LabLab – *Summer legume*

Overview

Lablab is a high protein legume that can be grown under irrigated or dry land conditions. It can be grazed or harvested for silage during summer and autumn. Lablab isn't a new forage, and has long been grown as part of forage mixes (i.e. Sorghum) and represents a cheaper source of protein compared to purchased protein concentrates.

In a recent trial (2015), the C4Milk team utilised lablab as a pasture and silage for feeding a PMR herd, demonstrating high rates of intake and good milk responses. When managed correctly, grazing lablab can provide a substantial part of a dairy cow's diet, providing a cheap source of protein and high quality forage.

Varieties

Lablab varieties that are used for grazing are Highworth and Rongai.

Growing

Full seed bed preparation is recommended to achieve a high germination rate. Plant lablab at 15 - 40 kg/ha depending on moisture conditions. A minimum soil temperature of 18oC is required at planting. Ideal planting time is generally between October and end of December.

Generally plant at 70 to 100 cm row spacing for rain-grown and 20 to 30 cm row spacing under irrigation at 30 to 50 mm depth into moist soil and press. Seed needs to be inoculated with rhizobia at planting.

Lablab is suited to a wide range of soils and can be direct drilled into crop stubble. Lablab can be sown into dry soil if rain is expected. Once seedlings are established, the plants are tolerant of dry or wet conditions. However, lablab is susceptible to root rot in very wet soil.

Weeds, especially grasses, can be a problem at establishment. This can be prevented by applying a pre-emergent herbicide before planting. Legumes are very sensitive to damage from 2, 4 D type herbicides.

Nutrient requirements

Crops may require P, K and S depending on soil test results, particularly on coastal soils. The general recommendation is 125 kg/ha of each of superphosphate and muriate of potash. P <20 mg/kg, K < 0.3 mequiv%.

Legume crops can fix up to 100 kg N/ha/crop, related to dry matter yield, which is available to following crops or pastures.

Table 1 - Typical mineral content of warm-season legumes and requirements to produce 5 t DM/ha

Nutrient requirement	N	P	K
Nutrient (% DM)	4	0.4	1.7
kg applied (/ha)	200	20	82

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Grazing management

Under dryland conditions, lablab can be ready to graze in 12 - 14 weeks. Yields are typically 3-6 t DM/ha over 1 to 3 grazing's. As a rule of thumb, when leaf canopy closure forms, remove cover with a short grazing period to promote plant growth.

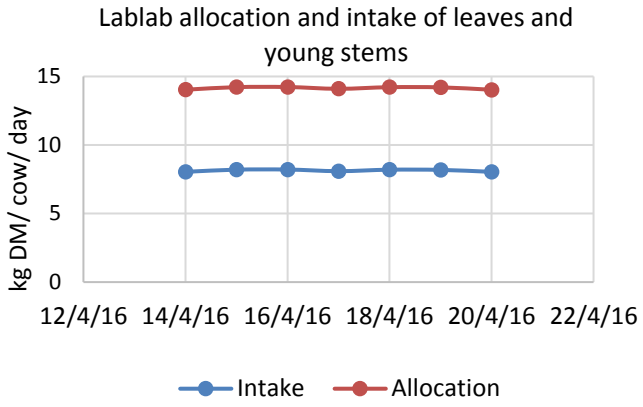
Lablab needs to be grazed in a lax manner, allowing cows to strip the leaves from the top of the plant. It's important not to let the cows trample the crop too heavily. In a C4Milk trial at the Gatton Research Dairy, cows grazed the crop when the total dry matter on offer was 4.4 t DM/ha. The stocking rate at each grazing was equivalent to 130 cows/ha, with the cows consuming 1.0 t DM/ha and resulting in an intake of 7.8 kg DM/cow/day.

In the trial, 40% of the lablab pasture on offer was composed of leaves and young stems and the remainder were mature stems. The cows grazed 35% of the pasture height, which was 58% of the total pasture on offer.

Image 1 – Lablab pasture pre-grazing

Image 2 - Lablab pasture post-grazing

Figure 1 – Graph displaying lablab allocation and intake of leaves and young stems



If you are considering planting lablab over summer, you could alternate grazing with kikuyu, lucerne or a tropical crop or pasture in a 24 hour period. Lablab is a forage source that is flexible, as it will hold quality as a mature crop for an extended period (months) and continue to regenerate over the warmer periods (weather permitting).

