

INCREASING THE PROFITABILITY AND SUSTAINABILITY OF GRAZING ENTERPRISES IN NORTHERN NSW BY COMPARING DIFFERENT INPUT AND GRAZING MANAGEMENT SYSTEMS

C.A. GADEN^A, J.M. SCOTT^B, E. HALL^C and J.A. HOAD^A

^A The Cicerone Project Inc., PO Box 1593, Armidale, NSW 2350

^B Centre for Sustainable Farming Systems, University of New England, Armidale, NSW 2351

^C Betty Hall Pty Ltd, PO Box W45, Armidale, NSW 2350

SUMMARY

The Cicerone Project has been set up to study the long term profitability and sustainability of 3 different input and grazing management systems. Farm A receives high inputs of sown pastures and fertiliser, and uses flexible rotational grazing, with 8 paddocks and 4-5 mobs of livestock. Farm B receives medium inputs of fertiliser, but uses similar grazing management and paddock allocations to Farm A. Farm C receives the same medium level of inputs as Farm B, but employs intensive rotational grazing involving long rest periods between grazings. This farm has 33 paddocks and livestock mobs are combined to no more than 3 mobs to increase the grazing pressure.

Livestock are weighed regularly; ewes are scanned for twins; parasite burdens are monitored; wool characteristics are measured for all sheep, e.g. fleece weight, Optical Fibre Diameter Analyser (OFDA) for micron and diameter profile along the staple length and Australian Wool Testing Authority (AWTA) test for tensile strength. Pastures are assessed monthly and each time stock are moved, and carrying capacity (dse) and grazing days per paddock are recorded. Soil tests are conducted prior to fertiliser application. Economic data on each farm have been collected and include all inputs such as labour, seed and fertiliser, fencing, agistment, animal health products and supplementary fodder.

Data have been collected since July 2000 when the different management treatments commenced. Already there are marked differences between the farms in the animal weights, breeding performance, wool characteristics, botanical analysis, parasites and economic performance.

Keywords: profitability, sustainability, rotational grazing, grazing pressure

INTRODUCTION

The Cicerone Project is a producer-led organisation funded by AWI with the motto of 'Compare - Measure - Learn - Adopt'. Land has been leased from CSIRO on the Northern Tablelands of NSW and The Cicerone Farm has been set up to study the long term profitability and sustainability of 3 different input and grazing management systems in this summer rainfall area. Cicerone leases a total of 250 ha of which 150 are utilised for the 3 farms. Ongoing trial results are published in a member newsletter and at <http://www.cicerone.org.au>. As each farm is subject to the same climatic conditions, and as the 'whole-farm' consequences of different management approaches are being measured, both researchers and farmers can view the findings as credible due to the scale employed.

MATERIALS AND METHODS

The allocation of land to the 3 farms was carried out in such a way that the starting conditions of each farm were equivalent. An electromagnetic conductance survey of the land was used in conjunction with data on slope and history to allocate equivalent land of each soil type with similar topography. New fences and water pipes were then installed. Thus, the 3 farms have non-contiguous paddocks spread over the whole area, with a series of laneways to allow easy stock movement between paddocks and to the yards. Re-fencing of paddocks was completed by July 2000 and the different management strategies and data collection commenced at this time.

Each farm differs in the levels of input (sown pastures and fertiliser) and grazing management. Ewes bought from CSIRO were randomly distributed across the 3 farms. They and their offspring stay on their own farm throughout the year, except for a 6 week period for joining when all ewes are run

together with rams on land adjacent to the farms. Purchased cattle have also been randomly allocated to each farm and make up 15% of the dse.

Farm A is a high input farm with flexible rotational grazing. It has 8 paddocks, 4-5 mobs of animals, and has been sown to deep-rooted perennial grasses and perennial legumes throughout. Fertiliser is applied to achieve targets of 60 ppm P and 10 ppm S, respectively. The target carrying capacity is 15 dse/ha within 5 years.

Farm B receives a medium level of inputs with flexible rotational grazing, with 8 paddocks and 4-5 mobs. There are no newly sown pastures, and the fertiliser input is close to the district average with targets of 20 ppm P and 6.5 ppm S, respectively. The target carrying capacity is 7 dse/ha within 5 years. Thus, these 2 farms may be compared for their differing levels of input as the grazing management is the same.

Farm C also receives a medium level of inputs, but with intensive rotational grazing being employed. The soil fertility targets are the same as for Farm B. The target carrying capacity is 15dse/ha within 5 years. The grazing management consists of just 1-3 mobs on 33 paddocks which may at times be further subdivided with electric fences to allow increased grazing pressure and much longer rest periods between grazings (up to 200 days). Thus, Farms B and C may be compared for their differing grazing management as the levels of inputs are the same. To illustrate the variation in grazing management, the lambs born in late 2001 had 7 paddock moves during the 12 months from marking if they were a Farm A lamb; they had 4 paddock moves if they were a Farm B lamb, and 73 paddock moves if they were a Farm C lamb.

