

# Forage Crops for Grazing at MAC 2010

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## Searching for answers



**Location:** Minnipa Ag Centre

### Rainfall

Av Annual: 325 mm

Av GSR: 242 mm

2010 Total: 410 mm

2010 GSR: 346 mm

### Paddock History

2008: Wheat

2009: Wheat

### Soil Type

Red sandy loam

### Plot Size

20 x 1.5 m x 3 reps

### Yield Limiting Factors

Nil

### Environmental Impacts

#### Soil Health

Soil structure: High organic carbon

Compaction risk: Low to medium

#### Social/Practice

Time (hrs): Sowing pre normal seeding

Clash with other farming operations:

Standard management

Labour requirements: Labour to shift sheep

#### Economic

Infrastructure/Operating inputs:

Grazing benefits requiring electric fence, portable trough

Cost of adoption risk: Low

- There are further opportunities to develop farming systems around the multipurpose break crops on upper Eyre Peninsula.

## Why do the trial?

Increasing variation in rainfall patterns may require consideration of multi purpose crops for mixed farming systems. There are a range of alternative field crops that may produce more biomass than current wheat cultivars and can provide options in terms of enterprise diversification, i.e. grazing/stored forage/grain or sometimes combinations of all three.

The aim of this trial is to provide data to assist in decision making when planning to use a field crop as a potential resource for grazing, hay and/or grain based on seasonal conditions, while in some cases utilising the benefits of a break crop within the cropping rotation.

## How was it done?

In paddock North 12 on Minnipa Agricultural Centre, field crop varieties (species, varieties and sowing rates are listed in Table 1) were sown into 20 x 1.5 m plots replicated 3 times on 31 May. Sowing rates were adjusted to establish 150 plants/m<sup>2</sup> of cereals, 75 of pulses and 50 of canola. DAP @ 60 kg/ha was applied at seeding, no further fertiliser or weed control was applied.

Plant counts, early biomass production and simulated grazing on 1 replicate (mowing) was carried out on 5 August and biomass production measurements were repeated on 28 September (approximately at anthesis) with grain harvest completed on 3 December from both the mown and unmown plots.

## What happened?

Established plant numbers were 10 – 20% below targeted density. The barley and the forage pea produced the highest early biomass production, the winter wheat, Naparoo, canola and vetch the lowest. At anthesis the vetch oat and vetch canola mixtures produced the highest biomass yield, the winter wheat the lowest. Grain yield from the barley was highest, the vetch and canola lowest. Grain yield following mowing in August was similar to the unmown plots in the wheat, barley and oats, and was reduced by the greatest amount in the triticale, forage pea and barley.

Table 3 presents the estimated gross margins from sowing cereals for grazing, cutting hay or grain recovery in good seasonal conditions.

## What does this mean?

The study has evaluated a range of crops that can provide both a risk management strategy in a mixed farming enterprise along and in some cases with a disease break and N input in the rotation. It has supported previous studies with cereals that have shown that grazing into early tillering on cereals will have only a limited impact on grain yield. These results were enhanced by 350 mm of growing season rainfall (66, 68 and 72 mm in August, September and October respectively).

This study has also shown that there are broad leaf alternatives, forage peas and vetch, that as a monoculture or as component of a cereal or oilseed mixture can increase total (anthesis) biomass production. The results suggest that there are further opportunities to develop farming systems around the multipurpose break crops on upper EP.

## Key messages

- Simulated grazing up to early tillering on cereals caused only a minor reduction in grain yield.
- There are broad leaf field crop alternatives, forage peas and vetch, that as a monoculture or as component of a cereal or oilseed mixture can increase total (anthesis) biomass production.

