University of Minnesota Extension
Horse Program

Plants Poisonous or Harmful to Horses

Plants that Cause Death

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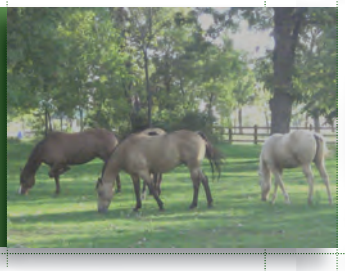


Providing research-based information to Minnesota horse owners

Foxglove

Species and Scientific Names: Foxglove *(Digitalis* species*)*; Rhododendron *(Rhododendron* species*)*; Oleander *(Nerium oleander)*; and Japanese yew *(Taxus cuspidata)*.

Origin: Foxglove was introduced from Europe; Rhododendron (including azaleas) is native to North America, Europe, and Asia; Oleander is native to the Mediterranean and Asian countries, and Japanese yew was introduced from Asia. Cultivars of these plants have been developed for use as landscape plants throughout much of the United States.

Lifecycle: Foxglove is a biennial. The seedling forms a rosette the first growing season and flowers the second season. Rhododendrons are perennial shrubs or small trees that rarely propagate and spread on their own in Minnesota. Oleander is a shrub found in the Southern United States. Japanese yew is a perennial shrub or tree.

Identification: Foxglove matures to 2 to 6 feet in height. Leaves are typically oblong, hairy, and have shallow, irregularly-toothed margins. Hanging, tubular flowers can be pink, yellow, purple, or white with a spotted patterns. Most rhododendron cultivars adapted to Minnesota are moderately sized shrubs (3 to 6 feet tall) and typically flower in spring. Flowers can be red, pink, lavender, yellow, or white. Leaves are narrow, and most rhododendrons are evergreen. Rhododendron are common landscape plants in Minnesota. Oleander grows as a shrub or small tree. The leaves are thick and leathery, flowers are showy and grow in large clusters that are white or any shade of pink or red. Oleander will not over winter in Minnesota, but are common house plants. Japanese yew are fine-textured evergreens. Needles emerge a light to yellow green in spring and mature to dark green. Dense growth, fine texture, and a rich green color make Japanese yew a very popular ornamental evergreen. The species can grow into trees up to 50 feet high.

Distribution: Foxglove is commonly found throughout the United States. Under favorable conditions, foxglove can reseed and persist, and some cultivars have naturalized in Eastern Minnesota. Rhododendron and Japanese yew are commonly

Rhododendron

Oleander

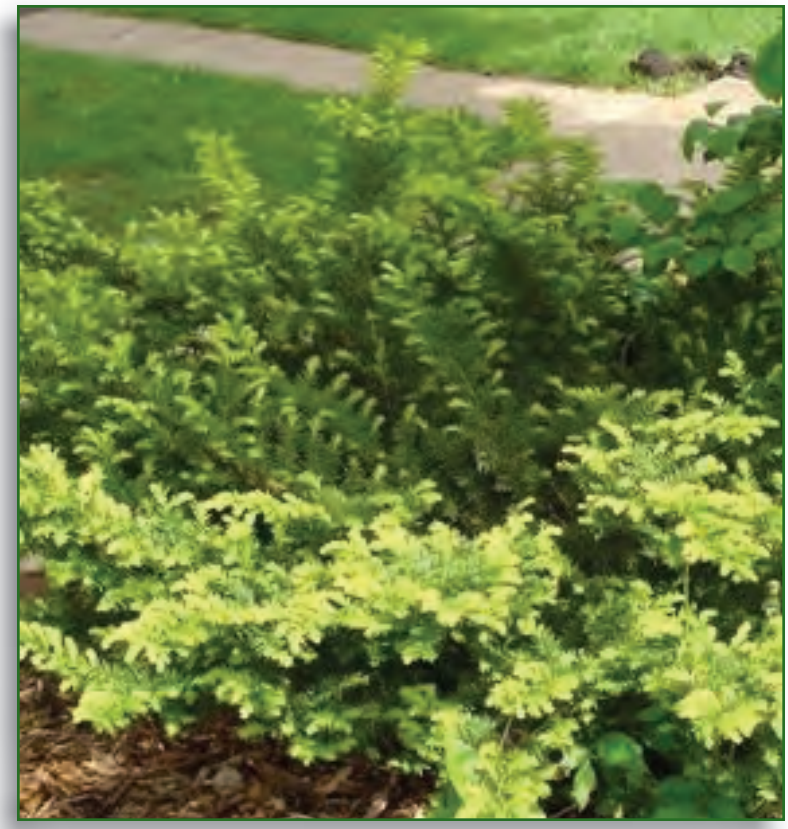
found throughout the United States. Oleander is a common ornamental in the Southern US, but can not over winter outdoors in Minnesota. Oleander is grown as a houseplant or in outdoor containers during the summer months.

Habitat: Foxglove is found around homes and other sites where it was once planted as an ornamental. Foxglove performs best in slightly acidic, moist soils and can spread to nearby pastures, meadows, and ditches. Rhododendron does best in partial shade and moist, acidic soils high in organic matter. Japanese yew can grow in shade or sun and does best in fertile, well drained soil with access to consistent moisture. Rhododendron and Japanese yew are usually intentionally planted landscape shrubs. Oleandar is also an ornamental, but is considered a house plant in Minnesota.

