

*Phalaris arundinacea* [简体中文](#) [正體中文](#)

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Cyperales	Poaceae

**Common name** alpiste roseau (French), hierba cinta (Spanish), kusa-yoshi (Japanese), gardener's-garters (English), ribbon grass (English), pasto cinto (Spanish), variegated grass (English), Rohrglanzgras (German), reed Canary grass (English), caniço-malhado (Portuguese)

**Synonym** *Phalaroides arundinacea* , (L.) Raeusch.  
*Phalaris arundinacea* , L. var. *picta* L.  
*Phalaroides arundinacea* , (L.) Raeusch. var. *picta* (L.) Tzvelev  
*Phalaris arundinacea* , f. *variegata* (Parn.) Druce  
*Phalaris japonica* , Steud.

**Similar species** *Dactylis glomerata*, *Phalaris aquatica*, *Calamagrostis canadensis*

**Summary** *Phalaris arundinacea* is a cool-season perennial grass that grows successfully in northern latitudes and can be invasive in wet habitats. Since it is tolerant of freezing temperatures and begins to grow very early in the spring, it can outcompete many other species. Any moist, fertile habitat provides good conditions for *P. arundinacea*. It is considered a serious threat in wet meadows, wetlands, marshes, fens, old fields, floodplains, wet prairies, roadsides and ditchbanks. The invasion is promoted by disturbances, such as ditching of wetlands, stream channels, deforestation of swamp forests, sedimentation, overgrazing and intentional planting. *P. arundinacea* tolerates frequent and prolonged flooding as well as submergence. It is moderately tolerant of drought and saline or alkaline soils. *P. arundinacea* spreads within sites by creeping rhizomes and forms dense and impenetrable mats of vegetation. New sites are colonised by seeds. *P. arundinacea* tolerates a small amount of shade, such as forest edges but not closed forest interiors.



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## Species Description

*Phalaris arundinacea* is a robust, cool-season, sod-forming perennial grass that produces culms (stems) from creeping rhizomes. The culms grow 0.6 to 2m tall. The leaf-blades are flat, 0.2 to 2cm wide and up to 0.5m long. Flowers are arranged in dense, branched panicles that can exceed 5 to 20cm in length. Immature panicles are compact and resemble spikes, but they open and become slightly spreading at anthesis. Spikelets are lanceolate, 5mm long and pale. Most contain three florets, two of which are extremely reduced, linear and infertile. One of the distinguishing features of the genus *Phalaris* is the presence of some infertile florets. The lemmas in the infertile florets are approximately 1mm long while those of the fertile florets are 3 to 4.5mm long. The glumes are strongly compressed and wingless.

*P. arundinacea* is morphologically variable, and more than ten infraspecific categories (varieties, subspecies, forms and races) have been described. These categories are based on characteristics such as the amount of branching, leaf colour, size, shape and density of inflorescences. Differences in the height at maturity and in size, shape, and colour of the inflorescence may depend on the habitat. There are no known morphological features for this species that allow native individuals to be distinguished from non-natives (Anderson 1961, in Lyons, 1998).

## Notes

It is generally thought that invasive populations of *P. arundinacea* are descendants of non-native cultivars or ecotypes (Apfelbaum & Sams 1987) or the vigorous result of crosses between cultivated varieties and native strains (Baker 1972, Barrett 1983, Merigliano & Lesica, 1998, in Lyons, 1998).

## Lifecycle Stages

Seeds are short-lived when inundated with water. Seeds germinate more readily immediately after maturation. Rates of germination decrease through winter and are poor the following summer. The most effective method to increase germination rates was soaking seeds in water at 50°C. Lyons (1998) states that water may dilute or rinse away water-soluble dormancy-enforcing compounds. Mechanical damage, increased light, and oxygen also successfully broke seed dormancy. Temperature changes had little effect on germination.

## Uses

*Phalaris arundinacea* produces nutritious, palatable, succulent herbage for pasture, silage, and hay. It is the most popular species for irrigation with pollution control sewage effluent from municipal and industrial sources as practice. It has also been planted on streambeds, gully bottoms, sloughs, pond banks, swamplands. Seed is used for birdseed. Snyder (1992) states that prairie chickens use it for cover in winter; however, commercial value is limited as seeds of the inflorescence shatter asynchronously and do not germinate readily or regularly (Griffith & Harrison 1954, in Lyons, 1998). *P. arundinacea* is also used for cover by muskrats and fish, and farmers have also used it for goose grazing areas.

## Habitat Description

*Phalaris arundinacea* can be classified as growing in semi-open and open habitats. Riparian habitats are at the greatest risk of being invaded and dominated by *P. arundinacea*, but any moist, fertile habitat provides good conditions for this species. It is considered a serious threat in wet meadows, wetlands, marshes, fens, old fields, floodplains, wet prairies, roadsides, ditchbanks. Streambanks, lakeshores, and shore swales also support the species. Invasion is promoted by disturbance, such as ditching of wetlands, stream channelization, deforestation of swamp forests, sedimentation, overgrazing, and intentional planting. Natural disturbances, such as scouring floods and low water conditions also promote invasion.

