

Oregon Department of Agriculture
Weed Risk Assessment for White Bryonia, *Bryonia alba* L.
February 2008

White bryonia (*Bryonia alba* L.) aka. White bryony, Wild hops, devils turnip, western kudzu.

Family: Cucurbitaceae

Findings of this review and assessment: White bryonia, has been determined to be a category of a “A” listed noxious weed as defined by the ODA Noxious Weed Policy and Classification System. This determination is based on two independent risk assessments following a literature review. Using a rating system adapted from USDA-APHIS Weed Risk Assessment Guidelines, white bryonia scored 40 out of a potential score of 46. Using the ODA Noxious Weed Rating system, white bryonia scored 23 also supporting an “A” listing. .

Introduction: White bryonia is a vigorous herbaceous perennial vine resembling kudzu in appearance and growth habit. Infestations will overgrow and smother small trees and shrubs forming dense mats which shade out all the vegetation it grows upon. If established in areas with no structure to climb, it will form a dense mat covering the ground. Vines emerge each spring from a large fleshy parsnip-shaped tuber and grow rapidly, sometimes to 30 feet. Populations are documented from south-east Washington State, Idaho, Utah and Montana.



Description: White bryonia develops an herbaceous vine each year sporting tendrils and palm-shaped, alternate, broadly 5-lobed leaves which are covered on upper and lower surfaces by small white glands. Flowers are small, greenish-white, 5-petaled and produced in clusters. Fruits consist of dark-blue berries 5/16 inches in diameter when fully ripe. When crushed, the berries contain a viscous fluid and emit a very bad odor. While the plant leaves and vines resemble the native *Marah oregana*, the fruiting structure on the native cucumber is a golf-ball sized fleshy pod covered in soft pointed

outgrowths, very unlike the black berries of the invasive species. The plants do not overlap in their growing environment.

Reproduction and dispersal: Reproduction occurs both sexually by seeds and asexually by apomixis. Population studies indicate multiple introduction events in the Pacific Northwest resulting in large clonal populations produced through apomictic production of propagules (Mack & Novak 2000). Some genetic variation is occurring through cross pollination between clones. For long-distant dispersal, blue-black seeds are produced which are eaten by birds and deposited after digestion.

Economic impact: All parts of the plant contain byonin which is poisonous to humans. Poisoning cases have been reported from this and related species worldwide. Livestock are also poisoned by eating the leaves and fruit. Dried root powder derived from the tubers is used in herbal medicine treatments and sold on many websites. Control and removal costs currently represent the largest economic cost to white bryonia invasion. Vines can present a problem in yards, fencerows on farms and in parks. Control is difficult and often takes several years.

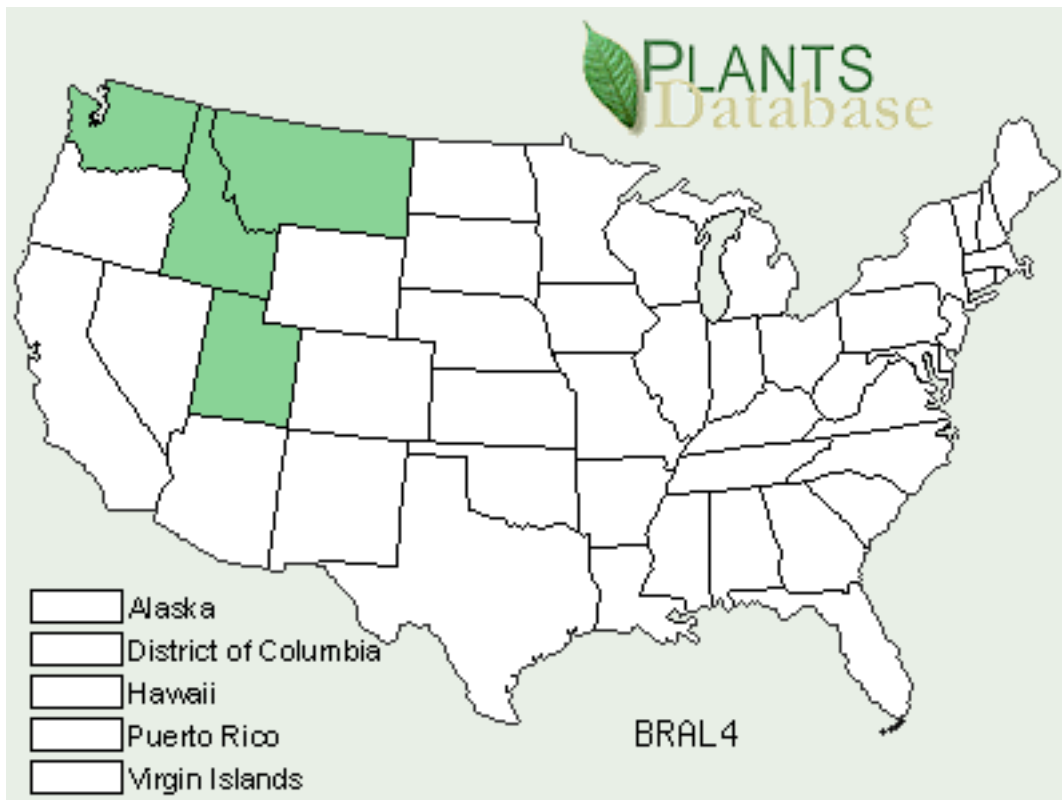
Environmental impact: White bryonia aggressively climbs and smothers small trees and shrubs commonly found along riparian areas and springs. Thick mats will exclude all other vegetation wherever it establishes in good soil. Many important geographic areas are at risk especially Hells Canyon and other river canyons of the Pacific Northwest where it can be expected to compete with native plants which often provide browse for game animals.



