

Improved Ryegrass Variety Trial

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Introduction

Including a pasture phase in your farming rotation can have huge benefits for the following cropping phase. Improvements can include increased soil organic matter, increased soil stability and a reduction in the weed seed bank. Phase farming, particularly on the Esperance sandplain, is becoming more common. It is helping farmers retain stock while using the pasture phase to manage problem soils and restore soil fertility reduced by frequent cropping. So what pasture species are successful in achieving both high quality fodder for livestock while also complimenting the following cropping phase?

Ryegrass has increasingly become an important pasture option in Esperance, as it can produce high amounts of quality feed. The potential for the new tetraploid, diploid and perennial ryegrasses to fit in a phase system was raised by a number of SEPWA members.

The aim of the trial was to investigate the suitability of these new ryegrass varieties to the Esperance region. Three variety trials were established across the sandplain and this paper will summarise the results.

Methods

Site locations: Gibson, Beaumont and Jerdacuttup. However monitoring at Jerdacuttup was stopped as pasture growth was limited.

Varieties:

Annual diploid: Kraka, Missile, Concord, Dargo and Charger

Annual tetraploids: Drummer, Rocket, Betta Tetila, Winterstar, Winterstar 2, Abundant and Sungrazer

Biennial ryegrass: Diplex, Maverick Gold and Crusader

Perennial diploid: Everlast, Roper and Extreme

Perennial tetraploid: Banquet

These were all compared with volunteer annual ryegrass (cv. Wimmera).

Seeding rate: All varieties were sown to achieve a desired plant density of 250 plt/m². Seeding depth was 0.5 – 1 cm.

Fertiliser: 65 kg/ha of MAPZCS was applied at sowing and 150 kg/ha of Sulphate Ammonia was topdressed after the second mowing.

Grazing management: Sites were mowed to simulate grazing when pasture reached 3 leaves, leaving a 5cm residue. Sites were mowed 4 times (6, 11, 14 and 17 weeks after sowing).

Measurements: Seedling vigour, groundcover, quality, pasture yield, maturities and botanical composition were recorded at each mowing. However only yield and maturity results will be discussed.

Results

Yield

All varieties had a significantly higher cumulative yield than annual volunteer (Figure 1 and 2). At Gibson all varieties performed the same with an average cumulative yield of 7059 kg DM/ha (Figure 1). At Beaumont, all varieties produced the same, except Sungrazer (6439 kg DM/ha) and Dargo (6296 kg DM/ha) had a significantly higher cumulative yield than Everlast (4955 kg DM/ha), Roper (4789 kg DM/ha) and Extreme (4741 kg DM/ha) (Figure 2).

Similar trends were seen at each site over the year however there was some differences detected. Rocket's yield was significantly higher than Roper's at the first mowing at both sites. This was an average difference of 523 kg DM/ha and it only occurred at the first mowing. At the second mowing all varieties at Beaumont were performing the same however at Gibson, Charger (2159 kg DM/ha) and Diplex's (2174 kg DM/ha) yield was significantly higher than Extreme (1672 kg DM/ha) and Banquet's (1664 kg DM/ha) (Figure 1).

At the third mowing all varieties were producing the same at both sites except at Beaumont, Sungrazer T (1405 kg DM/ha) was significantly better than Banquet (852 kg DM/ha). At the final mowing all varieties were producing the same yield at Gibson and Beaumont, with an average of 2311 and 2255 kg DM/ha respectively (Figure 1 and 2).

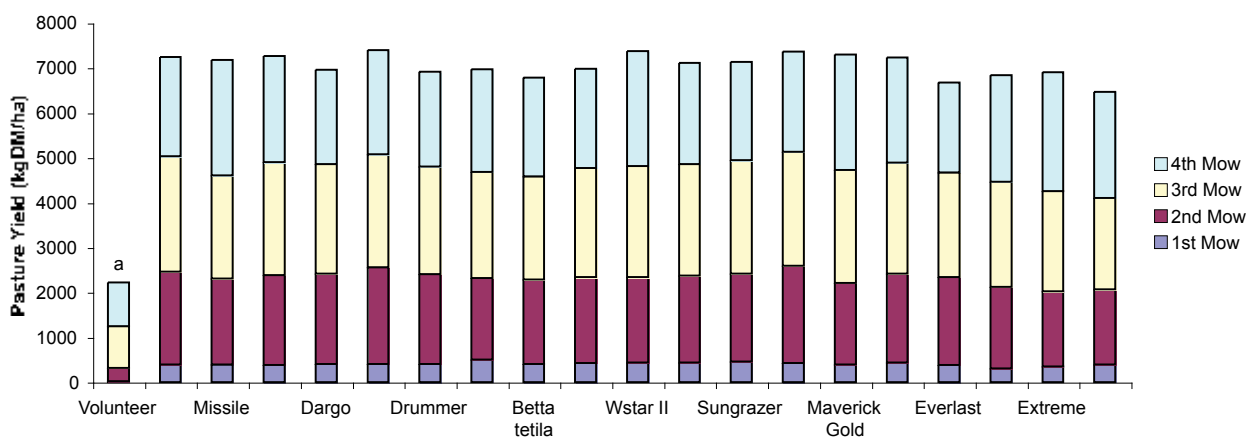


Figure 1: Cumulative yield (kg DM/ha) of ryegrass varieties at Gibson (letters on the graph indicate significant differences).

