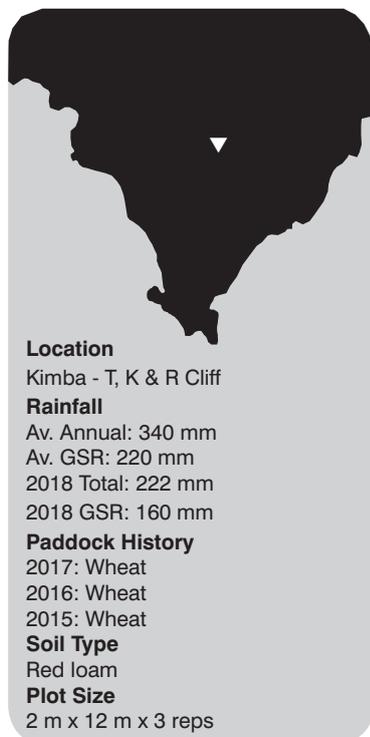


Which oat varieties performed best for hay production at Kimba in 2018?

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EXTENSION



- In a dry season Moby barley performed well for early dry matter production compared to oats, but performed poorly for grain yield.

Why do the trial?

Farmers in the Kimba area have been producing oaten hay for export for several years. The industry has been expanding, with dedicated storage facilities established in recent years on the outskirts of Kimba. To maximise production and quality, the Buckleboo Farm Improvement Group wanted to identify the current best oaten hay variety for the Kimba area.

How was it done?

Seed for seven oat varieties and one grazing barley variety were supplied by Balco. The trial was sown with SARDI small plot equipment on 4 May into moist seed bed conditions (wet to 10 cm only) with 60 kg/ha of DAP fertiliser (18:20:0:0). Seeding rates for every variety were targeted to an establishment of 180 plants/m².

Due to no weeds being present, no pre-emergent herbicides were applied to the trial site.

Plant establishment was counted on 20 June, with dry matter cuts taken on 12 July, 22 August, 31 August and 18 September. Plant height was measured on 18 September. Dry matter samples, simulating hay production, from 18 September (except Durack, 31 August) were dried for 48 hours at 40°C and sent for feed quality analysis using FeedTest. The trial was harvested on 8 November.

The trial was a randomised complete block design with three replications. Data was analysed using Analysis of Variance in GENSTAT version 19. The least significant differences are based on F prob = 0.05.

Key messages

- All oat varieties tested at Kimba in 2018 produced the same dry matter, hay quality and grain yield.
- Durack was the earliest maturing variety (for potential hay cutting and grain), so a good choice in very dry seasons.

Table 1 Establishment and growth of oaten hay varieties at Kimba in 2018

Variety	Plant establishment (plants/m ²)	Dry matter (t/ha)				Average height (cm)	Grain yield (t/ha)	
		Date	20 June	12 July	22 Aug			31 Aug
Brusher	138		0.18	1.3	2.2	6.6	50.8	1.18
Durack	131		0.15	1.3	1.8	4.7	45.0	1.28
Mulgara	103		0.12	1.0	1.7	5.1	46.8	1.08
Swan	111		0.12	1.4	1.9	5.3	54.6	1.15
Wallaroo	131		0.17	1.6	2.0	6.2	54.9	1.16
Wintaroo	110		0.09	1.0	1.8	4.8	48.0	1.08
Yallara	122		0.08	1.3	1.7	4.6	45.6	1.22
Moby barley	110		0.25	1.4	1.8	5.4	56.7	0.77
LSD (P=0.05)	20		0.08	ns	ns	ns	8.2	0.25

Table 2 Feed quality of oaten hay varieties at Kimba in 2018

Variety	Sampling date of tops	Dry matter (%)	Moisture (%)	Crude protein (% of dry matter)	Acid detergent fibre (% of dry matter)	Neutral detergent fibre (% of dry matter)	Digestibility (DMD) (% of dry matter)
Brusher	18-Sep	57	43	10	23	44	73
Durack	31-Aug	79	21	13	23	46	74
Moby barley	18-Sep	56	44	11	24	44	76
Mulgara	18-Sep	58	43	10	22	41	76
Swan	18-Sep	63	37	9	23	44	75
Wallaroo	18-Sep	59	41	12	24	49	71
Wintaroo	18-Sep	59	41	11	21	40	79
Yallara	18-Sep	62	37	11	22	43	75

