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Response of *Sorghum halepense* (L.) Pers. to nicosulfuron

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Abstract

Sorghum halepense (L.) Pers. population R survived the application of nicosulfuron in the corn field. This population has been treated with ALS (acetolactate synthase) inhibiting herbicides 5 consecutive years. The seeds of susceptible population (S) collected from area which had not been treated previously with any herbicide. The response of populations R and S to nicosulfuron was investigated in a whole-plant bioassay in controlled environment. Plants about 20 cm high were treated with following rates of nicosulfuron: 0, 10, 20, 40, 60 and 80 g a.i.ha^{-1}. Visual injury estimation and vegetative parameters (fresh weight, dry weight, leaf area) were recorded 7 days after herbicide application. ALS enzyme activity in different herbicide concentrations was determined *in vitro*. The statistical analyses were carried out using the statistical environment R with the extension package *drc*.

GR_{50} values for vegetative parameters were greater for the R (fresh weight: 218.58 g ha^{-1}; dry weight: 298.86 g ha^{-1}; leaf area: 52.62 g ha^{-1}) than for the S population (fresh weight: 55.72 g ha^{-1}; dry weight: 85.09 g ha^{-1}; leaf area: 27.39 g ha^{-1}), while I_{50} values for ALS activity were similar for both populations (R: 0.0227 µM; S: 0.0231 µM). Based on vegetative parameters R population was 1.92-3.92-fold less susceptible than S population, but on the enzyme level there was no differences. Therefore, resistance was not confirmed for R population, although this population showed somewhat decreased susceptibility to nicosulfuron, which can be regarded as an early stage of resistance development.

Biography

Sava Vrbnicanin has completed her Ph.D at the age of 32 years from University of Belgrade- Faculty of Agriculture. She is the Full Professor of Weed Science. She has published more than 20 papers in reputed international journals and many papers in national journals.