

# **Sunflower hybrids tolerant to herbicides (ALS inhibitors) and the potential risks of their crossing with weedy sunflower**

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## **Summary**

Weedy sunflower is an invasive plant on a territory of the Republic of Serbia, which means big losses of yield on agricultural fields. During the harvesting of the sunflower crops the dispersal of the seeds occurs, as a result- the volunteer plants appear next year. Weedy sunflowers originate from volunteer plants that live through a longer period on one locality. Spontaneous hybridization of weedy sunflower with other sunflower forms make them more aggressive. If the volunteer plants originate from the hybrids tolerant to ALS inhibitors herbicides, they can be the carriers of herbicide tolerance genes and thus will not be sensitive to these herbicides. The appearance of spontaneous hybridization between the volunteer sunflower, weedy sunflower, susceptible hybrids and the tolerant hybrid, is the consequence of genetic compatibility and overlapping in blooming phase. The exchange of the genetic material also enables the transfer of the AHAS gene (responsible for the tolerance to the ALS inhibitors herbicides) to the progeny of those seeds, where it can persist for 5 or more years. This study examined the spontaneous hybridization of different sunflower forms (volunteer sunflowers, weedy sunflowers, susceptible and tolerant hybrids) in field experiments throughout many years. The progeny (F1 generation), which was assumed it possesses the AHAS gene, was tested with the application of the recommended doses of the herbicides Express (a.i. tribenuron-methyl) and Pulsar 40 (a.i. imazamox). The significant percent of the progeny of different forms of sunflowers, the F1 generation, survived the herbicide treatment (8-31%). According to this, it is assumed that the surviving plants contain the gene mutation in their genome which controls the tolerance to ALS inhibitors herbicides.

