Appendix one

Central West weed survey

Efficient weed control in Central West NSW

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This GRDC project investigated weeds issues affecting grain producers in the Central West of NSW. The project consisted of a survey, herbicide trials and the production of this book.

The main aim of the survey was to identify the major weed species and their affect on the cropping, pasture and fallow phases in the Central West. The results are outlined in the tables below.

Sixty nine farmers responded to a survey conducted in 2002. The farmers surveyed were from an area west of the Newell Highway extending from Narrandera and Hillston in the south, to Nyngan and Dubbo in the north. The average cropping area per farm of those surveyed was approximately 1 239 hectares. Of this wheat production was 62% of the area, barley 14%, canola 12%, oats 6% and pulses 6%.

Crop weed species

Common name	Botanical name	Incidence on farms (%)
Annual ryegrass	*Lolium rigidum*	79.7
Wild oats	*Avena* spp.	78.3
Saffron thistle	*Carthamus lanatus*	65.2
Capeweed	*Arctotheca calendula*	49.3
Skeleton weed	*Chondrilla juncea*	47.8
Wireweed	*Polygonum aviculare*	37.7
Paterson's curse	*Echium plantagineum*	34.8
Wild radish	*Raphanus raphanistrum*	33.3
Mustard spp.	*Sisymbrium* spp.	24.6
Spiny emex	*Emex australis*	24.6
Fumitory	*Fumaria* spp.	23.2
Annual phalaris	*Phalaris* spp.	13.0
Caltrop	*Tribulus terrestris*	7.2
Corn gromwell	*Buglossoides arvense*	4.3
Silverleaf nightshade	*Solanum elaeagnifolium*	2.9
Shepherd's purse	*Capsella bursa-pastoris*	2.9
St.Barnaby's thistle	*Centaurea solstitialis*	2.9
Mexican poppy	*Argemone ochroleuca*	2.9
Camel melon	*Citrullus lanatus*	2.9
Paddy melon	*Cucumis myriocarpus*	2.9
Lucerne	*Medicago sativa*	1.4
Silvergrass	*Vulpia* spp.	1.4
Barley grass	*Hordeum* spp.	1.4
Soursob	*Oxalis pes capre*	1.4
Fleabane	*Conyza* spp.	1.4

Fallow weed species

Common name	Botanical name	Incidence on farms (%)
Camel melon	*Citrullus lanatus*	52.2
Paddy melon	*Cucumis myriocarpus*	46.4
Skeleton weed	*Chondrilla juncea*	43.5
Saffron thistle	*Carthamus lanatus*	37.7
Common heliotrope	*Heliotropium europaeum*	34.8
Annual ryegrass	*Lolium rigidum*	26.1
Bathurst burr	*Xanthium spinosum*	18.8
Wireweed	*Polygonum aviculare*	17.4
Paterson's curse	*Echium plantagineum*	15.9
Summer grass spp.	*Echinochloa* spp.	15.9
Capeweed	*Arctotheca calendula*	13.0
Wild oats	*Avena* spp.	10.1
Barley grass	*Hordeum* spp.	8.7
Volunteer wheat	*Triticum aestivum*	7.2
Silvergrass	*Vulpia* spp.	5.8
Silverleaf nightshade	*Solanum elaeagnifolium*	4.3
Sub clover	*Trifolium subterraneum*	4.3
Annual phalaris	*Phalaris* spp.	4.3
Marshmallow	*Malva parviflora*	4.3
Quena	*Solanum esuriale*	4.3
Lucerne	*Medicago sativa*	4.3
Wild radish	*Raphanus raphanistrum*	2.9
Mustard spp.	*Sisymbrium* spp.	2.9
Field bindweed	*Convolvulus arvensis*	2.9
Spiny emex	*Emex australis*	2.9
Couch	*Cynodon dactylon*	2.9
Caltrop	*Tribulus terrestris*	2.9
Horehound	*Marrubium vulgare*	1.4
Fumitory	*Fumaria* spp.	1.4
Soursob	*Oxalis pes-capre*	1.4
Volunteer lupins	*Lupinus* spp.	1.4

Pasture weed species		
Common name	Botanical name	Incidence on farms (%)
Saffron thistle	*Carthamus lanatus*	55.1
Paterson's curse	*Echium plantagineum*	37.7
Capeweed	*Arctotheca calendula*	30.4
Barley grass	*Hordeum* spp.	29.0
Horehound	*Marrubium vulgare*	15.9
Annual ryegrass	*Lolium rigidum*	15.9
Wireweed	*Polygonum aviculare*	14.5
Silvergrass	*Vulpia* spp.	14.5
Skeleton weed	*Chondrilla juncea*	11.6
Mustard spp.	*Sisymbrium* spp.	7.2
Bathurst burr	*Xanthium spinosum*	7.2
Common heliotrope	*Heliotropium europaeum*	5.8
Wild radish	*Raphanus raphanistrum*	5.8
Galvanised burr	*Sclerolaena birchii*	5.8
Wild oats	*Avena* spp.	5.8
Silverleaf nightshade	*Solanum elaeagnifolium*	4.3
Spiny emex	*Emex australis*	4.3
Caltrop	*Tribulus terrestris*	2.9
Soursob	*Oxalis pes-capre*	2.9
Yellow burr daisy	*Calotis lappulacea*	2.9
Speargrass spp.	*Stipa* spp.	2.9
Fleabane	*Conyza* spp.	2.9
St.Barnaby's thistle	*Centaurea solstitialis*	1.4
Annual phalaris	*Phalaris* spp.	1.4
Slender thistle	*Carduus pycnocephalus*	1.4
Fumitory	*Fumaria* spp.	1.4
Wild sage	*Salvia verbenaca*	1.4
Noogoora burr	*Xanthium occidentale*	1.4
Brome grass	*Bromus* spp.	1.4
Shepherd's purse	*Capsella bursa-pastoris*	1.4
Common sowthistle	*Sonchus oleraceus*	1.4

Photo: J. Edwards

Sheep in pasture.

