Plant Risk Evaluator -- PRE™
Evaluation Report

Euonymus alatus -- Texas

2017 Farm Bill PRE Project

PRE Score: 16 -- Reject (high risk of invasiveness)
Confidence: 71 / 100
Questions answered: 19 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: September 21, 2017

This PDF was created on August 13, 2018

Plant Evaluated

Euonymus alatus

Image by Chris Barton

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Euonymus alatus*) 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

Euonymus alatus is naturalized across much of Eastern North America. It is a 1 to 4 meter tall shrub which an produce thickets in forest understory, displacing native vegetation. Seed production is prolific and dispersed by birds.

General Information

Status: Submitted
Screener: Kim Taylor
Evaluation Date: September 21, 2017

Plant Information

Plant: *Euonymus alatus*

If the plant is a cultivar, how does its behavior differs from its parent's?
This evaluation is for the species, not a particular cultivar.

Regional Information

Region Name: Texas

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 **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Kartesz indicates the species is naturalized across much of eastern North America from the Atlantic coast west to eastern Kansas. It is also recorded from a single county in Colorado and Montana. "Winged euonymus has escaped plantings and naturalized in at least 21 eastern and mid-western states."

Reference(s):

- Missouri Botanical Garden PlantFinder (0). Euonymus alatus - Plant Finder.
- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
- USDA, & NRCS (2017). The Plants Database.

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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 **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Euonymus alatus is naturalized in parts of the southeastern US which share a similar climate to Texas.

Reference(s):

- 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 **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Euonymus alatus is listed as invasive but not banned in Connecticut, and is prohibited in Massachusetts. Euonymus alatus is designated an "environmental weed, naturalised, noxious weed, weed" by the Global Compendium of Weeds. The Invasive Plant Atlas indicates the species is invasive in New Hampshire, Massachusets, Connecticut, Illinois, Kentucky, Tennessee, Georgia and South Carolina. "Winged euonymus has escaped plantings and naturalized in at least 21 eastern and mid-western states. In some areas, it is now considered to be a threat to native plants because of its ability to establish itself in woodlands, forests, fields, roadsides and disturbed areas where, if conditions are favorable, it will out-compete native plants to form dense thickets."

Reference(s):

- Missouri Botanical Garden PlantFinder (0). Euonymus alatus - Plant Finder.
- Global Compendium of Weeds (GCW) (0). Euonymus alatus information from the Global Compendium of Weeds (GCW).
- USDA, & NRCS (2017). The Plants Database.
- EDDSMapS (0). winged burning bush, Euonymus alatus N/A Celastrales: Celastraceae (EDD maps).
- Invasive Plant Atlas of the United States (0). winged burning bush: Euonymus alatus (Celastrales: Celastraceae): Invasive Plant Atlas of the United States.

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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 **High** confidence in this answer based on the available literature.

Answer / Justification:

Areas where Euonymus alatus is considered invasive which share a similar climate to Texas include Georgia and South Carolina.

Reference(s):

- Invasive Plant Atlas of the United States (0). winged burning bush: Euonymus alatus (Celastrales: Celastraceae): Invasive Plant Atlas of the United States.

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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 **High** confidence in this answer based on the available literature.

Answer / Justification:

17 species of Euonymus are listed in the Global Compendium of Weeds, including E. japonicus, E. fortunei, and E. europaeus which occur in a similar climate to Texas (southeastern U.S.).

Reference(s):

- Global Compendium of Weeds (0). Global Compendium of Weeds: species index.
- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).

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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 **High** confidence in this answer based on the available literature.

Answer / Justification:

Less than half of the species range has a similar climate to Texas.

Reference(s):

- GBIF (0). Euonymus alatus (Thunb.) Siebold.

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 **High** confidence in this answer based on the available literature.

Answer / Justification:

"Winged euonymus has escaped plantings and naturalized in at least 21 eastern and mid-western states. In some areas, it is now considered to be a threat to native plants because of its ability to establish itself in woodlands, forests, fields, roadsides and disturbed areas where, if conditions are favorable, it will out-compete native plants to form dense thickets." "Euonymus alatus can invade not only a variety of disturbed habitats including forest edges, old fields, and roadsides but also in undisturbed forests." "Once established, it can form dense thickets, displacing native vegetation."

