DISPERSAL OF EPSPS AND ALS RESISTANT SMOOTH PIGWEED IN BRAZIL

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Destaque: shifts in susceptibility to glyphosate were observed in RS and PR. Shifts in susceptibility to chlorimuron were widely dispersed across Brazil.

Resumo: The first case of smooth pigweed (*Amaranthus hybridus*) multiple-resistant to EPSPS and ALS in Rio Grande do Sul State, Brazil, was reported in 2018. Since the first report, an important increase in the number of complainings about smooth pigweed control in agricultural regions has been observed, especially in southern Brazil. This information led us to investigate this issue, and the main goal of this work was to verify the dispersal of shifts in susceptibility of pigweed to glyphosate and chlorimuron in Brazil. Seed sampling was conducted in areas where *Amaranthus* plants survived herbicide application. A total of 520 samples were collected across 3 years (2018–2020). Seeds were collected from agricultural areas in 190 municipalities in seven Brazilian states. In greenhouse trials, the seeds from all *Amaranthus* populations were germinated and transplanted eight plants in 1 L pots (23 × 16 cm) filled with a commercial substrate, considered an experimental unit. Each population type was replicated three times (32 plants per population type) in a completely randomized design. A single discriminatory dose was used to characterize the shift in susceptibility to glyphosate and chlorimuron, 720 and 20 g ha^{-1}, respectively. Plant mortality was evaluated at 21 days after treatment and the maps of the dispersion of smooth pigweed populations were created for each herbicide using TIBCO Spotfire 10.3.1 Analyst®. Overall, 8.5% of the populations in Brazil had low susceptibility to glyphosate (mortality between 0% and 19%) and were observed only in Rio Grande do Sul and Paraná. The shift in susceptibility to chlorimuron in smooth pigweed is widely dispersed in distinct regions of Brazil. Of the total analyzed samples, 23.4% were considered low susceptibility to chlorimuron. In conclusion shifts in susceptibility to glyphosate were observed in Rio Grande do Sul and Paraná. Meanwhile, shifts in susceptibility to chlorimuron were widely dispersed across Brazil.

Palavras-chave: *Amaranthus hybridus*; Glyphosate; Chlorimuron