Photo; Gary O'Keefe. Latah County Weed Control, Idaho

Native range: Europe to northern Iran.

North American range: Documented in Montana, Nez Perce and Latah counties in Idaho and the SE counties of Washington State. Report indicate that it is spreading rapidly in all areas.



Control: Treatment information tested and compiled by Nez Perce Soil and Water Conservation District indicates that both chemical and manual applications are effective. (Rasmussen 2006) Foliar glyphosate provides 100% control though non-target damage is significant. Removing the top 3-4 inches of the tuber also offers 100% control though is labor intensive. Non-target effects are eliminated though. Drilling holes in the tuber and applying glyphosate or 2,4-D have also been tested with good results, though the legality of these treatments has not been determined for Oregon.

Assessing Pest Risk

Assessing Pest Risk: Two weed rating systems were used for this weed risk assessment. The first is a modified rating system adapted from the Weed Risk Assessment Guidelines for Qualitative Assessment developed by the United States Department of Agriculture, Animal and Plant Health Inspection Services, Plant Protection and Quarantine (USDA-APHIS 2002), a second system, Oregon Department of Agriculture's Noxious Weed Rating System, is also used.

ODA Modified USDA - Qualitative Risk Assessment

Common Name: White bryonia Scientific Name: Bryonia alba
(intermediate scoring may be used eg. =4)

1. Habitat Suitability: Suitable climate and habitats (and availability of host plants, if organism is a parasitic plant) would permit the weed to survive and establish.

High (5) can thrive and reproduce in most or all of the susceptible habitats and habitat is enormous *or* extremely limited and of high economic/ecological value.

Medium (3) can grow and reproduce in approximately one-third to two-thirds of susceptible habitats.

Low (1) Can thrive and reproduce in approximately one-third or less of susceptible habitats.

SCORE: 5

Explanation: Most of the state is susceptible to bryonia invasion.

2. Spread Potential after Establishment: Dispersal Potential (Speed and Distance)

High (5) Weed has potential for rapid natural spread throughout its susceptible range. Has high reproductive potential and highly mobile propagules. (e.g. Seeds can be wind dispersed over long distance.)

Medium (3) Weed has a moderate potential for natural spread with *either* high reproductive potential *or* highly mobile propagules. Propagules spread by moving water, humans or animals. Movement possible through long distance commerce.

Low (1) Weed has potential for *local* spread within a year. Moderate reproductive potential or some mobility of propagules. Animals may move propagules locally, wave action in lakes.

Negligible (0) Weed has no potential for natural spread in the analysis area

SCORE: 4

Explanation: Berries are rapidly dispersed by birds.

3. Economic Impact

High (5) Weed causes impacts in reduced crop yield, lowered commodity value, increased cost of production or a loss of markets due to contamination *or* weed also may cause significant impacts to recreation, fishing and hunting and property values. Control costs to manage infestations would become significant.

Medium (2) Weed causes two of the above economic impacts or a single impact over a wide range (over 5 types) of economic plants, recreation, products or livestock.

Low (1) Weed causes one of the above impacts.

Negligible (0) Weed causes none of the above impacts.

SCORE: 2

Some impacts in parks, on farms, and to homeowners would occur.

4. Environmental Impact:

Descriptions of environmental harm: Causes impacts on ecosystem processes; causes impacts on natural community composition; causes impacts in community structure; causes indirect impacts that are measured by a reduction in aesthetic value, reduced opportunities for recreation and reductions in other non-monetary values.

Scoring:

High (5) Plant causes significant impacts in most categories.

Medium (2) Plant causes moderate impacts.

Low (1) Few or no environmental impacts.

Negligible (0) None of the above effects probable.

SCORE: 5

Explanation: Trees and shrubs in dryer areas would be negatively impacted as well as certain wildlife. Bryonia forms thick carpets over all other vegetation.

5. Likelihood of Introduction and Spread:

Entry Potential: The likelihood that an exotic weed will be introduced and spread depends on the number of associated factors, some physical, some biological, some social/economic. For this analysis, consider the following five factors:

5a. Weed is a pest in similar climactic zones:

5= Weed is known to be a significant pest in similar climactic zones at place of origin *or* demonstrates significant adaptation to multiple climactic zones wherever it is found.

