Ecogenotoxicity of a Flumioxazin-Based Herbicide in Four Plant Models

Autores: Larissa Fonseca Andrade-Vieira; Tamires de Freitas Oliveira; Tamara Alessandra Costa Santos; Maria Fernanda Barbosa Vaz da Costa;

Filiação: Department of Ecology and Conservation, Institute of Natural Sciences, Federal University of Lavras, Caixa Postal 3037, CEP 37200-900, Lavras, MG, Brazil.

INTRODUCTION: Flumioxazin-based herbicides are widely used in agriculture to control broad-leaved weeds because of their high efficacy, rapid action, and residual activity in the soil, making them favored for pre-emergent applications. The increasing use of these herbicides has raised concerns about potential environmental risks. **OBJECTIVE:** To evaluate the effects of a commercial formulation based on flumioxazin on different plant models. **MATERIALS AND METHODS:** The species *Lactuca sativa* L., *Raphanus sativus* L., *Pennisetum glaucum* L., and *Triticum aestivum* L. were used to assess the impact of the herbicide on seed germination and initial seedling development. In addition, the genotoxic effects of the herbicide on Allium cepa L. root tip cells were analyzed, including assessment of the mitotic index, chromosomal aberrations, and the presence of micronuclei. **RESULTS**: The herbicide caused significant effects on seedling development in all the models tested, especially at concentrations higher than those recommended for agricultural use (> 0.05 g L^{-1}). Differential sensitivity was observed between species, with *P. glaucum* L. being the most sensitive, which reinforces the importance of assessing the effects on a variety of organisms. Genotoxic responses in *A. cepa* L. occurred at a dose six times higher than that recommended for field application. **CONCLUSION**: At doses within the recommended range, the flumioxazin-based herbicide was considered low risk to the terrestrial environment. The results reinforce the need for caution in agrochemicals and highlight the importance of plant models in ecotoxicological studies to promote more sustainable agriculture.

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