Plant Risk Evaluator -- PRE™
Evaluation Report

Lysimachia nummularia 'Aurea' -- Illinois

2017 Farm Bill PRE Project

PRE Score: 15 -- Evaluate this plant further
Confidence: 61 / 100
Questions answered: 18 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: October 17, 2017

This PDF was created on June 15, 2018

Plant Evaluated

Lysimachia nummularia 'Aurea'

Image by David J. Stang

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Lysimachia nummularia 'Aurea'*) in an effort to understand the invasive history, reproductive strategies, and the impact, if any, on the region's native plants and animals. This research reflects the data available at the time this evaluation was conducted.

Summary

Lysimachia nummularia 'Aurea' falls into the "evaluate further" category in Illinois. More information about seed production, viability, and germination for the cultivar 'Aurea' would complete the screening and produce a clearer picture of invasive risk. Though the species is widespread in the United States, it's only occasionally listed as invasive. Impacts to native plant communities are suspected, but not well-documented, and may only be moderate. Lysimachia nummularia presents the greatest threat in moist areas, such as wetlands and riparian zones, so it's recognized as an aquatic invasive in some places. The literature review produced conflicting information on several counts, as noted below, which lowered confidence levels and further justifies the "evaluate further" rating.

General Information

Status: Submitted
Screener: Emily Russell
Evaluation Date: October 17, 2017

Plant Information

Plant: *Lysimachia nummularia 'Aurea'*

If the plant is a cultivar, how does its behavior differs from its parent's?
'Aurea' has yellow leaves. May be less vigorous than the species, though it is known to occasionally revert. May be more floriferous than the species.

Regional Information

Region Name: Illinois

Climate Matching Map

To answer four of the PRE questions for a regional evaluation, a climate map with three climate data layers (Precipitation, UN EcoZones, and Plant Hardiness) is needed. These maps were built using a toolkit created in collaboration with GreenInfo Network, USDA, PlantRight, California-Invasive Plant Council, and The Information Center for the Environment at UC Davis.

Click here to see the generated climate matching map for this region. This climate match database is hosted by GreenInfo Network and publicly accessible.

Evaluation Questions

These questions are based in an original article published at the University of California, Davis, and can be found on the PLOS One website, here: https://doi.org/10.1371/journal.pone.0121053

Invasive History and Climate Matching (Questions 1 - 6)

1. Has the species (or cultivar or variety, if applicable; applies to subsequent "species" questions) become naturalized where it is not native?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

For the species: "It occurs throughout the eastern United States east of the Mississippi River from Minnesota south to Louisiana, east to Georgia, and north to Maine. It occurs throughout southern Ontario, southern Quebec, and the Canadian Maritime provinces. It is also found in Nebraska, Kansas, and Colorado. It occurs in the Pacific coastal states west of the Cascade Range in Washington and Oregon; in the northern Sierra Nevada in California; and in southwestern British Columbia and Vancouver Island." Confidence level is medium since we are relying on data for the species.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
- Innes, R. J. (2011). Lysimachia nummularia.

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2. Is the species (or cultivar or variety) noted as being naturalized in the US or world in a similar climate?

- Answer: **Yes**, which contributes **2** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Lysimachia nummularia is naturalized in Illinois, as well as parts of the Midwest, Northeast, and Ontario where there is climate overlap with Illinois.

Reference(s):

- Innes, R. J. (2011). Lysimachia nummularia.
- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).

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3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

- Answer: **Yes**, which contributes **2** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Lysimachia nummularia 'Aurea' is prohibited in Massachusetts. The species is restricted in Wisconsin, but the cultivar 'Aurea' is exempt. The species is also listed as invasive in Illinois, Michigan, Delaware, Pennsylvania, Virginia (medium risk), and West Virginia (moderately invasive). It is absent from "Plant Invaders of Mid-Atlantic Natural Areas" but is included in "Mid-Atlantic Aquatic Invasive Species Field Guide." Invasive impacts are not clear. USFS says: "Little is known about the direct ecological impact of moneywort, but there is concern that the dense mats may be precluding the establishment of more desirable native plant species. Consequently, many states list moneywort as invasive." Sources agree that: "it grows most vigorously and poses the biggest threat in moist areas such as wet meadows, swamps, floodplain forests, stream banks, bottoms, ditches, roadsides and along the banks of small water bodies."

