



Field Horsetail and Related Species

Equisetaceae

L.C. Burrill and R. Parker

The Horsetail (*Equisetaceae*) family comprises 30 species, all in the ancient genus *Equisetum*. During the Carboniferous age (more than 230 million years ago), the Horsetail family was the dominant plant group in the world, with plants reaching gigantic size. Two basic forms of horsetails survive today. One is the hollow, jointed, and leafless scouring rush. The other is the horsetail with whorls of slender, green, jointed branches around hollow, jointed stems, often occurring in great numbers, giving the appearance of a horse's tail.

Because the stems may become encrusted with minute particles of transparent silica, all of these plants often are named "scouring rushes." The name arose from the use of these plants by the pioneers as a scouring agent for pots and pans. They also are reported to be equivalent to the finest grades of steel wool in polishing wood finishes and were formerly standard items with European cabinet makers.

Several species of horsetail and scouring rush are found in the Pacific Northwest. They are perennial, non-flowering plants that reproduce by spores. The spore-producing portion (cone) of the plant contains thousands of dust-like spores equipped with spring-like appendages that uncoil as the spores dry,



Figure 1.—Field horsetail.

launching the spores from the cone into the wind. This is an important method by which these plants spread to new sites.

Spores eventually produce new plants that send branches downward into the soil. They establish successive, horizontal rootstock (rhizome) systems at about 12-inch intervals as growth continues downward. This profuse and deep root system can extend the borders of

patches or can lead to new infestations when root segments are transported.

Horsetails and scouring rushes are found most often in wet to moist areas, but once established they can grow well in moderately dry areas.

Field Horsetail (*Equisetum arvense* L.)

Two types of stems grow annually from dark, creeping, brown-woolly, tuber-bearing rootstocks (rhizomes). Tan-colored fertile stems emerge in early spring and reach a height of 1 foot. These unbranched stems are brittle, resemble small asparagus sprouts,

and end in a spore-bearing cone which may be up to 4 inches long. The fertile stems lack chlorophyll and die back shortly after the pale-green spores are shed. Fertile stems are rare compared to the sterile or vegetative stems.

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Sterile stems emerge after the fertile stems and may reach a height of 2 feet and die down in the autumn. These stems are tough and wiry, with whorls of numerous four-angled green branches (modified leaves) coming from the joints to form bushy plants. Ten to 12 ridges run up and down the stem, compared with the more numerous (20 to 40) but smoother ridges on stems of giant horsetail (*E. telmateia*).

Fleshy, tuberous growths, $\frac{1}{4}$ to $\frac{3}{4}$ inch in diameter, are arranged singly or in pairs on the rhizomes at numerous joints. These tubers store plant sugars (carbohydrates) and are located from a few inches to more than 6 feet deep. Carbohydrates are accumulated and stored after about mid-May. The plant has a surprising regenerative capacity because of the reserves in the extensive root system.

Livestock Poisoning

There are about 20 species of *Equisetum* in the Pacific Northwest and all are considered to be toxic. Field horsetail is the species that livestock eat most often.

Horsetail is poisonous to animals, particularly horses, when eaten in large quantities. Hay containing 20 percent or more horsetail produces symptoms in horses in 2 to 5 weeks.

Symptoms include unthriftiness, followed by weakness, especially in the hind quarters; lack of normal

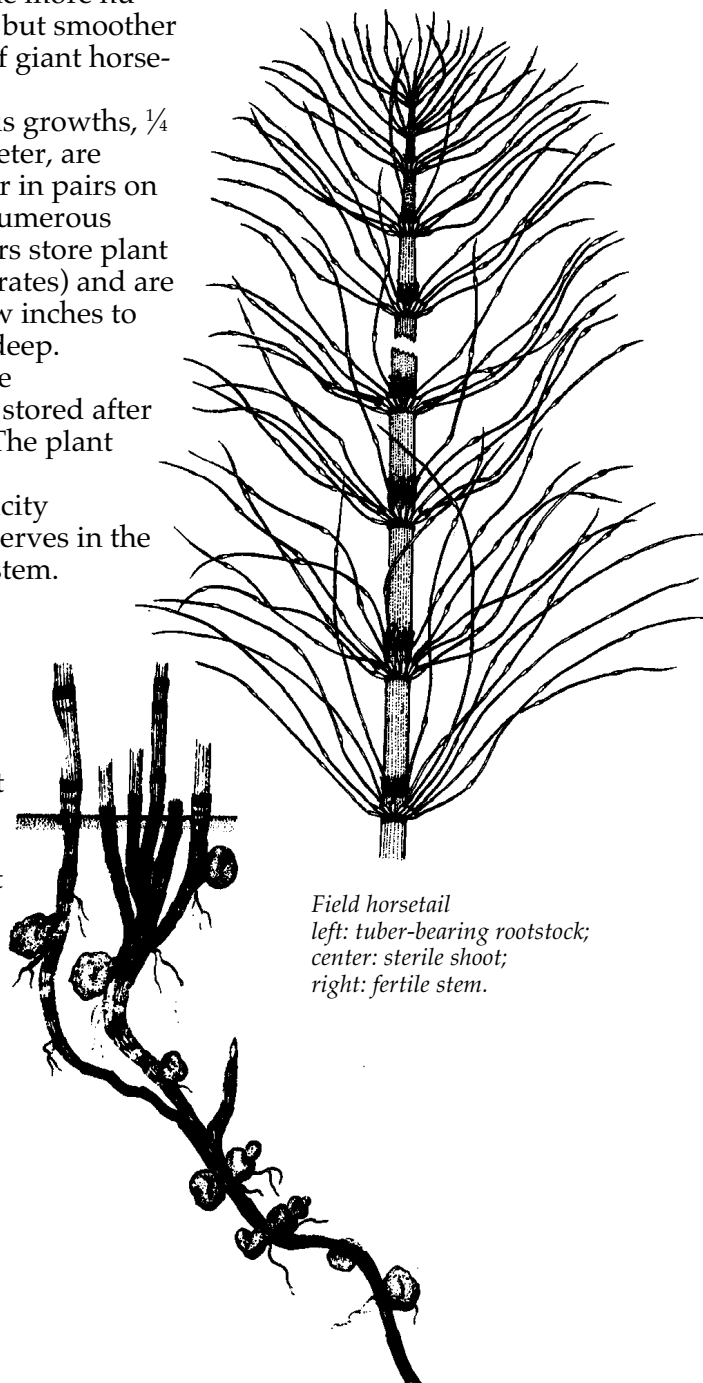
coordination; and difficulty in turning. The appetite remains normal until just before death. Attempts to work or exercise poisoned horses produce trembling and muscular exhaustion.