Appendix two

Glossary

A description of terms used in this book.

active ingredient	the biologically active part of the chemical present in a herbicide formulation primarily responsible for its phytotoxity.
annual	a plant which completes its life cycle within one year after germination.
biennial	a plant which completes its life cycle within two years after germination.
broadleaf	a dicotyledon or dicot plant usually characterised by the following: two seed leaves (cotyledons), leaves with net like veins and root systems with tap roots.
cereal or grass	a monocotyledon or monocot plant usually characterised by the following: one seed leaf (cotyledon), leaves with parallel veins and diffuse (fibrous) root systems.
dormancy	temporary suppression of growth which may be of advantage in surviving ultimately unfavourable conditions.
ecology	the science concerning the relationship between organisms and environment.
economic threshold	a level of expenditure above which it is no longer financially beneficial to continue an activity.
emergence	the event in seedling establishment when a shoot becomes visible by pushing through the soil surface.
fallow	(i) the period of time between crops, or, (ii) area of land set aside from a cropping regime – can be summer, winter or longer.
germination	the initiation of growth in seeds.
half-life (seed bank)	the time during with half the seeds left in the seed bank will either germinate or become unviable.
herbicide	a chemical or cultured biological organism that controls weeds.
herbicide drift	the drift of a herbicide off-target.
in crop	refers to (i) period of time from crop emergence to crop defoliation, or (ii) within a crop area.
Integrated Weed Management (IWM)	using a range of weed management tactics in conjunction with each other to reduce weed populations in sustainable system for whole farm management of weeds.
label	the directions for using a herbicide approved as a result of the registration process.
lateral movement	movement of a herbicide through soil, generally in a horizontal plane, from the original site of application.
ley	a brief period of time (one year) when a paddock is put under a different regime (e.g. crop under a pasture ley).
lifecycle	various stages in the life of a plant e.g. emergence, flowering, seed set.
mode of action	how a herbicide controls weeds.
non-selective herbicide	a herbicide that kills all plants treated.
noxious weed	a plant regulated or identified by law, as being undesirable, troublesome and difficult to control.
pathogen	an organism that causes a disease in another organism.
perennial	a plant which continues to grow from year to year.
phase	a period (usually 3–10 years) where a pasture or a series of crops is grown
phytotoxic	injurious or lethal to plants.
plant-back period	recommended period of time, after the use of herbicides, that will avoid damage to succeeding crops.
population	in ecology, a group of individuals of any one species.
post-emergence	after the emergence of seedlings.
pre-emergence	before the emergence of seedlings.
pre-plant application	applied before planting a crop, either as a foliar application to control existing vegetation or as a soil application.
preplant incorporated (PPI)	applied and blended into the soil before seeding.

residual herbicides	herbicides that continue to affect, injure or kill germinating weed seedlings or plant growth well after the application of the herbicide. Different herbicides have different residual effects, can remain in the soil profile for long periods of time, and can be moved around in the soil by irrigation, rainfall events or groundwater movement.
resistant populations	where the repeated use of one herbicide, or other herbicides with the same mode of action, has removed susceptible plants but has allowed the survivors to grow and multiply, producing a resistant population of plants.
rhizome	an underground stem, usually horizontal, producing leafy shoots and roots.
seed bank	the number of seeds, accumulated over time, present in the soil, which may germinate when conditions are favourable.
seed set	where mature seeds are present on the plant. Immature seeds will not germinate.
selective herbicide	a chemical that kills some plant species and not others.
soil moisture	the amount of water in the soil (wet weight minus dry weight).
species shift	the selection and increase of naturally tolerant weed species.
spot spraying	targeting of individual weeds with herbicides.
spray drift	off target movement of a pesticide.
suppression	a degree of reduction of plant growth, but not death.
surfactant	a material that improves the dispersing, spreading, wetting or other properties of a liquid by modifying its surface characteristics.
susceptibility	the sensitivity to, or degree to which, a plant is injured by a herbicide treatment.
synergism	the effect of two substances in combination which has a multiplier rather than an additive effect.
synergist	for herbicides – a non-herbicidal compound used to increase the efficacy of a herbicide by a physiological mechanism.
thresholds	a defined level beyond which action should occur.
tiller	a side shoot from the base of a grass plant near the ground, e.g. from the bottom of the stalk or stem of cereals or grasses.
tolerance	ability to continue normal growth or function when exposed to a potentially harmful agent.
toxicity	the ability of a substance to cause injury, illness, or other undesirable effects.
translocation	the process whereby a chemical is absorbed into the plant, via the leaves or roots, and is then moved to other parts of the plant.
vegetative reproduction	the reproduction of a plant via stems, leaves and rhizomes.
viable (seed)	a seed able to germinate.
weed	A plant environmentally suited to its place in the landscape, but from an agricultural productivity, ecological or aesthetic perspective is a plant out of place.
weed escapes	weeds that have survived a weed management method.
weed spectrum	the different species of weeds present within a community or given area.


MUDGEE
WARREN
GILGANDRA
WELLINGTON
CONDOBOLIN
PARKES
WEST WYALONG