

Corn could help farmers fight devastating weed

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Versatile and responsive to management, corn is grown throughout the world for everything from food to animal feed to fuel. A new use for corn could soon join that list, as researchers in China investigate the crop's ability to induce "suicidal germination" in a devastating parasitic weed.

Known commonly as sunflower broomrape, the weed causes extensive damage to vegetable and [row crops](#) in Asia, Africa, and southern [Eastern Europe](#). Lacking chlorophyll, it is a parasite and completely dependent on a [host plant](#) for water and [nutrients](#). An infestation of broomrape in sunflower fields can reduce yields by 50%. Sunflower is one of the main oil crops in China, and in one county, over 64% of a sunflower field covering more than 24,000 acres is currently infested.

Several strategies have been tested to stop the damage caused by broomrape, including chemical and cultural methods. Previous studies have shown the utility of using trap crops, which induce germination of the unwanted seed but do not allow for development and survival of the parasite thus causing "suicidal germination." However, no single method of controlling broomrape has yet been shown to be effective and feasible for small farms.

In a study published in the Jan.-Feb. issue of [Crop Science](#), Yongqing Ma and a research team from Northwest A & F University in China attempted to control broomrape infestation by using [corn](#) as a trap crop. Corn was a favorable option since both sunflower and corn can be grown

in the same areas of China. While corn cannot be parasitized by broomrape, the scientists found that a hybrid line of corn and its parental lines induced significant germination of broomrape seeds. They suggest that corn lines could be produced specifically to be used as a trap crop, thus controlling broomrape infestations and producing a forage crop for livestock feed.

To study the effect of several corn varieties on broomrape germination, the researchers tested both hybrid and inbred lines. They found that one hybrid and its parental lines consistently induced the highest germination rates. While none of the corn varieties tested was bred to be a trap crop for broomrape, by analyzing these successful lines, it may be possible to produce even more efficient varieties, the researchers say.

The research team sampled the corn in multiple ways looking at the effects of root extracts, shoot extracts, and soil samples from around the roots. Root extracts generally caused more germination than the shoot extracts. Researchers think that this is because the chemical most likely responsible for causing germination, strigolactone, is made in the roots of the corn plant.

Using the results of their study, the scientists believe that a breeding program could be developed to make corn varieties that are even better at inducing suicidal germination in broomrape. It would also be possible to determine how the chemical that induces germination is made by studying these corn varieties.

Finally, the authors note that the benefit of using corn as a trap crop extends beyond its effects on broomrape. If corn is successful, it can be harvested for livestock feed and other uses thus optimizing the effort and cost to plant it.

More information: www.crops.org/publications/cs/abstracts/53/1/260

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