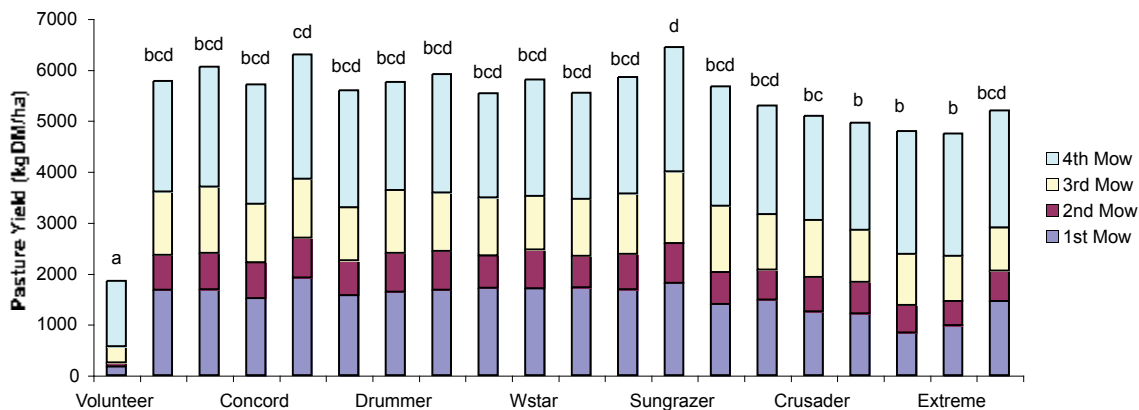


Figure 2: Cumulative yield (kg DM/ha) of ryegrass varieties at Beaumont (letters on the graph indicate significant differences).

Maturities

The majority of the varieties flowered in the last week of November. Table 1 shows that there were some similarities observed between the sites. Varieties that did not flower in this time period at Gibson: Banquet, Diplex, Concord, Charger and Maverick Gold and at Beaumont: Banquet, Extreme and Crusader.

Table 1: The flowering dates for Gibson and Beaumont*

Variety	DATE				
	30th- 31st* Oct	6 - 7th* Nov	13- 14th* Nov	20th- 21st* Nov	26th – 28th* Nov
Annual Volunteer			Abundant		Missile
*Annual Volunteer			Rocket		Kraka
			Sungrazer		Betta Tetila
			Drummer		Roper
			Dargo		Winterstar
			*Dargo		Crusader
			*Sungrazer		Everlast
			*Abundant		Winterstar 2
			*Drummer		Extreme
			*Rocket		*Betta Tetila
					*Missile
					*Roper
					*Kraka
					*Concord
					*Charger
					*Everlast
					*Diplex
					*Winterstar
					*Winterstar 2
					*Maverick Gold

Conclusions

The main conclusion from this trial is that there were no substantial yield differences between varieties except that all varieties had a significantly higher yield than annual volunteer. However site choice influenced this result, as sites were chosen based on low weed numbers particularly low background Wimmera populations, to ensure good establishment. It is suspected that if Wimmera was planted at a similar plant density (250 plants/m²) the production would match that of the other annuals. This is further supported by a study conducted by Black and Dee (1990), who found that Wimmera sown at the same rate as Concord had a higher yield by an average of 485.5 kg DM/ha.

It was expected that a yield difference would be seen between annuals and perennials. This trial showed that perennials matched the winter/spring production of the annuals. Depending on production over summer, perennial ryegrass could be more suitable than annuals in a phase systems as it will provide good growth during the season and may extend the growing season and utilise out of season rainfall. In addition groundcover could be maintained over summer minimising any erosion.

It is well documented that grazing intensities dictate yields. Work carried out by Smart (1999) found that if they grazed for a day, rather than 3 days there was a yield gain of 4%, if it was 3 days instead of 7 days there was a 20 % gain in yield. Their results in conjunction with the results obtained in this variety trial strongly suggest that grazing intensity will have a greater influence on yield than the variety.

References

Smart, B 1999 'Beef Pastures for Profit Increasing profit by improved pasture management and utilisation' Department of Agriculture

Black, R.G. and Dee J.N.P, 1990 'Ryegrass Variety Cultivar Trial' Department of Agriculture Western Australia (unpublished)