

Summary of EPPO Prioritization process¹ for: *Asparagus asparagoides*

In 2022/23, a number of species on the EPPO Observation List were re-prioritized with current information to assess if they should remain on the Observation List or be moved to another list. This is the prioritization summary for *Asparagus asparagoides* where the outcome is the species should remain on the Observation List.

Section A. Prioritization process scheme for the elaboration of different lists of invasive alien plants (pests or potential pests) for the area under assessment

A.1 Is the plant species known to be alien in all, or a significant part, of the area under assessment?

Yes: The species originates from South Africa and is alien in the whole EPPO region (EPPO, 2022).

A.2 Is the plant species established in at least a part of the area under assessment? (if yes go to A5)

Yes. The species occurs in some Mediterranean countries of the EPPO region.

According to the Euro+Med PlantBase (Euro+Med 2006+) these are the following:

Azores (Faial, Graciosa, São Jorge, São Miguel, Terceira); Balears (Ibiza); Canary islands (Gomera, Gran Canaria, Hierro, La Palma, Lanzarote, Tenerife); Corsica; France, with Channel is. and Monaco (France); Italy; Madeira archipelago (Madeira island); Morocco; Portugal; Sardinia; Sicily, with Malta (Sicily); Spain (continental), Gibraltar and Andorra; Tunisia

Established populations can be found in:

- Corsica (Jeanmonod, 2018) and parts of southern France (Tela Botanica, 2022).
- Italy, in Sicilia (Portal to the Flora of Italy 2022, Spampinato *et al.*, 2022). It is considered a casual alien in other regions (Campania, Calabria and Sardegna) (Stinca *et.* 2017).
- Spain (Castroviejo, 2013; Robledo & Carrillo, 2013). Locally established on the Balearic Islands (Ibiza: Vericad *et al.*, 2003, Mallorca: Sáez *et al.*, 2016) and Canary Islands (Izquierdo *et al.*, 2004).
- Portugal (continental). *A. asparagoides* has been naturalised for several decades on the outskirts of Lisbon (Domingues de Almeida & Freitas, 2006; Castroviejo, 2013). However, the observed established populations in Portugal are ambiguous. Domingues de Almeida & Freitas (2012) did not mention the species anymore in their “exotic flora list”.



¹ EPPO (2012) EPPO Prioritization process for invasive alien plants. EPPO Bulletin 42, 463-474.

Figure 1: GBIF distribution for *Asparagus asparagoides* in EPPO region. There were no records available in the Asian part of the EPPO region. Image/occurrence data accessed through GBIF Data Portal, data.gbif.org, 2022-09-12.

Scott & Batchelor (2006) undertook climatic projections for *Asparagus* species. Their parameters for *A. asparagoides* have been taken to run CLIMEX. The Mediterranean Basin (e.g. Portugal, Spain, Italy, parts of northern Africa) and the Atlantic coast (France) are considered to be suitable for the establishment of the species (Figure 2).

