

Witchweed: A Parasitic Pest

Witchweed (*Striga asiatica*) is a parasitic plant that attacks some of the most important crops in the United States—corn, sorghum, sugar cane, and rice. It also parasitizes certain weedy grasses.

Unlike most weeds, which merely compete with crops, parasites like witchweed do their damage more directly. They rob nutrients and moisture by tapping directly into the host's root system. Consequently, the host spends energy supporting witchweed growth at its own expense. While a parasitized host, such as a corn plant, may be less productive (produce fewer seeds), each witchweed plant produces as many as 50,000 seeds.

The American witchweed is one of many related parasitic plants native to Africa, India, the Middle East, and China. In these areas it can completely ruin agricultural productivity in affected land. No one is sure how or when witchweed first came to the United States. However, the slender, red-blossomed parasite was first identified in 1955 by a graduate student from India who knew it as the pest that had ruined sorghum production in his country.

Witchweed will grow in the presence of grassy weeds as well as grass host crops, so cotton, peanut, or soybean fields—along with home gardens or idle land—may harbor the pest. Witchweed emerges from the soil beginning in late June and flowers about 2 weeks later. Swollen seed pods follow, liberating thousands of microscopic seeds, which can live in the soil for at least 10 years.

Witchweed's prolific nature and its potential for devastating important American host crops led to a decision to eradicate this pest. Congress first allocated funds for this purpose in 1957. The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) established a research station and farm where it developed control methods.

Since its discovery in North and South Carolina, witchweed's spread has been halted, and the acreage supporting it has been reduced by 99 percent (from 450,000 acres to about 3,400).

Eradication is accomplished in three phases:

- Survey activities find and map all infestations,
- Quarantine activities prevent human spread of witchweed beyond the infested region, and
- Control activities seek to prevent existing plants from producing seeds and to destroy seeds already in the soil.

These activities involve the cooperative efforts of Federal and State governments as well as the general public.

Survey

APHIS and State cooperators have taken steps to prevent this dangerous weed from spreading from infested areas in North and South Carolina. APHIS is offering a \$25 reward to anyone who identifies and reports the weed. After receiving a report, officials remove the plant to stop reproduction. Then they destroy seeds already in the soil.

Finding every specimen of the slender, foot-tall witchweed plant is not without obstacles. The cooperation of landowners is essential. Scouts are sent out on foot, in vehicles, and on horseback to find infested sites. People are asked to check their own land and to report the presence of witchweed to an agricultural extension agent or witchweed personnel.

Containment Through Quarantine

Although the tiny witchweed seeds can be spread by wind or water, people are the chief means of dispersal. To prevent the spread of this pest, agricultural quarantines specify conditions for moving soil, plants, or machinery out of infested areas.

Eradication

Eliminating witchweed requires finding and killing plants before they go to seed and eliminating seeds already in the soil.

Herbicides are used on fields infested with witchweed. Extensive field research has provided information on the best chemical or combination of chemicals for the given crop, weed species, and field conditions.

Eliminating the microscopic seeds is another important part of eradication. Some seeds die of natural attrition or sprout only to be killed by an herbicide. However, since witchweed seeds can persist in the soil for a decade, efficient eradication requires accelerating the natural rate of seed germination.

Witchweed seeds can be eliminated from the soil by creating conditions that cause them to germinate when no host is present. This phenomenon is known as suicidal germination. Ethylene gas, a natural ripening agent produced by fruits, vegetables, and flowers, is injected into the soil under proper environmental conditions. It stimulates seed germination, but lacking a host, seedlings die.

Soil fumigation is another alternative, albeit an expensive one. Chemicals such as methyl bromide are used on occasion to assure seed destruction.

Eradication Within Reach

The large number of acres involved and the high seed production of this pest have made eradication a slow process. However, this parasite has been eradicated from 99 percent of the infested land. In 1995, the North Carolina Department of Agriculture assumed responsibility for eradication activities in that State. APHIS personnel continue eradication activities on the remaining 400 infested acres in South Carolina. APHIS will continue to provide support to these States for surveys to verify eradication and for post-eradication treatments.

Report Witchweed

Report any suspect witchweed plant by calling 1-800-206-WEED. (Outside of the Carolinas, call APHIS at 1-919-716-5590.)

For more information on witchweed and other noxious weeds, as well as additional APHIS programs, visit the APHIS Web site at <http://www.aphis.usda.gov>. Use the "Comments" link to send an e-mail request for additional information.

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