



agriculture & rural development

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PROVINCE OF KWAZULU-NATAL

PASTURES IN KWAZULU-NATAL

Pasture Production Systems

BEEF PRODUCTION FROM ITALIAN RYEGRASS

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INTRODUCTION

Animal performance depends largely on the quantity and quality of feed intake. The availability of herbage determines the quantity of feed intake while the age of regrowth of the pasture affects herbage quality. Important management factors, other than fertilisation and irrigation, that affect herbage on offer per animal (and thus daily gain per animal) include stocking rate and grazing system.

Type of animal and class of animal are important factors to be considered in the production of slaughter animals from Italian ryegrass.

STOCKING RATE

Stocking rate (the number of animals, of a specified class, per unit area of land for a specified time) is a critical management factor affecting:

- gain per animal per day (average daily gain),
- livemass gain per ha, and
- carcase grades.

GRAZING MANAGEMENT

The extremes of grazing management range from continuous grazing (one camp per herd for the grazing season) at the one extreme, through four, six and eight camp systems, to strip grazing at the other extreme. There are many arguments for and against the different grazing systems. Suffice it to say that the grazing system should be "designed" to attain the objectives of the beef production enterprise on each farm within the limits of stocking rate, managerial time and level of expertise available.

It is accepted that Italian ryegrass should not be defoliated shorter than 6 cm. However, with fixed stocking rates and variable growth of the pasture this is not always possible. In this respect two points are worthy of note:

- the slower the growth rate of the pasture (associated with severe defoliation in winter), the slower the grazing rotation should be to give the plants adequate time to recover (*i.e.* more camps);
- the faster the growth rate of the pasture (associated with lenient defoliation in spring), the faster the grazing rotation should be since the plants are not severely defoliated and thus recover quickly (*i.e.* shorter period of stay in a camp or fewer camps).

Ideally the grazing system should change to accommodate the growth rate of the pasture.

CLASS OF ANIMAL

To achieve efficient utilisation of the pasture, in terms of beef production, it is recommended that weaners with an initial mass of between 185 and 210 kg be used.

The high protein content of Italian ryegrass is used more efficiently and effectively by the weaner than by the older animal. Efficiency of feed conversion is also better in weaners than in older animals. In addition, it is possible to market relatively highly priced A1 animals if weaners are used. With older animals the best grades that can be obtained are the lower priced Prime B's or B1's.

MATURITY TYPE AND SEX OF ANIMAL

In general, early maturing cattle are best suited to a "beef off Italian ryegrass system" where the intention is to market slaughter animals, at 13 to 15 months of age, off pasture. Later maturing types can be considered when combining the use of Italian ryegrass with a summer pasture (*e.g.* kikuyu) and marketing the animals off the summer pasture (see Natal Beef Leaflet series), or where animals are to be "finished" in a feedlot.

Within the same breed or type of animal, the heifer will exhibit a lower daily gain than will the steer. However, the heifer will tend to fatten at a lighter mass and achieve a better grade than the steer.

ANIMAL MANAGEMENT

Besides routine inoculations, weaner calves should be treated against internal parasites. A broad spectrum remedy should be administered when placing the weaners on pasture and thereafter at roughly two to three monthly intervals. Ideally, dosing schedules should be based on worm egg counts in dung samples taken at regular intervals.

It is recommended that animals have free access to a mineral lick (*e.g.* two parts bonemeal: one part salt). Clean drinking water should be available at all times.

RESULTS FROM A GRAZING TRIAL AT CEDARA

The results reported here represent the mean performance of weaners grazing Italian ryegrass as the sole roughage. For each of the four seasons of the trial, grazing commenced within a week of 1 May. The data were calculated over a grazing period of 210 days: from the start of grazing until the end of November.

Soil fertility levels were maintained at or above 20 ppm phosphorus (P) and 150 ppm potash (K). Nitrogen (N) fertilisation consisted of five dressings of 75 kg N per dressing, applied at roughly six weekly intervals.

Irrigation was applied at a rate of 25 mm per week.

Animal and grazing management

Following weaning the weaners were dipped, dosed and placed on the Italian ryegrass (the Midmar cultivar was used throughout). Subsequent dosing for worms was at 8 to 10 weekly intervals.

Steers and heifers were run separately, each at stocking rates of 5, 7 and 9 weaners per hectare.

A fixed rotational grazing system was used throughout. The weaners were rotated through 8 camps with a fixed period of stay of 3,5 days per camp (allowing for a 24,5 day regrowth period).

A lick (consisting of two parts bonemeal and one part salt) and water were available *ad lib*.

Animal type and initial mass

The weaner calves used varied from 2/3 Hereford: 1/3 Simmentaler to 2/3 Simmentaler: 1/3 Hereford. Thus a range of maturity types was used.

