



Vegetation Management Guideline

Japanese Hops (*Humulus japonicus* Sieb. & Zucc.)

Species Character

DESCRIPTION

Japanese hops (*Humulus japonicus*) is a rapidly growing annual, or in rare instances a short-lived perennial, herbaceous vine with stems that climb or trail along the ground and have small down-turned prickles. The leaves are opposite, 5 - 12.5 cm (2 - 5 inches) in length and palmately divided into 5 - 9 lobes that gradually taper to a point. The leaf margins have small forward pointing teeth. The leaves, like the stems, have rough, down-turned hairs that may cause dermatitis in sensitive individuals. Petioles are often as long or longer than the leaf blade. Down-turned bracts occur where the leaf petioles attach to the stem. The species is dioecious with staminate and pistillate flowers occurring on separate plants. The staminate inflorescence is erect and 15 - 25 cm (6 - 10 inches) in length. The pistillate inflorescence is a dull-green, cone-shaped spike, 7 - 12 mm (1/4 - 1/2 inch) long with dense hairs at the margins of the bractioles. Pistillate flowers are petalless and greenish. The fruit, an achene, is a yellow-brown color, 4 - 5 mm (1/8 - 3/16 inch) in length and ovoid-orbicular in shape.

SIMILAR SPECIES

Japanese hops can be confused with native hops (*Humulus lupulus*), bur cucumber (*Echinocytis lobata*) and grapes (*Vitis* spp.). Native hops are a perennial herbaceous vine with 3-lobed, or sometimes unlobed leaves, that are rounded at the tip and have resinous glands beneath. The petiole of native hops is shorter than the leaf blade. Bur cucumber has alternate, 5-lobed leaves, lacks down-turned prickles on the stem and leaves and has tendrils. Grapes are perennial woody vines often with tendrils. Older vines often have brown, flaking bark, but new growth is tender and green, and may appear to be herbaceous. The leaves may be unlobed or 3- to 5-lobed. If identification of Japanese hops is in doubt, the plant's identity should be confirmed by a knowledgeable person or by consulting appropriate manuals or keys.

DISTRIBUTION

Japanese hops is native to eastern Asia. Some reports indicate it was introduced into the United States by the Massachusetts Company as early as 1629. Confirmed reports of Japanese hops in Connecticut date back to the late 19th century. Today, it is known from all of the Atlantic coast states except Florida and ranges west and north into Alabama, Tennessee, Arkansas, Kansas, Nebraska and North and South Dakota. It occurs throughout Illinois. Only the native hops (*Humulus lupulus*) is used in the production of beer. Japanese hops use is purely ornamental. The sale of Japanese hops is prohibited in Connecticut and Massachusetts.

HABITAT:

Japanese hops prefers rich, moist soils in floodplains where it can



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form dense stands. It is commonly found along streambanks and lakeshores and in wet meadows. It grows in full sun or shade and can thrive in disturbed areas such as roadsides, abandoned fields, forest edges and urban lots.

LIFE HISTORY

Japanese hops flowers in July - August. Reproduction is by small seeds that are dispersed mechanically; usually by wind or water along rivers and streams, or vegetatively through fragmentation. Once established, growth rate is very rapid and stems will trail along the ground or climb vegetation. Adventitious roots may develop at the nodes. Seeds may remain viable in the seed bank for three or more years.

EFFECTS UPON NATURAL COMMUNITIES

Japanese hops can form dense stands that may displace native vegetation. The climbing vines can also result in shading and/or girdling of more desirable vegetation.

CONTROL RECOMMENDATIONS

RECOMMENDED PRACTICES IN HIGH QUALITY NATURAL COMMUNITIES

Note: Regardless of the control method implemented, monitoring and/or followup treatments will be needed. Control efforts often result in a dramatic reduction of biomass during the first year of treatment, but some plants usually persist for at least three years.

MECHANICAL CONTROL

Hand pulling prior to seed maturation in late summer, can be effective for small populations. To minimize re-sprouting, as much of the rootstock as possible should be removed. When possible, pulled plants should be removed from the area as leaf nodes that remain in contact with moist soil may develop adventitious roots before the plants completely die.

Mowing, cutting with a brush cutter or other device, or burning with a torch will reduce aboveground growth and may prevent seed development if plants are cut or burned immediately prior to flowering. Re-sprouting is likely and additional treatments or cuttings may be necessary. To prevent spread by vegetative means, all Japanese hops plant material should be removed from rotary mowers prior to leaving an infested area.