**Table 1 Field crops sown and sowing rate (kg/ha)**

| Crop               | Variety                 | Sowing rate (kg/ha) |
|--------------------|-------------------------|---------------------|
| Wheat              | Naparoo & Gladius       | 50                  |
| Barley             | Barque                  | 50                  |
| Oats               | Wintaroo                | 50                  |
| Triticale          | Rufus                   | 70                  |
| Canola             | Tarcoola                | 4                   |
| Forage Peas        | Morgan                  | 70                  |
| Vetch              | Blanchefleur            | 16                  |
| Oats + Forage Peas | Wintaroo + Morgan       | 25 + 35             |
| Oats + Vetch       | Wintaroo + Blanchefleur | 25 + 8              |
| Canola + Vetch     | Tarcoola + Blanchefleur | 2 + 8               |

**Table 2 Plant establishment (plants/m<sup>2</sup>), Zadocks growth stages on 5 August and biomass production (DM t/ha) on 5 August and 28 September, and grain yield (t/ha) in 2010**

| Variety                | 5 August              |            |         | 28 September | Not mown           | Mown |
|------------------------|-----------------------|------------|---------|--------------|--------------------|------|
|                        | plants/m <sup>2</sup> | Zadocks GS | DM t/ha | DM t/ha      | Grain Yield (t/ha) |      |
| Naparoo                | 130                   | 1/5 - 2/5  | 0.4     | 1.9          | 2.9                | 2.6  |
| Gladius                | 122                   | 1/6 - 2/2  | 0.6     | 3.9          | 2.7                | 2.4  |
| Barque                 | 133                   | 1/6 - 2/2  | 1.0     | 4.5          | 3.4                | 2.7  |
| Wintaroo               | 126                   | 1/5 - 2/4  | 0.7     | 5.3          | 2.6                | 2.6  |
| Rufus                  | 125                   | 1/6 - 2/1  | 0.7     | 5.4          | 2.9                | 1.8  |
| Tarcoola               | 38                    | 7          | 0.4     | 3.9          | 0.8                | 0.6  |
| Morgan                 | 64                    | 10         | 0.9     | 3.6          | 2.8                | 1.9  |
| Blanchefleur           | 69                    | 6          | 0.5     | 5.4          | 1.6                | 1.6  |
| Wintaroo + Morgan      | 102                   |            | 0.7     | 5.3          | 2.8                | 2.5  |
| Wintaroo + Blanchfleur | 106                   |            | 0.6     | 7.7          | 2.7                | 2.5  |
| Tarcoola + Blanchfleur | 60                    |            | 0.7     | 6.7          | 2.5                | 2.2  |
| LSD (P=0.05)           |                       |            | 0.2     | 3.1          | 0.7                |      |

**Table 3 Gross margin (\$/ha) estimates from each component of the multipurpose enterprise**

|                        | <sup>a</sup> 5 August (\$/ha) | <sup>b</sup> 28 September (\$/ha) | <sup>c</sup> Unmown grain yield (\$/ha) | <sup>d</sup> Mown grain yield (\$/ha) |
|------------------------|-------------------------------|-----------------------------------|---|---------------------------------------|
| Naparoo                | 16                            | -107                              | 603                                     | 528                                   |
| Gladius                | 24                            | 39                                | 559                                     | 458                                   |
| Barque                 | 40                            | 88                                | 538                                     | 402                                   |
| Wintaroo               | 28                            | 148                               | 302                                     | 297                                   |
| Rufus                  | 28                            | 153                               | 319                                     | 158                                   |
| Tarcoola               | 16                            | 42                                | 274                                     | 124                                   |
| Morgan                 | 36                            | 21                                | 278                                     | 148                                   |
| Blanchefleur           | 20                            | 204                               | 102                                     | 100                                   |
| Wintaroo + Morgan      | 28                            | 146                               | 277                                     | 243                                   |
| Wintaroo + Blanchfleur | 24                            | 400                               | 266                                     | 231                                   |
| Tarcoola + Blanchfleur | 28                            | 319                               | 231                                     | 184                                   |

<sup>a</sup> Grazing value was calculated by multiplying the DSE (based on 1 kg DM/DSE/day) by \$30 (gross margin/DSE) and dividing by proportion of year.

<sup>b</sup> The 28 September hay production gross margins are based on collecting 65% of total available biomass with a \$115-130/t value and \$249/ha variable costs.

<sup>c</sup> Grain value calculated as \$250/t wheat, \$194/t barley and \$150/t oats, triticale and all feed grains (forage peas, vetch and mixtures), and \$535 canola with total variable costs from Farm Gross Margin Guide.

<sup>d</sup> The mown grain yield figures represent only 1 replicate and should be treated with caution.