

RUSSIAN OLIVE

Elaeagnus angustifolia L.

Plant Symbol = ELAN

Common Names: Oleaster, trebizond-date

Scientific Names: Synonyms are *Elaeagnus angustifolia* var. *orientalis*

Description

General: Russian olive is a large, thorny, perennial deciduous tree or small shrub that usually grows 10 to 25 feet tall. It is a non-native, invasive species. The alternately arranged leaves are 1 to 4 inches long and 0.5 to 1.5 inches wide with smooth edges. The upper leaf surface is green-gray while the lower surface is silver. The numerous thorns are 1 to 2 inches long and arranged alternately on stems. The flowers have four yellow sepals that resemble petals. They appear bell-shaped and are arranged in clusters (USDA, NRCS, 2019). New stem growth is covered with hairs that give it a silvery-gray appearance. Stems become smooth and reddish brown with age. Mature trunks can have a circumference up to 20 inches with dark gray, ridged bark. Roots can grow to depths of 40 feet. Russian olive has clusters of 0.5 inch, hard, olive-shaped fruit that each contain one seed. Immature fruits are silver and ripen to tan or brown.



New stems and leaves of Russian olive are covered with silvery-gray hairs; older stems are smooth and reddish brown; immature fruits are silver. Photo by NRCS.

Distribution: Russian olive is native to Europe and western Asia. It was introduced to the United States in the early 1900s and became widely distributed due to its extensive use as an ornamental species in drier regions of the Great Plains and Rocky Mountains. Russian olive has been used in shelterbelts, windbreaks, wildlife habitat plantings, and as an ornamental. Russian olive has escaped cultivation and become invasive. Plants thrive and spread along riparian corridors, irrigation systems, pastures, saline affected areas, and some wetland sites. For current distribution, please consult the Plant Profile page for Russian olive (*Elaeagnus angustifolia*) on the PLANTS Website.

Habitat: Russian olive thrives under a wide range of moisture and soil conditions. It grows effectively on poor mineral soils because of symbiotic nitrogen-fixing bacteria in the roots (USFS, 2014). It prefers areas where the water table is near the soil surface in riparian areas, flood plains, valley bottoms, irrigation ditches, springs, and sub-irrigated pastures and grasslands. It also grows well in uplands that receive as little as 8 inches of annual precipitation such as along roads, railways, and fence lines. It grows in sandy, silty or loamy soils with low fertility and low to moderate soluble salt concentrations and is described as tolerant to very tolerant of salt injury. It occurs from sea level to about 8,000 feet of elevation and is shade tolerant (USDA, NRCS, 2019).

Adaptation

Until the 1970s, Russian olive was one of a few commercially available medium-height trees used for dryland windbreaks and shelterbelts because of its ease of establishment and value for wildlife. More recently, the availability of tree species for dryland conservation practices has improved. Unfortunately, Russian olive escaped cultivation by the 1950s, and has become a widespread threat to plant communities in riparian areas, grasslands, irrigated pastures, and haylands. Russian olive can become the dominant species as it forms dense, monotypic stands that can prevent the establishment and regeneration of desired vegetation such as cottonwood and willows. It grows relatively quickly and develops a dense canopy which crowds out vegetation or prevents shade-intolerant vegetation establishment, thereby reducing species diversity and plant productivity. Its growth on streambanks can also alter the natural flood regime of a waterway and reduce availability of nutrients and moisture.

Uses

Livestock sometimes browse young Russian olive trees, but once thorns develop, they are deterred. Native birds and mammals eat the fruits produced by this species. Game birds are particularly fond of Russian olive seed. Several birds feed on sprouts from new seeds as they emerge from the soil. Smaller mammals such as squirrels and pocket gophers can heavily feed on the roots and bark of younger trees causing them to die. Several mice species feed on its seed and prevent Russian

olive seed germination. Bees and other pollinators will occasionally visit Russian olive flowers in low densities (Zouhar, 2005).

Status

Threatened or Endangered: Russian olive is not a threatened or endangered species.

Wetland Indicator: Russian olive is a facultative (FAC) wetland indicator species in the western mountains, valleys and coast, and the arid west regions of North America indicating that it is likely to occur in wetlands and non-wetlands. Its wetland status is facultative upland (FACU) in all other regions indicating that it usually occurs in non-wetlands but occasionally grows in wetlands (USDA, NRCS, 2020).

Weedy or Invasive: Russian olive is considered an aggressive invader, especially along waterways. It is listed on 46 state noxious weed lists and, for many states, the intentional spread or sale of this species is prohibited. This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Extension office, state natural resource, or state agriculture department regarding its status and use.

Please consult the PLANTS Website (<http://plants.usda.gov/>) and your state's Department of Natural Resources for this species current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Planting Guidelines

Russian olive is an undesired, invasive species, and should not be cultivated, planted, or propagated and it is unlawful to do so in many states. In the mid- to late-1900s, Russian olive was a recommended conservation species, however research has proven it is too difficult to manage and control (USDA, NRCS, 2019). A study of emergence and seed viability at the Bridger Plant Materials Center found that Russian olive seeds planted at a depth of 3 inches or deeper do not emerge and are not viable afterwards. This finding suggests that natural environmental conditions, like a flood event, could bury seeds to depths at which they will not emerge nor be viable if uncovered later (Hybner and Espeland, 2014). Please contact your local agricultural extension specialist or county weed specialist to learn how to best manage it in your area.

Management

Russian olive management typically focuses on control. Please see the control section.

