

Summer weeds survey of South Australian cropping districts

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SURVEY



Key messages

- **Heliotrope was the most frequent summer weed surveyed.**
- **Frequency ranking of summer weed species varied greatly between districts.**
- **Dry summer fallow conditions in 2014/15 is likely to have reduced summer weed pressure, but not species composition.**

Why do the trial?

Effective management of summer weeds can greatly improve subsequent crops by preserving stored soil moisture and nitrogen, improving crop establishment and reducing levels of weed vectored insects pests and disease (Cameron & Storrie, 2014). Information on summer weed species will both direct growers into targeted management of problem summer weeds in their cropping region and help direct future research into summer weeds.

How was it done?

A random paddock survey was conducted on summer weeds across South Australian (SA) cropping regions during February to March in 2015 and 2016. The Lower North (LN), Mid North (MN), Upper North (UN), Yorke Peninsula (YP), Mallee, Upper South East (USE), and Lower South East (LSE) cropping districts were surveyed in 2015. The Upper Eyre Peninsula (UEP) and Lower Eyre Peninsula (LEP) were surveyed in 2016. In total 298 paddocks were surveyed and a breakdown of total surveyed paddocks in each region is displayed in Table 1. Sites were selected at approximately 10 km intervals. At each site, weed species were identified along an 80-100 m long transect. Weed density was assessed visually and rated as either low (0-10 plants/m²), medium (11-50 plants/m²) or high (>50 plants/m²). Details of crop residue, soil type, NDVI (most sites) and comments on growth stage were recorded at each site. Any species that could not be identified on site had photos taken for later identification. Analysis of weed frequency was done using Microsoft Excel 2013.

What happened?

The frequency ranking of different summer weeds varied significantly across SA cropping regions. Heliotrope was the most prevalent summer weed species across all surveyed regions of SA and in eight of the nine individual cropping districts surveyed (Tables 1 and 2).

Roly poly, Afghan melon and Clammy goosefoot were common

summer weeds across most of the cropping regions. Whereas some weeds appear to be more localised in their distribution such as Tares (LN); Cutleaf mignonette (YP); Tar vine (UN); Skeleton weed, Small burr grass and Innocent weed (Mallee); Afghan thistle (UEP) and Wild radish (USE).

Sowthistle had the highest frequency of occurrence in the LSE region and it was also quite common in the LN and MN. Sowthistle was found at <10% of survey sites on the YP, which maybe a surprise given the increasing prevalence of this weed in lentil crops.

Panic grass was a regular occurrence in LN, MN, UN, and LSE districts where it has now established itself as a consistent summer weed.

While mallow was a regular occurrence in many cropping regions, it had a higher frequency in LN, MN and LEP cropping districts. Caltrop was only found at a regular frequency (>10%) in three regions (UN, Mallee and USE). Lincoln weed was only found to occur on the YP, UEP and LEP. Some areas had a much lower diversity of weed species (e.g. YP) than other others (e.g. USE and UN).

What does this mean?

The 2014/15 summer fallow period was quite dry for many cropping regions surveyed, which could have reduced summer weed pressure (density) and plant size, but weed species composition is still likely to be representative of the general trend.

Table 1. The frequency of summer fallow weed species for each South Australian cropping region (for all species found at more than 10% of sites). Frequency of sites given as a percentage and the number of paddocks surveyed for each district is in brackets.