Reference(s):

- Missouri Botanical Garden PlantFinder (0). Euonymus alatus - Plant Finder.
- Invasive Plant Atlas of the United States (0). winged burning bush: Euonymus alatus (Celastrales: Celastraceae): Invasive Plant Atlas of the United States.

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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:

"winged burning bush can successionally replace native shrubs and form a dense forest understory on some sites in the Northeast, so winged burning bush may increase fuel loads in plant communities it has invaded. However, data are lacking on how winged burning bush may alter horizontal and/or vertical fuel continuity and fuel loads from historical conditions."

Reference(s):

- USDA Forest Service Data and Information Systems (0). Euonymus alatus (fs.fed).

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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:

"Although no records of toxicity have been seen for this species, a number of plants in this genus are suspected of being poisonous and so some caution is advised." Fruit and young leaves may be edible but it is unclear if the species is toxic.

Reference(s):

- Plants For A Future (PFAF) (0). Euonymus alatus Winged Spindle Tree, Burningbush, Corky spindletree PFAF Plant Database.

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

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

Answer / Justification:

"Winged euonymus has escaped plantings and naturalized in at least 21 eastern and mid-western states. In some areas, it is now considered to be a threat to native plants because of its ability to establish itself in woodlands, forests, fields, roadsides and disturbed areas where, if conditions are favorable, it will out-compete native plants to form dense thickets." "Once established, it can form dense thickets, displacing native vegetation."

Reference(s):

- Missouri Botanical Garden PlantFinder (0). Euonymus alatus - Plant Finder.
- Invasive Plant Atlas of the United States (0). winged burning bush: Euonymus alatus (Celastrales: Celastraceae): Invasive Plant Atlas of the United States.

Reproductive Strategies (Questions 11 - 17)

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

- 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:

While the species can resprout from the roots it does not appear to spread vegetatively.

Reference(s):

- USDA Forest Service Data and Information Systems (0). Euonymus alatus (fs.fed).

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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: **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 this.

Reference(s):

- [Anonymous] .

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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 **High** confidence in this answer based on the available literature.

Answer / Justification:

Seeds are viable.

Reference(s):

- Plants For A Future (PFAF) (0). Euonymus alatus Winged Spindle Tree, Burningbush, Corky spindletree PFAF Plant Database.

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

- 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:

Seed production is "prodigious"

Reference(s):

- USDA Forest Service Data and Information Systems (0). Euonymus alatus (fs.fed).

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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: **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:

"Propagation: Seed - best sown as soon as it is ripe in a cold frame. Stored seed requires 8 - 12 weeks warm followed by 8 - 16 weeks cold stratification and can then be sown in a cold frame. When they are large enough to handle, prick the seedlings out into individual pots and grow them on in the greenhouse for at least their first winter. Plant them out into their permanent positions in late spring or early summer, after the last expected frosts.."

Reference(s):

- Plants For A Future (PFAF) (0). Euonymus alatus Winged Spindle Tree, Burningbush, Corky spindletree PFAF Plant Database.

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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 / Justification:

No information was found on age at flowering.

Reference(s):

- [Anonymous] .

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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: **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:

"Bloom Time: May to June" "Small fruits (1/3” red capsules) ripen in fall." " Fl. Apr-Jul, fr. Jul-Nov." "The fruit which appears from September to October" Length of reproductive time may depend on climate and local conditions, but can be as long 5 months.

Reference(s):

- Missouri Botanical Garden PlantFinder (0). Euonymus alatus - Plant Finder.
- efloras.org (0). Euonymus alatus in Chinese Plant Names @ efloras.org.
- Invasive Plant Atlas of the United States (0). winged burning bush: Euonymus alatus (Celastrales: Celastraceae): Invasive Plant Atlas of the United States.

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

Answer / Justification:

"Seeds are attractive to certain birds who eat and distribute them." "Birds and other wildlife eat and disperse the fruit."

Reference(s):

- Missouri Botanical Garden PlantFinder (0). Euonymus alatus - Plant Finder.
- Invasive Plant Atlas of the United States (0). winged burning bush: Euonymus alatus (Celastrales: Celastraceae): Invasive Plant Atlas of the United States.

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

- 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:

Seeds are dispersed by birds.

Reference(s):

- Missouri Botanical Garden PlantFinder (0). Euonymus alatus - Plant Finder.

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 **Medium** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of this.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 16 -- Reject (high risk of invasiveness)
Confidence: 71 / 100
Questions answered: 19 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:

- Steve Moore September 26, 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.