Comparison of oat varieties including imidazolinone (IMI) tolerant variety

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Key findings

- Kingbale produced similar or slightly lower hay yields compared to Wintaroo at Hart across two seasons.
- Kingbale grain yields matched or exceeded Wintaroo at Hart in 2019 and 2020.

Why do the trial?

The first imidazolinone (IMI) tolerant oat variety Kingbale was released by InterGrain in 2019. Kingbale offers hay growers flexibility in their rotation and can be used where IMI residues are of concern from previous crops. A Sentry® (imazapic and imazapyr) registration has been submitted to APVMA for pre-emergent use only, with earliest potential registration for use in oaten hay production in March 2021. Preliminary data suggests Kingbale has similar agronomic and disease characteristics to Wintaroo. The trial aim was to assess the performance of Kingbale against the commonly grown oat varieties Mulgara and Wintaroo in the Mid-North.

How was it done?

2019			
Plot size	1.75 m x 10.0 m	**Fertiliser**	Seeding: DAP (18:20) @ 75 kg/ha July 10: Easy N (42:5:0) @ 55 L/ha
Seeding date	May 30, 2019		
Location	Hart, SA		
Harvest date	November 27, 2019		
2020			
Plot size	1.75 m x 10.0 m	**Fertiliser**	Seeding: DAP (18:20) + Impact @ 80 kg/ha June 18: Easy N (42:5:0) @ 80 L/ha August 5: Easy N (42:5:0) @ 50 L/ha
Seeding date	May 6, 2020		
Location	Hart, SA		
Harvest date	November 14, 2020		

The trial was a randomised complete block design with three replicates and three varieties. The trial was managed with the application of pesticides to ensure a weed, insect and disease-free canopy. Biomass cuts were taken at watery-ripe stage (GS71) by cutting 4 x 1 m sections of row at 15 cm ('coke can') height per plot and hay yields (t/ha) were determined. Feed test values from the same trial in 2019 were provided by Balco. Quality parameters including acid detergent fibre (ADF), neutral detergent fibre (NDF), crude protein (CP), water soluble carbohydrates (WSC) were measured. Grain yields were recorded at harvest.

Results

Hay yields

Mulgara and Wintaroo had the highest hay yields at 3.21 and 3.09 t/ha respectively this season. Kingbale produced lower biomass at 2.63 t /ha (Table 1). Throughout the season Kingbale was visually shorter than Mulgara and Wintaroo. Data from 2019 also showed in a low-rainfall year (189 mm annual) Kingbale produced less dry matter than the commonly grown variety Yallara, and yielded the same as Wintaroo (Table 1). Similar trials conducted in the medium rainfall zones of Western Australia have also found Kingbale either matched or was slightly lower yielding compared to Wintaroo (Agrifutures 2020). These results demonstrate Kingbale is capable of matching Wintaroo yields and also provides the additional benefit of IMI tolerance, therefore giving greater rotation flexibility. This was expected as Kingbale is a close derivative of Wintaroo.

Grain yields

Grain yield for Kingbale was the same or higher than other commercially available oat varieties trialed at Hart in 2019 and 2020. In 2019, Kingbale grain yields were the same as Wintaroo and lower than Yallara, however, yields were low ranging from 0.5-0.9 t/ha (Table 1). In 2020, Kingbale had the highest grain yield of 2.23 t/ha followed by Wintaroo at 2.08 t/ha and Mulgara 1.98 t/ha.

Hay quality

The 2019 hay quality results again showed Kingbale performed similarly to Wintaroo. Across the various feed quality parameters; acid detergent fibre (ADF), crude protein (CP), water soluble carbohydrates (WSC) and neutral detergent fibre (NDF), results were the same for both varieties (Table 1). In all cases except CP, Yallara performed differently. Yallara had a high WSC % compared to Kingbale and Wintaroo. WSC % is an important parameter for the export market and higher values are desirable. As found in this trial, when WSC % increases, fibre content decreases (Table 1) and palatability increases (Department of Agriculture and Food 2017). Domestic markets place emphasis on the nutritional value of hay such as CP. Levels of >8% CP are sought after (Department of Agriculture and Food 2017) which all varieties exceeded.

Table 2. Grain, hay yields (t/ha) and hay quality data at Hart in 2019 and 2020.

Variety	Grain yield (t/ha)	Dry matter (t/ha)	Acid detergent fibre (%ADF)	Crude protein (% CP)	Water soluble carbohydrates (% WSC)	Neutral detergent fibre (%NDFom30)
2019						
Kingbale(b)	0.54[a]	2.31[a]	29.70[b]	8.80	16.90[a]	23.10[b]
Wintaroo(b)	0.59[a]	2.60[a]	29.10[b]	9.80	11.20[a]	22.60[b]
Yallara(b)	0.91[b]	3.57[b]	25.00[a]	9.00	34.50[b]	16.40[a]
LSD (P≤0.05)	0.17	0.55	3.00	NS	5.90	4.20
2020						
Kingbale(b)	2.23[c]	2.63[a]				
Mulgara(b)	1.98[a]	3.21[b]				
Wintaroo(b)	2.08[b]	3.09[b]				
LSD (P≤0.05)	0.04	0.41				

Summary

Across two seasons of trials, Kingbale hay and grain yields were similar compared to Wintaroo. Kingbale provides a new option for growers to include oats in their rotation where IMI residues are of concern. In the future (pending current APVMA application) there may also be a registration for the use of Sentry® (imazapic and imazapyr) pre-emergent only.

Acknowledgements

The Hart Field-Site Group would like to thank InterGrain, Jim Maitland and Wayne Heading for donating the seed for this trial.

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