

ABSTRACT

INFLUENCE OF DIFFERENT CO₂ LEVELS ON THE GROWTH, COMPETITION AND HERBICIDE SENSITIVITY OF SOME IMPORTANT WEEDS IN MAIZE (*Zea mays* L.)

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The aim of this study was to investigate the effect of different CO₂ levels on the growth, competition and herbicide sensitivities of *Sorghum halepense*, *Echinochloa cruss-galli*, *Amaranthus blitoides* and *Solanum nigrum* in maize (*Zea mays* L.). The effect of two different CO₂ level on the emergence of weed was investigated as the first step of the studies. This step was followed by studies concerning the growth of weeds and maize under ambient and elevated CO₂ conditions each with and without concurrence with maize/weeds. The last step of the study was to compare the herbicide sensitivities of the weeds under tested CO₂ conditions. Results showed that elevated CO₂ resulted with higher emergence rates in the case of some weeds. Maize growth was influenced by CO₂ levels depending on the competitive conditions, so that under elevated CO₂ conditions maize plants produced less biomass without competition while the biomass of maize was higher in the case of competition with weeds. Weed competition reduced in some experiments weed biomass significantly under ambient CO₂ conditions, while no biomass reduction occurred under elevated CO₂ conditions in most cases. Also weed response to elevated CO₂ was variable depending on competitive conditions. Weed growth was generally improved by high CO₂ under competitive conditions with weeds. Results of herbicide sensitivity experiments showed that elevated CO₂ caused in general lower herbicide effects. The results of these studies showed that the increase in the future atmospheric CO₂ level would influence the competition between maize and weeds, as well as the success of weed control measurements.

Key Words: Maize, weed, CO₂, competition, herbicide, *Sorghum halepense*, *Echinochloa cruss-galli*, *Amaranthus blitoides*, *Solanum nigrum*