We measure lamb weights each month from marking; ewes are weighed and fat scored 4 times a year; scanning for twins is carried out; wool characteristics are collected for all sheep e.g. fleece weight, Optical Fibre Diameter Analyser (OFDA) for micron and diameter profile along the staple length and the Australian Wool Testing Authority (AWTA) ATLAS test for tensile strength; individual fleece values are calculated; cattle are weighed regularly; pastures are assessed monthly and each time stock are moved; and carrying capacity and grazing days per paddock are recorded. Soil tests are conducted prior to fertiliser application. Parasites are monitored through faecal egg counts (FEC) and drench is only given when indicated by FEC. The exception to this is the quarantine drench we are obliged to give all sheep prior to use of the CSIRO shearing shed at shearing time in early August. Economic data on each farm are collected, including all inputs such as labour, seed and fertiliser, fencing, agistment, animal health products and supplementary fodder. Stock are given a current market value when they are bought or sold even if we 'sell' them for use in another trial. We access meteorological data from the CSIRO weather station.

RESULTS AND DISCUSSION

Grazing management

Farm A is the high input farm, but by taking out paddocks for re-sowing, we have effectively cut back the paddock number to 6 during the establishment phase. Thus, the grazed paddocks have livestock present for long periods and little rotation of paddocks was possible. On Farm B, there are usually 6 paddocks being grazed, with the other 2 being rested with a specific aim in mind, for example preparing for lambing or weaners. On Farm C, the animals are moved frequently, staying only a few days in each paddock depending on the season. From July 2000 to October 2001, Farm C had 16 paddocks in use and the rest period between grazings varied from 30 to 120 days. In October 2001, electric fencing was used to further subdivide the paddocks into 33 and the rest period increased to a maximum of 210 days during September to December 2002. Some paddocks were further subdivided into 2 or 3 with temporary electric fencing, effectively increasing paddock number to 40. At times during the drought, stock on all farms were given supplementary feed to reach target weights and fat scores.

Botanical composition

Figure 1 shows the broad classification of pasture types on the farms since just prior to the implementation of differing management (July 2000). The results indicate that the Farms are becoming quite different in their composition, with Farms A and C having higher proportions of 'desirable' grasses (i.e. deep-rooted, fertiliser responsive species) and little legume. The low levels of

legume reflect the dry seasons experienced since 2000. Nevertheless, Farm A, with a goal of 100% sown species, has now increased to about 70% of the more productive species (i.e. the sum of sown grasses such as phalaris, tall fescue + legumes + other introduced grasses not sown such as perennial ryegrass and cocksfoot) whilst Farm B is at 40% and Farm C 55%. Farm B is seeing an increase in native grasses at the expense of the desirable grasses. In all farms, both broadleaf and grassy weeds appear to be declining.

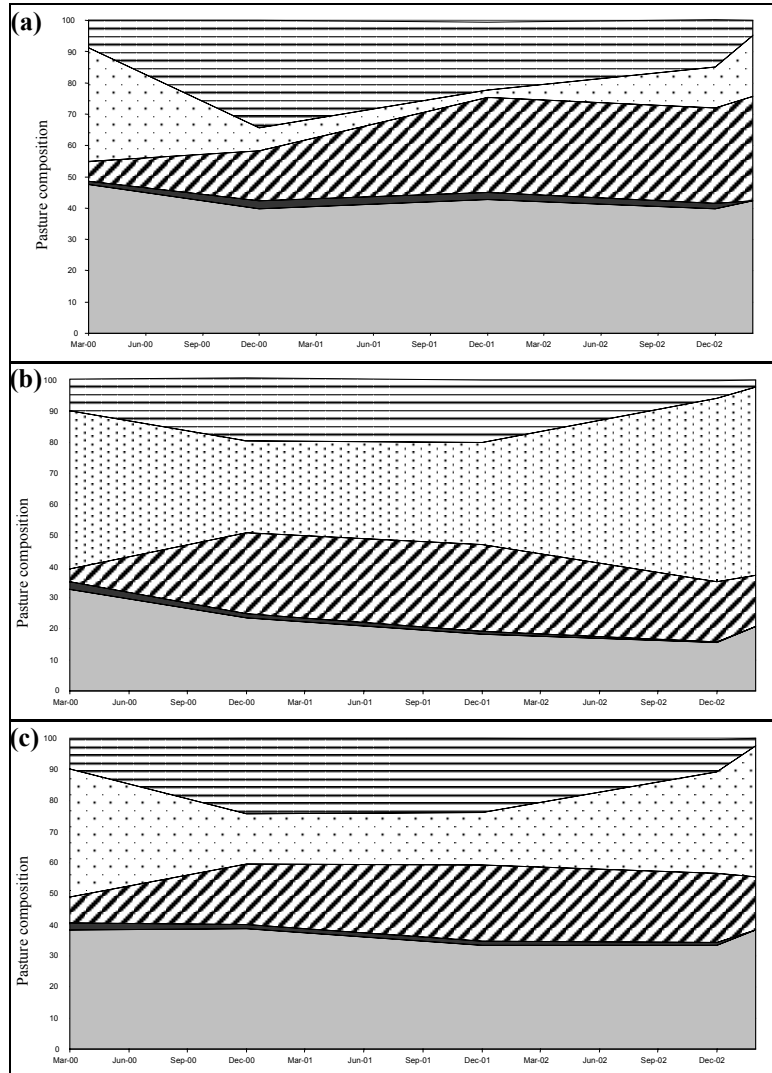


Figure 1. Botanical composition of Farms A (a), B (b) and C (c).

