

How global climate change makes it harder to farm: Higher CO₂ levels, warmer temperatures may spur glyphosate resistance in some weeds

Herbicides are the most commonly used means of controlling weeds. Recently, there has been growing concern over the potential impacts of global climate change, specifically, increasing temperatures and elevated carbon dioxide (CO₂) concentrations, on the sensitivity of weeds to herbicides.

Here, glyphosate response of [the weed species] *Conyza canadensis* and *Chenopodium album* was evaluated under different environmental conditions. Reduced glyphosate sensitivity was observed in both species in response to increased temperature, elevated CO₂ level, and the combination of both factors. Increased temperature had greater effect on plant survival than elevated CO₂ level.

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Glyphosate was [previously] found to be less effective under either high temperatures [e.g. in [Conyza canadensis](#)] or elevated carbon dioxide (CO₂) levels [e.g. in [Chenopodium album](#), [Cirsium arvense](#) and [Glycine max](#)] but no studies, to our knowledge, have examined the joint effects of both increased temperature and elevated CO₂ level on plant response to glyphosate.

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Plant sensitivity to glyphosate was reduced under [high temperatures and elevated CO₂ levels](#). For both species [of weeds in the study] and all populations, plant survival was highest under the combined high temperature and elevated CO₂ (HT/ECO₂) treatment.

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Taken together, the results of our study clearly indicate that the control of two major weeds in California agriculture by glyphosate could be reduced under the projected changes in climatic conditions. Compared to current conditions, both *C. canadensis* and *C. album* plants were less sensitive to glyphosate under the higher temperatures, elevated CO₂ levels and the combination of both environmental conditions, which are predicted for the future.

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In conclusion, we have shown that glyphosate-treated plants grown under increased temperature and elevated CO₂ level exhibit reduced glyphosate sensitivity. Thus, the continued overreliance on glyphosate for weed control under changing climatic conditions may result in more weed control failures.

Read full, original article: [Increased temperatures and elevated CO₂ levels reduce the sensitivity of *Conyza canadensis* and *Chenopodium album* to glyphosate](#)