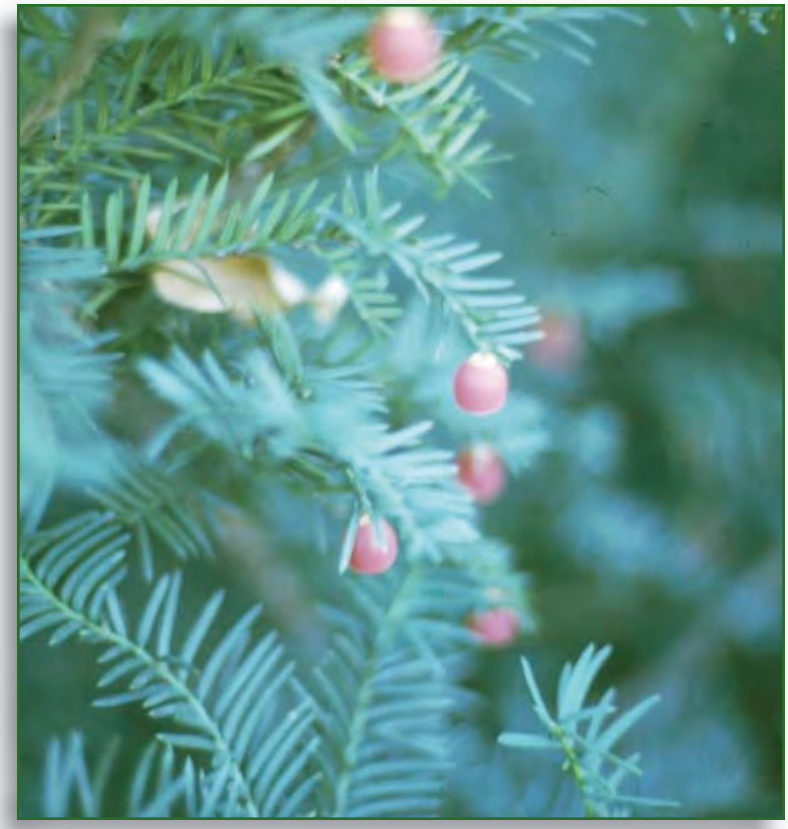
Control: Avoid introducing foxglove as an ornamental in proximity to horses. Using gloves, pull flowering plants before seeds develop to reduce the seed bank. Several herbicides are available to help control foxglove. Avoid planting Japanese yews, and Rhododendron, where horses will have access to them. Unwanted plants can be cut down, or dug out and removed. Although plants cut to the ground generally do not re-sprout, the use of a labeled herbicide on the stump can be used. Carefully read and follow all instructions on herbicide labels. Do not feed clippings from Oleander to horses, or any other livestock.

Toxin: The toxins in Foxglove, Rhododendron and Oleander are cardenolides. Cardenolides are also refereed to as cardiac glycosides. Several dozen cardenolides have been isolated from these plants; including digoxin, digitoxin, gitoxigen, and oleandrin. The chemicals associated with toxicity in Japanese yew are taxane derivatives. Taxine A and taxine B are of greatest toxicological concern, although small amounts of taxol may also be present.

Toxicity: The cardenolides interfere with sodium-potassium ATPase activity which allows a buildup of intracellular calcium in heart cells. Adverse cardiac conduction problems develop, ultimately leading to death. Concentrations of up to 480 micrograms of cardenolide per kilogram dry weight have been identified in the seed. Japanese yew toxicity in livestock has been reported after ingestion of 0.05 to 0.7 grams of fresh or dried leaves per kilogram body weight. About 0.1% body weight of leaves may be lethal to a mature horse.



Japanese yew



Red berries of Japanese yew

When Toxic: Cardenolide concentrations are usually highest in the fruit, flowers, and immature leaves. The mature leaves of flowering plants normally have lower cardenolide concentrations. The palatability of the cardiac glycoside plants is low, so toxicosis most commonly occurs when other forage is scarse or the plants are baled in hay. Exceptions have occurred after a frost or when trimmed or pruinned leaves were made available to animals.

Signs and Effects of Toxicosis: Animals may be found dead. Most animal species are susceptible to toxicity from these plants. Clinical signs of the cardenolides may be delayed for up to 12 hours after ingestion of the plant material. A profound weakness is usually observed first. Horses may not be able to raise their heads and edema of the head, lips, and eyes may develop as the toxicosis progresses. The heartbeat may be strong and slow at the initiation of signs but often becomes irregular as the toxicosis develops. Terminal seizures may be observed. Animals with Japanese yew toxicosis may show a trembling or quivering just before they drop to the ground.

Treatment: Treatment is often not possible due to the speed at which death occurs. Removal from the source of the plant and treatment with charcoal, then mineral oil is suggested. The focus of treatment is normally the heart. Atropine, lidocaine, phenytoin, and other cardiac drugs may be indicated depending on the cardiac abnormality present at the time. Digitoxin-specific Fab fragment antibodies have been developed for human use to bind cardenolides in serum.

Other Information: Be able to identify these plants and exercise extreme caution when pets (and humans) are in the vicinity of these plants, especially oleander. These plants should never be placed where animals can have contact with them. Extra care needs to be taken in cases where leaves can fall into a pasture. Decorative Japanese yew wreaths should not be placed on stall doors or fences.

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In Partnership...

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