3= Plant demonstrates weedy characteristics in non-place of origin areas only. Plant limited to a few climactic zones

1= Weed is strictly limited to one minor climactic area or zone. Plants exhibit little adaptability to new environments.

Score=3

Explanation: The plant is currently found throughout a variety of climactic zones.

5b. Proximity to State:

5= Weedy populations adjacent to Oregon border or within state.

3= Weedy populations found in Western US regions but not adjacent to Oregon border.

1= Weedy populations found in Eastern US regions or foreign country only.

Score=5

Explanation: Weed is currently found in Idaho and Washington adjacent to the Oregon border near Lewiston.

5c. Probability of detection at introduction point:

3= high probability of no initial detection, weed shape and form obscure/not showy, introduction probable on lands remote or off-limits to weed professionals

2= Weed easy to identify by weed professionals, ranchers, botanists, some survey and detection infrastructure in place.

1= probability of rapid detection high, plants showy, public easily recognizes weed, access not limited.

Score=3

Explanation: Plant will establish well in Hell's Canyon in remote environments.

5d. Probability of weed imported or moved to suitable habitat:

3= high probability that weed will be introduced yearly.

2= moderate probability of introduction.

1= low probability of introduction.

Score=3

Explanation: Birds will transport the seeds into Oregon annually.

5e. Probability of expansion in the State:

5= Environment possesses ideal growing conditions for reproduction and spread. Plant expresses full growth and reproductive potential in environment.

2= Environmental factors restrict full growth and reproductive potential.

1= Environmental factors damage plant growth and/or prevent reproduction.

Score=5

SCORE = Sum of 5 = 19

6. Current Distribution:

5= Not known to occur, or limited to 1 or a few infestations in state.

3= Regionally abundant (eastern/western Oregon)

1= Widespread, occurs throughout the state.

SCORE: 5

Explanation: Not known to exist in Oregon though no survey has been conducted for it.

The total risk score for white bryonia (out of a possible 46) with the USDA-APHIS Risk Assessment is: 40.

36-46 "A" weed 24-36 "B" Weed Below 24: unlisted

Oregon Department of Agriculture Noxious Weed Rating System

White bryonia
Common Name

Bryonia alba
Scientific Name

Points Category

- 1.3 Detrimental Effects:** Circle all that apply, enter number of circles
1. **Health:** causes poisoning or injury to humans or animals
 2. **Competition:** strongly competitive with crops, forage, or native flora
 3. **Host:** host of pathogens and/or pests of crops or forage
 4. **Contamination:** causes economic loss as a contaminate in seeds and/or feeds
 5. **Interference:** interferes with recreation, transportation, harvest, land value, or wildlife and livestock movement
- 2.3 Reproduction & Capacity for Spread:** Circle the number that best describes, enter number
1. Few seeds, not wind blown, spreads slowly
 2. Many seeds, slow spread
 3. Many seeds, spreads quickly by vehicles or animals
 4. Windblown seed, or spreading rhizomes, or water borne
 5. Many wind-blown seeds, high seed longevity, spreading rhizomes, perennials
- 3.5 Difficulty to Control:** Circle the number that best describes, enter number
1. Easily controlled with tillage or by competitive plants
 2. Requires moderate control, tillage, competition or herbicides
 3. Herbicides generally required, or intensive management practices
 4. Intensive management generally gives marginal control
 5. No management works well, spreading out of control
- 4.6 Distribution:** Circle the number that best describes, enter number
1. Widely distributed throughout the state in susceptible habitat
 2. Regionally abundant in part of the state, 5 or more counties, more than 1/2 of a county
 3. Abundant throughout 1- 4 counties, or 1/4 of a county, or several watersheds
 4. Contained in only 1 watershed, or less than 5 square miles gross infestation
 5. Isolated infestation less than 640 acres, more than 10 acres
 6. Occurs in less than 10 acres, or not present, but imminent from adjacent state
- 5.6 Ecological Impact:** Circle the number that best describes, enter number
1. Occurs in most disturbed habitats with little competition
 2. Occurs in disturbed habitats with competition
 3. Invades undisturbed habitats and crowds out native species
 4. Invades restricted habitats (i.e., riparian) and crowds out native species

TOTAL POINTS: 23

Note: Noxious weeds are those non-native plants with total scores of 11 points or higher. Any plants in 4.1, 4.2, and 4.3 should not be classified as “A” rated weeds. Ratings: 16+ = A, 15 – 11= B

References

Written Findings of the State Noxious Weed Control Board-Class B- B-Designate Weed 3/31/2007 www.nwcb.wa.gov/weed_info/written_findings/bryonia_alba.html

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PLANTS Profile for **Bryonia** alba (**white** bryony) | USDA PLANTS plants.usda.gov/java/profile?symbol=BRAL4

Finnigan B.F. 1995. Just the Facts—Sheet, Home and Garden Information, Topic: White Bryonia (Western Kudzu) Univ.of Idaho Extension Service Publication

Photos obtained through: Trish Heekin, Resource Conservation Planner, Latah Soil and Water Conservation District. 220 E. Fifth Street Moscow ID 83843

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