Reference(s):

- Massachusetts Department of Agricultural Resources (2009). Massachusetts Prohibited Plant List.
- Wisconsin Department of Natural Resources (2015). Moneywort (Lysimachia nummularia or L. nummelaria).
- USDA Forest Service, Forest Health Staff (2005). Weed of the Week: Moneywort Lysimachia nummularia L..
- University of Maryland Extension, Home & Garden Information Center (2015). Compilation of Regional Invasive Plant Lists.
- Stahlman, S. (2016). Mid-Atlantic Field Guide to Aquatic Invasive Species.
- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.

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4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- Answer: **Yes**, which contributes **3** points to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

The species is restricted in Wisconsin, but the cultivar 'Aurea' is exempt. The species is also listed as invasive in Illinois, Michigan, Pennsylvania, Virginia (medium risk), and West Virginia (moderately invasive). These areas have climate overlap with Illinois.

Reference(s):

- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.
- Wisconsin Department of Natural Resources (2015). Moneywort (Lysimachia nummularia or L. nummelaria).
- University of Maryland Extension, Home & Garden Information Center (2015). Compilation of Regional Invasive Plant Lists.
- Stahlman, S. (2016). Mid-Atlantic Field Guide to Aquatic Invasive Species.

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5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Lysimachia vulgaris is invasive in the Midwest.

Reference(s):

- Midwest Invasive Plant Network (2015). Midwest Invasive Plant List.

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6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Lysimachia nummularia 'Aurea' will grow in many climates.

Reference(s):

- GBIF Secretariat (2017). Lysimachia nummularia L..

Impact on Native Plants and Animals (Questions 7 - 10)

7. Does this plant displace native plants and dominate (overtop or smother) the plant community in areas where it has established?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"This species forms a dense ground cover layer, thereby altering the plant community structure and reducing the population size of some native species in the herb layer." (Wisconsin) "Although moneywort can occasionally become dominant in plant communities, it typically does not substantially modify natural habitats over large areas." (Innes)

Reference(s):

- Wisconsin Department of Natural Resources (2015). Moneywort (Lysimachia nummularia or L. nummelaria).
- Innes, R. J. (2011). Lysimachia nummularia.

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8. Is the plant noted as promoting fire and/or changing fire regimes?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of promoting fire or changing fire regimes.

Reference(s):

- [Anonymous] .

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9. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of health risks to humans or animals.

Reference(s):

- [Anonymous] .

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10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

This plant does not produce thickets because it is an herbaceous groundcover, only 2-4" tall.

Reference(s):

- [Anonymous] .

Reproductive Strategies (Questions 11 - 17)

11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

"Moneywort is a rapidly growing, herbaceous perennial that reproduces primarily vegetatively by creeping stems that root at the nodes." Cultivar 'Aurea' also spreads by creeping stems.

Reference(s):

- Innes, R. J. (2011). Lysimachia nummularia.
- Missouri Botanical Garden (2017). Lysimachia nummularia 'Aurea' - Plant Finder.

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12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"Vegetative regeneration may be important to moneywort's spread because it may be able to sprout from stem fragments." "Plant fragments can flow downstream and develop into new plants."

Reference(s):

- Innes, R. J. (2011). Lysimachia nummularia.
- Cao, L.., & Berent L.. (2014). Lysimachia nummularia L. - USGS & NOAA.

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13. Does the species (or cultivar or variety) commonly produce viable seed?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

No information was available for seed production of the cultivar 'Aurea' except "plants spread by rhizomes and self-seeding in optimum growing conditions to form large colonies." (MOBOT) Fine Gardening: "In summer, it produces many cup-shaped, bright yellow flowers." For naturalized populations of the species, some sources say "moneywort can spread rapidly both by creeping stems and seed dispersal." (Stahlman) Other sources say "seed production by moneywort is rare in the United States and in its native range. When seeds are produced, they are often inviable." (Innes)

Reference(s):

- Innes, R. J. (2011). Lysimachia nummularia.
- Stahlman, S. (2016). Mid-Atlantic Field Guide to Aquatic Invasive Species.
- Missouri Botanical Garden (2017). Lysimachia nummularia 'Aurea' - Plant Finder.
- Fine Gardening (2017). Lysimachia nummularia ‘Aurea’. Plant Guide.

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14. Does this plant produce copious viable seeds each year (> 1000)?

Answer / Justification:

There are no estimates of seed quantity in the literature, aside from: "a single seed capsule may contain 1 to 5 seeds" (Innes) "Rarely are seed capsules produced by these flowers. When it occurs, a seed capsule is ovoid in shape and has 5 cells, each cell containing several closely packed seeds." (Hilty)

Reference(s):

- Innes, R. J. (2011). Lysimachia nummularia.
- Hilty, J. (2016). Moneywort (Lysimachia nummularia).