The "natural" varieties of *P. arundinacea* are well suited to periods of frequent and prolonged flooding, and it is never injured by severe winter weather. They grow especially well in clay/loam soil and in sand (if the water content is high enough) but do not do well in peaty soils. It is categorized as a hard water species (in Lyons, 1998). Snyder (1992) states that it occurs along brackish tidelands. The upper range of water pH tolerance been measured to 8.8. *P. arundinacea* is not shade tolerant but is moderately tolerant of drought and saline or alkaline soils.

## Reproduction

*Phalaris arundinacea* shoots emerge from rhizomes or seeds and grow vertically through the soil surface during the first 5-7 weeks of spring. It has two periods of growth, one prior to seed maturation and one after. As the plants age they have more roots per node, while tillers per plant, total axillary shoot length, and node diameter decrease. After the second growth period, culms collapse and form dense, impenetrable mounds (in Lyons, 1998). Snyder (1992) states that rhizomes grow into dense mats within 1 year, and up to 74 percent of new shoots are believed to arise from rhizomes.

## General Impacts

*Phalaris arundinacea* can form dense, persistent, monotypic stands in wetlands, moist meadows, and riparian areas that increase sedimentation, alter water circulation and ecosystem processes. These stands exclude and displace desirable native plants and animals. Areas invaded may be of little use to wildlife (Lavergne & Molofsky 2006). Lyons (1998) states that it threatens many endangered species because its stands are shade tolerant and highly competitive despite relatively dry conditions. It constricts waterways and irrigation canals because it promotes silt deposition. Conversely, its colonies perched on the edges of incised watercourses may promote further erosion of soil beneath the dense mats of rhizomes by causing cutaways where water flows rapidly. When in flower, the species produces abundant pollen and chaff, which aggravate hay fever and allergies.

## Management Info

**Physical:** Physical removal of *Phalaris arundinacea* is easy and efficient early in the colonisation process before the formation of monotypic stands. Removal by hand pulling is practical only for small stands and requires a large time commitment (Hutchison 1992, in Lyons, 1998). Hand pulling was effective if done over the entire population 2-3 times per year for five years. Covering *P. arundinacea* infestations with black plastic has been suggested (Hoffman and Kearns 1997, in Lyons, 1998). For this method to be successful, light levels should be reduced to less than 40% of normal intensity and the plants should not be allowed to grow beyond the plastic (shoots emerging beyond the edges of the covering will provide food to covered rhizomes). Following successful control with black plastic, the area can be seeded with local, native species. Native grasses and forbs are the best plants to use as competitors. Seeds can be collected and raked into the soil after control.

**Mechanical and Manual:** Mechanical methods are aimed at removing stems, leaf canopy and seed heads before maturation. Cutting stems and mowing can expose the ground to light that will promote regeneration of native species. Apfelbaum and Sams (1987) found that clipping seed heads before maturation did not reduce dominance but Lyford (1993 in Lavergne & Molofsky 2006) found that clipping stems down to 8 cm tall every two weeks reduced its density. Discing soil and plants can stimulate the growth of native species.

**Chemical:** Several herbicides have been used to control Phalaris, including amitrole-T (3-amino-1,2,4-triazole ammonium thiocyanate), glyphosate (N-[phosphonomethyl]glycine) and dalapon (2,2-dichloro propionic acid). Tu *et al* (2001) reports good control by first mowing in late spring-early summer at the onset of flowering, then applying a foliar spray of Rodeo® in a 2% solution with either 0.5% Bio-88® or R-11® nonionic surfactant in fall, before the first frost. The formulation can be applied with a backpack sprayer or an ATV with a boom attachment.

**Integrated management:** Competitive crop management has been most effective when used in conjunction with prescribed burning (Hutchison, 1992, in Lyons, 1998). Desert saltgrass (*Distichlis stricta*) may be used as a "replacement species" in alkaline or saline soils where erosion may pose a problem after herbicide application and subsequent removal of *P. arundinacea* (Marquis *et al.*, 1984 in Lyons, 1998). Restoration of native wetland communities, partly by sowing a mixture of desirable species as early season cover crops and manipulating mixes of species may be a promising strategy to contain new infestations and restore native wetland communities (Lavergne & Molofsky 2006)

The [Weed Control Methods Handbook](#) provides you with detailed information about the tools and techniques available for controlling invasive plants, or weeds, in natural areas. This Handbook is divided into eight chapters, covering a range of different control methods: manual, mechanical, promoting competition from native plants, grazing, biocontrol, herbicides, prescribed fire, solarization, flooding, and other, more novel, techniques. Each control method has advantages and disadvantages in terms of its effects against the target weed(s), impacts to untargeted plants and animals, risks to human health and safety, and costs.

## Pathway

CNCPP (1998) states that *P. arundinacea* is the most popular species for irrigation with pollution control sewage effluent from municipal and industrial sources as practice. CNCPP (1998) states that farmers have planted *P. arundinacea* because it produces nutritious, palatable, succulent herbage for pasture, silage, and hay.

