

## Equisetum: Biology and Management

Horsetails are members of the genus *Equisetum*, the only genus in the family Equisetaceae. There are 15 species of equisetum found worldwide; field horsetail (*Equisetum arvense*) and scouring rush (*Equisetum hyemale*) are the most common species in Iowa. The plant has numerous common names, including snakeweed, skeletonweed and others (the common names for the two species mentioned above are used interchangeably by many). They are considered living fossils since they are relics of the Carboniferous geological period (325 million years ago). The remains of their ancient ancestors became the vast deposits of coal found throughout the world.

**Biology** In the plant world, equisetum is most closely related to ferns. Like the ferns, they do not produce seed, but rather reproduce sexually through the formation of spores. Spores are relatively unimportant in the spread of equisetum. Equisetum produces an extensive underground rhizome system that can reach depths of four feet or more. Patches of equisetum expand radially as the rhizomes extend outward from the patch center. In the absence of soil disturbance that moves rhizome pieces, lateral spread of horsetail is relatively slow. Researchers in Canada found an expansion rate of approximately 20 inches per growing season.

Scouring rush produces unbranched, jointed stems that can reach heights of 4 ft. Leaves are reduced to small scales at the joints. The stems are perennial in that they survive more than one year, and each stem is topped by a spore-producing cone.



Scouring rush in soybean

Field horsetail produces two distinct types of shoots. Fertile shoots are short-lived and produced in the spring. They are whitish to light brown, 6 to 12 inches tall and topped with the spore producing cone. The sterile shoots are produced after the fertile shoots and resemble miniature pine trees. They can reach heights of 10 to 20 inches.



Field horsetail in corn

The hollow, jointed, stems of equisetum are the plant structure familiar to most people. *Equisetum* species found in other continents have similar growth habits that reach heights of 25 feet. The stems of equisetum contain high concentrations of silica and were once used to scour and clean various surfaces – hence the name scouring rush.

Horsetail and scouring rush are most commonly found in poorly drained areas, such as roadsides, wetlands and drainage ditches. The preference for wet areas is due to the requirement for a moist environment during establishment with spores. However, the plants may move into well-drained areas through vegetative reproduction. As tillage has been reduced for corn and soybean production, equisetum may slowly encroach into crop fields from established patches in road right-of-ways.

**Management** In today's world where we have relatively quick fixes for most weed problems, horsetail is a plant for which an easy answer has yet to be found. Controlling an established equisetum patch cannot be accomplished with any single tactic, whether it is tillage, mowing or herbicide application. There has been little recent research on equisetum management, thus the information provided below should not be viewed as recommendations by Iowa State University. Many of the products mentioned below do not specifically mention horsetail or scouring rush on the label. While it is legal to use the herbicide to control a pest not specified on the label (as long as the weed is located in a labeled site), the manufacturer is not responsible for the performance of the product.

Non-cropland Repeated mowing or tillage can be used to control equisetum; however, no information is available on the optimum frequency and duration of disturbance. Studies with other creeping perennial weeds possessing deep reproductive structures suggest that at least two years of repeated disturbance would be required to eliminate an established patch. Regrowth should be eliminated before it has an opportunity to replenish root energy reserves, thus remove new growth before it exceeds a height of 8 to 10 inches.

Few of the herbicides commonly used in Iowa agriculture have much activity on equisetum. Care must be taken not to apply herbicides directly to standing water in ditches unless described on the product label. MCPA, a phenoxy herbicide similar in activity to 2,4-D, is reported to provide suppression of horsetail, although horsetail is not listed on most MCPA labels. MCPA is cleared for use in grasslands and non-crop areas. Repeat applications of 2-3 pt/A are suggested to suppress horsetail. Casoron 4G (dichlobenil) is cleared for use in non-crop areas and specifies horsetail on its label. The label states to apply at 150 to 200 lbs/A in the late fall or early spring. Triclopyr (Garlon, Remedy, etc.) is reported to have activity on scouring rush.

Telar (chlorsulfuron) is a sulfonyleurea herbicide in the same family as Accent and Classic. The label recommends 1 to 3 oz/A for controlling scouring rush. Telar is cleared for use in non-crop areas such as roadsides, fencerows, etc. At the higher rates it may cause significant injury to grasses present in these

areas. Chlorsulfuron is a fairly persistent product, especially in high pH soils. Recent research by the University of Nebraska found Telar had the best activity of the herbicides evaluated on scouring rush.

SedgeHammer contains halosulfuron, another sulfonyleurea herbicide. It is labeled for field horsetail control at rates of 2.7 oz/A. SedgeHammer is cleared for use on turf and non-crop areas.

Cropland The encroachment of equisetum into corn and soybean fields has become more common as roadside management has become less intensive and with the increased use of conservation tillage. Eliminating equisetum from areas adjacent to the production field is probably the best control option, but this is easier said than done. Once the weed has become established in a field, tillage is unlikely to have much impact on the weed due to the depth of the rhizome system. Tillage may actually increase the problem by spreading rhizome pieces throughout the field.

Researchers in Canada have reported that products containing flumetsulam (Python, Hornet) have fair to good activity on horsetail. Python is labeled for both corn and soybean, whereas Hornet is registered for use in corn. Permit contains halosulfuron, the same ingredient in Sedgehammer. The label specifies postemergence control of horsetail in corn, however, the maximum use rate in corn is 1.3 oz compared to the 2.6 oz recommended for Sedgehammer. Yukon is a combination of halosulfuron and dicamba registered for use on corn.

Although horsetail is slow-spreading and relatively non-competitive with crops, over time it can increase in density to the point of having negative impacts. There is no simple solution to eliminating a stand of horsetail once it gets established. Reacting soon after new stands of horsetail are observed will greatly simplify their management. When dealing with a well established stand, persistence will be required to bring it under control. It seems only fitting that a plant possessing traits allowing it to survive millions of years will not succumb easily to our management strategies.

Chloutier, D. and A.K. Watson. 1985. Growth and regeneration of field horsetail. *Weed Sci.* 33:358-365.

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Common chemical and trade names are used in this publication. The use of trade names is for clarity by the reader. Inclusion of a trade name does not imply endorsement of that particular brand of herbicide and exclusion does not imply nonapproval.