

C4 Milk

# Winter Forage Combination Demonstrations

Photo1. Aerial photo of the 33 winter forage plots, with 12 dryland (bottom row) and 21 irrigated (middle and top row) forage plots.

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An integral component of the C4Milk project is focusing on reducing the purchased feed costs for both the milking and dry stock diets. Increasing the use of home grown feeds offers the opportunity to reduce feed costs whilst maintaining diet quality. Going forward, competition from other intensive livestock industries, export markets and industries such as biofuels for key diet ingredients will necessitate an increased focus on what can be produced on-farm.

A winter forage combinations demonstration has been set up at Gatton Research Dairy in southeast Queensland to investigate a range of cereal and legume based forages and their potential combinations. An assessment of alternative starch based cereal options have been grown alongside more traditional winter cereal forages, along with a number of high protein winter legumes and brassica species (Table 1). Combinations of cereals and legumes are also being assessed to look at the potential to increase forage quality (crude protein) whilst maintaining or increasing forage yield relative to traditional cereal crops grown as a monoculture. This demonstration aims to evaluate the most suitable options grown under both irrigated and dryland conditions with regards to yield, forage quality and agronomic suitability for use in dairy systems across Australia.

A total of 33 demonstration plots were sown in mid-May 2019 (Photo 1). The plots (5 x 10 m) were planted into a fully cultivated seedbed, pre-irrigated (full soil moisture

Winter starch forages	Winter protein forages	Winter Combinations
Barley	Canola	Barley & Field peas
Cereal Rye	Faba Beans	Barley & Vetch
Forage Wheat	Field Peas	Oats & Forage Rape
Oats	Lupins (2 varieties)	Oats & Vetch
Triticale	Vetch (2 varieties)	Triticale & Vetch
		Wheat & Faba Beans
		Wheat & Vetch

Table 1 A range of starch and protein based forages are being assessed within the winter forage demonstration.

Forage	Varieties	DM Yield (kg DM/ha)
<b>Dryland cereals</b>		
Barley	Dictator	4535
Cereal Rye	Southern Green	4349
Oats	Austin	3556
<b>Irrigated cereals</b>		
Barley	Shephard	5497
Barley	Dictator	5314
Cereal Rye	Southern Green	5312
<b>Combinations – irrigated</b>		
Oats & Vetch	Austin & Poppani	5396
Oats & Forage Rape	Austin & Winfred	4630
Canola only	Hyola (10 kg/ha planting rate)	4522

Table 2 Preliminary dry matter yields (kg DM/ha) of the top three yielding cereals and combination forages after the first cut at eight weeks after planting.



*Photo 2. Irrigated Austin oats that was cut (right side of pipe) 8 weeks after planting with 3 weeks of regrowth compared to 11 weeks of growth (left side of pipe) .*

profile), fertilised and herbicide applied prior to planting. The demonstration is comprised of both an irrigated and a dryland component, with the irrigated area managed for optimal water requirements whilst the dryland area was established with an in-crop irrigation to fill the soil moisture profile and subsequently left to survive on rainfall. A number of plots (15 in total) will be assessed from a grazing and hay production perspective, with half of the plot cut multiple times to assess regrowth (Photo 2). The remainder of the plot and other forage species will be left until mature for a single silage cut, which will be milky dough for the cereals and early pod development or late flowering for the legumes and brassicas (Photo 3).

The first cuts were taken eight weeks after planting to simulate grazing and hay production, with preliminary yields of the top three dryland and irrigated cereals and combination forages provided in Table 2 (page 4). Only 15 of the 33 blocks have been identified to be cut multiple times to simulate grazing or hay production, with all of the legumes being a single cut only. The irrigated forages are expected to be cut 2-3 times before harvesting a final silage cut in September, whilst the dryland blocks will most likely be harvested 1-2 times depending on rainfall and regrowth potential of the forage. Cumulative yields and quality will be assessed for the multiple cuts across the growing season. The single cut forages will be harvested at the ideal maturity in August and September, with dry matter (DM) percent, DM yield, forage quality and silage quality being assessed.



*Photo 3. Lupins and Faba beans grown as high protein winter forages.*

The range of winter forages being assessed for dryland and irrigated dairy systems is comprehensive and will have relevance for a number of dairy regions across Australia, particularly the forage quality results as the yields will be specific to the region and climatic conditions within which it has been grown. The demonstration will also host a Winter Forage Combinations field day at the Gatton Research Dairy on the 21st August, where the plots will be inspected and preliminary results will be discussed. ■■

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