C4Milk Winter Forages wrap up

Image 1. Inspecting the Bennett wheat crop at the Winter Pasture and Forages Field Day held on 12th October, 2021.

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Far North Queensland demonstration

Queensland's Department of Agriculture and Fisheries (DAF) established a winter demonstration plot in Far North Queensland (FNQ) earlier this year. A 10-hectare irrigated site previously planted to summer corn was planted to four forage crops in July. Table 1 provides agronomic information relating to all four crops in the demonstration. Amistar Xtra was applied across all four crops to control the fungal pathogen *Bipolaris sorokiniana (Cochliobolus sativus)* which had significantly impacted the Shepherd barley. Lorsban was applied to control Cabbage white butterfly and Diamond back moth, the larvae of which were causing issues in the Hyola canola.

Quadrat cuts were taken from all four crops 54 days after planting. Subsamples were sent to Forage Lab Australia for nutritional analysis. Table 2 (Page 7) provides yield data (kg dry matter [DM] per ha) and values for crude protein, neutral detergent fibre, starch and metabolisable energy.

An industry field day was held in October to enable dairy farmers and contract forage growers to observe the crops and discuss agronomic management and crop performance. The event attracted 32 people, including 20 dairy farmers, three contract forage growers and nine service providers.

Agronomic Practice	Canola var. Hyola	Wheat var. Buchanan	Wheat var. Bennett	Barley var. Shepherd
Planting date	10/07/21			
Area planted	1.5 ha	2 ha	2 ha	4 ha
Seeding rate	5 kg/ha	100 kg/ha	100 kg/ha	100 kg/ha
Fertiliser applications	125 kg/ha Entec urea at planting			
	100 kg/ha granular urea (Day 46)			
Rainfall	95 mm			
Irrigation	130 mm			
Fungicide applications	Amistar Xtra – (800ml/ha) + Banjo (500ml/100L of water) applied Day 55			
Insecticide applications	Lorsban (500ml/ha) applied Day 55			

***Table 1** Details of agronomic practices undertaken for all four crops in the FNQ demonstration.*

Crop	Yield – dry matter (kg/ha)	Crude Protein (% DM)	NDF (% DM)	Starch (% DM)	Metabolisable Energy (MJ/kg DM)
Canola var. Hyola	2745	30.6	25.9	4.6	11. 6
Wheat var. Buchanan	4109	21.1	48.3	1.9	10.6
Wheat var. Bennett	2997	27.8	41.8	2.3	11.1
Barley var. Shepherd	3919	17.4	53.7	1.7	10.0

Table 2 *Yield and concentrations (dry matter (DM) basis) of crude protein, neutral detergent fibre (NDF), starch and metabolisable energy 54 days after planting for four winter forages grown in FNQ.*

The Buchanan wheat reached the correct dry matter (DM) percentage (32-36%) for direct cut ensiling before the field day. All four crops were mown 94 days after planting with the Shepherd barley (34.9 % DM) and Buchanan wheat (40.1 % DM) being chopped and ensiled on the same day. The Hyola canola (20.1 % DM) and Bennett wheat (20.5% DM) were wilted for 24 hours and ensiled the following day. Images 3 to 6 show all four crops on the day of harvest. The Buchanan wheat reached the correct dry matter (DM) percentage (32-36%) for direct cut ensiling before the field day. All four crops were mown 94 days after planting with the Shepherd barley (34.9 % DM) and Buchanan wheat (40.1 % DM) being chopped and ensiled on the same day. The Hyola canola (20.1 % DM) and Bennett wheat (20.5% DM) were wilted for 24 hours and ensiled the following day. Images 3 to 6 show all four crops on the day of harvest.

Quadrats were cut on the day of harvest and subsamples were sent to Forage Lab Australia for nutritional analysis. Table 3 provides yield data (kg DM per ha) and values for crude protein, neutral detergent fibre, starch and metabolisable energy.

The Bennett wheat responded very well to harvesting and immediately produced new shoots and tillers. All other crops did not regrow after harvesting.

