

## Non-chemical tactics for improved control of key northern region weeds

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**Summary** Under existing conservation farming systems of the northern cropping region of Australia, herbicides are heavily relied upon for fallow and in-crop weed control. Subsequently, herbicide resistant and difficult to control weeds are common throughout the region. To improve management of key weeds and to retain useful herbicides, there is a need to identify alternative non-chemical tactics for weed management. This paper will discuss the effects of targeted tillage, strategic burning and cover crops on the management of key weed species including feathertop Rhodes grass (*Chloris virgata* Sw.), awnless barnyard grass (*Echinochloa colona* (L.) Link.), windmill grass (*Chloris truncata* R.Br.), flaxleaf fleabane (*Conyza bonariensis* (L.) Cronquist) and common sowthistle (*Sonchus oleraceus* L.). Targeted tillage has been evaluated across four seasons and sites and has included tillage of different intensity and

multiple passes. All forms of tillage have generally reduced the emergence of target weeds. However, the results are not consistent across seasons, likely due to interacting factors of rainfall, temperature and soil disturbance. Strategic burning of *C. virgata* patches reduced surface-lying seeds by 93% and emergence within the patch from 785 plants m<sup>-2</sup> to 450 plants m<sup>-2</sup>. Different cover crops, cover crop combinations and termination times were compared for efficacy in suppressing *E. colona* and *C. virgata*. All cover crop treatments with millet reduced *E. colona* emergence compared with cowpea and lablab on their own. The integration of these alternative non-chemical tactics will improve weed management and further reduce the impact of weeds on crop production systems.

**Keywords** Herbicide resistance, non-chemical, tillage, cover crops, burning.