

Mixtures of two herbicides have less environmental impact when mixed in laboratories

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Research group of the University of Córdoba. Credit: University of Córdoba

A research group at the University of Córdoba evaluated the commercial mixture formulated in a laboratory and the tank-based mixture of two herbicides to determine which method is more effective in terms of weed control and environmental impact.

In 2017 the company Nufarm Europe proposed to the Higher Technical School of Agricultural and Forestry Engineering (ETSIAM) at the UCO a study of the results of two products having a significant agronomic impact: the herbicides [glyphosate](#) and 2,4-D (synthetic auxin). After three years of research, they concluded that the commercial mix produced in the company's laboratories is more effective than manual mixes produced in tanks.

To do this, they used in vivo techniques (tests with greenhouse plants) and in vitro (biochemical tests) on two different broad-leaved plants that are difficult to control due to their natural resistance to and tolerance of glyphosate. In this regard, *Conyzacanadensis* and *Epilobiumciliatum*, gathered in Spanish and Chilean olive groves, respectively, were analyzed. "The objective was to determine the effectiveness of the formulated mixture vs the tank mixture with respect to weed control, environmental impact and application cost," explained Professor Rafael De Prado, with the UCO.

Glyphosate and 2,4-D are two herbicides widely used to combat broad-leaved weeds and unwanted grasses in fields. Glyphosate is characterized by its strong absorption into the soil, rapid biodegradation, and lower toxicity. Its predominance in the world pesticide market is mostly due to its use on crops like rapeseed, cotton, corn and soybeans, especially in the Western Hemisphere and in Mediterranean Europe, on perennial crops (olive groves, vineyards, and almond groves). Along this line, the study by the University of Córdoba found that the commercial mixture formulated in laboratories of the herbicides glyphosate and 2,4-D is more effective and has a lower [environmental impact](#) than manual

mixing performed in tanks by people, sometimes without sufficient training.

The project was carried out both in the field, with the help of the Autonomous University of Chapingo (Mexico), the Federal University of Sao Carlos (Brazil), the MAIBA-INTA, Argentina, and the ETSIAM, where the lab studies were conducted. The UCO research team, together with the three Latin American universities, concluded that environmental and economic risks could be reduced, and effectiveness controlling these difficult-to-control weeds could be boosted 10-20% using glyphosate.

More information: Candelario Palma-Bautista et al, Comparison of premix glyphosate and 2,4-D formulation and direct tank mixture for control of *Conyza canadensis* and *Epilobium ciliatum*, *Environmental Pollution* (2021). [DOI: 10.1016/j.envpol.2021.117013](https://doi.org/10.1016/j.envpol.2021.117013)

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