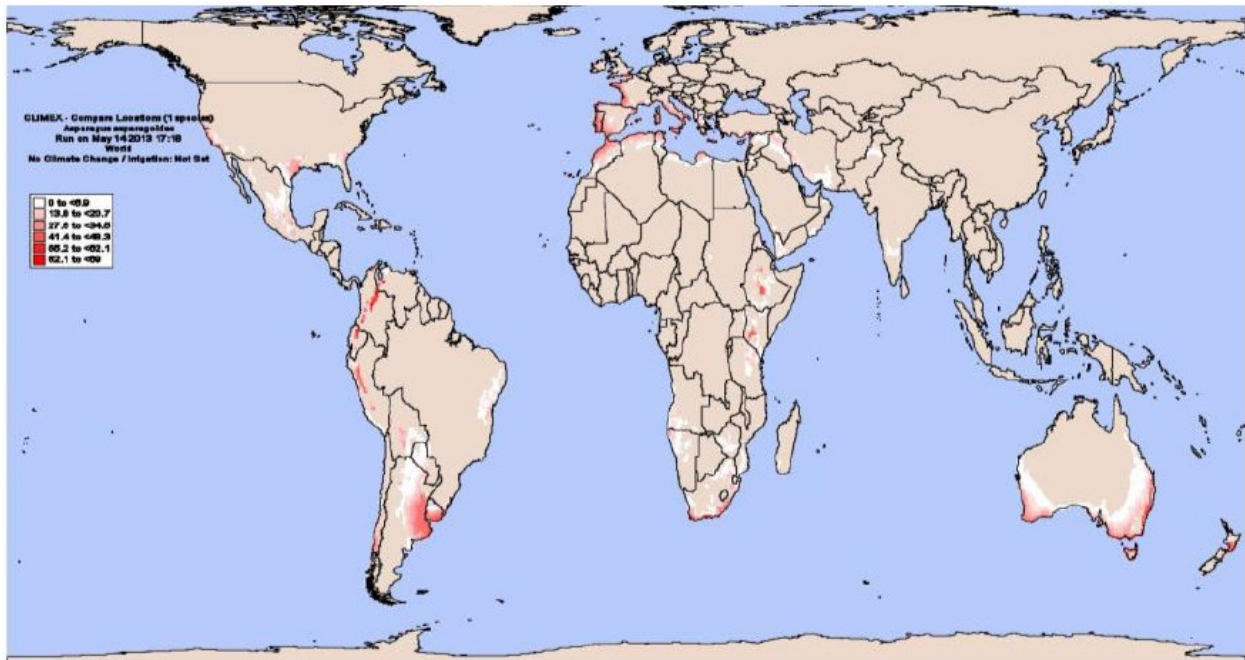


Figure 2: Worldwide projected distribution of *Asparagus asparagoides* using CLIMEX based on the parameters of Scott & Batchelor (2006).

A.3 Is the plant species known to be invasive outside the area under assessment?

Yes. *Asparagus asparagoides* is recognized as a major environmental weed e.g. in Australia and in parts of CA-USA naturalized (Jepson Flora Project, 2022). *A. asparagoides* grows very quickly, rapidly dominates, smothers understory vegetation, and changes the floristic composition of the system (Morin *et al.*, 2006; Stephens *et al.*, 2008).

A.4 Based on ecoclimatic conditions, could the species establish in the area under assessment?

Yes. See Figure 2.

A.5 How high is the spread potential of the plant in the area under assessment?

Medium with moderate uncertainty

The species produces globular berries, which contain up to 14 black, shiny, spherical ovoid seeds. Seeds remain persistent for 2 to 3 years if buried (Brusati & DiTomaso, 2005). The species may also reproduce vegetatively through rhizomes, as a new plant can regrow from rhizome fragments (Morin *et al.*, 2006).

Seeds can be disseminated in several ways:

- *Water*: Seeds of *A. asparagoides* are dispersed by water. When the plant colonizes riverbanks, seeds may be dispersed downstream by water flow. In Australia, it was highlighted that 93% of *A. asparagoides* occurrences were within 500 m of watercourses (Pigott *et al.*, 1996).
- *Birds, animals*: Frugivorous birds are recognized as important contributors to seed dispersal. Dispersal over long distances by birds is possible and can increase the rate of spread at landscape level. Stansbury (2001) estimated a dispersal distance of 12 km (based on the gut passage speed, flight speed etc.). However, bird dispersal of seeds is highly stochastic and consequently dispersal is difficult to predict precisely (Morin *et al.*, 2006). In the EPPO region, bird dispersal was also observed in Corsica (Paradis, 2002), this may nevertheless also remain a rare event. Animals may also disperse seeds. In this respect, seeds have been observed in rabbit droppings and there is anecdotal evidence that foxes are dispersal agents (Morin *et al.*, 2006).
- *Contaminated soil*: Earthworks (e.g., during road construction) can spread rhizomes and seeds over considerable distances (Stansbury & Scott, 1999). Seeds can be transported in mud attached to machinery and vehicles or clothes (Parsons & Cuthbertson, 2001).
- *Natural dispersal*: Stansbury & Scott (1999) estimated from a landholder survey that patches of about 10 m² expanded radially by approximately 0.6 m year⁻¹.
- *Others*: dumping of garden rubbish (CRC, 2000).

In the EPPO region, although this species has been present in the Mediterranean Basin since the 19th century, populations of the species remain quite stable. For example, in Sicily, the species is reported as established since 1858, the populations are stable (G. Domina, University of Palermo, pers. com., 2013). Likewise, the populations from Mallorca (Bellver forest) (since 1986) seemed to have little capacity to spread according to Sáez *et al.* (2016), but recently, it has proliferated in the area of the Bellver forest (Cronica Balear, 2022).

Since there is little specific information on the spread capacity from Australia, and due to the observations in the EPPO countries (only few new records, very locally spreading populations), the spread potential and uncertainty is ranked as medium.

A.6 How high is the potential negative impact of the plant on native species, habitats and ecosystems in the area under assessment?

High with a high uncertainty

In its native range in South Africa, *A. asparagoides* mainly occurs as a minor understory species. In contrast, it invades a variety of habitats in warm temperate climates of Australia and New Zealand including coastal heath or sandy dunes, woodlands or forests, creek and riverbanks, swamps, dry coastal vegetation, dry and damp open-forest, and littoral rainforest.

