

Field evaluation of selected canola competitive cultivars for suppression of natural weed populations

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Summary In 2014–2016, replicated field trials were performed to evaluate mechanisms of weed suppression in Australian canola genotypes in moderate to low rainfall zones at Wagga Wagga (572 mm) and Con-dobolin (449 mm) NSW, respectively. In 2015–2016, a split plot design with and without trifluralin as the main plot and cultivar as the sub plot was employed for trials; in this experiment 8 cultivars including hybrid and open-pollinated cultivars were assessed. At each site, crop and weed growth were monitored at various phenological stages including early season, vegetative, grain-filling, harvest and post-harvest. Certain cultivars exhibiting early vigour and also the ability to intercept light due to leaf canopy structure were associated with increased suppression of in-crop weed growth in canola trials; in addition, improved post-harvest weed suppression was associated with the presence of remaining crop residues after harvest. Cultivars GT-50, Hyola 600RR and Hyola 50 were

the most weed suppressive and consistently higher yielding in each year at both locations. CB Taurus and GT-50 provided higher weed suppression only after harvest when residues remained in plots for 150 days post-harvest. Pre-emergence trifluralin treatment resulted in improved crop yields in contrast to untreated plots for most, but not all, cultivars. In this case, the cultivars that possessed rapid early growth and vigour and significantly reduced light availability at the soil surface limited weed growth in the absence of trifluralin. Our results indicated that establishment of certain canola cultivars effectively resulted in enhanced in-crop and post-harvest weed suppression, with or without the use of post-emergent herbicides during the growing season, particularly for common spring and summer annual weeds which were problematic post-harvest.

Keywords Weed suppression, canopy architecture, phenology, crop residue, annual weeds.