1882	Horticulture (pathway cause) (datasheet/109038)		Yes		USDA-APHIS (201 (datasheet\420729BCA-4A30-BD2E C5745CD14859)



## Risk of Introduction

*P. aurea* is a high risk alien invader and recorded as High Risk in the USDA-APHIS Weed Risk Assessment of July 2012 (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

Running bamboos are of great concern due to their rapid spread by an underground rhizome system, and the possibility of naturalization (Smith and Mack, 2012 (datasheet\42072#D00D1C7A-B760-4F68-880A-DE672BB4FEEF)).

There is also a high risk potential for naturalization through improper rhizome disposal, and rhizome dispersal by water. Documentation shows infestations are spreading offsite without the aid of human cultivation by water (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859); Bugwood Presentations, 2014 (datasheet\42072#E66F5A36-D326-4C93-B8F4-F40EF5E76CC8)).

Also of great concern is the high volume of online sales, with rhizomes being shipped all over the Internet to the unsuspecting public. In many cases, online shipping is without a plant name shown, and easily bypasses all international plant regulation laws (Rickel, 2012 (datasheet\42072#64D2F655-B24F-44BF-BF13-A3449444F0FF)).

## Habitat

Infestations occur in undisturbed habitats including along stream edges and riparian corridors (Smith and Mack, 2012 (datasheet\42072#D00D1C7A-B760-4F68-880A-DE672BB4FEEF)). It thrives in full sun, but also tolerates shade, spreading into forests.

*P. aurea* spreads more rapidly in moist soils (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

## Habitat List

Category	Sub-Category	Habitat	Presence	Status
Terrestrial	Terrestrial – Managed	Cultivated / agricultural land	Present, no further details	Harmful (pest or invasive)
		Managed forests, plantations and orchards	Present, no further details	Harmful (pest or invasive)
		Managed grasslands (grazing systems)	Present, no further details	Harmful (pest or invasive)
		Disturbed areas	Present, no further details	Harmful (pest or invasive)
		Rail / roadsides	Present, no further details	Harmful (pest or invasive)
		Urban / peri-urban areas	Present, no further details	Harmful (pest or invasive)
	Terrestrial - Natural / Semi-natural	Natural forests	Present, no further details	Harmful (pest or invasive)
		Natural grasslands	Present, no further details	Harmful (pest or invasive)
		Riverbanks	Present, no further details	Harmful (pest or invasive)
		Riverbanks	Present, no further details	Natural
		Wetlands	Present, no further details	Harmful (pest or invasive)
		Wetlands	Present, no further details	Natural

## Hosts/Species Affected

Continual thick leaf litter within the stand of bamboo along with the dense shade in the bamboo stand prohibits the growth of other species of plants. It is also possible that *P. aurea* has allelopathic effects (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

## Biology and Ecology

### Reproductive Biology

*P. aurea* reproduces vegetatively by rhizomes. It is capable of producing seeds but at very long intervals and the rarity of flowering makes reproduction by seed unlikely (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

Bamboo flowers are wind pollinated. There are contradictory reports that bamboo dies after flowering. Some reports suggest the rhizomes are capable of resprouting (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)).

### Physiology and Phenology

*P. aurea* spreads rapidly by underground rhizomes each year followed by new culms (stems) each spring from the previous years rhizome spread. Spread is rapid in all directions (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)).

New culms emerge in the spring and reach their mature height in a few short weeks. Each successive year the culms emerge thicker, with underground rhizomes that rapidly spread faster each successive year.

### Longevity

*P. aurea* is long lived. Documentation and field work have shown the infestation increases over time to cover acres (EDDMapS, 2016 (datasheet\42072#96C4E384-BB8C-497C-A56E-90297EB06914)). A single clump of golden bamboo can produce up to 9.3 miles of stems in its lifetime, all interconnected as one organism (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)).

### Population Size and Structure

Dense stands can potentially invade acres of land, forming a monoculture and suffocating native vegetation as the rhizomes spread underground further each year (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

### Environmental Requirements

*P. aurea* is a cold hardy temperate running bamboo tolerating temperatures as low as -15°C and by some reports -20°C (Young and Haun, 1961 (datasheet\42072#115B268B-28F7-4190-9B7D-5E796DD5837A); Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE); EDDMapS, 2016 (datasheet\42072#96C4E384-BB8C-497C-A56E-90297EB06914)).

In China, golden bamboo stands grow at elevations up to 1000 m in the southeast. In the southwest region of China, golden bamboo stands grow at elevations up to 2000 m (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)).

