

Species Dataform and Scoresheet for *Euonymus alatus* Thunb. (Burning bush, Winged euonymus)

Species Dataform and Scoresheet		
<i>Euonymus alatus</i> Thunb. (Burning bush, winged euonymus)		
Native range: Eastern Asia		
Date evaluated: March 24, 2009		
	Answer Choices	Response
Introductory Questions		
1. Current federal and state regulations	Y/N	N
Comments: Appears on several invasive species lists (not laws) in the Southeastern U.S., including South Carolina (Watch), Tennessee (Significant threat), Kentucky (Severe threat), Virginia (Low invasiveness), and the USFS Forest Inventory and Analysis and State Monitoring for Invasive Plants (Invasive.org 2009).		
2. Occurrence in the horticultural trade	Y/N	Y
Comments:		
3. North Carolina nativity	Y/N	N
Comments: Native of eastern Asia (Weakley 2008).		
4. Presence in natural areas	Y/N	Y
Comments: Invades natural areas (Ebinger 1983).		
5. Non-invasive cultivars	Y/N	N
Comments: Chen et al. (2006) have studied the development of transgenic sterile cultivars of <i>Euonymus alatus</i> . Researchers at North Carolina State University are working on developing new, seedless, noninvasive cultivars for landscape applications.		
	Maximum Point Value	Number of Points Assigned
Section 1. Ecological Impact		
1a. Impact on abiotic ecosystem processes	10	0
Comments: Unknown impacts on abiotic ecosystem processes.		
1b. Impact on plant community structure	20	10
Comments: The dense fibrous root system of <i>E. alatus</i> prevents the establishment of native species (Chen et al. 2006). Dense thickets may shade out native herbs and displace native shrubs (Martin, 2006). This species has established populations in a mature second growth forest that dominate the understory (Ebinger 1983).		
1c. Impact on species of special concern	5	0
Comments: Unknown impacts on species of special concern.		
1d. Impact on higher trophic levels	5	0
Comments: Unknown impacts on higher trophic levels.		
Section 1. Subrank	40	10
Section 2. Current Distribution and Potential for Expansion		
2a. Local range expansion	7	0
Comments:		
2b. Long-distance dispersal potential	13	13

Comments: Seeds dispersed long distances by birds and water (Chen et al. 2006). Seeds are dispersed by birds (Martin 2006).		
2c. Reproductive characteristics	8	8
Comments: Seeds germinate readily from bird-dispersed fruits (Martin 2006). A mature plant may produce up to 50,000 seeds that are dispersed by birds and water and germinate readily (Chen et al. 2006). Expands through vegetative reproduction (Swearingen et al. 2002). Grows well in a variety of environmental conditions, including different soil types, pH levels, and full shade (Martin 2006).		
2d. Range of communities	6	0
Comments: The range of affected communities in North Carolina is unknown.		
2e. Similar habitats invaded elsewhere	6	6
Comments: <i>Euonymus alatus</i> has established populations in a mature white oak upland forest and an open second growth lowland forest in Illinois (Ebinger 1983). Populations have been found growing in ravines in valley floor forests and glacial drift hill prairies (Martin, 2006). Escaped cultivation in Connecticut, Virginia, Pennsylvania, and Illinois, possibly into woodland areas and coastal scrubland (Martin, 2006). Comparable Natural Communities of North Carolina (Shafale and Weakley 1990) = Low elevation mesic forests, low elevation dry and dry-mesic forest and woodlands, and communities of the coastal zone)		
Section 2. Subrank	40	27
Section 3. Management Difficulty		
3a. Herbicidal control	5	0
Comments: Cut stumps may be painted with glyphosate (Martin 2006). Glyphosate and triclopyr may be applied to cut shrubs (Swearingen et al. 2002).		
3b. Nonchemical control methods	2	1
Comments: Seedlings can be hand-pulled and large plants may be cut but regrowth may need to be repeatedly cut back (Martin 2006).		
3c. Necessity of individual treatments	2	2
Comments: Herbicides should be applied to cut stumps immediately after cutting (Martin 2006). Herbicides should be applied to shrubs that have been cut to the ground (Swearingen et al. 2002).		
3d. Average distribution	2	1
Comments: Populations of this species may dominate an area of the forest understory or consist of a few large shrubs and numerous seedlings (Ebinger 1983).		
3e. Likelihood for reestablishment	2	2
Comments: This species produces a high number of seeds that are dispersed by birds (Martin 2006), which may allow reestablishment in a treated area. Regrowth from treated shrubs should be repeatedly cut back (Swearingen 2002). Treatments of cutting and herbicide application may require a five-year commitment for control (NatureServe 2008).		
3f. Accessibility of invaded areas	2	1
Comments: Inaccessible areas may be colonized, since seeds are dispersed by birds and the species is highly shade-tolerant (Martin 2006).		
3g. Impact on native species and environment	5	2
Comments: The nonselective herbicides glyphosate and triclopyr may impact non-target species.		

Section 3. Subrank	20	9
Section 4. Benefits and Value		
4a. Estimated wholesale value	-7	-3
Comments: The annual estimated wholesale value attributed to this species is \$5,221,000 (Trueblood 2009).		
4b. Percentage of total sales	-5	-2
Comments: Among the producers that sell this species, the highest percentage of total sales attributed to this species from any one grower is estimated to be 6-10% (Trueblood 2009).		
4d. Ecosystem services	-1	0
Comments:		
4e. Wildlife habitat	-1	0
Comments:		
4f. Cultural and social benefits	-1	0
Comments:		
Section 4. Subrank	-15	-5
Overall Score	100	41
Overall Recommendation: Moderately weedy and recommended for use with specific guidance – These species have less than high ecological impact, distribution and invasive potential, and management difficulty in relation to economic value. These plants should not be grown in close proximity to natural areas that have communities similar to those where this plant has been found to naturalize or near natural areas that have sensitive or threatened plants and/or natural communities. (Overall Score: 34 – 66)		
Summary: <i>Euonymus alatus</i> (Burning bush) is moderately weedy in North Carolina and may be recommended for horticultural use with specific guidance by the North Carolina Nursery and Landscape Association. The ecological impacts of <i>Euonymus alatus</i> are largely unknown, but dense thickets of this species may shade out native herbs and displace native vegetation. There is potential for the additional invasion of burning bush to natural areas due to the high potential for natural dispersal. The difficulty of managing <i>E. alatus</i> is moderate considering the availability of control methods, but management may be costly considering the time and labor required to effectively treat stands of this species. <i>Euonymus alatus</i> is economically valuable to the nursery industry.		

References:

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