

Witchweed, Destructive Foreign Pest Of Corn, Invades Carolina States

WASHINGTON — (USDA) — An insidious weed parasite that destroys corn and other crops of the grass family by attacking their roots has appeared for the first time in the United States at more than 40 scattered locations in 3 counties in North Carolina and 4 counties in South Carolina, the U. S. Department of Agriculture, Clemson Agricultural College, and North Carolina State College announced jointly today.

Common name of the pest is "witchweed." Botanists call it *Striga lutea*, or more correctly *Striga asiatica*. It has been identified during the past few weeks at scattered locations in Bladen, Columbus, and Robeson Counties, North Carolina, and in neighboring Dillon, Horry, Marion, and Marlboro Counties, South Carolina. So far as the Department now knows, the weed's discovery in these areas is its first reported occurrence anywhere in the Western Hemisphere.

Witchweed does its damage below ground, penetrating the roots of the host plants to which it lives and depriving them of nutrients and water. The parasite may also inject into the hostplant roots some substance that interferes with normal growth of these plants.

Scientists of the State Agricultural Experiment Stations, Extension Service specialists, and State regulatory officials in

North and South Carolina, working in cooperation with USDA's Agricultural Research Service, are taking immediate steps to determine the extent of witchweed infestation. Plans are being laid also for research aimed at making next season's control measures against the pest as effective as possible.

This harmless-looking weed — it seldom grows more than a few inches high — is a scourge of corn and sorghum in South Africa and a serious pest of rice, sugarcane, and other crops in the Far East. The Union of South Africa has reported that it does more damage to corn in that country than fungus diseases and insects combined.

USDA scientists believe that if witchweed became widespread it might be capable of destroying more corn in the United States than the European corn borer, whose depredations cost farmers more than \$80 million a year. The parasitic weed could also attack summer-grown small grains, sorghum, sugarcane, rice, and pasture grasses in this country.

FACTS ABOUT WITCHWEED

The weed has caused severe damage in the few corn fields it has infested in the Carolinas. It has been found also in fields planted to other crops, along roadsides, and on vacant land. Although witchweed has been observed in tobacco, peanuts, beans, peas, sweetpotatoes, and other crops not related to grasses, it does not parasitize these crops and so does them no damage.

However, crabgrass or other grasses growing in fields of non-susceptible crops can make witchweed seeds lying dormant underground germinate and produce new plants that serve to spread the infestation. A single witchweed may produce up to half a million microscopic seeds. These tiny seeds are capable — much like the spores of a rust fungus — of easy distribution by wind and other means.

Witchweed seeds cannot germinate without the help of suitable plants. They may lie dormant in the ground for years. Germination occurs only

when the seed comes near or in contact with the roots of corn and certain other plants, mainly grasses, which evidently secrete some substance that causes the weed seed to begin growing. But even in the presence of these host plants, witchweed seeds normally remain dormant for about 18 months.

After germination, the roots of the witchweed each develop a bell-shaped sucking organ — called a haustorium — which penetrates a nearby root of the host plant. These suckers gradually plug the host plant's vascular system, preventing it from getting nutrients and water from the soil. A plant so parasitized slows in growth and soon shows acute symptoms of drought, even when the surrounding soil is quite moist. Most plants attacked by witchweed die within a few weeks after symptoms of wilting first appear.

For about a month after its seed germinates, the witchweed grows entirely underground, often several inches below the soil surface, living off its host. Then it emerges from the soil as a bright green plant.

A month or so later the weed puts out small flowers, usually bright red but sometimes white or yellow. The first flowers appear near the base of the plant and others bloom later higher up. Seeds of the lower flowers are often mature by the time the higher flowers bloom. Most witchweed plants do not grow taller than 8 or 9 inches, but they may range up to 18 inches.

Within a month after the first flowers open, their seed pods burst and scatter the tiny seeds, which are almost too small for the eye to see. The life cycle of the weed, from germination to release of mature seed, thus takes 3 to 4 months.

Witchweed seems to prefer light soils, considerable moisture, and warm temperatures, but in South Africa it has shown ability to grow under a wide range of soil, moisture, and climatic conditions.

CONTROL MEASURES UNDER STUDY

The chemical weed-killer 2, 4-D will destroy witchweed plants found above ground, but spraying with this chemical is not expected to have any effect on dormant witchweed seed lying below the soil surface.

The likelihood of drift damage from 2, 4-D sprays in adjoining fields of cotton, tobacco, and other crops that are easily injured by the chemical may limit its use against witchweed in the present areas of infestation. However, the feasibility of using various chemical weed-killers and soil fumigants to eradicate witchweed is being explored intensively by scientists of the affected States and USDA.

One of the control measures against this weed parasite that is widely used in South Africa is the planting of "trap crops" — non-susceptible plants that are not attacked by witchweed but that nevertheless have roots able to cause dormant seeds of the pest to germinate. Plants of this type include peanuts, soybeans and cowpeas.

These trap crops, planted alone or in rotation in infested fields, help to reduce the pest's numbers. The witchweed seeds they cause to germinate do not produce seed-bearing plants, because the trap crops will not serve as hosts and thus give the parasite nothing to live on. However, if crabgrass or other plants susceptible to the weed are allowed to grow in fields planted to trap crops, they can cause some seed-bearing witchweeds to develop.

Since seeds of this pest lie dormant in the soil for about 18 months, and since only those seeds lying against or close to the roots of the trap crops will be made to germinate after the dormant period, South

African researchers recommend growing trap crops for 4 or more years in succession to do a thorough job of controlling the weed.

Sudangrass and other host plants of the witchweed, though not true "trap crops", are also planted purposely in South Africa to stimulate germination of dormant witchweed seeds. For these host plants to aid in controlling the weed, they must be plowed under before the witchweed they help to grow matures its seed.

Two or three plantings of Sudangrass may be grown and plowed under in a single season to obtain maximum reduction of the potential witchweed population. (Unlike Sudangrass, non-grass trap crops such as cowpeas do not have to be plowed under to aid in witchweed control.)

The Department cautions, however, that trap crops and other cropping methods do not always insure witchweed eradication. Also, their use may be costly to farmers.

USDA scientists point out that the main objective of any witchweed control program is to prevent the weed from producing seed. Information received from the Union of South Africa's Department of Agriculture emphasizes that the parasite, though able to do a great deal of damage, is by no means uncontrollable.

Suggestions made by South African scientists point to the following as practical control methods that may be useful in the United States:

1. In fields heavily infested with the pest, growing and plowing under a susceptible crop such as Sudangrass can help reduce witchweed numbers.
2. Light infestations can be reduced and eventually eliminated in many cases by mechanical or chemical weed control.
3. The practice of rotating corn with a trap crop such as cowpeas, in addition to other methods of witchweed control, is a worthwhile long-term practice wherever the pest threatens the corn crop.

All practical approaches to

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Thomas Kelly



Nancy Huff

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This program is conducted under the direction of the Co-operative Extension Service.

more positive and economical control and eradication methods for use against witchweed are to be explored in State-USDA research now getting under way.

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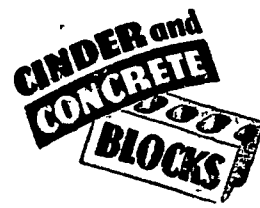
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