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15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

Answer / Justification:

No information was available on germination requirements and rates.

Reference(s):

- [Anonymous] .

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16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"Plants reach maturity in 2-3 years."

Reference(s):

- Wisconsin Department of Natural Resources (2015). Moneywort (Lysimachia nummularia or L. nummelaria).

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17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

For cultivar 'Aurea', MOBOT reports "bloom time: June" For the naturalized species in Illinois, "the blooming period occurs intermittently from late spring to late summer, and can last 2-3 months for a colony of plants, although usually few flowers are produced."

Reference(s):

- Missouri Botanical Garden (2017). Lysimachia nummularia 'Aurea' - Plant Finder.
- Hilty, J. (2016). Moneywort (Lysimachia nummularia).

Dispersal (Questions 18 - 20)

18. Are the plant's propagules frequently dispersed long distance (>100 m) by mammals or birds or via domestic animals?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

"The extent to which seeds are dispersed by animals is not fully known, but this may be another method of transport."

Reference(s):

- USDA Forest Service, Forest Health Staff (2005). Weed of the Week: Moneywort Lysimachia nummularia L..
- Stahlman, S. (2016). Mid-Atlantic Field Guide to Aquatic Invasive Species.

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19. Are the plant’s propagules frequently dispersed long distance (>100 m) by wind or water?

- Answer: **Yes**, which contributes **1** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"Seeds spread naturally through flood waters". "Plant fragments can flow downstream and develop into new plants."

Reference(s):

- Innes, R. J. (2011). Lysimachia nummularia.
- USDA Forest Service, Forest Health Staff (2005). Weed of the Week: Moneywort Lysimachia nummularia L..
- Stahlman, S. (2016). Mid-Atlantic Field Guide to Aquatic Invasive Species.
- Cao, L.., & Berent L.. (2014). Lysimachia nummularia L. - USGS & NOAA.

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20. Are the plant’s propagules frequently dispersed via contaminated seed (agriculture or wildflower packets), equipment, vehicles, boats or clothing/shoes?

- Answer: **No**, which contributes **0** points to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

No evidence of accidental dispersal by humans.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 15 -- Evaluate this plant further
Confidence: 61 / 100
Questions answered: 18 of 20 -- Valid (80% or more questions answered)

PRE Score Legend

The PRE Score is calculated by adding the point totals for each (answered) question.
< 13 : accept (low risk of invasiveness)
13 - 15 : evaluate further
> 15 : reject (high risk of invasiveness)

Questions Answered Legend

It is important to answer at least 16 questions to consider a PRE Score as "valid".
>= 16 : valid (80% or more questions answered)
<= 15 : invalid (not enough questions answered)

Organization Ownership and Content Privacy

Organization: 2017 Farm Bill PRE Project
Content Privacy: Public

Evaluation Reviewers

The PRE approach is to base decisions on science and make decisions by consensus of diverse horticultural stakeholders. The literature review and process of answering PRE's questions are based on science; the decisions of which plants to prioritize are based on consensus. To ensure this process is in place and that PRE is collaborative, volunteer stakeholders are recruited from each region to review evaluations. The following experts in their profession (plant science, conservation, or horticultural trade) have participated as volunteer PRE reviewers for this evaluation:

- Richard Hawke October 30, 2017

This evaluation has a total of 1 reviewer(s).

Evaluation Issues

The following section lists all public issues for this evaluation. Issues provide a way for stakeholder reviewers to communicate any concerns or suggestions they might have with the plant or evaluation. Please email PlantRight@suscon.org if additional action is required to resolve open issues.

There are currently no issues associated with this evaluation.

About PRE and this Plant Evaluation Report

The PlantRight Plant Risk Evaluator -- PRE is an online database and platform enabling those involved in non-native, terrestrial plant production to know before they grow if a plant poses a regional invasive risk. This tool offers many benefits, and we encourage you to visit the PRE website (https://pre.ice.ucdavis.edu) for more information.

If you are a nursery trade association, or involved in the research, development or distribution of horticultural plants we invite you to join the PRE community. If you are a plant scientist, affiliated with a horticultural college or botanic garden, and would like to learn more about becoming a PRE Screener, please drop us an email, PlantRight@suscon.org, requesting a PRE Account.

PRE beta funding is provided by Sustainable Conservation (http://www.suscon.org/) and a USDA Farm Bill grant.