Late-staged weed-control options are significantly reducing annual ryegrass seed production

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Summary French serradella is a productive annual pasture legume species suited for Australian agriculture. Despite its use, there is little information about the management of these species in the context of weed management, particularly if the weeds are herbicide-resistant, either in terms of directly maximizing pasture productivity or their potential impact on farming systems as part of an integrated weed management package. This study focused on (1) Evaluate the effectiveness of weed management options in reducing weed seed banks in serradella; (2) Evaluate pasture productivity, weed control and its impact on weed seed and serradella seed viability including changes in the soil weed seed bank. Two trials conducted at the UWA-Ridgefield farm/Pingelly. In addition to the control treatments, Trial_1 includes PSPE (propyzamide, imazethapyr, propyzamide+imazethapyr, flumetsulam); Post (Thistrol Gold, imazethapyr, imazamox, flumetsulam); Full canopy (weed wiper, spray-topping, mowing+spray-topping, hay/silage production, green-manuring, brown-manuring). Trial_2 treatments include spray-topping with clethodim at early tillering and late tillering stage; spray-topping with paraquat at heading and early filling stage of ryegrass. Herbicidal and cultural control options applied later in the weed lifecycle, such as weed wiping using glyphosate, spray-topping using paraquat, mowing prior to ryegrass flowering followed by spray-topping, biomass cutting for hay/silage production, incorporation of green biomass into the soil (green manuring), and the non-selective use of glyphosate to kill all plants prior to ryegrass flowering (brown manuring) were effective at reducing annual ryegrass seed production by more than 80% compared to the untreated control. The highest serradella yield was achieved following the application of flumetsulam applied post-sowing/pre-emergent with the second greatest serradella seed production following propyzamide and/or imazethapyr treatment. Paraquat, especially when used at the heading stage of ryegrass, reduced the ryegrass seed production to <2.5% of the untreated control (weedy control). The application of glyphosate or paraquat was effective at reducing ryegrass seed production, however these treatments also greatly reduced serradella seed production, making these treatments unsuitable in self regenerating pastures.

Keywords Serradella, herbicide-resistance, spray-topping, seed-bank