Oaten hay trials, 2006

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Take home messages

- Hay crops can be used for both risk management and as part of an integrated herbicide resistant grass management program.
- Paddock selection is important. It is best to select a paddock with a low weed burden; there are limits to the amount of ryegrass that is accepted for export oaten hay.
- For quality oaten hay it is important to minimize stem thickness; this can be achieved by the use of high seeding rates. Cross sowing may be necessary to ensure windrows are supported by stubble for bailing, especially if sowing using wide row spacings.
- Adding high rates of nitrogen during the season to increase the quantity of hay can lead to a poor quality crop with low sugar content. Export hay needs to be soft and sweet tasting – the sweetness of hay is measured as the sugar or water soluble carbohydrates, which must be tested to a minimum of 20% to reach export quality.
- Lontrel can no longer be used in crops for export oaten hay. Alternative chemicals are available.

Background

Oaten hay for domestic and export markets is an option in crop rotations as both a weed management and as a risk management tool. Compared to grain crops, hay crops are less dependent on spring rainfall and avoid the risk of crop loss through frost. Cutting hay prior to ryegrass flowering prevents seed set of any herbicide resistant plants.

In 2006, a combination of drought and frost resulted in the other cereals (principally wheat) and canola also been cut for hay. Due to the severe domestic stock feed shortages, domestic prices of cereal hay have exceeded $230 per tonne and generally exceeded export hay prices. The viability of the export oaten hay industry will be dependent on domestic hay prices falling to more historic levels. Under more normal hay marketing conditions, quality is a critical factor influencing the profitability of export oaten hay.

Aim

The trials conducted by BCG aimed to investigate:

1. the balance between maximising production, through the application of nitrogen, and quality, where one of the marketing factors is the level of soluble sugars, which are reduced through the application of nitrogen.
2. herbicide alternatives to Lontrel, that has been prohibited from use in export oaten hay crops due to residual presence of the herbicide in the stems and leaves
3. Best bet variety options.

Methods

Trials were conducted at Hopetoun and Rupanyup.

Three oat varieties, Glider, Kangaroo and Wintaroo, were sown at Rupanyup on 18th May at 120kg/ha as non replicated demonstrations. Sowing was conducted in two directions; W to E and

N to S, with a 60kg/ha sowing rate used in each direction using 17.5cm row spacings. 50kg of Supreme 10 Z was used as a basal fertiliser treatment, with additional nitrogen treatments: 100kg N/ha at sowing and 100kg/N topdressed at GS30. Herbicides were applied: Triflur480 0.8l/ha IBS; GS30 Cadence; Amicide 1.0l/ha; LVE 0.5l/ha + Ally 5g; LVE 0.5l/ha + Eclipse 5g; Buctril MA 1.4l/ha.

A similar trial was sown at Hopetoun on 15th May, 2006 with the exception that Brusher was sown rather than Glider.

Results

For the production of export oaten hay, there exist minimum specifications for a range of quality parameters (see Table 1).

Table 1: Export oaten hay quality parameters and minimum specification standards.

Abbreviation	Quality Parameter	Measurement unit	Min. specification
WDM	Dry Matter	%	>58%
CP	Crude protein (N x 6.25)	% of DM	4-10.
ADF	Acid detergent Fibre	% of DM	<32%
NDF	Neutral detergent fibre	% of DM	<57%
WSC	Water soluble carbohydrates	% of DM	>18%
IVVDMD	Digestibility (NIR)	% of DM	
DOMD	Digestibility (calculated)	% of DM	>58%
ESTME	Metabolisable energy	MJ/kg DM	>9.5

Rupanyup site

The trials were sown on 18th May For oaten hay comparisons between nitrogen treatments, results were averaged over varieties (see Table 2).

Table 2: Influence of nitrogen treatments on dry matter production and various hay quality parameters. Results are the means over the 3 variety comparisons.