The mass of the weaners at the start of the trial ranged from 175 to 210 kg (the heifers were approximately 10 kg lighter than the steers).

Animal performance

The relationships between stocking rate and average daily gain per animal and between stocking rate and livemass gain per hectare (averaged over a 210-day period for three stocking rates for each of four seasons) are illustrated in Table 1.

From Table 1 it can be seen that as the stocking rate is increased, from 5 to 9 weaners per ha, so there is a concomitant decrease in average daily gain (ADG) per animal. This applied to both the steers and the heifers.

TABLE 1. The effect of stocking rate on the performance of steer and heifer weaners (meaned for four seasons at a 210 day grazing period, grazing irrigated) Italian ryegrass as the sole feed.

SR	Intial mass / animal (kg)	Initial mass / ha (kg)	Final mass / animal (kg)	Final mass / ha (kg)	ADG (kg)	Livemass gain per ha (kg)
STEERS						
5	201	1 005	414	2 070	1,012	1 065
7	198	1 386	386	2 702	0,894	1 316

9	202	1 818	337	3 033	0,627	1 215
HEIFERS						
5	190	950	362	1 810	0, 825	860
7	188	1 316	350	2 450	0, 773	1 134
9	191	1 719	326	2 934	0, 645	1 215

SR = Stocking rate expressed as the number of weaners per hectare

ADG = Average daily gain per animal

Note: 210 days can be regarded as the minimum period on pasture.

In some seasons and at the lighter stocking rates the period on pasture could be longer, particularly with the early planting of ryegrass.

Livemass gain per ha for steers followed a different pattern from that for the heifers. From Table 1 it can be seen that the maximum livemass gain per hectare occurred at a stocking rate of 7 for the steers and 9 for the heifers. However, of particular significance, for slaughter animal production, is the relationship between stocking rate, average daily gain and final mass of the animals. These factors have a significant effect on animal grades.

Carcase grades

Stocking rate, sex of animal and animal type have an effect on carcase grades. At similar stocking rates the heifers graded better than did the steers. For a stocking rate of 5 weaners per hectare all heifers graded Super A, while 50 % of the steers graded Super A and 50 % A1. At a stocking rate of 7 weaners per hectare all heifers graded Super A while the steer gradings were 17 % Super A and 83 % A1. At a stocking rate of 9 weaners per hectare 50 % of the heifers graded Super A and 50 % graded A1, while all steers graded A1 with the possibility of up to 17 % of the steers being graded A3.

In most instances the lower grades within a stocking rate treatment resulted from a lack of "finish" of the later maturing types.



Beef animal on pasture

INCLUSION OF CLOVER

The sowing of white and red clover (seeded at 3 kg and 5 kg seed per hectare respectively), when planting Italian ryegrass pastures, is strongly recommended. Preliminary data indicate that at stocking rates of six or more weaners per hectare, the inclusion of clover results in improved animal performance, improved carcass grades and the lengthening of the grazing season.

CHOICE OF STOCKING RATE

The choice of the actual stocking rate to use will depend on several factors (excluding the grazing system). Included in the factors to be considered are:

- the market (both for purchases and sales)
- initial weaner mass
- the final mass required
- the carcass grade desired
- the length of time on pasture
- the sex of the animal.

According to the results obtained (Table 1) there would be little point in exceeding the stocking rate that provides for maximum livemass gain per hectare.

Economic analysis of the data indicates that for slaughter animal production the economic "optimum" stocking rate is lighter than the stocking rate which provides for maximum livemass gain per hectare. There may, however, be conditions where the stocking rate selected is higher than that providing for maximum livemass gain per hectare. These include:

- where finishing of animals is to be in a feedlot,

- where the market price of "home grown" weaners is very low and it is anticipated that spring prices will be relatively high
- where weaners are available at low prices in autumn and it is anticipated that spring prices will be high.

It is obvious that the "optimum" stocking rate will vary from one situation to the next. Cognizance should be taken of the "overall beef strategy" on the farm as well as the prevailing and anticipated weaner and carcase grade prices. Since each situation is different no blueprint or single formula exists to cover all situations.

Due to the large number of economic variables involved in a "beef from Italian ryegrass programme" it is recommended that the economists (Directorate of Agricultural Production Economics, Natal Region) be consulted before producing beef from Italian ryegrass.

NOTE: IMPLANTS AND SUPPLEMENTARY FEEDING

The influence of growth stimulants on animal performance was not evaluated in the trial reported here. However, the use of growth stimulants is advocated where daily gain per animal exceed 0,5 kg.

As with growth stimulants supplementary feeding has not been evaluated with weaners on Italian ryegrass. Supplementation may be useful at high stocking rates, particularly during the "lean months" when low temperatures limit pasture growth rates, or to improve grades at the end of the season.