## Latitude/Altitude Ranges

Latitude North (°N)	Latitude South (°S)	Altitude Lower (m)	Altitude Upper (m)
30	20	0	2000

## Air Temperature

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Parameter	Lower limit	Upper limit
Absolute minimum temperature (°C)	-20	
Mean annual temperature (°C)	10	30
Mean maximum temperature of hottest month (°C)	15	35
Mean minimum temperature of coldest month (°C)	-15	20

## Rainfall

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Parameter	Lower limit	Upper limit	Description
Dry season duration	0	4	number of consecutive months with <40 mm rainfall
Mean annual rainfall	1000		mm; lower/upper limits

## Rainfall Regime

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Summer  
Uniform

## Soil Tolerances

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### Soil drainage

free

### Soil reaction

acid  
alkaline  
neutral

### Soil texture

light  
medium

## Means of Movement and Dispersal

### Natural Dispersal

Cases of spread by water have been documented in Connecticut (Bugwood Presentations, 2014 (datasheet\42072#E66F5A36-D326-4C93-B8F4-F40EF5E76CC8)) and there is the potential for rhizome fragments to be washed downstream along riparian corridors (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

Although spreading by seed is unlikely as flowers and seeds are rarely produced it cannot be ruled out completely (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

### Accidental Introduction

The spread of *P. aurea* along roadsides by plows moving rhizomes has been documented. Observation has shown loose rhizome fragments and rhizomes growing up along roadsides where plows could potentially transport the rhizome spreading the bamboo (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

Improper disposal of the rhizomes is common, causing new bamboo infestations to start. Spread can occur from improper dumping of yard waste into natural areas (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

### Intentional Introduction

*P. aurea* has been widely introduced as an ornamental in both temperate and tropical areas of the world (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)). *P. aurea* has also been introduced for making fishing poles, walking sticks, umbrella and fan handles and pipe stems (McClure, 1957 (datasheet\42072#34C7F4D2-03B1-4A6F-ACFB-113E4A8EA892)).

## Pathway Causes

Cause	Notes	Long Distance	Local	References
Disturbance (datasheet/109028)	Accidental movement of rhizome contaminated soil	Yes	Yes	USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)
Garden waste disposal (datasheet/109035)	Accidental disposal of rhizomes by dumping yard waste	Yes	Yes	USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)
Horticulture (datasheet/109038)	Deliberately selling rhizomes online or promoted as an ornamental	Yes	Yes	Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE); Rickel, 2012 (datasheet\42072#64D2F655-B24F-44BF-BF13-A3449444F0FF)
Landscape improvement (datasheet/109045)	Sold as an ornamental	Yes	Yes	Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)
Nursery trade (datasheet/109049)	Sold as an ornamental	Yes		Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)
Ornamental purposes (datasheet/109051)		Yes	Yes	Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)
People sharing resources (datasheet/109053)	Observation of problem infestations - origin	Yes	Yes	EDDMaps, 2016 (datasheet\42072#96C4E384-BB8C-497C-A56E-90297EB06914)

## Pathway Vectors

Vector	Notes	Long Distance	Local	References
Mail (datasheet/109076)	Widely sold online to the unsuspecting public	Yes	Yes	Rickel, 2012 (datasheet\42072#64D2F655-B24F-44BF-BF13-A3449444F0FF)
Water (datasheet/109085)	Potential to spread by water	Yes	Yes	USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)

## Impact Summary

Category	Impact
Economic/livelihood	Negative
Environment (generally)	Negative
Human health	Negative

## Economic Impact

*P. aurea* has a negative impact on property values. Numerous property appraisals have shown a reduced market value for a property that has the presence of *Phyllostachys* invasive running bamboo (Haussler, 2012; Brown, 2016 (datasheet\42072#0EF955C1-2215-43F6-8786-4A0078EC734C)).

Properties infested with *Phyllostachys* running bamboos often have a stigmatized market value and are very hard to sell (Sutton, 2016 (datasheet\42072#F0FD7572-840B-45E7-B354-696AEE04E173)). Eradication is difficult and results in expensive bamboo abatement measures including the repeat use of pesticides.

A recent report of one bamboo eradication project at the historical Yorktown Battlefield is costing approximately \$78,000 (Riddle, 2016 (datasheet\42072#EE25C273-4730-4311-B6FA-369A506C298C)).

