
Sorghum has potential to suppress *Amaranthus hybridus* germination and seedling vigour

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Abstract

Chemical and mechanical weed control strategies can be environmentally detrimental and therefore alternative weed management practices are continually being explored. Sorghum produces a potentially weed suppressing natural toxin called sorgoleone, which is the most abundant metabolite in this hydrophobic exudate. We conducted pot experiments to evaluate the potential allelopathic effects of sorghum root residues and root exudates on the germination and early growth of *Amaranthus hybridus* (L.), a problematic broad leaf weed of Zimbabwe, in the 2015/16 season at Henderson Research Station. A completely randomized design with four treatments (SC Smile, SC Sila, Macia and a control) replicated three times was used. For three consecutive times, sorghum was planted at a density of 10 seeds per pot using the same growing media. At 7 days old, stems of sorghum seedlings were excised using sterile surgical blades, leaving the root system undisturbed in the soil. After the third harvest of sorghum, seeds of *A. hybridus*, were then dribbled into the pots at a density of 3 seeds per pot. Germination and seedling vigour of *A. hybridus* were observed. In comparison with the control treatment, results showed that germination and early seedling development of *A. hybridus* grown in the media where sorghum had grown were greatly suppressed. There was a significant difference (P0.001) in the suppression of *A. hybridus* germination and seedling vigour across treatments. The control treatment had the highest germination (85%), while SC Sila had the lowest germination percentage (13.3%). The control treatment produced the most vigorous plants while SC Smile produced the weakest weed seedlings. Suppression of weed seed germination and weed seedling growth gives crops an early competitive advantage over weeds. There is potential in utilizing sorghum allelopathy for *A. hybridus* control.

Keywords: sorghum, weed control, allelopathy, *A. hybridus*, competitive advantage

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