

Public Abstract

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Title:Control of Amaranthus species using dicamba as a PRE- and POST- herbicide in Missouri

The auxinic herbicide dicamba has been used traditionally as a selective POST herbicide to control broadleaf weeds in monocot cropping systems. Endowing dicamba resistance in crops is an emerging technology which will allow the use of dicamba POST in broadleaf cropping systems such as soybeans. The objectives of this study were to evaluate the efficacy of multiple rates of dicamba on common waterhemp when applied PRE and to evaluate the efficacy of multiple rates of dicamba POST on various growth stages of common waterhemp and Palmer amaranth. Research was conducted from 2011 to 2013 at multiple locations in Missouri. When applied PRE, 0.56 kg ha<sup>-1</sup> dicamba reduced waterhemp emergence by 37% compared to the untreated control; waterhemp emergence with the same rate of 2,4-D was similar. Across all site years, treatments with acetochlor reduced emergence 80%; total biomass was reduced 77% greater than growth regulator treatments. When applied POST, control of both species with 2,4-D at 1.12 kg ha<sup>-1</sup> was statistically equivalent to 0.84 kg ha<sup>-1</sup> of dicamba. For plants 5 to 10 cm, visual control was 63 to 98% for both species across all rates at 28 days after treatment; as plants exceeded 12 cm in height, visual control ranged from 36 to 86% for Palmer amaranth and 57 to 99% for waterhemp. Both dicamba and 2,4-D can effectively manage waterhemp and Palmer amaranth; a use rate of 0.84 kg ha<sup>-1</sup> on Amaranthus plants up to 18 cm resulted in optimal control.