## Environmental Impact

### Impact on Habitats

*P. aurea* is highly detrimental to the environment and can alter an entire native ecosystem through its rapid formation of dense stands. It poses a threat to many natural areas, including parks and conservation land (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859); EDDMapS, 2016 (datasheet\42072#96C4E384-BB8C-497C-A56E-90297EB06914)).

### Impact on Biodiversity

Continual thick leaf litter within the stand of bamboo along with the dense shade in the bamboo stand prohibits the growth of other species of plants. The formation of monocultures in forests and riparian corridors completely excludes other native vegetation and over time the bamboo will eventually form a dense forest (Young and Haun, 1961 (datasheet\42072#115B268B-28F7-4190-9B7D-5E796DD5837A); USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859); EDDMapS, 2016 (datasheet\42072#96C4E384-BB8C-497C-A56E-90297EB06914)). It is also possible that *P. aurea* has allelopathic effects (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

*P. aurea* is listed as invasive in Australia and Hawaii, and has naturalized or is listed as invasive in 273 counties in the USA, including the mid-Atlantic region of the USA, Pennsylvania, Maryland, Virginia, West Virginia, and Georgia. It is reported to be fully naturalizing in New Zealand, with infestations forming dense stands, and some invading national parks (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

## Social Impact

*P. aurea* can have negative impacts on property, including damage to driveways and sidewalks (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

Many laws and regulations have been passed to protect property and stop the continual nuisance. This list is growing as people are becoming more aware of the invasiveness of running bamboo (Rickel, 2014).

*P. aurea* infestations may pose a serious indirect risk to human health as blackbird and starling species often roost in *Phyllostachys* invasive bamboos and can serve as vectors for the human respiratory disease, Histoplasmosis (Glahn et al., 1994 (datasheet\42072#09D00CC8-081B-4D98-85D8-2BC99E17DFFA); Miller, 2013). The microscopic fungus, *Histoplasma capsulatum*, is found where bird droppings accumulate within the bamboo infestation. This fungus produces airborne fungal spores which when inhaled can cause the disease Histoplasmosis. The disease produces very few symptoms, but can have serious health effects (Lenhardt, 2004; Cleveland Clinic, 2016 (datasheet\42072#DEC41789-3BBB-491C-ADD9-0E05E9376FBA); University of Maryland Medical Center, 2016 (datasheet\42072#AC79705C-4FE0-45B2-AA10-7D4B205C536F)).

When the blackbirds roost repeatedly for several years the bamboo may become an indirect threat to humans. The soil becomes contaminated with the spores of the fungus that cause histoplasmosis in humans. Workers removing bamboo should wear a respirator, or dust masks and take precautions to avoid inhaling the spores (Flynt and Glahn, 1993 (datasheet\42072#17ABFE1C-E0AF-47F1-89D6-503E28F135BB); Glahn et al., 1994 (datasheet\42072#09D00CC8-081B-4D98-85D8-2BC99E17DFFA)).

Several cases have been reported recently, including two in Arkansas, USA. Such cases often involve burning of bamboo, which had been previously used as a blackbird roost. In 2011, a bamboo bonfire affected 18 people, where 7 individuals were confirmed to have contracted the disease and 11 others likely to have contracted the disease (Haselow et al., 2014 (datasheet\42072#45C063D3-3D99-470B-8A09-0ADE42165D6B)). Another similar story saw two children infected and transferred to the Arkansas Children's Hospital. It was later found that others who attended the same gathering were also ill with the same symptoms (Haselow et al., 2014 (datasheet\42072#45C063D3-3D99-470B-8A09-0ADE42165D6B)). In 1980, another histoplasmosis case relating to bamboo was reported in Louisiana. Workers were clearing a large bamboo infestation that was heavily contaminated with blackbird faeces. All 6 workers became ill (Haselow et al., 2014 (datasheet\42072#45C063D3-3D99-470B-8A09-0ADE42165D6B)).

