

Broomrape, a Noxious Parasitic Weed, is Back in Texas



Branched broomrape

The Problem

Branched broomrape (*Orbanche ramosa*) is a parasitic, invasive plant first found in Karnes County, Texas in 1981. This plant attaches to the roots of its host and robs the plant of water and nutrients, thereby severely impacting growth and yield of the host plant. During the late 80s', branched broomrape was documented in roughly over 1000 acres in Karnes County, TX with small infestations reported in nearby Goliad, Bee, DeWitt, and Atascosa counties. Coordinated control and eradication programs were established by the United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS), the Texas Department of Agriculture (TDA), and Texas A&M AgriLife Extension Service. This program diligently monitored and sprayed infested sites to keep this weed in check. However, efforts have been discontinued since 2008 as governmental funding for this program was no longer available due to budget cuts.

In spring 2015, there were reports of branched broomrape occurring in several locations in Karnes County, the original place where it was found some 35 years ago. Researchers from Texas A&M University, with assistance from Karnes County Extension office and local farmers documented broomrape infestations at six sites (see the locations at <http://j.mp/1ErVTSv>), but additional infestations are more likely to be present in this region. Although this plant is currently confined to cemetery sites, pasturelands, and roadside right-of-ways in Karnes County and surrounding areas, it severely threatens the vegetable industry in the Winter Garden region and Rio Grande Valley due to high potential for spread through equipment. This parasitic plant can attack a wide range of crops, including tomato, bell pepper, potato, eggplant, cabbage, coleus, onions, broad bean, celery, carrot, and sunflower.

Biology

Broomrape lacks chlorophyll (the green pigment) and thus is unable to produce food through photosynthesis. This plant robs all nourishment from its host plant by attaching to the host roots through a structure called haustoria (Figure 1).



Figure 1. Haustorial connection of broomrape with the root of a weed host

In south Texas, broomrape seed germination occurs from December to February. The plants begin to appear aboveground in February, but the majority of emergence occurs during March and April. Multiple flushes (cohorts) of emergence could be found within a single season (Figure 2). Research conducted by Dr. Mike Chandler, Emeritus Texas A&M Weed Scientist, showed that the first flowers appear just three days after the plant breaks the ground (Figure 3) and mature seeds are produced in just 14 days after flowering. Broomrape produces in excess of 50,000 tiny (<0.5 mm), dust like seeds per plant (Figure 4). Seeds can spread through farm equipment, water, wind, and animals. Broomrape seeds are long-lived in the soil (>10 years), but only a portion of the seed present in the soil will germinate each year.

Control

Effective control interventions involve integration of physical, chemical, mechanical, and cultural tactics where feasible. If the infestation is small and confined, emerged plants could be physically removed and destroyed prior to seed maturity. Spraying the host plants with glyphosate, the active ingredient of Roundup®, is an effective chemical strategy. Because Roundup is a systemic herbicide, it will translocate from the host to the broomrape and destroy the plants. Mechanical means of destroying the host plants (such as tillage, flame throwing, etc.) will also help control the parasite. Planting flax as a false host and destroying broomrape as they break the ground will also be effective. Because broomrape emerges in multiple flushes, periodic interventions are necessary to arrest seed production from each flush of seedlings. Given the long-term persistence of broomrape seeds in the soil, sustained long-term efforts are vital to quarantine and control this species.

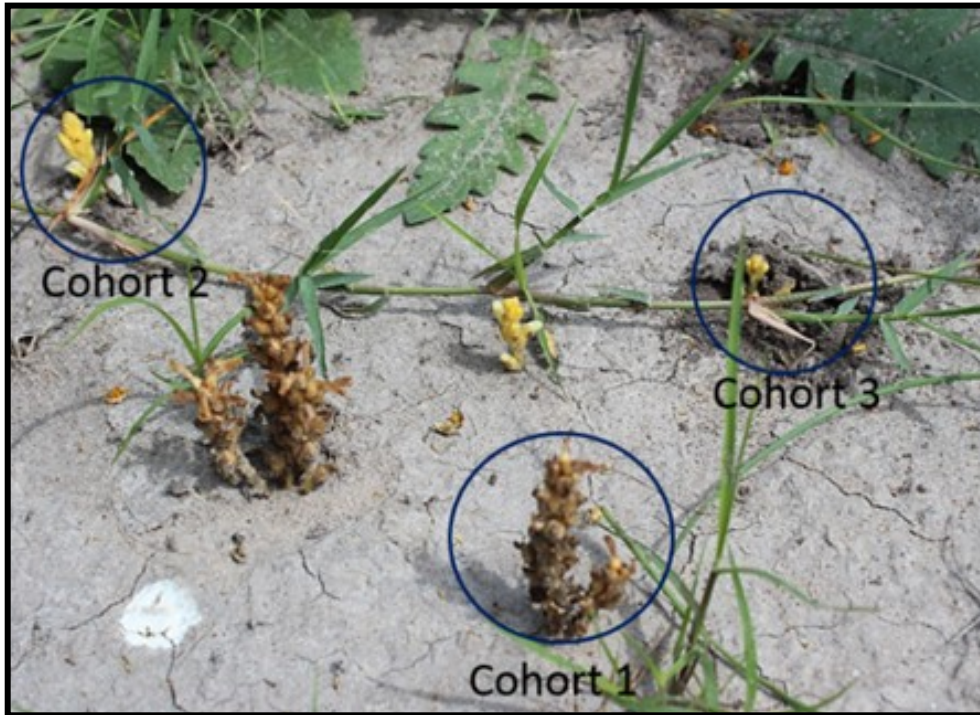


Figure 2. Emergence of broomrape in multiple flushes (cohorts). This picture was taken on April 21, 2015 at which point the early emerging cohort has already produced mature seed and additional flushes continued to emerge and flower.



Figure 3. Flowering in broomrape shortly after appearing above ground



Figure 4: Tiny seeds produced by broomrape

We Need Your Help

A task force was formed to coordinate efforts to monitor, quarantine, and control broomrape in Karnes County and surrounding areas to prevent its spread to the Winter Garden and Rio Grande Valley. The task force seeks your help in locating any additional infested sites in and around your properties. Best place to look are fence lines close to state and county highways and places where mowers, tractors and other implements are stored. If you suspect any broomrape plants, please notify your local county extension agent (Karnes county: Jared Alewine, jared.alewine@ag.tamu.edu, 830-780-3906) or the task force chair (Muthu Bagavathiannan, muthu@ag.tamu.edu, 979-845-5375). DO NOT try to pull plants if they have already turned brown – you may unintentionally spread seeds by doing so.

Broomrape Task Force Members: Dr. Muthu Bagavathiannan, Texas A&M AgriLife Research, College Station (Chair); Dr. Barron Rector, Texas A&M AgriLife Extension (ESSM), College Station (Extension lead); Jared Alewine, Karnes County Extension Agent, Mr. Zack Yanta, local producer and an active member of Texas Farm Bureau; Dr. Josh McGinty, Texas A&M AgriLife Extension, Corpus Christi; Dr. James Grichar, Texas A&M AgriLife Research/Extension, Yoakum; Dr. Paul Baumann, Texas A&M AgriLife Extension, College Station; and Dr. Ron Lacewell, Asst. Vice Chancellor of Federal Relations, Texas A&M University, College Station.

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