Capturing barley grass in broad acre paddocks

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RESEARCH

Searching for answers

Location
Minnipa
Rainfall
Av. Annual: 325 mm
Av. GSR: 241 mm
2017 Total: 281mm
2017 GSR: 155 mm
Soil Type
Red loam
Plot Size
Paddock monitoring

Location
Yaninee
Rainfall
2017 Total: 274 mm
2017 GSR: 126 mm
Paddock History
2017: Medic pasture spray topped
2016: Grass free medic pasture
2015: Mace wheat
Plot Size
Paddock monitoring

Location
Condada
Rainfall
2017 Total: 233 mm
2017 GSR: 123 mm
Paddock History
2017: Hatchet wheat
2016: Mace wheat
2015: Grass free medic pasture
Plot Size
Paddock monitoring

Key message

- **In 2017, approximately 50% of barley grass weed seed was already on the ground (dropped) before the first swathing opportunity.**

Why do the trial?

Barley grass continues to be a major grass weed in cereal cropping regions on upper Eyre Peninsula (EP). Swathing a cereal crop involves cutting the cereal crop and weeds into windrows at between 20 and 40% grain moisture and allowing it to dry after cutting. Having the weed seeds cut and in the windrow before the seed heads shatter and before tillers fall over, may allow greater weed seed collection when using a chaff cart or windrows. Swathing early then harvesting for weed seed collection needs further evaluation as it may provide farmers with another tool for integrated weed management, especially for barley grass that matures and sheds seed before crops ripen.

How was it done?

Four quadrats were taken at GPS-located sampling points before swathing. Crop and weeds were cut at 15-17 cm height (header cutting height). Crop and grass weeds were separated to measure weight and weed seed head length and calculate potential weed seed capture. Surface soil was also collected, and barley grass weed seeds were cleaned from the soil sample and weighed to calculate the weed seed which had dropped before swathing. To assess weed seed capture in chaff dumps after harvest, chaff was collected from paddock dumps to determine the species being collected at harvest by planting the chaff out in trays and assessing for weed germination every four weeks.

What happened?

On upper EP the 2017 growing season rainfall was a decile 1 (well below average), with the first substantial rainfall event not until early July in cold conditions. Low plant tillering and continued dry seasonal conditions resulted in a very poor season.

Swathing wheat at Heddle's did not occur in 2017 due to poor crop growth and low bulk. However, data for barley grass seed drop in crop by harvest was still captured by monitoring two cereal crops weekly over a five week period from the beginning of harvest (17 October) at Oswald's and Cook's (Table 1). Both of these paddocks had grass weeds present as a result of changes in planned rotation due to the poor start to the 2017 season. Plant cuts and soils were collected to assess the amount of barley grass which could have been captured if early swathing of a cereal crop had occurred. Ryegrass was also present in Oswald's at low numbers, with most being greater than 15 cm in height so potentially able to be captured using harvest weed seed collection.

In the 2016 season, 65% of barley grass seed had already dropped to the ground by 27 October in Heddle's swathed paddock.

Table 1. Wheat plants and barley grass seeds/m² from the beginning of harvest 2017 at Oswald's and Cook's.

	Date	Wheat (plants/m²)	Barley grass (plants/m²)	Barley grass seeds/m² above 15 cm	Barley grass seeds/m² below 15 cm	Barley grass seeds/m² already on/in soil	Total Barley grass seeds/m² under 15 cm	Barley grass seed/ m² for weed seed collection* (%)
Cook's	17 Oct (grain moisture 24.6%)	256	78	2500	1380	1350	2730	48
	25 Oct	278	39	3350	1760	2830	4590	42
	1 Nov	158	108	900	1070	1280	2370	28
	7 Nov	214	31	120	160	1520	1680	7
	16 Nov	242	44	8860**	810	5890	6700	57**
Oswald's	17 Oct (grain moisture 29.5%)	177	192	6810	2370	3560	5930	53
	25 Oct	236	458	6650	940	11400	12360	35
	1 Nov	169	194	5074	1210	12390	13600	27
	7 Nov	167	61	470	230	3152	3400	12
	16 Nov	200	390	3180	1530	30200	31700	9

**(Barley grass seeds/m² above 15 cm)/(Barley grass seeds/m² above 15 cm + Total Barley grass seeds/m² under 15 cm) multiplied by 100*

***This sample was in a higher density weed area, with larger weeds and heads*

What does this mean?

The grass weed seed collection showed the amount of barley grass seed which could potentially be collected using swathing of the crop was 50% when grain moisture was above 25%. Harvest generally started in the Minnipa area in late October/early November, and only 30-40% of barley grass seed was still in the heads or above 15cm during this time. The barley grass seed retention will decline with every successive week. If growers are aiming to collect grass seed using harvest weed seed management strategies (chaff carts or windrows) they need to harvest grassy paddocks as early as possible.

This research is ongoing for the next two seasons so more information and knowledge will be generated about weed seed management in current farming systems.

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