## Risk and Impact Factors

### Invasiveness

- Proved invasive outside its native range
- Has a broad native range
- Abundant in its native range
- Highly adaptable to different environments
- Tolerant of shade
- Has high reproductive potential
- Gregarious
- Reproduces asexually

### Impact outcomes

- Damaged ecosystem services
- Ecosystem change/ habitat alteration
- Monoculture formation
- Negatively impacts forestry
- Negatively impacts human health
- Negatively impacts livelihoods
- Threat to/ loss of endangered species
- Negatively impacts animal/plant collections

### Impact mechanisms

- Allelopathic
- Competition - shading
- Competition (unspecified)
- Rapid growth

### Likelihood of entry/control

- Highly likely to be transported internationally deliberately
- Highly likely to be transported internationally illegally
- Difficult/costly to control

## Uses List

### General

Botanical garden/zoo

### Materials

Carved material

### Ornamental

garden plant

## Wood Products

### Sawn or hewn building timbers

For light construction

### Woodware

- Industrial and domestic woodware
- Sports equipment
- Tool handles

## Similarities to Other Species/Conditions

*P. aurea* looks very similar in appearance to *Phyllostachys aureosulcata*. This confusion has led to many misidentifications, often with *P. aureosulcata* being incorrectly identified as *P. aurea*. However there are some differences which can be used to separate the two species. *P. aureosulcata* has a yellow groove (called a sulcus) on every other section (called an internode) of the young shoots. It also has a rough sand papery feel when rubbing a hand up and down the canes, and some random culms that occasionally have a crook or zigzag growth pattern. These traits are not found in *P. aurea*.

In contrast, *P. aurea* will have compressed internodes bunched together and distorted. This characteristic trait will appear on a few random lower canes and is unique to *P. aurea*. This trait has often been used to correctly identify the bamboo, for example, an infestation that naturalized in Illinois was originally reported as *P. aurea*, and later was found to be *P. aureosulcata* (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)).

*P. aurea* is slightly less cold tolerant than *P. aureosulcata*, otherwise they behave similarly as do all *Phyllostachys* invasive bamboos, which spread rapidly forming a dense monoculture choking off all native vegetation (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

## Prevention and Control

*Due to the variable regulations around (de)registration of pesticides, your national list of registered pesticides or relevant authority should be consulted to determine which products are legally allowed for use in your country when considering chemical control. Pesticides should always be used in a lawful manner, consistent with the product's label.*

### Prevention

The best prevention is to prohibit the planting of *Phyllostachys* invasive running bamboos (Connecticut General Assembly, 2014).

### Rapid Response

Rapid response is very important with *P. aurea*. The earlier a stand of bamboo is eradicated the easier it will be due to the size of the bamboo and spread of the rhizomes underground. Removing the bamboo before it escapes to surrounding properties is also advantageous. An established older stand will require a great deal more effort (Rickel, 2012 (datasheet\42072#64D2F655-B24F-44BF-BF13-A3449444F0FF); USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

### Public Awareness

Educating the public not to plant *Phyllostachys* invasive running bamboo is one of the most important ways to prevent more infestations (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)). The public is now becoming very aware of the damage caused by *Phyllostachys* invasive running bamboo, at least in some places. Passing out fact sheets and spreading the word through education will help slow down the spread of this destructive invasive.

### Eradication

Diligence is required to eradicate an infestation of golden bamboo. The bamboo must be removed in its entirety to be successful. The area must be monitored closely for missed rhizome fragments as this is all that is needed to repeat the invasion (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

### Containment/Zoning

*P. aurea* easily bypasses containment eventually, and planting it anywhere, even in containers, should be avoided (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

### Physical/Mechanical Control

Effective bamboo removal involves digging out the rhizomes deeply enough to avoid leaving any rhizomes behind. This has proven to be the most effective bamboo removal.

Repeated cutting to the ground will not yield control; bamboo is a grass and easily tolerates cuttings (Bugwood, 2016 (datasheet\42072#AB2572DC-5E51-4458-847C-2A875673934C)). It has been documented that rhizome growth also becomes more aggressive after a disturbance, so removing all of the rhizomes is the most effective way to stop further spread and damage (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)).

### Biological Control

There are no known biological controls for *P. aurea*. No documentation exists referring to insects or pathogens as a way to control golden bamboo (Gucker, 2009 (datasheet\42072#7BC58B05-199B-4A57-9B0F-0F75323A67DE)).

### Chemical Control

*P. aurea* resists herbicide, and is difficult to eradicate. In most cases digging the rhizomes out proves to be faster and safer. Control with foliar application using glyphosate must be repeated over and over to be successful. The bamboo must be eradicated in its entirety to be successful. The area must be monitored closely for regrowth for several years (USDA-APHIS, 2012 (datasheet\42072#2CD5E112-9BCA-4A30-BD2B-C5745CD14859)).

One of the reasons golden bamboo resists herbicide is that the rhizomes are chambered off inside, (segmented) and can be very dense making it very difficult to eradicate with herbicides (Mark Czarnota, University of Georgia, USA, personal communication, 2012).