Nutrient Value

Forage quality of lablab pasture is much higher than lablab silage for example protein (31.5 vs 20.6 %) and NDF (38.3 and 49 %). The difference being that cows select leaf and young stems where silage harvests all material.

Table 2 – Nutrient comparison of lablab.

	Lablab irrigated pasture	**Lablab dryland pasture**	**Lablab Silage**
Crude protein %DM	31	24	21
NDF %DM	38	51	49
ME (MJ/kg DM)	10	6-10	13-14

Milk production

Dry matter intake of legumes by cows is generally higher than tropical grasses and summer forage crops. Legumes can support an additional 2-4 L milk/cow/day when grazed in combination with other high quality feeds.

Table 3 – Lablab silage and pasture intakes in comparison to other feeds

	TMR	PMR
Corn Grain	2.10	1.70
Canola Meal	2.26	0.74
Minerals	0.25	0.33
Sorghum Headlage	6.63	4.88
Lucerne hay	2.57	0.67
Lablab Silage	3.68	
Forage Sorghum Silage	4.70	5.11
Lablab Pasture		8.12
DM Intake	22.19	21.55
Diet Cost $/cow/day	$5.56	$3.93
Potential MOFC $/cow/day	$8.19	$9.82
Potential milk yield (L/cow)	**31.2**	**29.9**
Potential MOFC @ 55c/L	**$11.60**	**$12.52**

Lablab is a valuable feed either as a pasture or a silage in relation to reducing the reliance on other protein sources in diet. The substitution of lablab for lucerne hay and canola meal in this diet (Table 3) reduces the cost of the diet significantly without impact on milk production.

Economic Value

Lablab either grown as a dryland or irrigated crop is a cheap form of pasture and protein in the diet of milking cows.

Table 4 – The cost of dryland lablab under varying utilisation

Irrigation	3 360 kg/ha	4 480 kg/ha	5 600 kg/ha	6 720 kg/ha
0 ML/ha	$0.10	$0.08	$0.06	$0.05

A dryland lablab crop represents good value irrespective of the yield (low, medium, high rainfall). Dryland lablab is weather tolerant, although dryland lablab will have lower crude protein levels than irrigated Lablab.

Table 5 - The cost ($) of irrigated lablab under varying utilisation (DM utilisation kg/ha) and level of irrigation (ML/ha)

Irrigation	4 200 kg/ha	5 600 kg/ha	7 000 kg/ha	8 400 kg/ha	9 800 kg/ha
1.8 mL/ha	$0.15	$0.11	$0.09	$0.08	$0.07
2.4 mL/ha	$0.17	$0.13	$0.10	$0.08	$0.07
3.0 mL/ha	$0.18	$0.14	$0.11	$0.09	$0.08
3.6 mL/ha	$0.20	$0.15	$0.12	$0.10	$0.08
4.2 mL/ha	$0.21	$0.16	$0.13	$0.11	$0.09

In Table 5 (above) the shaded area represents the utilisation required to achieve a low feed cost per unit of feed.

The irrigated lablab offers a certainty of a yield with a higher crude protein level. If high levels of yield are not achieved, then as indicated by the shaded area in Table 5, lablab could be a more expensive feed than a well-managed and fertilised pasture.

Potential risks limiting yield would be over-grazing or grazing in wet conditions leading to destruction of the base of the lablab plant, reducing the economic benefits of lablab.

Table 6 – Comparison of lablab to other protein sources

Sample	CP %	NDF %	Yield t DM/ ha	As Fed $/ tonne	$/KG CP
Lablab pasture (IR)	35	29	5	75	0.43
Lablab silage	20	49	7	48	1.00
Lucerne pasture (IR)	30	24	12	-	0.36
Lucerne silage (IR)	18	43	2.3	120	1.33
Soybean Silage	18	38	7	60	0.78
Canola meal	53	27	-	460	1.19

Lablab and lucerne pastures can be excellent replacements for soybean and canola meal from a crude protein perspective assuming NDF is below 30%. From an economic perspective lablab, soybean and lucerne pastures/silage represent extraordinarily good value when compared to purchased protein meals/grains.

Scan this QR code for links to C4Milk financial analysis.

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