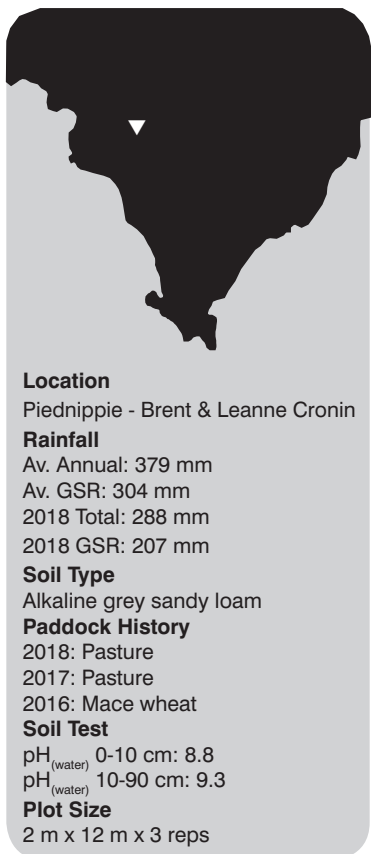


Maximising dry matter production for grazing systems on alkaline soils

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RESEARCH



compared to the current district practice of volunteer annual medics.

- **Further research needs to be done on regeneration and herbicide tolerance of newer pasture species.**

Why do the trial?

The aim of this trial was to identify plant varieties or mixtures that can increase dry matter production of the pasture break phase on the highly alkaline soils of upper Eyre Peninsula. Current cropping and grazing systems are mostly based on monocultures and the potential feed base of the break phase could be broadened to be more productive for grazing and available for a longer time period in the season. Current oat varieties, mixed break crops and newer pasture species were trialled at Piednippie in 2018 to investigate whether a more productive and prolonged feed base is possible.

How was it done?

There were three separate trials conducted in 2018. Seven oat varieties and one grazing barley variety (Moby), were sown in an oats trial at Piednippie on a 2017 pasture paddock. See article 'Which oat varieties performed best for hay production at Kimba in 2018', for more information on the oat varieties used in this trial. The mixed crops trial consisted of eight combinations of vetch, peas, canola, oats and barley, as listed in Table 1. The pasture and grazing species trial consisted of annual medic species, disc medics, trigonella, clovers, biserrula, serradella and plantain. See the article 'Dryland Legume Pasture

Systems: Legume Adaptation', for more information on the pasture species trialled.

Oat varieties were sown at rates estimated to produce a plant establishment of 120 plants/m². All pasture species were sown at 7.5 kg/ha except Casbah biserrula and Trigonella balansae (APG5045) which were sown at 5 kg/ha due to smaller seed size.

The trial was sown with SARDI small plot equipment on 7 and 8 June into moist seed bed conditions (wet to 10 cm depth only) with 100 kg/ha of single super fertiliser (0:8:0:11) applied to all trials. The fertiliser treatments in the pasture trial had 100 kg/ha of single phosphate top-dressed at sowing. The trials were sprayed with 1.5 L/ha Spray.seed on 15 June post sowing, pre-emergence to kill regenerating medic. After the rains in mid-August, late germinating Ward's weed was an issue and the oats were sprayed early September with 750 ml/ha Tigrex. Most of the pasture plots were sprayed with Targa @ 170 ml/ha, 500 ml/ha of Uptake and Broadstrike @ 25g/ha. The canola plots and Trigonella plots were sprayed with Targa @ 170 ml/ha and Simazine @ 400 g/ha.

Plant establishment of oats was counted on 2 July, and for the mixed crops and pasture species on 18 July. Dry matter cuts were taken on 3 October. Neither the oat or mixed species trials were harvested for grain yield due to galahs decimating the trial in late October.

Key messages

- **There is the potential to increase plant dry matter production and grazing using mixtures of plant species.**
- **Kaspa peas produced the greatest dry matter overall with 1.7 t DM/ha, and an oats/medic mix also did well (1.3 t DM/ha). The short season oats variety, Durack, produced the greatest dry matter for oats with 1.1 t DM/ha. Toreador disc medic (bred for sandy soils) produced the best dry matter (0.75 t DM/ha) amongst the pasture species.**
- **In a poor season like 2018, dry matter production in pastures could be improved**

Table 1 Establishment and growth of forage and pasture options at Piednippie in 2018

