GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Rhamnus cathartica***

Rhamnus cathartica 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Rhamnales	Rhamnaceae

Common name European buckthorn (English), European waythorn (English), Carolina buckthorn (English), nerprun purgatif (French), ﷺpine noire (French), buckthorn (English), common buckthorn (English), nerprun cathartique (English), Hart's thorn (English), espinheiro-cerval (Portuguese), Kreuzdorn (German), tamuje (Portuguese), cervispina (Spanish)

Synonym

Similar species *Frangula alnus, Rhamnus alnifolia, Rhamnus lanceolata*

Summary Rhamnus cathartica commonly known as common or European buckthorn is a deciduous small tree that prefers lightly shaded conditions. It is tolerant of many soil types and can be found in open oak woods, deadfall openings in woodlands and edges of woodlands. It may also be found in prairies and open fields. It tends to form dense, often even-aged thickets, crowding and shading out native shrubs and herbs. In fire-adapted ecosystems the lack of vegetation under buckthorn prohibits fires. R. cathartica is also an alternate host of the crown rust of oats. Fire is very effective in controlling R. cathartica and is a preferred method when the population is young. In wetlands water tables have been artificially lowered in order to attempt to control this species.

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Species Description
Mehrhoff *et al.* 2003 states that, \"*R. cathartica* is a deciduous small tree or coarse shrub 2 to 6m tall. The glabrous branches usually have shoots that are tipped with stout spines. The leaves are arranged opposite to sub-opposite, are elliptic to ovate, 3.6 to 7.2cm long, and can be acute or obtuse. They are glabrous and have minutely serrate margins. The lateral veins (usually 3, but can have 2 or 4) on each side are strongly upcurved. The plant leafs out early in spring and leaves remain on the plant late into the autumn, when most of the native species have already lost their leaves.\"

Notes
WDNR (2003) reports that, \"The first few individuals established in a natural area are usually from seeds transported by birds. Once these individuals begin to produce seed, *R. cathartica* can rapidly form dense thickets. The vigor of *R. cathartica* is positively correlated to light availability.\"

Lifecycle Stages
(North American region) WDNR (2003) states that, \"*R. cathartica* flowers from May through June and fruit ripens August through September; glossy buckthorn blooms from late May until the first frost and produces fruit from early July through September. The abundant fruits are eaten birds, thus encouraging the long-distance dispersal of horticultural plantings. Seedlings establish best in high light conditions, but can also germinate and grow in the shade. The exotic buckthorns have very rapid growth rates and resprout vigorously after they have been cut.\"
Converse (1984) states that, \"Seedlings invade apparently stable habitats. Recruitment is most successful where there is ample light (Leitner 1984, Kowlaski 1968) and exposed soil (Andreas 1983). Tests of *R. cathartica* seedlings grown under various densities and light intensities showed reduced growth as shade increased (Leitner 1984). In North America *R. cathartica* leafs out prior to most woody deciduous plants in late April to mid-May. The leaves are retained into late September through October and sometimes into November (Hanson and Grau 1979, Lovely 1983). Leaf-drop possibly occurs earlier in open areas than in shade (Pauly 1984).\"

Uses
Wieseler (1999) states that, \"*R. cathartica* was introduced to North America as an ornamental shrub, for fence rows, and wildlife habitat. Introduction of buckthorn was based on its hardiness and ability to thrive in a variety of soil and light conditions.\" Converse (1984) states that, \"*R. cathartica* has been cultivated for hedges (Wyman 1971), forestry uses, and wildlife habitat. This species is also used in shelter belt planting (Hubbard 1974). Naturalized habitats include pastures, fencerows, roadsides, and slopes of ravines.\"

