BROME AND BARLEY GRASS CONTROL IN THE EYRE PENINSULA

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Key messages

- Trifluralin can provide useful control of low levels of brome and barley grass.
- No crop damage was observed this season from Metribuzin/Diuron mixes applied pre-sowing.

Why do the trial?

Grassy weeds continue to challenge growers across upper Eyre Peninsula. Brome grass is an issue across many regions, however the past three dry seasons has favoured barley grass, which is becoming an issue of greater importance. Brome grass control trial results from other seasons can be found in EPFS 2004, pg 145 and EPFS 2005, pg 146. Two herbicide trials were grown to compare the grass weed control of various herbicides and compare crop safety and grain yield on wheat at Penong and barley at Mangalo.

How was it done?

The trials focussed on a base rate of Trifluralin (0.8 L/ha at Penong and 1 L/ha at Mangalo), to which other herbicides were added to investigate their impact on weed control. The target weeds were brome grass and barley grass.

Herbicide treatments were applied pre-sowing using a hand boom calibrated to deliver 70 L/ha with 11001 Turbodrop Airmix nozzles producing a medium/coarse droplet spectrum.

The Mangalo trial was sprayed and sown on 30 May and Penong was sprayed and sown on 2 June.

Both sites were sown using knife points and press wheels on 230 mm row spacing with the herbicides incorporated by sowing (IBS). Both sites were sown into pasture paddocks with minimal residue remaining after grazing in 2007.

Penong was sown with 50 kg/ha of Wyalkatchem wheat, and Mangalo was sown with Barque barley at 50 kg/ha.

Both sites were monitored for crop and weed emergence post-sowing. Potential weed seed set was gauged by assessing seed heads/m^2 prior to harvest.

What happened?

Table 1 Grass weed control and barley yield with various herbicides at Mangalo

Treatment	Diuron (g/ha)	Metribuzin (g/ha)	Trifluralin (L/ha)	Barley plants/ m^2	Barley grass heads/m^2	Brome grass heads/m^2	Yield (t/ha)	Cost $/ha	Gross Income ($/ha)
1	140		1	179	17.8	17.8	0.80	8.82	103
2	280		1	161	32.2	9.6	0.86	10.64	110
3	420		1	162	22.2	4.4	0.88	12.46	110
4		100	1	183	19.3	5.9	0.81	10.70	102
5		200	1	137	3	0	0.96	14.40	120
6	140	100	1	162	16.3	8.1	0.87	12.52	109
7	280	100	1	149	31.9	8.9	0.90	14.34	111
8	280	200	1	153	10.4	1.5	0.84	18.04	100
9			1	153	28.9	14.1	0.76	7.00	99
10		No spray		166	86.7	52.2	0.58	0.00	81
LSD (P=0.05)				*ns*	*22.1*	*13.9*	*0.20*		

*Gross income is yield x price (Feed 1 barley @ $140/t) less herbicide costs.

Mangalo

None of the herbicides applied at Mangalo depressed barley emergence.

All of the herbicides applied reduced barley and brome grass seed head emergence. However, only 200 g/ha Metribuzin reduced barley and brome grass head emergence more than the base rate of Trifluralin.

The level of weed control obtained with Trifluralin alone did not increase barley yield. All other mixes of herbicides resulted in greater barley yield than the control. Treatment 5 (200 g/ha Metribuzin + 1 L/ha Trifluralin) was the only treatment to yield higher than 1 L/ha Trifluralin.

Table 2 Grass weed control and wheat yield with various herbicides at Penong

Treatment	Diuron (g/ha)	Metribuzin (g/ha)	Trifluralin (mL/ha)	Wheat plants/ m^2	Barley Grass heads/m^2	Brome grass heads/m^2	Yield (t/ ha)	Cost ($/ ha)	Gross Income ($/ha)
1	140		800	113	103	10	0.55	7.42	143
2	280		800	110	82	11	0.59	9.24	153
3	420		800	125	97	7	0.53	11.06	137
4		100	800	128	93	13	0.52	9.30	134
5		200	800	135	50	9	0.54	13.00	140
6	140	100	800	127	53	9	0.55	11.12	136
7	280	100	800	121	74	11	0.50	12.94	126
8	280	200	800	136	47	14	0.58	16.64	149
9			800	123	79	8	0.54	5.60	134
10		No spray		128	176	11	0.51	0.00	126
LSD (P=0.05)				*ns*	*40*	*ns*	*ns*		

*Gross income is yield x price (APW $258.50 and GP $248.50) less herbicide costs.

Penong

Dry conditions post sowing at Penong appeared to prevent the full activation of Diuron or Metribuzin herbicides. As a consequence there was no crop damage from these treatments but also very limited extra grassy weed control early in the season.

All of the herbicides reduced barley grass seed head emergence, however none of the extra herbicides added to Trifluralin were able to improve weed control over and above the base rate of Trifluralin.

At the Penong site, brome grass seed head emergence and final wheat yields were the same across all treatments.

The gross income result of the base rate of Trifluralin at both sites was better than the no spray treatment. All herbicides (except Treatment 7 at Mangalo) improved gross income over the base rate of Trifluralin for both sites.

What does this mean?

Metribuzin and Diuron have much greater requirements for moisture to activate the chemical than Trifluralin. This is why in both trials there were only small improvements in weed control offered by the addition of other herbicides to the base rate of Trifluralin. These herbicides can be extremely effective with adequate soil moisture post-sowing, however can be ineffective without it.

