

## Summary of EPPO Prioritization process<sup>1</sup> for: *Solidago nemoralis*

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 *Solidago nemoralis* 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: *Solidago nemoralis* is native to North America and is alien to the whole EPPO region (Plants of the world online).

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

No. *Solidago nemoralis* is absent from the EPPO region.

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

No.

The plant was introduced into: Assam, Fiji, Jawa (Figure 1) – no information of its status (Plants of the world online).

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

Yes. The plant grows in diverse climate zones in the following Köppen climate areas:

- Bsh, Bsk: Dry, Semi-Arid or steppe hot/cold
- Cfa: Humid subtropical climate
- Dfa, Dfb, Dfc, Dwc: continental, no dry season, warm / hot-summer. Dry winter+ cold summer

*S. nemoralis* has the potential to establish in the above-mentioned ecoregions in the assessed area.

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

Medium spread potential with medium uncertainty.

The plant inhabits prairies (growing on black soil, gravel, sand), dry and sandy fields, sandy roadsides, railroads, dunes, *Quercus velutina* savannas, eroded clay banks, abandoned fields in diverse ecoclimatic conditions (minids\_SOONE 2004, EPPO Rep. 03-2004, Plants of the world online).

*S. nemoralis* is an obligate outbreeder, containing two varieties:

1. *S. nemoralis* subsp. *decemflora* (DC.) Brammall ex Semple. (Syn. According to the USDA var. *longiptiolata* (Mack. & Bush) Palmer & Steyerl) a tetraploids, grows on the prairies and open fields and is adapted to full sunlight.

---

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

2. *S. nemoralis* subsp. *nemoralis* commonly diploid, though tetraploids do occur, grows in deciduous forest region. Hybridization between varieties is possible but there is no documentation (Plants of the world online, Chmielewski J.G, and Semple J.C. ,2004).

The plant spreads mainly by seeds within wind-dispersed achenes. It might disperse from branched caudices (stem and root) whenever caudices are being removed (Chmielewski J.G, and Semple J.C. ,2004).

There are evidences that *S. canadensis*, *S. gigantea* and *S. altissima* are invasive in parts of the assessed area (Poland, Slovakia, the Czech Republic, Hungary, and Norway). These three species are morphologically similar (Gala-Czekaj D. et.al, 2021, Szymura, M. and Szymura T.H, 2013).

However, *S. nemoralis* differs from the former mentioned species by few characteristics, which might contribute to its lower invasiveness potential:

- It has lesser dispersal potential by its achenes
- The plant produces a higher proportion of stem to rhizome tissue than occurs in other associated species of *Solidago* (Chmielewski J.G, and Semple J.C. ,2004).
- Seed and germination: It may form a short-term persistent soil seed bank up to 4.3yr. The seeds will not germinate on the soil surface after brief summer rainfall (Chmielewski J.G, and Semple J.C. ,2004). In germination experiments which conducted with 10 cycles of moistening, 4% of the seeds germinate while 50% germination occurs in *S. altissima* (Walck, J.L., Baskin J.M and Baskin C.C., 1997). Germination rises by 90 days of cold moist pretreatment (USDA Plant fact sheet).

There is no available information about *S. nemoralis* establishment beyond its native area although it has been traded for decades and even known to be introduced.

The expansion potential seems medium, with medium uncertainty. More data needed on plant biology, ecology & trade history.

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

Low with high uncertainty.

In its native area, *S. nemoralis* has a tendency to form groups of plants (USDA: Plant fact sheet). *S. nemoralis* produces allelopathic compounds and benefits of plant arbuscular mycorrhiza symbiosis, characteristics which may contribute to its expansion potential (Sokornova, S. et.al., 2022). Nevertheless the plant is not known to spread beyond its geographical native range (Plants of the world online) and no information available regarding its impact outside its native habitat.

Benefits: *S. nemoralis* is a nectar source for butterflies, honeybees, and bumblebees, it is grazed by domestic and wild Mammals (Chmielewski J.G, and Semple J.C. ,2004).

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

Medium with high uncertainty.