Habitat Description
Wieseler (1999) states that, \"*R. cathartica* prefers lightly shaded conditions. An invader mainly of open oak woods, deadfall openings in woodlands, and woods edges, it may also be found in prairies and open fields. It is tolerant of many soil types, well drained sand, clay, poorly drained calcareous, neutral or alkaline, wet or dry.\"
Gale (2000) states that, \"*R. cathartica* seems to do best in well-lit, well-drained areas, but is tolerant of a broad range of soil types (neutral to alkaline, sandy or clayey soils) and light conditions (TNC 1995, in Gale 2000). Across its range, *R. cathartica* is a particularly problematic invasive of deciduous forest communities. For example, the eastern deciduous forest community, found throughout much of the American portion of its range, has experienced extensive invasion.\"
Converse (1984) states that, \"The native habitats of *R. cathartica* are diverse and include the understory of open oak (Leitner 1984, Tansley 1968), oak-beech, or ash woods (Tansley 1968, Hinneri 1972). It also occurs in riverine woods (Leitner 1984, Tansley 1968), thickets on exposed rocky sites (Hinneri 1972), hedgerows (Eldin 1968, Polunin 1969), pastures (Polunin 1969, Tansley 1968, Duffey *et al.* 1974) and alkaline shrub carr fens (Godwin and Bharucha 1932, Tansley 1969). It grows in well-drained sand, clay, or poorly drained calcareous soils, but prefers neutral or alkaline soils. It is less vigorous in dense shade, and may grow on woodland edges in sunny southern or western exposures (Leitner 1984).\"

Reproduction
Wieseler (1999) states that, \"*R. cathartica* is a dioecious plant, meaning that each plant produces only male or female flowers and fruiting trees are always female. Most of the fruits fall directly beneath the shrubs, creating a dense understory of seedlings characteristic of *R. cathartica* stands. The plentiful fruit is eaten by birds and mice and is known to produce a severe laxative effect, helping distribute seeds through birds, often far from the parent plant. *R. cathartica* often establishes beneath trees at the edges of forests and fields.\"
Converse (1984) states that, \"Natural reproduction is primarily sexual; asexual means are absent or insignificant. *R. cathartica* reaches seed bearing age quickly (Godwin 1936). Flowers of *R. cathartica* may be polygamous, but are usually dioecious (Barnes and Wagner 1981) and bloom May through June during leaf expansion (Fernald 1950). The globose black drupes of *R. cathartica* ripen in August through September, and each contains three or four grooved seeds. They ripen in July through August and have two or three ungrooved seeds (Fernald 1950). Fruit production of both species is abundant each year (Hubbard 1974). Fruit is efficiently dispersed usually by starlings, blackbirds, woodducks, elk, mice (Ridley 1930), cedar waxwings, robins and blue jays. Mice are also seed predators (Godwin 1936). Apparently, few bird species readily tolerate the anthranquinones (emodin) present especially in the immature fruit, preventing premature dispersal (Trail and Dimond 1979). *R. cathartica* retains fruit into, or throughout, the winter. Because *R. cathartica* fruit is retained on the plant longer and is therefore more visible to birds, seeds may be dispersed more frequently over long distances.\" The authors continue on to state that, \"The importance of water dispersal is unknown, but dry fruit of *R. cathartica* can float six days and seeds float three days before sinking\".

Nutrition
Converse (1984) states that, \"The vigour of \"*R. cathartica* is often related to light availability. It seems that seedlings of *R. cathartica* establish readily under partial light.\"