Lower North (25)	Mid North (33)	Yorke Peninsula (34)	Upper North (22)	Mallee (48)	Upper Eyre Peninsula (58)	Lower Eyre Peninsula (37)	Upper South East (14)	Lower South East (19)
Heliotrope 84%	Heliotrope 68%	Heliotrope 47%	Heliotrope 68%	Heliotrope 67%	Heliotrope 48%	Heliotrope 51%	Heliotrope 71%	Sowthistle 21%
Sowthistle 44%	Panic grass 35%	Cutleaf Mignonette 24%	Stinking Love Grass 27%	Afghan Melon 46%	Afghan Melon 38%	Lincoln Weed 27%	Afghan Melon 36%	Clammy Goosefoot 16%
Panic grass 32%	Clammy Goosefoot 32%	Prickly lettuce 21%	Rolypoly 27%	Rolypoly 29%	Lincoln Weed 34%	Afghan Melon 24%	Clammy Goosefoot 36%	Heliotrope 16%
Mallow 28%	Mallow 26%	Lincoln Weed 15%	Panic grass 23%	Caltrop 27%	Rolypoly 29%	Medic 24%	Panic grass 29%	Panic grass 16%
Goosefoot 24%	Sowthistle 26%	Afghan Melon 12%	Caltrop 18%	Skeleton Weed 23%	Fleabane 28%	Mallow 22%	Stinking Love Grass 21%	Spear Thistle 16%
Rolypoly 20%	Wireweed 26%	Rolypoly 12%	Clammy Goosefoot 18%	Small burr Grass 19%	Caustic Creeper 16%	Onion Weed 19%	Caltrop 21%	Couch Grass 11%
Afghan Melon 16%	Salvation Jane 18%		Tar Vine 18%	Prickly Paddy Melon 17%	Prickly Paddy Melon 16%	Stinking Love Grass 14%	Lincoln Weed 21%	Mallow 11%
Wireweed 16%	Caustic Creeper 15%		Salvation Jane 18%	Wild Turnip 17%	Stinking Love Grass 14%	Fleabane 14%	Wild Radish 21%	Ox Tongue 11%
Prickly lettuce 12%	Afghan Melon 12%		Afghan Melon 14%	Onion Weed 15%	Onion Weed 14%	Sowthistle 14%	Capeweed 21%	Fathen 11%
Tares 12%	Stemless thistle 12%		Couch Grass 14%	Stinking Love Grass 13%	Prickly lettuce 14%	Wireweed 14%	Couch Grass 14%	
Salvation Jane 12%			Caustic Creeper 14%	Innocent Weed 10%	Silverleaf 12%	Capeweed 14%	Caustic Creeper 14%	
Medic 12%			Mallow 14%		Nightshade 12%	Clammy Goosefoot 11%	Fleabane 14%	
			Wireweed 14%		Afghan Thistle 12%	Rolypoly 11%	Mallow 14%	
			Salt bush 14%		False Sow Thistle 10%		Prickly lettuce 14%	
			Storksbill 14%				Stinkwort 14%	
							Salvation Jane 14%	
							Saffron Thistle 14%	
							Salt Bush 14%	



Weeds

Table 2. The frequency of summer fallow weed species across South Australian cropping regions, 298 survey sites (for all species found at more than 5% of sites). Note that weed species are arranged in order of decreasing frequency.

Common name	Scientific name	Occurrence all SA (% of fields)
Heliotrope	<i>Heliotropium europaeum</i>	57%
Afghan melon	<i>Citrullus lanatus</i>	25%
Roly poly	<i>Salsola australis</i>	18%
Lincoln weed	<i>Diplotaxis tenuifolia</i>	14%
Sowthistle	<i>Sonchus oleraceus</i>	14%
Clammy goosefoot	<i>Chenopodium pumilio</i>	13%
Panic grass	<i>Panicum spp</i>	13%
Stinking love grass	<i>Eragrostis cilianensis</i>	11%
Fleabane	<i>Conyza bonariensis</i>	11%
Mallow	<i>Malva parviflora</i>	11%
Caltrop	<i>Tribullus terrestris</i>	10%
Prickly paddy melon	<i>Cucumis myriocarpus</i>	9%
Onion weed	<i>Asphodelus fistulosus</i>	9%
Prickly lettuce	<i>Lactuca serriola</i>	9%
Wireweed	<i>Polygonum aviculare</i>	8%
Caustic creeper	<i>Chamaesyce drummondii</i>	8%
Medic	<i>Medicago polymorpha</i>	7%
Salvation jane	<i>Echium plantagineum</i>	7%
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	6%
Skeleton weed	<i>Chondrilla juncea</i>	6%
Couch	<i>Cynodon dactylon</i>	5%

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References

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