Variety	Plant establishment (plants/m ²)	Dry matter (t/ha)
Date	20 June	3 Oct
Oats (target 120 plants/m ²)		
Brusher	100	0.89
Durack	87	1.11
Mitika	88	0.74
Moby barley	88	0.74
Mulgara	86	0.85
Swan	92	0.85
Wallaroo	83	0.77
Wintaroo	83	0.59
Yallara	98	0.84
LSD (<i>P</i> =0.05)	<i>ns</i>	0.20
Mixtures		
Medic (Angel) 7.5 kg/ha and oats (Yallara) 40 kg/ha	79 (M), 73 (O) 152 total	1.30
Canola (43C80) 5 kg/ha	85	0.84
Peas (Kaspa) 90 kg/ha	60	1.69
Vetch (Volga) 30 kg/ha and barley (Moby) 40 kg/ha	33 (V), 61(B) 94 total	1.02
Vetch (Volga) 30 kg/ha and oats (Yallara) 40 kg/ha	65 (V), 76 (O) 141 total	1.09
Vetch (Volga) 25 kg/ha and oats (Yallara) 30 kg/ha	31 (V), 51 (O) 81 total	0.94
Vetch (Volga) 30 kg/ha, canola (43C80) 2 kg/ha and oats (Yallara) 40 kg/ha	36 (V), 38 (C), 64 (O) 138 total	1.00
Vetch (Volga) 45 kg/ha	65	0.54
LSD (<i>P</i> =0.05)	<i>ns</i>	0.32
Pasture species (7.5 kg/ha sowing rate)		
Angel (SU tolerant Herald hybrid) strand medic	131	0.31
Angel (SU tolerant Herald hybrid) strand medic topped with 100 kg/ha of single phosphate at sowing	130	0.13
Bartolo bladder clover	251	0.44
Casbah biserrula (5 kg/ha)	243	0.05
Cavalier spineless burr medic	122	0.18
Cobra balansa clover	209	0.13
Harbinger strand medic	73	0.19
Herald strand medic	136	0.55
Margurita French serradella	162	0.07
District practice regenerating medic (Piednippie)	57	0.27
Natural regenerating medic topped with 100 kg/ha of single phosphate at sowing	29	0.26
PM250 strand medic	172	0.58
Ranger plantain	98	0.06
SARDI Rose clover	202	0.37
Toreador disc medic	337	0.75
Trigonella balansae (5045) (5 kg/ha)	192	0.52
LSD (<i>P</i> =0.05)	94	0.20

The three trials were randomised complete block designs with 3 replications. Data were analysed using Analysis of Variance in GENSTAT version 19. The least significant differences are based on F prob = 0.05.

What happened?

The 2018 growing season rainfall at Piednippie was a decile 2-3, with below average rainfall for all months except August, when good rains were received.

The germination was patchy with not all plots established by 2 July. Plant establishment was lower than targeted, especially in the cereals.

Low levels of *Rhizoctonia* and *Pratylenchus thornei* inoculum were present at the site.

There were no differences in plant establishment in the oats trial with a trial average of only 89 plants/m² (Table 1). Durack oats, the earliest maturing variety, produced the highest early dry matter in the oat trial (Table 1), but differences between most oat varieties were small except for production from Wintaroo, which was quite low.

Kaspa peas performed the best at the site with good establishment and growth, and the highest dry matter. The cereal and legume mixes, especially the oats and medic, also performed well producing greater dry matter than pasture species trialled.

What does this mean?

Kaspa peas produced the greatest dry matter at the site in a poor season, and as a legume would provide nitrogen fixation and a good disease break for future cereal crops. Other pea varieties such as Morgan and Wharton may provide even better forage options for grazing. The early maturing oat variety Durack was the most productive oat variety. The oats and Angel medic mix also performed well for dry matter production.

Toreador disc medic, bred for sandy soils, produced more dry matter than the other medic species, although the total amount was still low (<1 t/ha). The production of other legumes such as serradella and biserrula was negligible. Although dry matter was low due to below average rainfall, there was potential for peas and the

mixtures of cereals and legumes to improve overall production on grazing systems compared to the current regenerating pasture.

Spreading 100 kg/ha of single phosphate fertiliser at sowing on top of the current best option strand medics did not result in better dry matter production of the strand medics. Recent work at Minnipa and Piednippie has shown P can limit dry matter production and medic nodulation, but more research is needed to find a method to apply phosphorus in regenerating pasture systems without resowing.

This was one season's results in a below average rainfall year so further work needs to be done on some of the newer species, including regeneration, herbicide tolerance and how they fit into current farming systems.

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