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## Contribuintes

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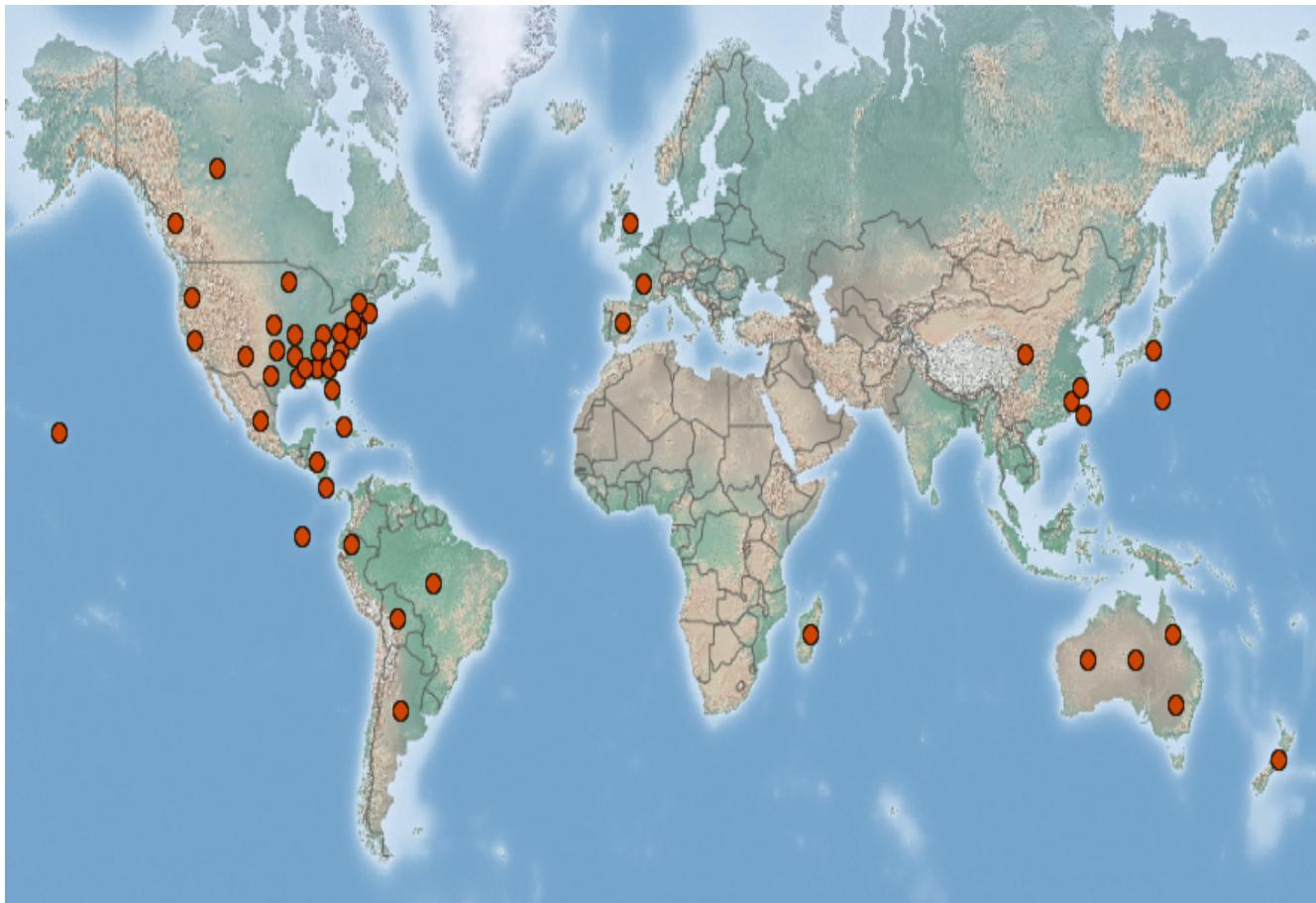
28/06/16 Texto original por:

Caryn Rickel, Instituto de Pesquisa Invasiva em Bambu, Connecticut, EUA

## Mapas de distribuição

Você pode deslocar e ampliar o mapa

[Salvar mapa](#)



Analisar por: Origem

CABI

Serviço de Conservação de Recursos Naturais (NRCS)

Dados de espécies invasivas do CABI

Analisar por: Invasivo

Não gravado

Não invasivo

Invasivo

Analisar por: Densidade

Presente, sem mais detalhes

Difundido

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