In some USA Western states, it is considered as a troublesome weed in moist, highly fertile soils. The plant may displace other desirable vegetation if not properly managed. Chemical treatments are mentioned in the literature in apple orchards, pastures, and soybean fields (EPPO Reporting Services, 03-2004, USDA: Plant fact sheet).

In some of the eastern USA states *S. nemoralis* was absent from tilled fields completely and from notill fields until the 7th year (Soybean), generally considered as a low importance weed.

Forestry: It typically declines as woody plant density increased (southern Illinois) (Chmielewski J.G, and Semple J.C., 2004).

Horticulture: *S. nemoralis* is a part of rock and butterfly gardens. If not properly managed may displace other desirable vegetation (USDA: Plant fact sheet, Chmielewski J.G, and Semple J.C. ,2004).

The plant is known to host the following pests:

*Rhizaspidotus dearnessi* a (Cockerell) Polyphagous scale (Au. Gov. Dep. of Agr. Water and Env. ,2020) *Agromyza posticata* Meig, *Phytomyza albiceps* Meig., and *P. chrysanthemi* Kowarz, *Melanoplus femurrubrum* (adults), *Phoetaliotes nebrascensis* (nymphs) and *Spharagemon collare* (adults) (Chmielewski J.G, and Semple J.C. ,2004).

**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 medium uncertainty.

No information on negative effect on animal and human. Trade restrictions could influence cut flowers and propagation material (seeds) trade and might change rock and butterfly gardening habits.

Benefits: Is used in Folk medicine as supportive treatment for infections, headaches, rheumatism etc.

**Outcome of Section A: *SOLIDAGO NEMORALIS* 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

*Solidago nemoralis* 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:

#### Selected references

##### Internet:

Chmielewski J.G, and Semple J.C., The biology of Canadian weeds. *Solidago nemoralis* Ait. 130 (2004)  
<https://cdnsiencepub.com/doi/pdf/10.4141/P03-200>

Draft group pest risk analysis for soft and hard scale insects on fresh fruit, vegetable, cut-flower and foliage imports. 2020. By: Australien Government. Department of Agriculture Water and Environment.  
<https://www.agriculture.gov.au/sites/default/files/documents/draft-report-scales-group-pest-risk-analysis.pdf>

EPPO (2004) Mini data sheet on *Solidago nemoralis* (deleted). Available at:  
[https://www.google.com/search?q=\)+Mini+data+sheet+on+Solidago+nemoralis&rlz=1C1GCEB\\_enIL1028IL1028&oq=\)+Mini+data+sheet+on+Solidago+nemoralis+&aqs=chrome..69i57j33i160l2.502j0j15&sourceid=chrome&ie=UTF-8](https://www.google.com/search?q=)+Mini+data+sheet+on+Solidago+nemoralis&rlz=1C1GCEB_enIL1028IL1028&oq=)+Mini+data+sheet+on+Solidago+nemoralis+&aqs=chrome..69i57j33i160l2.502j0j15&sourceid=chrome&ie=UTF-8)

EPPO Reporting 03-2004. Num. article: 2004/042  
<https://gd.eppo.int/reporting/article-1563>

Plants of the world Online, Royal Botanic Gardens Kew  
<https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:249731-1>

USDA Natural Resources Conservation Service  
<https://plants.usda.gov/home/basicSearchResults?resultId=1ef3c389-1204-4b5e-bf00-8e67f1f8c2a4>

##### Articles:

Gala-Czekaj D., Synowiec, A. and Dabkowska, D., Self-Renewal of Invasive Goldenrods (*Solidago* spp.) as a Result of Different Mechanical Management of Fallow. (2021) *Agronomy*, 11, 1065.

Sokornova, S., Malygin, D., Terentev, A., Dolzhenko, V. Arbuscular Mycorrhiza Symbiosis as a Factor of Asteraceae Species Invasion. (2022) *Agronomy*. 12, 3214.

Szymura M., Szymura T.H., Soil preferences and morphological diversity of goldenrods (*Solidago* L.) from south-western Poland. (2013). *Acta Soc Bot Pol* 82(2):107–115 DOI: 10.5586/asbp.2013.005, Abs.