These herbicides are unlikely to provide adequate control in the face of a high background population of grass weeds. Utilisation of rotation and pasture/ crop topping in addition to these pre-sowing herbicide options will be the most effective form of grass weed control where populations of grass weeds are substantial.

The success of IBS herbicide usage in no-till systems requires the herbicide to be present and active in the inter-row. Managing soil throw, particularly from the back rows of the seeder is very important. Crops seeded from the front tines of the machine must not be buried with soil from the back tines, because this will bury the seed too deep and also cause soil with concentrated herbicide to be left in the crop row. If there is excessive soil throw, then uneven germination may result, as well as stunted crop growth from all but the back rows of the seeder.

Diuron and Metribuzin can cause significant crop damage if certain conditions prevail post sowing. A large rainfall event can wash these soluble herbicides into the bottom of the press wheel furrow which can cause a reduction in crop emergence and reduced crop vigour. A significant wind event on light sands can have a similar effect with herbicide

concentrated on top of the emerging crop.

Metribuzin and Diuron are not registered for application in no-till systems pre-sowing. This trial was to indicate potential efficacy and crop safety with various rates and combinations of herbicides. Check your herbicide label prior to usage.

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Many of the herbicide mixes used in these trials are off label and for research purposes only to indicate potential efficacy and crop safety. Check the label prior to applying herbicides.

Category:

"Try this yourself now" – that's about all we can do, it's time to try it out for yourself.

Location
Penong
Sam & Bill Shipard
Group: Charra Ag Bureau
Rainfall
Av Annual: 318 mm
Av GSR: 215 mm
2008 Total: 328 mm
2008 GSR: 179 mm
Yield
Potential: (W) 1.5 t/ha
Actual: 0.6 t/ha
Paddock History
2007: Pasture
2006: Wheat
2005: Barley
Soil Type
Grey calcareous sand
Plot size
13 m x 3 m x 4 reps
Yield Limiting Factors
Rainfall

Location
Mangalo
Brendan Crettenden
Group: Franklin Harbour Ag Bureau
Rainfall
Av Annual: 340 mm
Av GSR: 260 mm
2008 Total: 169 mm
2008 GSR: 132 mm
Yield
Potential: (B) 1.2 t/ha
Actual: 0.9 t/ha
Paddock History
2007: Wheat
2006: Pasture
2005: Barley
Soil Type
Siliceous sand over clay
Plot size
13 m x 3 m x 4 reps
Yield Limiting Factors
Rainfall

For further information

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RESIDUAL HERBICIDES AT SOWING USING DISC AND TYNE NO TILL SEEDING EQUIPMENT

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Acronyms *IBS = Incorporated by sowing*
PSPE = Post sowing pre emergent

Key points

1) Residual herbicides are essential in sustainable no till farming systems
2) Knowing the properties of each residual herbicide is essential for the desired combination of crop safety and weed control.
3) IBS application of residual herbicides generally allows greater crop safety than PSPE applications, and has made higher application rates possible. These higher rates have advantages of combating stubble tie up, extended incorporation windows, increase in efficacy and broader weed spectrum, eg TriflurX.
4) Tyne machines generally allow greater crop safety than discs.
5) IBS in discs is much safer than PSPE in discs.
6) Many herbicide labels have not changed as our farming system has evolved.

During the shift from conventional farming systems to no till farming systems, the effective use of herbicides has become increasingly important.

A well planned herbicide strategy can mean the difference between making no till work or not.

Over the last 5-6 years, it has become apparent that the rapid change in farming systems has overtaken farmer knowledge on how to use many herbicides in conservation farming systems. Older more traditional herbicides that were designed for use in cultivated systems can still be used very effectively in no till systems, however they are usually used in a different manner.

In addition, many herbicide labels (especially older type or generic herbicides) still have the same content on the label today as it did 10-15 years ago. Some products with generic counterparts even have totally different label claims for the exact same active ingredient. This creates many issues for farmers and agronomists wanting to use these herbicides in our modern no till farming systems.

This is especially the case in break crops such as chickpeas, lupins and fieldpeas, where we are nearly always trying to sow them into standing stubble.

As a response to this issue, a number of trials and demonstrations have been conducted by district agronomists in 2007, 2008 and 2009 in conjunction with local grower groups and herbicide company technical support staff, aiming to

a) Educate growers on how various herbicides work in the field in no till cropping systems, ie mode of action.
b) How to use each herbicide most effectively with different seeding equipment, ie knife points and harrows vs knife points and press wheels vs discs.
c) Gain understanding on the effectiveness of each herbicide in each use situation, ie crop safety and weed control.
d) Obtain data to support herbicide permit applications or label changes.

The main outcomes from these trials and paddock experiences are

- Residual herbicides at sowing are very effective at controlling a wide range of weeds both in crop and well into the following summer.
- Some residual herbicides also have valuable knockdown properties. This is very useful because knockdown herbicide options prior to sowing are limited for hard to kill weeds.
- Knowing the chemistry and mode of action of each herbicide is paramount to enable the best combination of crop safety and weed control. Heavy rainfall just after sowing when combined with certain soils can lead to crop damage.

Herbicides such as Metribuzin, Diuron, Simazine, Boxer Gold (S-Metolachlor component), Prometryn, Balance and Spinnaker are mobile with soil water, whilst Trifluralin and Pendimethalin are less mobile.

Mobility can also change with time for particular herbicides. For example with Boxer Gold, the longer it is allowed to bind to soil particles, the less chance of the herbicide becoming mobile in the soil. Other herbicides such as Logran are mobile regardless of binding period.

- IBS application technique seems to be the safest way of using most residual herbicides, as the seed furrow is left free of high concentrations of herbicide.