Yield, quality and economics of production data for all four crops will be presented to industry at a discussion group which will be held in the first week of March 2022. **For more information please contact Jo Srhoj on 0458 065 695 or Joanna.Srhoj@daf.qld.gov.au**

Image 2 Farmers and service providers at the Winter Pasture and Forages Field Day

Image 3 Canola var. Hyola on the day of harvest (94 days after planting)

Image 4 Wheat var. Bennett on the day of harvest (94 days after planting)

Crop	Yield – dry matter (kg/ha)	Crude Protein (% DM)	NDF (% DM)	Starch (% DM)	Metabolisable Energy (MJ/kg DM)
Canola var. Hyola	6715	6.9	52.3	1.3	8.7
Wheat var. Buchanan	11147	11.9	49.4	7.4	10.0
Wheat var. Bennett	5654	15.3	53.4	2.4	10.1
Barley var. Shepherd	9699	12.1	46.4	10.5*	10.4

** High starch levels in the Shepherd barley crop may be attributed to the early senescence of the crop as described above resulting in a higher percentage of starch within the total dry matter.*

Table 3 *Yield and concentrations (dry matter (DM) basis) of crude protein, neutral detergent fibre (NDF), starch and metabolisable energy 94 days after planting for four winter forages grown in FNQ.*

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Image 5 Wheat var. Buchanan on the day of harvest (94 days after planting)

Image 6 Barley var. Shepherd on the day of harvest (94 days after planting). Note this Shepherd barley crop was significantly impacted by spot blotch which initiated early senescence in the crop.

Image 7 Wheat var. Naparoo at second cut harvest. Note rust incursion.

Image 8 Wheat var. Bennett at second cut harvest. Rust was evident.

Image 9 Wheat var. Severn at second harvest cut. Note more erect growth habit which resulted in a higher second cut and an overall higher yield. No rust was evident.

South-East Queensland demonstration

In winter this year, the C4Milk team and the staff from UQ Gatton Research Dairy (GRD) conducted a winter crop demonstration based on several varieties trialled since 2019. Previous demonstrations have highlighted the potential of less commonly grown winter crops. In this year's demonstration, three different varieties of wheat, one canola, one combination of wheat and canola and two different planting rates of faba beans were grown at the GRD. All crops except faba beans were harvested as multiple cut crops. Agronomic practices used to grow the crops are shown in Table 4.

Agronomic Practice	Canola var. Hyola	Faba Beans var. Nasma	Wheat var. Severn/Bennett/ Naparoo	Canola var. Hyola/ Wheat var. Naparoo
Planting date	18/6/21	18/6/21	20/6/21	18/6/21
Area planted	0.8 ha	0.8 ha each seeding rate	2 ha each variety	2 ha
Seeding rate	5 kg/ha	100 and 200 kg/ha	50 kg/ha	5 kg and 50 kg/ha
Fertiliser applications	Nil	Nil	200 kg/ha urea 5/8/21 100 kg/ha urea post first cut 5/9/21	200 kg/ha urea 5/8/21 100 kg/ha urea post first cut 5/9/21
Rainfall	79 mm prior to first cut 70 mm prior to second cut	149 mm	74 mm prior to first cut 68 mm prior to second cut	74 mm prior to first cut 68 mm prior to second cut
Irrigation	79 mm	79 mm	130 mm	130 mm
Herbicide applications	Nil	Raptor (45g/ha) Spreadwet 1000 (200ml/ha) 20/7/21	Wipeout 540 (2l/ha) Kamba 750 (160 ml/ha) Catalyst 700 (300ml/ha) 21/6/21	Wipeout 540 (2l/ha) Kamba 750 (160 ml/ha) Catalyst 700 (300ml/ha) 21/6/21

Table 4 *Details of agronomic practices undertaken for all seven crops in the SEQ demonstration.*

The multi cut crops (three wheat varieties, wheat/canola combination and the canola) were harvested on September 1, 72 days post planting. The faba bean harvest and the second cut of the canola were taken on October 6, 110 days post planting. The second and final cut was later than ideal due to prevailing wet weather around harvest. The three wheat varieties and the combination of wheat and canola were taken on October 26, 130 days post planting and 55 days post first cutting. Quadrat cuts were taken at each harvest stage for each crop and sent to Forage Lab Australia for nutritional analysis. Table 5 (Page 9) shows the yield and nutritional analysis for each of the cuts for each crop.

As with previous winter demonstrations, the wheat varieties had high nutritive value, particularly with regard to high protein and lower neutral detergent fibre (NDF) concentrations. Naparoo and Bennett (Images 7 and 8, respectively) both showed rust incursion this season while Severn (Image 9) showed little evidence of rust. Severn also had high yields, especially in the second cut, with the later than ideal harvest date significantly increasing Severn's yield compared to the other two varieties. The combination of canola and wheat had comparable performance to the wheat varieties, however, needed slightly longer to wilt when compared to the straight wheat plantings. The wheat and combination crops were all ensiled as pit silage at the GRD.

