



agriculture & rural development

Department:
agriculture
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PROVINCE OF KWAZULU-NATAL

PASTURES IN KWAZULU-NATAL

Pasture Utilisation

PRINCIPLES OF PASTURE UTILISATION

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INTRODUCTION

Once the grazier has established the need for cultivated pastures and the role they will play in the overall livestock enterprise(s) on the farm, it is then necessary for him to decide on management strategies to utilise the pastures efficiently.

It must be accepted that with the establishment of cultivated pastures there is:

- increased financial input with respect to:
 - fertiliser, seed and pasture establishment;
 - the possible need to purchase:
 - N equipment/machinery for seedbed preparation, establishment and fertilisation;
 - N irrigation equipment;
 - the possible need to purchase additional animals (if veld is replaced by pastures up to eight times the number of animals could be carried on the same area of land);
- increased managerial input (time);
- increased expertise required with respect to;
 - pasture management;
 - animal management (intensive system).

Clearly there is considerable input (financial and managerial) into cultivated pastures. Thus it is necessary that the principles, relating to pasture utilisation, be understood to allow for the formulation of efficient utilisation systems.

SOME FUNDAMENTAL FACTS

Pasture growth rates

The growth rate (or regrowth rate following defoliation) of pasture plants is related to light interception in the following ways.

- The amount of light energy that the leaves can capture. Within reason, the more leaf material, the faster will be the growth rate (or regrowth rate) of the pasture. Growth rate slows down once the leaves start to shade themselves.
- Regrowth following defoliation is dependant on the severity of defoliation. Severely defoliated plants regrow more slowly than do leniently defoliated plants. Leniently defoliated plants have a larger leaf area to capture light than do severely defoliated plants. Severely defoliated plants need to draw on stored reserves to produce new leaves to capture the light.

Pasture quantity-quality relationships

While fertilisation and irrigation exert pronounced effects on dry matter production and herbage quality, these two management factors are not the concern of this article. It will be assumed that fertilisation is at an optimum and that moisture is not limiting to production. Suffice it to say that the faster the growth rate of the pasture, the higher will be the quality and palatability (and thus intake) of the herbage on offer to the animals.

Frequency and severity of defoliation

The frequency and severity with which pasture plants are defoliated have a pronounced effect in terms of:

- quality of the herbage produced;
- quantity of herbage produced.

The more frequently a plant is defoliated, the lower is the dry matter yield. Within limits, the less frequently a plant is defoliated, the higher is the dry matter yield. In the same vein, the more severely a plant is defoliated, the slower is the regrowth and the lower is the yield. The less severely a plant is defoliated, the faster is the regrowth rate and the higher is the yield. Clearly there are several possibilities in terms of frequency and severity (height) of defoliation. Table 1 gives an indication of the yield and quality of herbage with different grazing/cutting management strategies.

The effects of the frequency and the intensity of defoliation on herbage production and herbage quality, shown in Table 1, are generalisations. While the principles mentioned apply to all pastures, the degree of the effects is not the same for all pasture species. For example, the decline in herbage quality with age is far more dramatic as plants mature with infrequent defoliation, with a grass like weeping love grass than it is with white clover. Similarly, kikuyu is more "tolerant" of severe defoliation than is cocksfoot. The important issue is for the grazier to "know" the species he is dealing with and to apply the principles "within the limits" of the species (this is part of the increased expertise referred to earlier).

TABLE 1. The effect of different intensities and frequencies of defoliation on herbage quality and dry matter yield.

Defoliation Frequency and Severity	Dry matter yield	Herbage quality
Frequent and Severe	Low	High
Frequent and Lenient	High	Medium
Infrequent and Severe	High	Low
Infrequent and Lenient	Medium	Low

Quantity, quality and severity of defoliation

Animals will select herbage of a higher quality than the "average" quality of herbage on offer in a pasture. With rotational grazing, the longer the animals remain in a pasture, the poorer the quality and quantity of dry matter intake. This is because animals select the most palatable and nutritious herbage first. As the pasture is grazed down so the animals are offered herbage which is less palatable and less nutritious. Thus, intake of both quantity and quality (less material of a poorer quality on offer) is reduced as the pasture is grazed down.

In practice, the objectives of attaining high dry matter yields from the pasture (long regrowth periods) and of offering the animals high quality herbage (short regrowth periods), in a rotational grazing system, are in conflict. Added to this conflict is the fact that, should a pasture be leniently utilised, a large amount of herbage is left after grazing. This accumulated material will reduce the quality of the herbage offered to the animals at the next grazing by "contaminating" the new growth.

It is, however, possible to allow the pasture to grow out (long regrowth period) to maximise yield and to use a "leader" herd (*i.e.* the herd that requires high intakes of high quality herbage) to have unrestricted intake and free selection, and to use a "follower" herd to utilise the pasture to a level where regrowth will not be "contaminated" by ungrazed material. With this system it must be accepted that the "follower" herd could have a low level of production (depending on the pasture species).

STOCKING RATE

Stocking rate is defined as the number of animals, of a particular class, per hectare of pasture for a defined period (usually the growing period of the pasture in question).

Animal performance is determined by:

- the quantity;
- the quality;
- the digestibility of the herbage eaten.

The quantity of herbage eaten, or the dry matter consumed by the grazing animal, is affected by:

- the age of regrowth (the younger the regrowth the more palatable the pasture);
- the quality, of the pasture (within limits, the higher the quality the higher the intake);

- the digestibility of the herbage eaten (the higher the digestibility, the faster the rate of passage through the animal and the higher the intake);
- the amount of herbage on offer per animal. Within limits, the more herbage on offer (or available) per animal, the greater will be the intake.

Within a specific grazing system the amount of herbage on offer per animal has the greatest influence on intake per animal and thus animal performance. Stocking rate, one of the management variables that can be controlled by the farmer, is the single most important factor affecting intake by the animal and thus production per animal and production per hectare. The further implications of stocking rate on gain per animal and animal gain per hectare are discussed in another leaflet (Natal Pastures Leaflet 3.6). Suffice it to say here, that as the stocking rate is increased (*i.e.* more animals per hectare) there is less herbage available per animal and intake per animal declines (and so also does the gain per animal). However, with increasing stocking rate there is more efficient utilisation of the pasture (there is less wastage and more herbage is converted to animal products). At high stocking rates the animals are "forced" to utilise most of the herbage on offer and the pasture requires a long regrowth period to recover.

CONCLUSIONS

- **Pasture yield, pasture quality and regrowth rate of the pasture are affected by:**

Pasture yield, pasture quality and regrowth rate of the pasture are affected by:

- severity of defoliation,
 - frequency of defoliation, and
 - length of regrowth period between defoliations.
- Dry matter intake, by the grazing animal, is related to:
 - amount of herbage on offer per animal,
 - quality of herbage on offer to the animals,
 - palatability of the herbage on offer;
 - digestibility of the herbage.
- High intake per animal, and thus good production per animal, is associated with poor utilisation of the pasture, but high regrowth rates of the pastures. Utilisation efficiency of the pasture can be improved by using leader and "follower" herds or flocks.
- Stocking rate has a pronounced effect on individual animal performance, animal production per hectare, and on the efficiency of pasture utilisation.