Table 3 Feed quality of oaten hay varieties continued, at Kimba in 2018

Variety	Digestibility (DOMD) (Calculated) (% of dry matter)	Est. metabolisable energy (Calculated) (MJ/kg DM)	Water soluble carbohydrates (% of dry matter)	Fat (% of dry matter)	Ash (% of dry matter)
Brusher	69	11	29	3	5
Durack	69	11	24	3	5
Moby barley	71	11	28	3	6
Mulgara	71	12	33	3	6
Swan	70	11	32	3	5
Wallaroo	67	11	22	3	5
Wintaroo	73	12	33	3	6
Yallara	70	11	30	3	5

What happened?

The 2018 season was dry with below average rainfall for all months except August, when good rains of 71 mm were received. September and October had low rainfall, but the temperatures were mild during grain filling conditions. 2018 was a decile 3-4 growing season rainfall at Kimba.

The germination was patchy after sowing with not all plots fully established by 31 May. Plant establishment was lower than targeted, with the trial having an average of only 120 plants/m² (Table 1).

Moby barley produced the highest early dry matter, but there were no differences in dry matter production between any of the varieties during the rest of the

growing season (Table 1). Durack matured earlier than the other varieties and the feed quality test for hay cutting was taken three weeks before the other varieties. There were no differences in feed quality or grain yield between the oat varieties in 2018 (Tables 2 and 3).

Oat variety summary

Brusher

Brusher is an early-mid season hay variety developed by SARDI and commercialised by AEXCO. Brusher is a tall line which is three to seven days earlier to head than Wintaroo and this suits it well to low rainfall areas. It has good early vigour, but slightly less than Wintaroo. Brusher has excellent hay yield in low to medium rainfall zones and has consistently had

excellent hay quality to match the yield. Brusher is an improvement compared to Wintaroo for hay quality, stem rust, leaf rust, bacterial blight and septoria resistance. It is resistant but moderately intolerant to CCN and stem nematode. When there is a high CCN population in a paddock with favourable seasonal conditions, Brusher will have significantly lower hay yield than tolerant varieties. Brusher is moderately low in grain lignin, with improved hay digestibility. Brusher has proved to be a popular variety in the earlier regions of SA, WA, and VIC. (SARDI Oat Newsletter 2018).

Durack

Durack is a moderately tall variety similar in height to Carrolup and Yallara measuring between 80 and 90 cm. Durack is a short season maturity, mid-tall variety. It is similar in height and yield to Yallara. Durack is the earliest maturing oat variety of any current milling or hay variety. Durack has good lodging and shattering resistance and good early vigour. Grain yield is similar to the tall varieties Carrolup and Yallara across all states and an improvement compared to tall varieties bred for hay. Grain quality for this line is excellent. Hay yield averaged over low, medium, and high rainfall sites is lower than other longer season varieties. Care will need to be taken to cut this very early maturing variety at the correct growth stage. Monitoring the crop will be the key to achieving the highest hay quality (SARDI Oat Newsletter 2018).

Moby forage barley (*Hordeum vulgare*)

Moby was a selection from Dictator (Heritage seeds), which has now been replaced by Dictator2. Moby is an early maturing, 6 row, white seeded awnless barley with excellent winter growth and rapid establishment. Leaf size varies according to environmental conditions and is more comparable with oat varieties than traditional barley types. Moby will tolerate multiple grazings until the production of the first node. Being winter active, Moby offers an extended sowing window compared to forage oats from mid-autumn to mid-winter. Best time of harvesting for silage or hay is milky-dough to dough stage.

