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The Ancient Horsetail

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EXPERT REVIEWED

We often get phone calls and questions about a unique group of plants. Horsetails can be considered living fossils. This group of plants is what is left of a group of plants that were as thick as forests and had relatives as big as trees that flourished during the Devonian period approximately 350 million years ago.

Commonly known as horsetail, they are also called “scouring rush,” “marestail” (a common name used for another weed in Indiana), “horse pipes,” “jointed monkey grass,” or “snake grass.” These plants are often overlooked, until they are on the margins of a pond, in a ditch, or encroaching on a producer’s field. However, if looked for they are quite common.

The word “weed” is similar to the word “beauty,” - they are both in the eyes of the beholder. Horsetails are not always considered weeds. Horsetails were not always considered weeds. There are historical reports of ancient Romans eating its tender young shoots for medicinal purposes; however, the Romans also thought lining thier aqueducts with lead was a good idea. Horsetail’s value is still being investigated today.

It is theorized that horsetail may play an important role in the ecology of a watershed. Its value may be misinterpreted without proper research and understanding. One study of an Alaskan shrub Wetland reported that horsetail played an important role in removing and cycling certain nutrients (Marsh et al., 2000).

Identification

Horsetail has several distinguishing characteristics. One such characteristic is horsetail’s hollow stems (Figures 1 and 3). Its stems also are jointed, can easily be separated into sections, and have siliceous ridges that make it rough to the touch. In a pinch campers have been known to clean frying pans with these weeds, a use reflected in the name “scouring rush.” The stem is the primary photosynthetic organ. Much of the horsetail we see consists of branchless stems. However, branched stems are fairly common also. One thing you will notice about horsetail is that it does not appear to have leaves. Leaves are present but they are reduced to small scales.

Life Cycle and Reproduction

Sometimes, to be cantankerous, we’ll ask students what the flower looks like. Every now and then someone says that it has a yellow or purple flower. But it’s a trick question - horsetails reproduce by spores, so do not have flowers.

Horsetails have two separate living structures or stages in thier life cycle. The one we can see without visual aids is the spore producing stage, which includeds the vegetative stems (Figure 3). The part of horsetial’s life cycle that is difficult to see is called a gametophyte and it is a very small multi-cellular structure that goes through the sexual part of horsetail’s life cycle.

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Figure 1. Close-up of the segmented stem and small grayish leaves.

One often finds horsetail in ditches and around ponds due to this sexual part of its life cycle. The gametophyte requires a wet environment to survive.

However, vegetative reproduction allows horsetail to wander into drier environments. Horsetail has a deep root system with rhizomes that can produce many terrestrial stems, giving it the appearance of a colony (Figure 2). When you see horsetail, it usually has several stems reaching to the sky, making it look like a branchless forest that's almost as high as your waist. Tillage can spread horsetail rhizomes into drier parts of a field.

Impact and Control

Horsetail's impact as a weed might be considered marginal. With proper growing conditions and proper drainage, most crops can compete with this weed. However, aesthetics is sometimes a concern. Also, there are tales that the silica in the stems can dull combine blades; however, we have not seen any research to support this claim. Horsetail can cause equisetosis in horses, sheep, and (rarely) in cattle, if eaten for a long period of time. Symptoms of this poisoning include breathing and heart problems, fever, digestive problems, convulsions, and death (for more on equisetosis, see Purdue Extension publication WS-9, Indiana *Plants Poisonous to Livestock and Pets*, http://www.vet.purdue.edu/depts/addl/toxic/cover1.htm).

Figure 2. Horsetail growing in a colony in a ditch

If horsetail needs to be controlled, it is not an easy task. It is far more effective to prevent horsetail from establishing itself whenever possible. This includes avoiding light tillage in areas where horsetail occurs. If tillage occurs, be sure to clean your equipment so you don't transport rhizomes to new areas. Also, you should improve drainage in poorly drained areas near ditches, bodies of water, and low spots.

Mechanical control is difficult. A study in Quebec, Canada removed horsetail by hoeing 16 times, but this did not have any impact on regrowth (Cloutier and Watson, 1985). There are few chemical control options. The lack of efficacy of many herbicides, specifically contact herbicides, is partially due to the fact that horsetail is a perennial with a deep root system complete with rhizomes. Herbicide uptake is minimal because of the lack of leaf area.

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Figure 3. Drawings of horsetail fertile and sterile stems, strobilus (4), and spores (7). Picture source: *The World's Worst Weeds* 1991. LeRoy G. Holm, Donald L. Plucknett, Juan V. Pancho, and James P. Herberger. Krieger Publishing Company, Malabar FL

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Many herbicides just don't enter the plant at high enough levels to get the job done. The siliceous structure of its stem also may inhibit the uptake and translocation of herbicides into the plant.

The branched vegetative form of horsetail may be more receptive to herbicide applications, but in Indiana, one typically sees only the reproductive stems. The hollow, tube-like reproductive stem may be harder to control than the vegetative stem. Also, remember that this plant is often found near water, which precludes the use of many herbicides.

Glyphosate products are often used to suppress horsetail; however, you should expect regrowth. To eradicate a horsetail stand you may have to make several applications over several years. In many cases, control of horsetail with glyphosate is inconsistent. Casoron® (dichlobenil) has also been reported to have activity on horsetail. MCPA has been used in small grains to suppress horsetail. Richardson and Zandstra of Michigan State University reported control ranging from 77% to 92% with Curtail M® (MCPA + clopyralid) at 3.5 pts/A. Curtain M® is not labled in the state of Indiana and has a 30-day rotation to field corn, and a 12- to 18-month rotation, depending on organic matter, to soybean.

Peter Sikkema of the University of Guelph, Ontario, has reported more than 80% control (and as high as 95% control) with combinations of glyphosate and flumetsulam. Flumetsulam can be found in the product Python®.

So if you should see this plant, give it a little respect and wonder about its role in the scheme of things. Don't hold your breath waiting for it to flower though, you will be waiting a long time.

For more information on horsetail, see:

1) Biology and Control of Field Horsetail (*Equisetum arvensis* L., Horsetail Family) - Jerry Doll University of Wisconsin. (http://ipcm.wisc.edu/uw_weeds/extension/articles/conhorsetail.htm)
2) USDA Plant Database (http://plants.usda.gov/)
3) Indiana Plants Poisonous to Livestock and Pets: Equisetum. Purdue University. (http://www.vet.purdue.edu/depts/addl/toxic/plant29.htm)

References:

Cloutier, D. and A.K. Watson. 1985. Growth and regeneration of field horsetail (*Equisetum arvense*). Weed Science 33:358-365

Marsh, A.S., J.A. Arnone, III, and B.T. Bormann. 2000. The role of Equisetum in nutrient cycling in an Alaskan shrub wetland. Journal of Ecology. 88:999-1011

Richardson, R.J. and B.H. Zandstra. 2004. Equisetum Control. Accessed April 19, 2007. Web Page: http://www.ipm.msu.edu/landreport/2004/EquisetumControl.pdf

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