**Principal source:** [Lyons, 1998. Element Stewardship Abstract for \*Phalaris arundinacea\* L.](#)

**Compiler:** National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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## ALIEN RANGE

<b>[1]</b> AFGHANISTAN	<b>[1]</b> ALGERIA
<b>[1]</b> ARGENTINA	<b>[1]</b> AUSTRALIA
<b>[10]</b> CANADA	<b>[1]</b> CHINA
<b>[1]</b> COLOMBIA	<b>[1]</b> EGYPT
<b>[1]</b> FALKLAND ISLANDS (MALVINAS)	<b>[1]</b> INDIA
<b>[1]</b> INDONESIA	<b>[1]</b> JAPAN
<b>[1]</b> KOREA, DEMOCRATIC PEOPLE'S REPUBLIC OF	<b>[1]</b> KOREA, REPUBLIC OF
<b>[1]</b> MAURITANIA	<b>[1]</b> MONGOLIA
<b>[1]</b> NEW ZEALAND	<b>[1]</b> PUERTO RICO
<b>[3]</b> RUSSIAN FEDERATION	<b>[1]</b> SOUTH AFRICA
<b>[1]</b> SRI LANKA	<b>[1]</b> TAIWAN
<b>[1]</b> TUNISIA	<b>[45]</b> UNITED STATES

**Red List assessed species 1: EN = 1;**

[Platanthera praeclara](#) **EN**

## BIBLIOGRAPHY

**10** references found for *Phalaris arundinacea*

### Management information

[Ecology and Control of Reed Canary Grass \(\*Phalaris arundinacea\* L.\)](#), Stephen I. Apfelbaum and Charles E. Sams; Applied Ecological Services, Inc

**Summary:** Information on ecology and management methods.

[IUCN/SSC Invasive Species Specialist Group \(ISSG\), 2010. A Compilation of Information Sources for Conservation Managers.](#)

**Summary:** This compilation of information sources can be sorted on keywords for example: Baits & Lures, Non Target Species, Eradication, Monitoring, Risk Assessment, Weeds, Herbicides etc. This compilation is at present in Excel format, this will be web-enabled as a searchable database shortly. This version of the database has been developed by the IUCN SSC ISSG as part of an Overseas Territories Environmental Programme funded project XOT603 in partnership with the Cayman Islands Government - Department of Environment. The compilation is a work under progress, the ISSG will manage, maintain and enhance the database with current and newly published information, reports, journal articles etc.

[Lyons K.E. 1998. Element Stewardship Abstract for \*Phalaris arundinacea\* L.. The Nature Conservancy.](#)

**Summary:** An Element Stewardship Abstract containing detail report on description, distribution, dispersal methods, impacts, habitats and control.

Available from: <http://tncweeds.ucdavis.edu/esadocs/documnts/phalaru.html> [Accessed 13 June 2003]

[Snyder S. A., 1992 SPECIES: \*Phalaris arundinacea\* U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory.](#)

**Summary:** Detailed report on description, distribution, impacts, habitats and control.

Available from: <http://www.fs.fed.us/database/feis/plants/graminoid/phaaru/all.html> [Accessed 13 June 2003].

Varnham, K. 2006. [Non-native species in UK Overseas Territories: a review. JNCC Report 372. Peterborough: United Kingdom.](#)

**Summary:** This database compiles information on alien species from British Overseas Territories.

Available from: <http://www.jncc.gov.uk/page-3660> [Accessed 10 November 2009]

[WAPMS \(The Western Aquatic Plant Management Society\) 2003. \*Phalaris arundinacea\*: Reed Canarygrass](#)

**Summary:** Report on description, economic importance, habitat, distribution and control.

Available from: <http://www.wapms.org/plants/reedcanary.html> [Accessed 13 June 2003].

## General information

[CNCPP \(Center for New Crops & Plants Products\) 1998. \*Phalaris arundinacea\* .L. Purdue University.](#)

**Summary:** Short summary on uses, description, distribution and habitat.

Available from: [http://www.hort.purdue.edu/newcrop/duke\\_energy/Phalaris\\_arundinacea.html](http://www.hort.purdue.edu/newcrop/duke_energy/Phalaris_arundinacea.html) [Accessed 13 June 2003].

Holm L. G., et al., 1979 A geographical Atlas of World Weeds. John Wiley and Sons . New York

**Summary:** Distribution.

[ITIS \(Integrated Taxonomic Information System\), 2005. Online Database \*Phalaris arundinacea\*](#)

**Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from:

[http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p\\_action=containing&taxa=Phalaris+arundinacea&p\\_format=&p\\_ifx=plglt&p\\_lang=](http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Phalaris+arundinacea&p_format=&p_ifx=plglt&p_lang=)  
[Accessed March 2005]

Perkins, Thas E. , Wilson, Mark V. 2005. The impacts of *Phalaris arundinacea* (reed canarygrass) invasion on wetland plant richness in the Oregon Coast Range. Biological Conservation 124 (2005) 291-295