N treatment	DM (t/ha)	WDM	Crude Protein	ADF	NDF	WSC	DOMD	ESTME
Control	3.18	75.7	5.9	27.5	48.3	29.4	64.8	10.2
Pre-drilled	5.01	79.8	8.7	25.7	47.4	27.3	67.9	10.8
Post sowing	3.14	74.6	9.0	27.0	46.3	26.3	66.3	10.5
LSD (5%)	1.15	NS	1.9	NS	NS	NS	2.4	0.5

The Rupanyup site was inherently nitrogen deficit at the time of sowing, and clear dry matter (DM) responses to the application of nitrogen at sowing are apparent (Table 2). Interestingly, there was no response to the late application of nitrogen, presumably due to the exceptionally dry finish to the season. Consistent with many observations of cereal hay produced in 2006, the hay quality was excellent, with high levels of stem and leaf sugars (WSC), high digestibility and good levels of metabolisable energy. Against this background of overall excellent quality, nitrogen application had negligible impact on the hay quality and clearly the application of nitrogen at sowing was highly profitable in this situation.

Table 3: Influence of varieties on dry matter production and various hay quality parameters. Results are the means over the 3 nitrogen treatments.

Variety	DM (t/ha)	WDM	Crude Protein	ADF	NDF	WSC	DOMD	ESTME
Glider	2.98	66.8	9.3	24.7	43.5	28.6	70.6	11.3
Kangaroo	4.49	80.1	7.9	29.0	49.8	25.1	63.2	9.8
Wintaroo	4.85	74.0	6.6	27.7	48.3	27.5	64.2	10.1
LSD (5%)	1.00	NS	1.6	2.3	3.8	NS	2.09	0.45

Significant differences were observed between the varieties for dry matter production and a range of quality comparators. Such differences are often the result of the interaction between the variety and the particular site/seasonal conditions and single site results should be treated with caution. In terms of dry matter production, the early maturing Wintaroo was higher than the mid-season Kangaroo which was significantly higher than the late maturing Glider. In general, the quality of Glider was superior to the other varieties.

Lontrel is widely used as a "spike" to improve activity of other herbicides on volunteer legumes, thistles and capeweed. A number of different herbicide mixes were trialled as alternatives to Lontrel, which is now prohibited from use on export oaten hay crops following the discovery of the active ingredient Clopyralid in oaten hay in Japan. The cheaper mixes involved Ally or Eclipse (both at a rate of 5gms/ha) with LVE, or Amicide, with slightly more expensive alternatives being Buctril and Dicamba. It should be noted that Ally is not registered for use on oats, and may cause some crop yellowing. Given that green leaf colour is an important quality parameter for export oaten hay, the trial aimed to investigate whether the use of Ally is worthy of consideration. It should also be noted that Amicide is only registered for a maximum rate of 800mls/ha in oats, whereas it is registered for use at 1.2l/ha in the other cereals. The Ally mixes are generally considered to only provide suppression of vetch, whereas the Buctril or Dicamba alternatives should provide complete control.

No visual symptoms of Ally damage were observed on the oaten hay trial, and the few vetch volunteer plants within the plants were completely controlled by all the treatments. The trials were not designed for determining the tolerance of the oat varieties to these alternative chemical treatments, and further work is required to evaluate these mixes under a range of conditions with varying levels of volunteer legumes.

Hopetoun site

Brusher, Wintaroo and Kangaroo were trialled at the Hopetoun site producing 0.92, 1.03, and 1.08 t/ha of dry matter by the 2nd October. Due to the exceptionally dry conditions prevailing, no further measurements, or estimates of hay quality, were conducted.

Commercial practice

The relative profitability of hay is obviously heavily dependent on the requirement by the producer to use contract services for hay production. Approximate costs for the use of contractors are as follows: Windrowing $25/ha, raking $15/ha, super conditioning $37/ha, baling $20 per bale (550kg) and cartage $5/bale. Additional infrastructure costs include shedding if delivery can not be made directly out of the paddock.

In 2006, hay (of any form) was often more profitable than attempting to harvest crops due to the effect of frosts and the lack of soil moisture/poor rainfall predictions combining to significantly reduce grain yields.

In the longer term, growers should consider oaten hay not just for the financial return in a given season, but for the potential benefit it may provide for herbicide resistant grass management (see separate article on herbicide resistance grass management). Growers should also consider oaten hay in areas of their property that are regularly exposed to frost events, as a means of risk management.

Potential growers should talk to a hay company before sowing as each company has different requirements that might determine how you manage the crop. Quality will often determine the profitability of the oaten hay options. However, in 2006, hay quality was generally excellent as a consequence of the season rather than any particular crop management approach.