In late stages, muscular rigidity and constipation may be noted. In fatal cases, death is preceded by quiescence and coma.

Removal of the contaminated forage in the early stages of poisoning brings about rapid recovery. Horsetail poisoning is rarely fatal to cattle or sheep but usually results in a loss of condition.

Field horsetail may inhibit surrounding vegetation (allelopathy) because of its alkaloid content. Researchers in Russia studied the effects of water extracts taken from field horsetail on seed germination and early growth of meadow grasses. Of 13 species tested, field horsetail displayed the strongest inhibitory effect on seed germination and seedling vigor after it had been applied to 30 species of grasses.

Field horsetail is common throughout the Pacific Northwest and all of the United States except the southeastern area.



Field horsetail
left: tuber-bearing rootstock;
center: sterile shoot;
right: fertile stem.

Giant Horsetail
(*Equisetum telmateia* Ehrh.
var *braunii* (Milde) Milde)

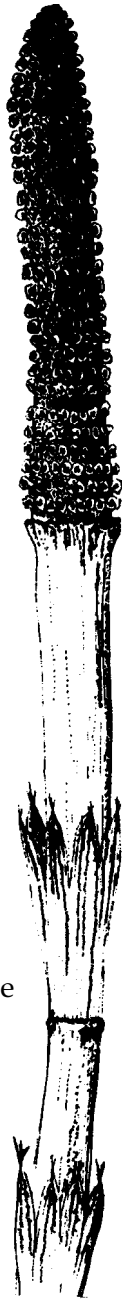
Giant horsetail resembles field horsetail, but is taller and more robust. It has more numerous ridges on the vegetative stems than field horsetail and fertile stems are abundant. Giant horsetail is found west of the Cascade summits in the Pacific Northwest.

Scouring Rush
(*Equisetum hyemale* L.)

Scouring rush differs from the horsetails in that the stems are leafless, all are fertile, and they do not die back in the fall. The stems resemble fertile stems of the horsetails, but they are green and have two black bands at the joints. Each stem is topped by a spore-bearing cone. Stems reach 4 feet in height. Plants may be seen throughout the Pacific Northwest on banks of ditches or the edge of waterways and reservoirs. Scouring rush can be weedy but also is an attractive plant for certain garden uses.

Braun's Scouring-Rush
(*Equisetum laevigatum* A. Br.)

This plant is similar to scouring rush, but in the Pacific Northwest it grows as an annual and usually is shorter than scouring rush. It usually has one black band around each stem segment, whereas scouring rush has two bands. Braun's scouring rush sometimes is found with



Giant horsetail



Scouring rush

numerous weak branches whorled around the stems, but the spore-producing cone on top distinguishes it from the leaf-bearing stage of field horsetail.

Control

Cultural Control

In field crops, ornamentals, and landscaped areas, field horsetail most often is the problem from this plant group. On roadsides and railroads, it usually is giant horsetail that is a problem, while the scouring rushes are problems on road-sides and in ditches or on their banks. Each setting has different opportunities and restrictions for control of weeds.

Lasting control of the horse-tails is difficult to achieve because of the high level of food reserves stored in the rhizome.

Prevent spread and establishment of horsetails by using only clean soil and planting material for ornamental settings. In certain situations, it may be reasonable to stop spore formation by destroying the fertile stems before they mature. Mechanical methods, flame, or herbicides are effective options.

The shoots are without functional leaves, so the plants cannot tolerate much shading. Look for opportunities to reduce vigor and growth with shade from plants or synthetic shading fabric.

For established patches, efforts should be directed at depleting the food reserves in the rhizomes. Complete removal of the tops about 2 weeks after each emergence for 3 or 4 years should give good control.

Horsetail stems are neither strong nor sharp. Thus they are effectively blocked by most of the porous fabrics (geotextiles) used in landscape and industrial sites. Layers of bark mulch, sawdust, or other plant material will not control horsetails. When it is safe and economical to use it, controlled flame is temporarily effective against horsetail.

Chemical Control

There are several herbicides that give temporary or season-long control of the horsetails and scouring rushes. Few herbicides applied once provide lasting control. Selection of a herbicide depends on the crop or site being treated.



Figure 2.—Scouring rush often grows on roadsides.



Figure 3.—Giant horsetail often grows in areas where the ground has recently been disturbed.

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Since herbicide registrations change frequently, this publication doesn't make specific recommendations. Refer to the *Pacific Northwest Weed Control Handbook*, revised and published annually by the Extension Services of Oregon State University, Washington State University, and the University of Idaho.

Detailed instructions for herbicide use are provided on container labels and in other literature provided by manufacturers.