

**NEW APPROACHES FOR ACHIEVING DURABLE RESISTANCE TO  
BROOMRAPE IN SUNFLOWER**

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**ABSTRACT**

Sunflower broomrape (*Orobanche cumana* Wallr.) is a holoparasitic plant that causes significant yield losses to sunflower crops. Hence, the development of broomrape-resistant hybrids is one of the prime breeding objectives. Using conventional plant breeding methods, resistance genes have been identified which led to the development of a number of resistant hybrids, adapted to different growing regions worldwide. However, while there are many studies on genetic of resistance to broomrape in sunflower, the molecular tools that are available for research on *O. cumana* are very scarce. Recent advances in sunflower genomics paved the way for application of modern breeding tools in broomrape breeding and find durable solutions for limiting broomrape spread and virulence. Here we present an overview of those new tools, such as phenotyping, -omics, and genome editing techniques, which need to be introduced into the sunflower breeding programs in order to achieve durable resistance to this parasitic plant.

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