Mulgara

Mulgara was released in 2009 and commercialised by AEXCO. It is a tall mid-season variety with excellent early vigour and good straw strength. Hay yield is lower than Wintaroo, but hay quality is better than Wintaroo. Mulgara also

retains good hay colour and resists brown leaf tipping. Grain yield is similar to Wintaroo, but Mulgara has slightly better grain quality with the exception of high hull lignin. The seed size of Mulgara is larger than other hay varieties and similar to Swan. Care should be taken to sow this variety at the correct seed density taking into account its seed weight. Mulgara has excellent disease resistance. It is resistant and tolerant to CCN and stem nematode. Compared to Wintaroo, Mulgara has improved leaf rust, bacterial blight, and red leather leaf resistance. (SARDI Oat Newsletter 2018).

Swan

Older Western Australian hay variety released in 1967 by DAFWA. Swan is a tall, medium maturing oat. Swan is not widely accepted by hay exporters as the stem tends to be too thick. It is grown successfully for export, however, in eastern areas. Grain yield is not as high as others although it does have low husk lignin.

Wintaroo

Bred by SARDI, Wintaroo oat was released in 2003. It is suitable for hay, grazing, and a feed oat. A tall, mid-season variety for all rainfall zones. Susceptible to leaf and stem rust. Resistant and moderately tolerant to CCN and MRMS to *P. neglectus* nematodes. It remains a very popular mid-season hay variety continuing to deliver excellent hay yield and quality across the major hay producing regions of Australia.

Wallaroo

Bred by SARDI in 1987. Wallaroo is a hay, grazing and feed oat. Tall, mid-season variety for all rainfall zones.

Yallara

Yallara is a medium tall early to mid-season variety similar to Euro for flowering and maturity.

Released in WA in 2009, Yallara is a milling line with slightly better grain quality than Euro but not as susceptible to stem rust. It has bright, plump grain suitable for the milling industry and specialised feed end-uses. Seednet is the commercial partner. Yallara is a Euro look alike with improved leaf rust resistance. It is resistant but intolerant to CCN. It is moderately susceptible to BYDV, bacterial blight, and septoria. Yallara is susceptible and intolerant to stem nematode and susceptible to red leather leaf. Yallara has excellent grain quality. It has high hectolitre weight, low screenings, and high groat percent. The grain is plump and bright and could suit niche markets like the horse racing industry in addition to human consumption. Yallara was evaluated for hay production, and hay yield is similar to popular hay varieties with excellent hay quality. Yallara Fact Sheet based on National Oat Breeding Program results available from Seednet - http://www.seednet.com.au/documents/Yallara_Factsheet_Aug_2013.pdf (SARDI Oat Newsletter 2018).

What does this mean?

2018 was a tough season at Kimba. Plant establishment was lower than expected with the trial having an average of only 120 plants/m², despite aiming for a plant establishment of 180 plants/m². Soil conditions were moist at seeding but only to a depth of 10 cm and conditions were dry for the first few months of the season with little growth until mid-August. Adequate soil moisture and mild spring conditions in late August and September resulted in quick plant growth and high dry matter production.

Durack matured earlier than the other varieties and the feed quality testing for hay cutting was taken three weeks before the other varieties. Growers would need to be aware of this and make sure they are organised to cut Durack for hay at a much earlier time than

they may be accustomed to with other varieties. There were no differences in feed quality between the varieties at Kimba in a drier season. There were no differences in dry matter production of all varieties during the rest of the growing season, but all varieties performed very well producing high dry matters with the late winter rains and mild spring conditions.

The oat varieties all had the same grain yield, while Moby barley yielded lower than the oats.

In 2018 in dry seasonal conditions, the commonly grown varieties in the region performed similarly for hay production and quality was the same. However, Swan is not widely accepted by hay exporters as the stem tends to be too thick and is very susceptible to stem rust. All oat varieties achieved over 8% protein and estimated metabolisable energy greater than

9 MJ/kg DM, so would meet export quality standards. Other export standards that need to be met include colour, weather damage and weed seeds.

Moby barley produced more early dry matter so may have potential for early grazing opportunities.

Acknowledgements

Thanks to Trevor, Kerri and Randall Cliff for having the trial on their property and to BigFIG for the opportunity to run the trial. Thank you to Steve Jeffs and Fiona Tomney for helping with the trial sampling, and Balco for providing the seed.

Reference

For further information:

http://pir.sa.gov.au/__data/assets/pdf_file/0018/334332/SARDI_Oat_Newsletter_2018.pdf



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