Weed seed predation in a low rainfall cropping zone of Western Australia: spatial variation of weed seed predation

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Summary Granivory (seed predation) has potential to become a biological weed control measure in broadacre farming systems. To date there is little information on the significance and the variability of seed loss from farmland in the Western Australian environment. In this study weed seed predation was estimated on a 50 m by 50 m grid to determine the spatial variation in a 16 ha cropping field on the Merredin research station, 260 km east of Perth, Western Australia. Annual ryegrass, wild radish and wild oat seeds were placed in a post-harvest canola field, which was fenced on the north and east sides and bordered by vegetation on the south and west sides. The percent of seed removed by granivores from different types of exclusion cages was measured over three, two-week periods, during late January to early April.

Ants or other invertebrates were the most common seed harvesters and removed a significantly larger proportion of seeds than rodents, rabbits or birds. Seed predation was spatially aggregated over the field and was generally highest in the parts of the field near the vegetation and the fence line and lowest in the centre of the field. This was particularly apparent when ants were excluded from the cages. The seed removal rates were highest for annual ryegrass followed by wild oat and then wild radish. Seed harvesting was lowest in late January and peaked in February before slowing in late March.

The results indicate that predation is influenced by proximity to refuges such as fence lines and native vegetation. In order for seed predation to be uniform across a field, granivorous ants must be present. Annual ryegrass seed is favoured over the larger seed types and predation activity increases with ambient temperature over summer before slowing as temperatures decrease in late summer, early autumn.

Keywords Biological control, herbivory, ants.

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