

Sunflower Broomrape (*Orobanche cumana*), a serious parasitic weed identified for the first time in the U.S.

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Executive summary. Broomrape was first reported in North America in Yakima, WA in 2025. This report follows the presentation at the 2026 National Sunflower Association Research Forum, where we reported on the pathogen, the potential impact and/or concern for sunflower production in North America, key characteristics for identification, best management practices following a potential identification, and a brief summary of ongoing/future research. *For more information, including images, please refer to the 2026 NSA Research Forum presentation at: https://www.sunflowernsa.com/uploads/179/15_revised_Charles.Block_Orobanche.cumana_2026.Forum.pdf*

What is Broomrape?

Taxonomic background. Broomrapes are obligate parasitic plants within the genus *Orobanche* (recently reclassified to include *Aphyllon* and *Phelipanche*). These holoparasitic weeds lack chlorophyll, and rely entirely on their host plants for water and nutrients. They can cause serious yield loss on affected crops.

Biology. Broomrape plants are annuals, germinating from seed each year. Their life cycle is closely-tied to host root exudates which stimulate *Orobanche* seed germination. Upon germination, *Orobanche* germ tubes grow toward and penetrate sunflower roots, forming specialized structures called haustoria, which are used to extract nutrients. Tubercles (nodules) develop on the root surface and grow into emergent shoots within about 35 days. Flowering and seed production occur rapidly thereafter, enabling efficient reproduction and seed spread. Seeds are easily dispersed by wind, water, machinery, livestock and harvested crops.

Orobanche cumana is a weedy plant species that parasitizes sunflowers. It is considered native to Russia, having been first described on sunflower in 1886 (Harveson et al. 2016). Spread of *O.*

cumana historically followed expansion of sunflower production across Ukraine, Moldova, Romania, Bulgaria, and Hungary. Sunflower broomrape is now widespread through the major sunflower-growing areas, including Spain, France, Italy, Romania, Hungary, Bulgaria, Ukraine, and Russia, frequently causing significant yield losses (Parker 2026). *O. cumana* is also present in Israel, Syria, and Egypt in the Middle East, in China and Mongolia, and in Tunisia (Parker 2026). The first report of *Orobancha cumana* in the Western hemisphere came from Bolivia in 2024 (Barea et al. 2025) followed by a first report in North America in Yakima, WA in 2025 (WSDA 2025). Although *O. cumana* has not yet been detected in major U.S. sunflower production regions or in seed production areas such as California, its presence in the U.S. raises concern about potential spread.

Why is *Orobancha* of such concern? The biology and reproductive capacity of *O. cumana* contribute to its high-risk potential. A single sunflower plant may have one to several dozen *Orobancha* plants attached to the root system, causing stunting and wilting of the host plant. Each *Orobancha* flower produces a capsule containing up to 1,000 seeds, and there may be up to 100 flowers per plant. The seeds are tiny and resemble finely ground pepper (measuring 0.25 - 0.4 mm X 0.1 - 0.2 mm in size) with 2-3 million seeds per ounce. Seeds can remain dormant in the soil for decades, creating a seedbank that numbers in the billions.

Yield losses in severely affected fields in Europe and Russia have approached 50% or greater. All non-native *Orobancha* species, including *O. cumana*, are listed as U.S. Federal Noxious Weeds. Thus, their movement is regulated, underscoring the importance of early detection and containment.

How do I identify *Orobancha cumana*? *Orobancha* species are identified by morphological traits including plant height and branching, flower characteristics – color, size, and shape, and microscopic examination of seeds. However, accurate species confirmation may require molecular (DNA-based) diagnostics due to similarities among *Orobancha* species. Each *O. cumana* plant consists of a single stem, pale yellow-white to light-brown in color, typically 40-60 cm (16-25”) tall and bearing white to pale-blue flowers with downward-curving, purple-tinted corollas, slightly resembling snapdragon flowers.

What to do if you suspect broomrape on your property?

1. Importantly, please do NOT collect plants, unless explicitly directed by qualified regulatory or diagnostic personnel, to minimize the chance of seed spread.
2. Record the specific location of the plants (e.g. GPS coordinates) to enable follow-up investigation by appropriate authorities, even if you are not available to accompany them.
3. Take pictures, particularly close-up photos of flowers and overall plant appearance.

4. If possible, collect information on field cropping history, and source of the sunflower seed.
5. Notify relevant authorities. Suspected cases should be reported to the state university plant diagnostic lab, an Extension agent (or educator or pathologist) or the State Department of Agriculture. Supporting documentation (images, location data, field history) should be submitted as requested.
6. To help prevent spread, please carefully clean your boots before you leave the site. Please do not visit additional sunflower fields until boots have been thoroughly cleaned.

What might happen if broomrape is confirmed?

Broomrape is classified as a noxious weed, and its containment and eradication are critical steps to prevent establishment and spread. As broomrape is a serious concern for the sunflower industry, it is likely that state agencies will become involved. To minimize the likelihood of establishment and spread, activities may include localized herbicide applications, controlled burning, and other means of ensuring eradication.

Best practices for plant removal to minimize the risk of spread.

We recommend seeking professional guidance, however, general steps include:

1. Park vehicles away from the affected area before collecting *Orobanche* plants.
2. Wear disposable personal protective equipment, including plastic boot covers and gloves.
3. Remove all visible *Orobanche* stems and place them in a sealed plastic bag.
4. Before leaving the field, remove boot covers, gloves, and disposable coveralls while standing on a large plastic sheet. Place the disposable personal protective equipment in a sealable plastic bag, and destroy as directed by the experts.
5. Remove the bag(s) with the *Orobanche* stems from the field and submit to a lab or destroy as directed.

Can Broomrape be managed?

Despite its capacity to cause significant yield losses, *O. cumana* can be managed through an integrated pest management (IPM) framework incorporating chemical, genetic, and cultural strategies.

Chemical control. *O. cumana* exhibits sensitivity to acetolactate synthase (ALS)-inhibiting herbicides. Post-emergence application of imidazolinone herbicides in imidazolinone-tolerant sunflower cultivars (e.g. Clearfield) has demonstrated efficacy in killing emerged broomrape plants but does not affect seed in the soil. Enhanced control has been reported when combined with a plant growth regulator such as prohexadione calcium.

Genetic Resistance. Broomrape-resistant hybrids are a key management tool. However, at least eight physiological races of *O. cumana* have been identified across Europe and Asia (Harveson et al. 2016), with more races likely to emerge in the future. Thus, the effectiveness of resistance is dependent on identifying the race present within a field.

Crop Rotation. Although *Orobanche cumana* is primarily specific to sunflower (*Helianthus annuus*), occasional parasitism of solanaceous crops (e.g. tomato, tobacco, eggplant) has been reported. Rotation with non-host crops—including legumes, maize, and small grains—is strongly recommended. Additionally, certain *Brassica* spp. (e.g. mustard, canola) may contribute to seedbank suppression by release of allelopathic (phytotoxic) compounds during decomposition when incorporated as green manure.

Soil solarization. In regions with suitable climatic conditions, solarization may reduce the viability of the soil seedbank. This involves covering moist soil with transparent plastic sheeting and maintaining soil temperatures at or above 45°C for several weeks. Control may be enhanced by incorporation of organic matter prior to treatment.

Collectively, these strategies emphasize the importance of early detection, strict sanitation, and coordinated management to lessen the risk posed by *Orobanche cumana* to sunflower production systems.

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