Sown grasses
 Sown Legumes
 Introduced grasses
 Native grasses
 Weeds & weedy grasses

When favourable seasonal conditions return, we expect the legume component of Farm A to increase relative to the other farms. This is likely to generate substantial changes in animal production due to increases in legume growth, increases in animal consumption and the return of significant amounts of nitrogen to the soil.

Farms A and B have been run with stock performance in mind, whereas Farm C has been run to benefit the pasture species. The long rest period obtained, up to 210 days in the drought, has been useful in parasite control, but has meant the grass is less suitable as sheep feed when animals return to graze.

Animal weights

The body weights of lambs from marking were measured each month in their first year and results for each year have shown that, in general, the lambs on Farm C do not grow as well as those on the other farms (Figure 2). Liveweight results for the 2001 drop wether lambs show there are marked

differences in liveweight between the 3 farms from as early as marking (which reflects variation in the ewes' nutrition). The trend of Farm C animals lagging behind continues through to maturity and has occurred each year.

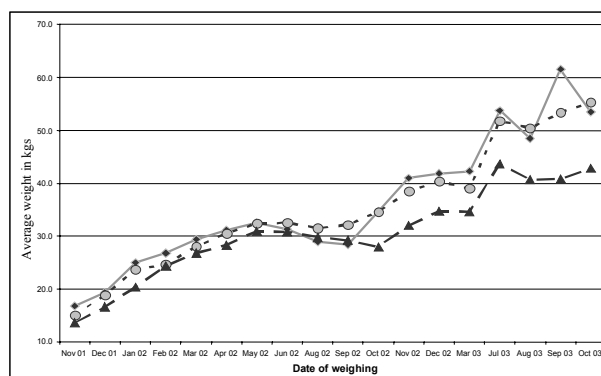


Figure 2. Average body weights 2001 drop wethers (Farm A ◆; Farm B ○; Farm C ▲).

Fleece weights and micron were variable between the farms. Table 1 shows the body and fleece weights and micron for ewes in 2001, and other stock on the 3 farms at the 2002 and 2003 shearing. These differences are also reflected in the fat scores (FS) of the mature ewes (at 1 Sept 2003, the average FS for the Farm A ewes was 3.3, for the Farm B ewes 3.1, and for the Farm C ewes 2.6). Over the lifetime of the animal, the lower fleece weights and lower fertility (as shown by scanning results) could be considerable, resulting in lower profitability.

Table 1. Shearing results from 2002 and 2003.

2002	Body Weight (kg)	Micron	Fleece weight (kg)	2003	Body Weight (kg)	Micron	Fleece weight (kg)
A ewes	46.1	18.6	3.9	A ewes	54.7	19.6	4.0
B ewes	45.9	18.7	3.7	B ewes	53.5	19.4	3.6
C ewes	43.5	18.4	3.5	C ewes	48.9	16.9	3.2
A01mxd	30.1	17.0	2.2	A01wthrs	53.7	19.0	4.3
B01mxd	31.5	17.2	2.1	B01wthrs	51.8	18.6	4.0
C01mxd	29.6	16.6	1.9	C01wthrs	43.7	17.2	3.0
A wth	38.6	18.9	4.3	A02ewes	39.5	18.0	2.4
B wth	31.1	18.8	3.8	B02ewes	39.2	18.1	2.3
C wth	32.8	18.4	3.6	C02ewes	30.3	16.9	1.7

Economic analysis

Labour, fencing and water, supplementary feed, animal health costs, pasture establishment and maintenance have all been monitored for each farm. The greatest expense on Farm A has been the establishment of new pastures, whereas on Farm C, it has been the fences and water troughs. In 2003, Farm C sheep have had 2 less drenches than on the other farms. Wool income has varied between the farms; although micron for Farm C is lower, this is counteracted by a smaller fleece weight. At the 2002 shearing, the wool from Farm A earned \$13200, Farm B \$8700, and Farm C \$7710.

To date, the high set up costs of Farm A and Farm C, and their elevated labour costs, are making these 2 farms appear unprofitable. Farm B is the only 1 that is "in the black". However, it is unfair to compare their total costs over just a 3 year time frame. Stocking rates on the 3 farms have been similar, and only this year has Farm A started to reach its potential for running more stock. The changes in the Farm C pastures are only just emerging. Further analysis over the next few years should give a more realistic indication of both profitability and sustainability.

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Email: cicerone@northnet.com.au