

VEGETATION MANAGEMENT GUIDELINESiberian elm (*Ulmus pumila* L.)**SPECIES CHARACTER****DESCRIPTION**

Siberian elm is a fast-growing, small to medium-sized tree with an open, round crown of slender, spreading branches. It generally measures 50-70 feet (15-21 meters) tall with a spread equal to three-fourths its height. Its rough bark is gray or brown and shallowly furrowed at maturity. Both the small, blunt buds and slender, smooth twigs are nearly hairless. Twigs, which are often zigzag, have alternately arranged leaf scars that are half round in shape and each contain 3 bundle traces. This elm is distinguished by its small, elliptic, smooth, singly-toothed leaves, that reach lengths of approximately 0.8-2.6 inches (2-7 cm). Blades of the alternate, simple leaves are short-pointed at the tip and tapering or rounded at the asymmetrical base. The short-petioled leaves are dark green and smooth above, paler and nearly hairless beneath, and yellow in autumn. Foliage is slightly pubescent when young, and firm at maturity. Flowers are greenish, lack petals, and occur in small drooping clusters of 2-5. The winged fruit of this hardy tree is a 1-seeded, smooth, circular or rather obovate samara that is 0.4-0.6 inch (10-15 mm) wide and hangs in clusters.

SIMILAR SPECIES

Siberian elm is distinguished from American elm (*Ulmus americana*) and slippery elm (*Ulmus rubra*) based on the following characteristics. Siberian elm has relatively small leaves (rarely more than 2 inches or 5 cm long) that are symmetrical or nearly so at the base and are once-serrate. Both American and slippery elm have leaves typically over 2.8 inches (7 cm) long that are strongly asymmetrical at the base and are usually twice-serrate. Siberian elm should be accurately identified before attempting any control measures. If identification of the species is in doubt, the plant's identity should be confirmed by a knowledgeable individual and/or by consulting appropriate books.

DISTRIBUTION

Siberian elm is native to northern China, eastern Siberia, Manchuria, and Korea, and was introduced to the U.S. in the 1860's. It is the hardiest of all elms and does well even in areas with cold winters and long periods of summer droughts. Often planted in recent decades because of its fast growth and resistance to Dutch elm disease, it is now established at least from Minnesota south to Arkansas and west to Utah.

HABITAT

Because this elm tolerates a variety of conditions, such as poor soils, high salt concentrations, and low moisture, it is found in dry regions, along roadsides, in pastures, in grasslands, as well as in moist soils along streams. It invades dry and mesic prairies, including sand prairies.

LIFE HISTORY

The tree flowers in spring before leaves begin to unfold. The samaras follow quickly and are disseminated by wind, allowing the species to form thickets of hundreds of seedlings in bare ground. Seeds germinate readily in the same year that they are produced and seedlings grow rapidly. Trees generally



begin producing seeds after eight years of growth.

EFFECTS UPON NATURAL AREAS

If there is a nearby seed source, the tree can invade and, in a few years, dominate prairie areas, particularly if they have been subjected to past disturbance or fire suppression.

CONTROL RECOMMENDATIONS

RECOMMENDED PRACTICES IN NATURAL COMMUNITIES OF HIGH QUALITY

Initial effort in areas of heavy infestation

Girdling trees is the preferred management technique where practical. Girdle large trees in late spring to mid-summer when sap is flowing and the bark easily peels away from the sapwood. Girdled trees die slowly over the course of one to two years and do not resprout. When girdling a tree, the bark and phloem must be removed from a band around the tree trunk and the xylem must remain intact. If girdled too deeply, the tree will respond as if it had been cut down and will resprout from the roots. Girdling can be done with an ax, saw, or chainsaw. Two parallel cuts 3-4 inches apart, cutting through the bark slightly deeper than the cambium are needed. The bark is knocked off using a bark spud, bark knife, or a blunt object such as the head of an ax. The girdles should be checked every several weeks at first to make sure bark does not develop over the cut area.

If girdling is not an option, trees can be cut, and any resprouts that occur subsequently should also be cut. If time constraints prevent cutting the new sprouts, the stumps created by the initial tree cutting can be treated with Roundup (a formulation of glyphosate) or Garlon 4 (a formulation of triclopyr) to prevent resprouting. While the Roundup label recommends a 50-100% concentration of Roundup for stump treatment, a 10-20% concentration has proven effective. A 20% solution of Garlon 4 when mixed with a mineral or plant-oil based carrier has also proven effective. Roundup or Garlon 4 can be applied to the cut stump either by spraying the stump with a low pressure hand-held sprayer or wiping the herbicide on the stump with a sponge applicator to prevent resprouting. Herbicides should be avoided except when there is not enough time to go back and cut the sparse resprouts. Care should be taken to prevent contacting nontarget plants with the herbicide. Do not use Garlon 4 if snow, ice, or water is present on the ground. By law, herbicides only may be applied as per label instructions and by licensed herbicide applicators or operators when working on public properties.

