

Developing a more productive, persistent panic grass cultivar

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Abstract

Six elite lines of *Megathyrsus maximus* (syn *Panicum maximum*) and one line each of *Panicum coloratum* and *Chloris gayana* have been selected following evaluation studies on the north-west slopes of New South Wales and in the northern agricultural region of Western Australia. These lines have shown much better persistence, production and cool season tolerance than existing commercial cultivars, but have not been tested under extensive grazing. Large replicated plots of these lines and commercial cultivars have been sown at 2 sites in NSW and 1 in WA. Production and persistence of these pastures will be monitored under grazing with the aim of releasing a new cultivar in collaboration with a commercial partner.

Introduction

Research has shown that tropical grasses offer many benefits in northern New South Wales and on the south coast and the northern agricultural area of Western Australia. Leading producers in these regions are developing productive, sustainable farming systems based on tropical grasses, but new varieties and robust ‘agronomy’ pack-

ages for perennial-based farming systems need to be developed for more widespread adoption.

The Future Farm Industries Cooperative Research Centre (CRC) (formerly CRC for Plant-Based Management of Dryland Salinity) project ‘Perennial Grass Breeding’ supported by Meat & Livestock Australia evaluated 130 accessions and cultivars at 5 sites in WA and 3 sites in NSW between January 2004 and December 2008 to identify lines with increased productivity, persistence and cool season tolerance.

Six lines of *Megathyrsus maximus* (syn *Panicum maximum*) and 1 line each of *Panicum coloratum* and *Chloris gayana* showed excellent persistence under hot dry conditions in summer and autumn and better cool season tolerance than the commercial cultivars with rapid recovery in spring and equal or higher biomass production (Table 1; C.A. Harris, unpublished data). These lines also have good growth habit, tiller density, seed production and nutritive value. The persistence, productivity and feed quality of these elite lines under grazing will be evaluated at a wider range of sites in the target regions. This will be conducted as part of the ‘Productive, persistent tropical grasses in farming systems’ project funded by FFI CRC until 2011. This paper outlines our activities to develop a new tropical grass variety.

The next step

Evaluation under grazing

The grazing experiment sites are located at:

- (i) ‘Mitiamo’ (29°56’S, 150°26’E; 296 m elevation; 741 mm AAR), ~ 25 km west of Bingara on a red Chromosol soil
- (ii) Tamworth Agricultural Institute (31°09’S, 150°59’E; 434 m elevation; 674 mm AAR), ~ 5 km south-east of Tamworth on a red Chromosol soil

Table 1. Seasonal production and persistence of 'elite' *M. maximus* and *P. coloratum* lines and commercial cultivars at Yetman, northern NSW (February 2005 – February 2008). Table sorted according to persistence.

Species and line/cultivar	Seasonal production ¹				Green leaf over winter (%)	Persistence ²
	Spring	Summer	Autumn	Total		
<i>M. maximus</i> 050	4.0	6.1	6.2	6.3	30	72
<i>M. maximus</i> 066	4.0	4.9	5.1	5.7	34	71
<i>P. coloratum</i> 019	3.6	5.4	5.0	4.5	38	71
<i>M. maximus</i> 057	3.2	5.0	4.8	5.2	36	70
<i>M. maximus</i> 062	3.3	5.0	5.4	4.5	34	70
<i>P. coloratum</i> 020	3.1	5.0	4.2	3.9	39	70
<i>C. gayana</i> cv. Katambora	5.2	6.8	5.4	6.0	42	70
<i>M. maximus</i> control	2.7	2.8	2.7	2.3	20	26
<i>P. coloratum</i> cv. Bambatsi	2.0	2.8	2.3	2.5	28	25

¹Average visual yield score over each season and annual total; score scale is 1 to 9 where 1 is lowest and 9 is highest.

²Percentage of originally established plants in drill row still alive at February 2008.

Table 2. Cultivars and elite lines of tropical grasses sown in experiments in NSW and WA in 2008–2009.

Species and line/cultivar	Bingara NSW	Tamworth NSW	Badgingarra WA
<i>M. maximus</i> 045			✓
<i>M. maximus</i> 049	✓	✓	✓
<i>M. maximus</i> 050	✓	✓	✓
<i>M. maximus</i> 057	✓	✓	✓
<i>M. maximus</i> 059	✓	✓	✓
<i>M. maximus</i> 062	✓	✓	
<i>M. maximus</i> 066	✓	✓	
<i>M. maximus</i> cv. Gatton	✓	✓	✓
<i>M. maximus</i> cv. Green	✓	✓	✓
<i>P. coloratum</i> 020	✓	✓	
<i>P. coloratum</i> cv. Bambatsi	✓	✓	
<i>C. gayana</i> 018	✓	✓	✓
<i>C. gayana</i> cv. Topcut			✓
<i>C. gayana</i> cv. Katambora	✓	✓	✓

(iii) Badgingarra Field Station (30°19'S, 115°32'E; 490 mm AAR) ~ 200 km north of Perth on a grey sand soil.

The lines and cultivars in each experiment (Table 2) were sown in plots (77–100 m²), with 4 replicates. The WA site was sown in September 2008 and the NSW sites in January 2009. The pastures were allowed to set seed in the first year, with grazing starting in late autumn at the WA site and in spring on the NSW sites. The plots were sown in commercial paddocks (except at Tamworth) and will be grazed with the rest of the paddock by cattle at Bingara and Badgingarra and by sheep at Tamworth. Herbage mass will be assessed when the pasture has accumulated 2000–3000 kg/ha DM before being grazed. Residual herbage mass after grazing will also be assessed. Stock number, class and approximate weight will be recorded. Plant numbers and frequency will be assessed at the end of spring and

autumn each year to monitor changes in persistence, and seasonal nutritive value of the lines/cultivars will be monitored.

Conclusion

A decision on the commercial potential of the lines and possible release of a new cultivar will be made in collaboration with a commercial partner in 2011.

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