CHEMICAL CONTROL

Triclopyr (Garlon 3A, Tahoe 3A) are broadleaf specific herbicides that can control Japanese hops. For Garlon 3A and Tahoe 3A, a 2 % solution (2 ½ ounces of herbicide per gallon of solution) is recommended. Garlon 3A and Tahoe 3A are rainfast in 3 hours, Curtail in six hours. Apply the herbicides to thoroughly cover the plants. **Do not spray so heavily that herbicide drips off the target species.** Care should be taken to avoid spraying non-target plants. The herbicide should be applied while backing away from the area to avoid walking through wet herbicide. Personal protective wear is recommended when applying herbicide. Do not spray Garlon 3A or Tahoe 3A over open water, lakes, rivers, streams or creeks. By law, herbicides may only be applied as per label instructions and by licensed herbicide applicators or operators when working on public properties.

RECOMMENDED PRACTICES ON BUFFER AND SEVERELY DEGRADED SITES

Same as for high quality areas with the addition of the following practices.

Glyphosate (Roundup, Rodeo) and glyphosate, N- (Accord) are non-selective, broad spectrum herbicides that control most herbaceous and woody plants species. For best results, mix 2.5 ounces of Roundup or Rodeo or 6 ounces of Accord per gallon of solution. Roundup, Rodeo, and Accord are rainfast in six hours. Rodeo and Accord are labeled for use in and around water including wetlands in forests; however, it should not be applied within one half mile of potable water intakes.

BIOLOGICAL CONTROL AGENTS

Japanese hops is susceptible to the hop latent *carlavirus* and *Humulus japonicus ilarvirus* which are transmitted by aphids. Plants infected with hop latent *carlavirus* usually exhibit systemic chlorotic flecking while plants infected with *Humulus japonicus ilarvirus* usually show necrotic local lesions, chlorotic mottle or mosaic in leaves. However, both viruses also infect native hops and several other commercially important plant species, so their use as biocontrol agents probably is not feasible.

FAILED OR INEFFECTIVE PRACTICES

Since Japanese hops usually behaves as an annual, prescribed burning probably is not an effective management tool as the plants are not likely to be active during dormant season burns. Dried material from vines that have climbed into trees or other vegetation can present safety and control issues if located near firelines. In South Korea, studies examining the effects of burning on *Miscanthus sacchariflorus* found that burning stimulated Japanese hops and that burned plots were dominated by Japanese hops by mid July.

REFERENCES

- Brunt, A.A., K. Crabtree, M.J. Dallwitz, A.J. Gibbs, L. Watson, and E.J. Zurcher, (eds.) (1996 onwards). 'Plant Viruses Online: Descriptions and Lists from the VIDE Database. Version: 16, January 1997.' URL: <http://biology.anu.edu.au/Groups/MES/vide>. Accessed: June 27, 2006.
- Farm World. Online glossary. URL: www.farmworldonline.com/General/Terms.asp. Accessed June 28, 2006.
- Gleason, H.A. and A. Cronquist. 1991. Manual of vascular plants of Northeastern United states and adjacent Canada. The New York Botanical Garden, New York. 810 pp.
- Invaders of the Gateway Region. Missouri Botanical Garden. URL: www.mobot.org/Invaders/ViewSpecies.asp?SpeciesID=6. Accessed June 28, 2006.
- Kim, G. Y., C. W. Lee, H. S. Yoon, and G. J. Joo. 2005. Effect of Cutting and Burning on the Growth Pattern of *Miscanthus sacchariflorus* in the Woopo Wetland, South Korea. *IN* : The Aquatic Plant Management Society, Inc. 45th Annual meeting. July 10-13, 2005. Hyatt Regency San Antonio, San Antonio, TX. URL: www.apms.org/2005/Program.pdf. Accessed June 28, 2006.
- Mehrhoff, L. J., J. A. Silander, Jr., S. A. Leicht, E. S. Mosher and N. M. Tabak. 2003. IPANE:

- Invasive Plant Atlas of New England. Department of Ecology & Evolutionary Biology, University of Connecticut, Storrs, CT, USA. URL: <http://www.ipane.org>. Accessed June 27, 2006.
- Mohlenbrock, R.H. 2002. Vascular flora of Illinois. Southern Illinois University Press, Carbondale.
- Hager, A and D. Nordby. 2005. Japanese Hops. The Bulletin. No. 23, Article 11. Department of Crop Science, University of Illinois, Champaign. Available at: www.ipm.uiuc.edu/bulletin/contents.php?id=49. Accessed: June 27, 2006.
- USDA, NRCS. 2006. The PLANTS Database (<http://plants.usda.gov>, 27 June 2006). National Plant Data Center, Baton Rouge, LA 70874-4490 USA. Accessed June 27, 2006.
- Virginia Tech weed identification guide. Available at: www.ppws.vt.edu/scott/weed_id/humja. Accessed June 27, 2006.
- Invasive species - Japanese hops. (*Humulus japonicus*). Wisconsin Department of Natural Resources. URL: www.dnr.state.wi.us/invasives/fact/japanhops.htm. Accessed: June 27, 2006.

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