Rapid growth of *A. asparagoides* and its climbing habit provide canopy dominance and make it highly competitive. It is a major problem for conservation, because it can change the structure, floristic composition and ecology of natural ecosystems (Morin *et al.*, 2006). In Australia, the species was considered one of the most invasive plants in natural ecosystems in southern Australia in the 1990s, but has obviously passed its peak. The release of biological control agents (leafhopper, rust fungus) played most likely an important role in the large-scale decline of *A. asparagoides* (Morin *et al.*, 2022). In California, it dies back in the summer, leaving a blanket of entwined stems that can be a fire hazard. Roots can survive long droughts and re-sprout when it rains. The tuber mat forms a thick barrier just below the surface, which limits the access of other plants to soil moisture and nutrients. More than 85% of the plant weight is below ground when it is actively growing (Brusati & DiTomaso, 2005).

Specific studies on the impact of the species in the EPPO region are not available.

- In Spain, *A. asparagoides* is regulated in the whole of Spain (including the Canary Islands), and its entry, possession, transport and trade are prohibited (Ministerio de agricultura, alimentación y medio ambiente, Boletín Oficial de Estado, Lunes 12 de diciembre de 2011). Mallorca: Recently, populations in Mallorca have been removed (Cronica Balear, 2022). The species has been found in coastal sand dunes (wooded dunes with *Pinus pinea*) (Asensi *et al.*, 2014). Canary Islands: At present, there is no evidence that the *A. asparagoides* affects protected or endangered species, as it has a very restricted distribution. However, it can develop a strong competition with endemic or native species that characterize the midlands and mountain areas of the Canary Islands (Reyes-Betancort & Santos Guerra 2010).

- In France, the species is present on the coastal edge from Toulon to the French border to Italy, more particularly in sectors where the climate is mild and rainfall is sufficient. It seems to be especially invasive in degraded habitats, although it can also colonise undisturbed coastal scrub (INVMED, 2022). In Corsica, dense mats of *A. asparagoides* are reported to threaten the native and rare plant *Prasium majus* (Paradis & Piazza, 2004; INVMED, 2022). Jeanmonod (2018), however, details few occurrences and considers the species to be rare in Corsica [“La plante change de statut de fréquence et devient «R» (rare)”].

- In Malta, the plant has been cultivated as an ornamental plant, but its cultivation is decreasing. According to Mifsud (2022), the species “form[s] established non-invasive populations”.

The species could have a major impact on natural habitats as it has been observed in countries outside the EPPO region (Australia). Until now, specific impacts have not been observed in the EPPO region; however, the species already infests locally natural habitats. The potential negative impact on biodiversity is ranked as high and the uncertainty as high, too.

A.7 How high is the potential negative impact of the plant on agriculture, horticulture or forestry in the area under assessment?

Medium with a high uncertainty

In Australia, *A. asparagoides* is not known to invade agricultural systems, except for orchards (Morin *et al.*, 2006). Negative impacts of the species in citrus orchards were “increased labour and financial costs, damage to citrus trees, reduced fruit production, impediment to irrigation and fruit harvesting, and unsightliness” (Morin *et al.*, 2006). Kwong & Holland-Clif (2004) stated that “at least 12% of growers within the Murray Valley [Australia] region have orchards infested with the weed”. The cost of control is estimated to be as high (Morin *et al.*, 2006) *A. asparagoides* does not invade pastures, as it cannot withstand constant grazing. It invades pine plantations, but it is not perceived to have a significant impact on tree growth (Kwong & Holland-Clift, 2004; Morin *et al.*, 2006). In California, the species is known to invade disturbed areas and extensive areas of croplands (Brusati & DiTomaso 2005).

There are large fruit growing areas in the Mediterranean countries, which are potentially at risk. However, the potential negative impact is ranked as medium, as only specific agricultural production systems may be affected (irrigated citrus orchards,). As no impact has been observed so far and the information on impacts originates from other continents (Australia), the uncertainty is ranked as high.

A.8 How high are the potential additional impacts (e.g. on animal and human health, on infrastructures, on recreational activities, other trade related impacts such as market losses)?

Low with a low uncertainty

The species is not reported to be toxic (Morin *et al.*, 2006). It has been observed that plant shoots can form dense mats, which die-back in the summer, creating a fire hazard (CRC, 2000), though, no further information could be found on this point.

Outcome of Section A: *Asparagus asparagoides* is included on the EPPO Observation List

		A5 -Spread potential		
		Low	Medium	High
Adverse impacts (maximum rating from questions A6, A7 and A8.	Low	List of minor concern	List of minor concern	List of minor concern
	Medium	List of minor concern	Observation List	Observation List
	High	Observation List	Observation List	List of invasive alien plants

Asparagus asparagoides is not considered further. The assessment stops here.

B. Prioritization process scheme for the identification of invasive alien plants for which a PRA is needed

B.1 Is the plant species internationally traded or are there other existing or potential international pathways?

B.2 Is the risk of introduction by these international pathways identified to be superior to natural spread?

B.3 Does the plant species still have a significant area suitable for further spread in the area under assessment?

Outcome of section B:

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