General Impacts
Mehrhoff *et al.* 2003 states that, \"*R. cathartica* tends to form dense, even-aged thickets, crowding and shading out native shrubs and herbs, often completely obliterating them. Dense buckthorn seedlings prevent native tree and shrub regeneration. In fire-adapted ecosystems such as savannas and prairies, the lack of vegetation under buckthorn prohibits fires. Buckthorn control is also of interest to small grain producers; the shrub is an alternate host of the crown rust of oats, which affects oat yield and quality.\" Schmidt and Whelan (1999) conducted a study on the effects of exotic shrubs on songbird nests and concluded that the, \"Data show that exotic *R. cathartica* affected songbird nest success in two ways. First, exotic shrubs directly enhanced nest predation (primarily by large mammals) in American Robins, perhaps through a combination of lower nest height, the absence of sharp thorns, and a branch architecture that may facilitate predator movement.\" Gale (2000) reports that, \"An extended growing season likely gives *R. cathartica* a competitive advantage over native plant species as well. Harrington et al. (1989, in Gale 2000) showed that *R. cathartica* leaves remain on the tree an average of 58 days longer than its native counterparts, *Cornus racemosa* and *Prunus serotina*. Its leaves emerge earlier and senesce later. In both cases, upper canopy foliage is largely absent. Consequently, photosynthesis under high light availability conditions is significantly greater for *R. cathartica* than for native shrub species.\" *R. cathartica* is a host for soybean crop pest *Aphis glycines*, the Soybean aphid (Ragsdale *et al.* 2003). Converse (1984) states that, \"*R. cathartica* rapidly forms dense, even-aged thickets. In an open site, *R. cathartica* establishment is followed by lateral crown spread. This extension continues until branches touch adjacent shrubs. The large leaves and continuous canopy create dense shade. Even-aged thickets are common in both wetlands and in woodland under stories.\"
The litter of *R. cathartica* decomposed rapidly, and promotes the rapid decomposition of litter in the forest floor adjacent to where it grown (Heneghan *et al.* 2002). Soils under *R. cathartica* have been shown to have modified nutrient cycling – with a higher percent N and C, and impact that may persists after the plant has been physically removed (Heneghan *et al.* 2004).

Management Info
Physical: Heidorn (1990) states that, \"Fire is very effective in controlling *R. cathartica* and is the preferred method whenever feasible. Regular prescribed fire will kill seedlings and shrubs of these species in fire-adapted upland and wetland (e.g. fens, sedge meadows, marshes) sites. Some control usually will be evident after the first burn. However, for complete control in established stands of *R. cathartica*, burning yearly or every other year may be required for 5-6 years or more. In wetlands, where the water table has been artificially lowered, restoration of water levels often will kill *R. cathartica*. When burning is not feasible, larger trees can be cut or girdled and re-sprouts clipped as they occur. In upland areas where burning is not feasible, cut stumps can be treated with Trimec or Roundup to prevent re-sprouting.\"
ODNR (2003) states that, \"Prescribed burning has been used to control *R. cathartica* in some natural areas. Fire will top kill stems, however re-sprouting will occur and seed germination may increase. Several years of burning may be necessary to control these species and may not be appropriate in some natural areas. Hand pulling may be successful in small infestations, although several seasons may be required, as re-sprouting will occur if part of the root is left behind. This method also disturbs the soil, increasing seed germination. Repeated mowing has been reported effective in maintaining open areas and preventing seedling establishment.\"
Chemical: Gale (2000) states that, \"The best time of year to use herbicides on i>R. cathartica is just after the native grasses and wildflowers have gone dormant (Boudreau and Wilson 1992, in Gale 2000). Herbicide applications may be done early in the season just after the trees have leafed out and before the trees have begun to bud, but those conducted in the fall or early winter appear to be the most effective (Aho 2000, Bohnen 2000, Solecki 1997, in Gale 2000).\"
ODNR (2003) states that, \"Control of *R. cathartica* with systemic herbicides has been successful in many situations. Application of Roundup®, Accord®, Glypro® or Garlon 4® to cut stumps during the growing season and in warm days of winter has proven to be effective. Other application methods may include basal bark and foliar application. A foliar application of Garlon 3A® in dense thickets may be very effective in the spring and fall. Without treatment, stems will re-sprout vigorously after cutting due to the extensive root system.\"

Principal source: IPANE, 2001 *Rhamnus cathartica* (Common buckthorn , European buckthorn)
Wieseler, 1999 *Rhamnus cathartica* L.

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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[2] CANADA

[28] UNITED STATES

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