Injection using the EZ-Ject lance with Roundup capsules is an effective control. For plants with numerous stems, each stem greater than 2 cm (3/4 inch) may need to be treated to ensure the plant is killed. Stems larger than 5 cm (2 inches) in diameter should be injected with an additional capsule for each 2.5 cm (1 inch) increase in stem diameter. For plants with multiple stems less than 1.5 cm (1/2 inch), a capsule may be injected into the upper portion of the root crown.

Seedlings can be pulled out by hand and small trees can be removed carefully by grub hoe. Elm seeds blowing in from nearby areas are often a greater threat than resprouting of established elms. Managers should eliminate nearby Siberian elms whenever possible.

Initial effort in areas of light infestation

Same as given above for heavily infested areas.

Maintenance control

A regular fire regime should control Siberian elm in fire-adapted communities. Before commencing any prescribed burns, open burning permits must be obtained from the Illinois Environmental Protection Agency and often the appropriate local agencies too. Burns should be

administered by persons trained or experienced in conducting prescribed burns, and proper safety precautions should be followed. Siberian elms should be controlled in areas surrounding a preserve whenever possible.

RECOMMENDED PRACTICES ON BUFFER AND SEVERELY DISTURBED SITES

Initial effort in areas of heavy infestation

Same as above except that labor-saving chemical methods may be preferred. In areas with dense stands of trees less than three inches in diameter, basal bark application of a 20% solution of Garlon 4 mixed with mineral or plant-based oil has proven effective. Spray the basal parts of the tree to a height of 12 -15 inches thoroughly wetting the surface to the root crown, but not to the point of runoff. Garlon 4 can be applied either by spraying the tree with a low pressure hand-held sprayer or wiping the herbicide on the tree with a sponge applicator. Apply at any time, including winter months except when snow cover or water prevent spraying to the ground line.

Initial effort in areas of light infestation

Same for natural communities of high quality except that labor-saving chemical methods may be preferred.

Maintenance control

A regular fire regime should control this species in fire-adapted communities. Annual mowing may be appropriate in some situations, especially where nearby seed sources cannot be removed.

FAILED OR INEFFECTIVE PRACTICES

No biological controls are known that are feasible in natural areas.

ACKNOWLEDGMENTS

Dr. Robert M. Mohlenbrock and the Southern Illinois University Press generously permitted use of illustrations from their *Illustrated Flora of Illinois*.

REFERENCES

- Brown, L. 1986. Audubon society nature guides: grasslands. Alfred A. Knopf, Inc., New York. 853 pp.
- Fernald, M. L. 1950. Gray's manual of botany, eighth edition. American Book Co., New York. 1632 pp.
- Mohlenbrock, R. H. 1986. Guide to the vascular flora of Illinois. Southern Illinois University Press, Carbondale. 507 pp.
- Rydberg, P. A. 1932. Flora of the prairies and plains of central North America. New York Botanical Garden, New York. 672 pp.
- Swink, F. and G. Wilhelm. 1979. Plants of the Chicago region. Morton Arboretum, Lisle, Illinois. 922 pp.

PERSONAL COMMUNICATIONS

- Apfelbaum, Steve. 1988. Applied Ecological Services, Juda, Wisconsin.
- Harty, Fran. 1988. Division of Natural Heritage, Illinois Department of Natural Resources,

Springfield, Illinois.

Martin, Mark. 1988. Wisconsin Department of Natural Resources, Madison, Wisconsin.

Nyboer, Randy. 1988. Division of Natural Heritage, Illinois Department of Natural Resources, Springfield, Illinois.

Packard, Steve. 1989. Formerly with The Nature Conservancy, Chicago, Illinois.

Pearson, John. 1988. Iowa Natural Heritage Survey, Des Moines, Iowa.

Written for the Illinois Nature Preserves Commission by:

Jill Kennay and George Fell
Natural Land Institute
320 South Third Street
Rockford, Illinois 61108

First and second revisions for the Illinois Nature Preserves Commission by:

Bob Edgin
9940E 500th Ave
Newton, IL 62448

Equal opportunity to participate in programs of the Illinois Nature Preserves Commission (INPC), Illinois Department of Natural Resources (IDNR) and those funded by the U.S. Fish and Wildlife Service and other agencies is available to all individuals regardless of race, sex, national origin, disability, age, religion or other non-merit factors. If you believe you have been discriminated against, contact the funding source's civil rights office and/or the Equal Employment Opportunity Officer, IDNR, One Natural Resources Way, Springfield, Ill. 62702-1271; 217/785-0067; TTY 217/782-9175.