

Quantifying the Effect of Two Different Pasture Management Systems on Milk Production and Farm Profitability

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This study compared a predominantly kikuyu-based farm system (Kikuyu farmlet) with a farm system predominantly without kikuyu (Ryegrass farmlet) for three years (June 2012 – May 2015). The Kikuyu farmlet included mulching and introduction of Italian ryegrass on all kikuyu-based pastures to improve pasture quality and cool season pasture production. Stocking rate was higher on the Kikuyu farmlet (3.2 cows/ha) than the Ryegrass farmlet (3.0 cows/ha) during the first two seasons however, during the third season, stocking rates were similar (3.0 cows/ha).

The Kikuyu farmlet grew less pasture during winter (0.57 t DM/ha/annum) and more during late summer and autumn (0.96 t DM/ha) than the Ryegrass farmlet. Both the Kikuyu and Ryegrass farmlets produced a similar amount of total pasture per annum (13.9 v 13.7 t DM/ha respectively) when averaged over the three seasons. Pasture covers followed pasture growth, with covers lower during winter and higher during autumn on the Kikuyu farmlet compared with the Ryegrass farmlet.

Feeding of palm kernel expeller (PKE) and maize silage supplementation was varied according to the need to fill feed deficits. Supplement use was higher on the Kikuyu farmlet than the Ryegrass farmlet during the first and second seasons (mean of 5.28 and 4.55 t DM/ha/annum respectively). In the third season, when stocking rates were similar, supplement use was identical between farmlets (2.76 t DM/ha). In all years the supplement use was higher on the Kikuyu farmlet during winter and lower during autumn than on the Ryegrass farmlet, a result of lower pasture growth on the Kikuyu farmlet as kikuyu pastures transition to temperate species. Encouraging this transition to occur as quickly as possible, as in the use of mechanical kikuyu control (mulching) and/or introduction of Italian ryegrass, is a strategy to minimise this greater supplement requirement during winter.

When averaged over the three seasons of the study, milk production was identical between farmlets (1154 kg MS/ha). Differences in seasonality between farmlets were small. It is likely that milk production differences between farmlets were somewhat masked by relatively high levels of supplement use. If supplement use had been lower, then significant differences in seasonality may have occurred. As with milk production, body condition score was similar between farmlets, again differences that might have occurred as a result of pasture type being masked by supplement use.

When averaged across the three seasons, farm working expenses were higher on the Kikuyu farmlet (\$5,686/ha) compared with the Ryegrass farmlet (\$5,236/ha). The main cause of this higher cost was the annual mulching and under-sowing of Italian ryegrass and the higher supplement use in the first two seasons. The average operating profit for the three seasons was higher on the Ryegrass farmlet (\$2,855/ha) than the Kikuyu farmlet (\$2,433/ha). This difference was mainly in the first season, when turnips were grown on the Ryegrass farmlet but not on the Kikuyu farmlet, significantly affecting milk production during summer. Turnips were grown on both farmlets in the following years and differences in farm profitability were small, though still showing an advantage to the Ryegrass farmlet.

This study indicates that, when managed appropriately, the production and profitability of kikuyu farms is likely to be slightly lower than that of ryegrass farms. However, comparison between farm systems was compromised by differences in farm management applied between farmlets in some years. This finding contrasts with a previous study by the same group that showed kikuyu systems having higher production and profitability than non-kikuyu systems. In the previous study brassicas were not sown for summer production on any farmlet and this possibly compromised the ryegrass-based farmlet to a greater degree than the kikuyu-based farmlets. Because the farmlet structure within this current study was better balanced than in the previous study, the results of this study should be treated with greater confidence.

In conclusion, when kikuyu is well managed, such as the integration of short term ryegrass as used in this study, the presence of kikuyu is likely to have little effect on farm performance.

Table 1. Summary of Kikuyu and Ryegrass farmlet data

	Average – 3 years		2012/13		2013/14		2014/15	
	Kikuyu Farm	Ryegrass Farm	Kikuyu Farm	Ryegrass Farm	Kikuyu Farm	Ryegrass Farm	Kikuyu Farm	Ryegrass Farm
Annual Pasture Growth (kg DM/ha/annum)	13,935	13,718	12,459	11,759	13,008	13,957	16,340	15,439
Supplement Fed (kg DM/ha)	4,440	3,956	4,918	4,052	5,639	5,057	2,763	2,760
Milk Solids (kg/ha)	1154	1154	1077	1108	1271	1236	1115	1120
Milk Solids (kg/cow)	416	429	351	370	461	482	436	436
Farm Working Expenses (\$/ha)	\$ 5,686	\$ 5,236	\$ 5,592	\$ 4,838	\$ 6,429	\$ 6,000	\$ 5,038	\$ 4,869
Operating Profit (\$/ha)	\$ 2,433	\$ 2855	\$ 1,309	\$ 2,249	\$ 5072	\$ 5182	\$ 917	\$ 1,133