Canola (Image 10, Page 9) again showed good all round feed quality. Canola requires a longer wilting period than other crops due to it's higher moisture content. It was conserved as round bale silage.

Faba beans showed a higher yield at the higher seeding rate which was contradictory to the plot trials carried out at the GRD in 2020. The faba beans (Image 11, Page 9) were also ensiled as round bale silage. We will investigate further the ensiling abilities of faba beans and subsequent feed out quality and palatability.

Crop	Yield – dry matter (kg/ha)	Crude Protein (% DM)	NDF (% DM)	Starch (% DM)	Metabolisable Energy (MJ/kg DM)
Canola var. Hyola first cut	5562	19.6	30.0	5.0	10.0
Canola var. Hyola second cut	4185	21.1	38.6	2.7	9.2
Wheat var. Severn first cut	3179	32.1	37.6	2.2	11.4
Wheat var. Severn second cut	10525	14.2	50.4	8.8	9.4
Wheat var. Bennett first cut	2407	34.8	34.9	2.8	11.7
Wheat var. Bennett second cut	6708	15.0	48.1	4.2	8.9
Wheat var. Naparoo first cut	2662	33.2	35.6	2.4	11.5
Wheat var. Naparoo second cut	6811	19.0	55.5	2.6	8.4
Canola/Wheat combi var. Hyola/ Naparoo first cut	3551	29.2	27.3	3.8	10.4
Canola/Wheat combi var. Hyola/ Naparoo second cut	6146	15.0	48.1	4.2	8.9
Faba beans 100 kg/ha	8363	Pending	Pending	Pending	Pending
Faba beans 200 kg/ha	11645	Pending	Pending	Pending	Pending

Table 5 *Yield and concentrations (dry matter (DM) basis) of crude protein, neutral detergent fibre (NDF), starch and metabolisable energy at harvest in SEQ winter demonstration crops.*

Canola requires a longer wilting period than the other crops due to it's higher moisture content.

Image 10 Canola before harvest

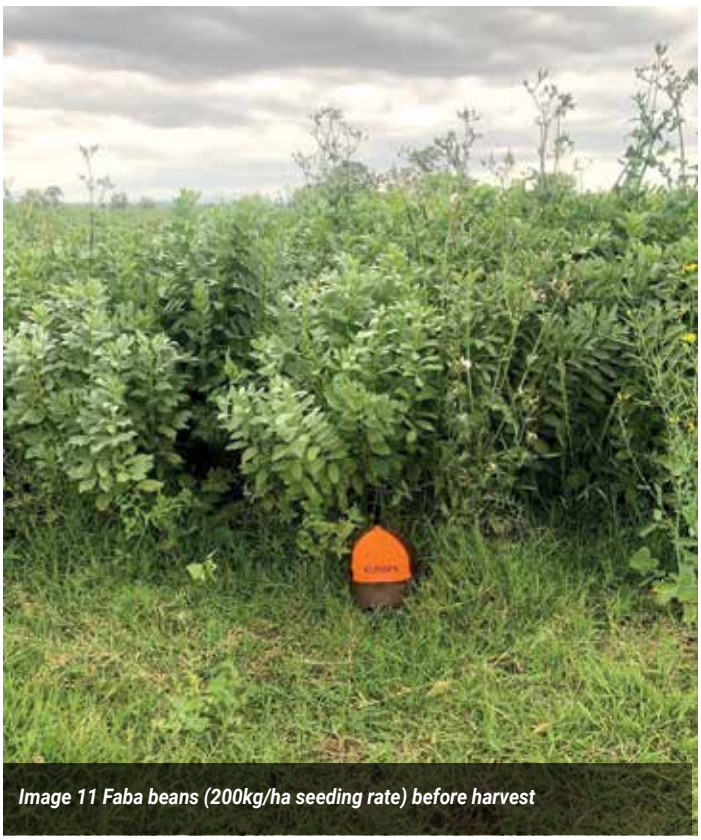

Image 11 Faba beans (200kg/ha seeding rate) before harvest

For more information on this project, email Mark Bauer on mark.bauer@daf.qld.gov.au