Environmental Concerns

Russian olive is an aggressive invader, capable of out competing desired species. It spreads easily through a variety of ways, but its hardiness is the reason it is difficult to control. Russian olive is tolerant to high winds, floods and drought, extreme hot and cold temperatures, and can grow on both saline and alkaline soils (USFS, 2014). There is evidence that Russian olive is one of the most salt-tolerant tree species on saline soils (Scianna, 2016). These tolerances, combined with its aggressive growth and competitiveness with native species, make it difficult to control, especially after establishment.

Seeds spread easily through several different modes and account for most new plants that emerge. Most commonly, birds and other animals such as coyotes, deer, racoons, and smaller mammals consume the fruit and excrete seed in new areas. Fruit floats and is easily dispersed along waterways. While seed is not produced until the tree is at least 4 years old, viable seed can persist in the soil for many years thereafter (USFS, 2014). In a seed longevity study, there was significant evidence that a Russian olive seed can remain viable for up to 28 years and possibly longer (Scianna et al., 2012). Although less frequent, Russian olive can also spread by vegetative sprouts, stem cuttings, and root pieces (USDA, NRCS, 2019).

A study by Lesica and Miles (2004) found that areas with greater beaver populations may support the spread of Russian olive. Beavers prefer native woody species, such as cottonwood and willow, rarely using invasive woody species in their diets. As with other invasive species, Russian olive thrives when there is less competition and no natural predators.

The southwestern willow flycatcher (*Empidonax traillii extimus*) is an endangered, native bird that uses Russian olive and saltcedar (*Tamarix ramosissima*) for nesting habitat (USFWS, 2014). The southwestern willow flycatcher will nest in native riparian areas wherever possible but are forced to use invasive species as an alternative in areas where native plants have been displaced (USFS, 2014). Cautionary measures should be used when removing these invasive plant species to ensure the endangered bird is not harmed.

Control

Cultural: Preventing establishment is the most effective and least expensive control tactic. In several western states, it is unlawful to plant Russian olive as a landscape or ornamental tree. As with other non-native invasive species, detecting new infestations early and acting quickly to eradicate or contain an infestation is advised. Targeting control on low-density sites is

less costly on a per-acre basis and helps limit future seed production while allowing the understory to return to desired species. On high-density sites it can be challenging and expensive to remove Russian olive without adverse impacts for the environment. Machinery, humans, and livestock should be checked and cleaned after travelling through infested areas in order to prevent the spread of seed. Increased awareness and education about Russian olive is beneficial to all communities in the U.S., especially those near wetlands and waterways. Regardless of control methods used, sites should be monitored for at least two years following treatment to manage new seedlings and herbaceous weeds, and to make sure desired competitive vegetation is establishing.



Russian olive infestation in a riparian area. Photo by USDA-USFS.

Mechanical: Control options include pulling, mowing, cutting, and girdling. Seedlings can be controlled by hand-pulling or frequent mowing until stems get larger than one inch in diameter. Russian olive can be cut with chainsaws, axes, shears, etc. Cutting closely to the ground will eliminate top growth for a short period but sprouts will develop from the base of the stumps. Girdling interrupts the transport of photosynthates to the root system which effectively starves the entire plant. Girdling is the complete removal of a horizontal 2 to 5-inch wide strip of bark from the entire circumference of the trunk.

Chemical: Herbicides can provide effective control as foliar and basal-bark applications and should be combined with mechanical treatments in order to manage Russian olive. Foliar applications are useful on developed trees only after there is sufficient foliage to uptake the applied herbicide. Thoroughly wet green leaves and shoots, especially near the top of the plant, while minimizing dripping. It is advised to conduct foliar spraying in the late fall to reduce the chances of injury to desirable vegetation; however, more than one foliar application may be needed each year. Basal bark applications are applied directly to the entire circumference of the lower two feet of an uncut trunk at any time of the year and are most effective on stems <5 inches in diameter. In addition, cut stumps and girdling combined with herbicide treatments will improve control, limit sprouting, and can be applied at any time of the year except freezing conditions. Thoroughly wet the cut surface or girdle wound with herbicide immediately after cutting. Use individual plant herbicide treatments (i.e., spot spraying foliage, basal bark applications, cut stump, girdling) for light infestations, areas with difficult access, or areas with desirable vegetation. Use broadcast foliar applications for dense infestations and when desired vegetation is absent. Effective herbicides for Russian olive control contain the active ingredients triclopyr (Garlon 3A, Garlon 4), 2,4-D + triclopyr (Crossbow), imazapyr (Arsenal, Habitat), or glyphosate (Roundup). Consult the label on the need to add a nonionic surfactant (USDA, NRCS, 2019; USFS, 2014).

Please contact your local Extension specialist or county weed specialist to learn what control methods work best in your area and how to use it safely. Always read label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

Grazing: Trained goats will selectively graze Russian olive seedlings and young trees. Grazing will be most effective when combined with other controls. There are currently no classical biological control options (USDA, NRCS, 2019).

Prescribed burning: Prescribed fire will not eliminate Russian olive but can be considered for suppression of saplings. Integration with herbicides can increase effectiveness of control. Russian olive can grow from buds that are in contact with soil, so it is important to make sure all plant remnants are destroyed by fire, shredding, or mulching. In some cases, Russian olive can come back more effectively and quickly after prescribed burning or wildland fire. It is important to create and maintain a monitoring plan because early detection is the key to managing Russian olive. This may include monitoring areas adjacent to the burn area (Zouhar, 2005).

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Citation

Pokorny, M., J. Mangold, and R. Noack. 2020. Plant Guide for Russian olive (*Elaeagnus angustifolia* L.). USDA-Natural Resources Conservation Service, Bridger Plant Materials Center, Bridger, MT 59014.

Published: April 2020

Edited: 2April20HD

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