

Canola residues do not reduce establishment, growth, and yield of following summer crops

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Abstract

Sowing of summer-growing species (e.g. grain sorghum, cotton, mungbeans, maize) into the stubble of recently harvested winter crops (e.g. wheat, barley, chickpea, canola) is practised widely in the north-eastern cropping zone of Australia. With the recent increase in canola area in the region, there are concerns that canola crop residues may be antagonistic to the germination, establishment, growth, and yield of summer crops, in addition to the well documented non-host effect of *Brassica* species on vesicular-arbuscular mycorrhizae (VAM). We report five field studies conducted at two locations in the north-eastern grains region of Australia where grain sorghum and mungbean were grown after canola, Indian mustard, and wheat. The experiments included treatments that varied residue removal and retention, irrigation, and time between winter crop harvest and sowing date of the summer crop. Non-host effects of brassicas on VAM and phosphorus nutrition were eliminated by conducting field experiments in soils of relatively high P status.

This study failed to find consistent evidence that *Brassica* crops reduce the establishment, growth, and yield of following sorghum and mungbean crops. This is despite evidence from the literature on pot studies that extracts from *Brassica* residues can reduce germination and growth of a variety of crops, and anecdotal field evidence from farmers and the authors in the region. Based on our study, there does not seem to be a strong case for avoiding double-cropping summer crops into canola residues in the northern grains region.

Keywords: sorghum, mungbean, *Brassica*.