

# Influence of broadacre crop rotational sequence on the weed seedbank in the Riverina

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**Summary** Incorporation of effective crop rotations for supplemental weed control has been shown to reduce the growth and establishment of annual weeds and deplete the weed seed bank in broadacre cropping systems. Long term rotational trials were established in 2014-2018 to quantify the impact of strategic management practices upon weed infestation, with a focus on key winter annual and summer fallow weeds, in the moderate and low rainfall zones of Wagga Wagga and Condobolin, NSW, respectively. Rotations assessed both grain and pasture crops to determine if long-term weed management was facilitated through successful manipulation of the weed seedbank over five growing seasons. Seedbank dynamics were assessed under glasshouse conditions by recording continuous weed seedling emergence in field soil collected yearly from each rotational treatment over

a 5 year period. Total weed seed density was successfully depleted in all rotations receiving average and above-average rainfall from 2014 to 2017. However, limited rainfall in 2017-2018 negatively impacted rotational crop biomass and canopy closure, and a dramatic and significant rebound in weed seedbank numbers was observed in subsequent seedbank assessments. Several rotations were particularly effective in suppressing weed seedbank numbers over time, suggesting crop selection is an important consideration. The most successful rotations included a diverse selection of cereals and/or pulses (i.e. 5 separate species), while the least successful rotations included a lucerne monoculture, a lucerne/grass pasture and rotations with multiple years of wheat or field pea.

**Keywords** Weed seedbank, broadacre crop, rotation, Riverina