



agriculture & rural development

Department:
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PROVINCE OF KWAZULU-NATAL

PASTURES IN KWAZULU-NATAL

Pasture Utilisation

PRODUCTION AND UTILISATION OF PASTURE FOGGAGE

P E Bartholomew, T M du Plessis and C I Macdonald

INTRODUCTION

Foggage is a "loose" term used to refer to herbage that has been allowed to grow out during autumn and which is conserved on the land to be grazed when required during winter. This leaflet deals with various aspects of the production and utilisation of grassland foggage.

PRODUCTION AND MANAGEMENT

Irrespective of the pasture species or time of closing up a pasture for foggage, the pasture should be grazed heavily or mown to remove old and dead material prior to putting up for foggage.

Time of foggaging

The time of closing up a pasture for foggage will affect a number of aspects of foggage production.

Quantity of dry matter

The quantity of dry matter conserved as foggage is largely affected by the length of the autumn rest period.

- Dry matter yield is directly related to the length of the autumn rest and to the amount of autumn rainfall. In areas characterised by low autumn temperatures and a dry autumn it is necessary to close the pasture early (about January/February).
- The pasture species will affect the rate of accumulation of dry matter over the autumn period. Certain species exhibit a distinct autumn growth rhythm, making them valuable foggage species, while other species are primarily summer producers.
 - Autumn - winter growing species include:
 - Cocksfoot (*Dactylis Glomerata*)
 - Tall fescue (*Festuca arundinacea*)
 - Perennial ryegrass (*Lolium perenne*)

- Summer growing species include:
 - kikuyu (*Pennisetum clandestinum*)
 - Smuts finger grass (*Digitaria eriantha*)
 - Nile grass (*Acroceras macrum*)
 - Dallis grass (*Paspalum dilatatum*)

Species of the autumn group can be closed up later than the summer group to achieve the same dry matter production.

Quality of dry matter

In general the quality of the foggage is inversely related to the length of the autumn rest; the longer the autumn rest the poorer is the quality. This is, however, not the case with all species. For example, with tall fescue the soluble carbohydrate content of the herbage rises in autumn, thus enhancing its palatability and nutritive value.

Pastures which have had a relatively short autumn rest consist largely of young leafy material of high quality, suitable for young or producing stock. A long autumn rest produces a high yield of poorer quality pasture, suitable for maintenance for older and non-producing stock. In a grazing system where rotational grazing is practised the closing of paddocks may be staggered to produce a series of foggaged pastures of varying age and yield. The pasture rested early in the autumn would be utilised first, before the quality drops.

Botanical composition of the pasture

A prolonged autumn rest adversely affects the clover component of a grass/clover sward if the grass is allowed to shade out the clover. Early autumn closing of a mixed pasture containing perennial ryegrass or tall fescue would tend to favour the grass species to the detriment of the clover component. The lower the clover component the lower the quality of the foggage.

Losses

High dry matter losses caused by frost "burn" and rotting, are associated with long rests. The nature of these losses will be discussed later.

The effect of fertiliser application

Of the fertilisers applied nitrogen (N) is the most important and, provided the other nutrients (especially phosphorus and potash) are in adequate supply, has a major effect on pasture production. However, the response to N applied in autumn is limited in terms of both quantity and quality. Moderate levels of N applied in autumn will:

- improve the resistance to cold;
- improve dry matter yield and quality;
- provide a residual response for early spring growth.

Nitrogen levels of 50 to 75 kg N/ha are used, depending on pasture species, soil moisture status and foggaging period. High levels of N, at closing down for foggaging, are not recommended and can result in increased rates of pasture decay.

Potash increases the frost resistance of pasture species. However, potash applications should be based on soil analysis recommendations.

Effect of plant spacing

In general, a row planted pasture has advantages over a broadcast pasture. These advantages include:

- reduced dry matter losses through plant decay (as a result of better air circulation);
- reduced damage to the plants through trampling by stock.

The row spacing generally advocated is 250 to 300 mm. Row planted pastures have the additional advantage of facilitating the maintenance of a balanced grass/legume mixture.

Role of desiccants

Desiccants are applied to standing herbage in autumn, once the desired yield and quality has been reached, to artificially cure the material *in situ* and so retain most of the nutritive value. This has been achieved with varying degrees of success by various workers. The general effects of a desiccant (usually paraquat) applied at this time are:

- to retain higher levels of crude protein in the herbage;
- to improve herbage digestibility and thus animal performance;
- to slightly reduce dry matter yields.

The application of desiccants may affect the botanical composition of a pasture, especially a grass/legume mixture. There is evidence to suggest that paraquat applied to a dense pasture is not as effective as desired. As yet only limited work has been done in this field. Economics will, no doubt, be a deciding factor in the success of the use of desiccants.

Grazing management practices

The two major forms of grazing management used, when utilising pasture foggage, are continuous grazing and strip grazing. A back fence is not normally necessary when strip grazing foggage. In strip grazing foggage a new area is allocated to the animals on a daily to a weekly basis. Strip grazing is recommended as it allows for:

- more efficient utilisation of the herbage;
- more effective rationing of the feed supply.

A two herd or flock system can be used to advantage when utilising foggage. Animals with the highest nutritional requirement should be grazed ahead of animals with a lower nutritional requirement in either a rotational or a strip grazing system. If strip grazing is practised with two or more herds or flocks then a back fence is required to separate the groups of animals.

Continuous grazing, although more wasteful than strip or rotational grazing, is less costly in terms of labour and materials and can give satisfactory animal performance at moderate to low stocking rates.

Suggestions and guidelines

A suggested sequence of operations for closing down and utilising a pasture for foggage would be:

- Clean up the pasture, prior to closing down for foggage production, by grazing heavily or mowing to remove old and dead material.
- Apply nitrogen fertiliser (if the need for potash is indicated by the soil analysis, apply potash).
- Strip graze.
- Leave a reasonable stubble, 40 to 50 mm, after grazing.
- Move stock to alternative sites during wet periods to avoid trampling.
- If necessary slash the pasture after utilisation.
- Utilise the better quality foggage (areas closed down last) with animals that have the highest nutritional requirements and the poorer quality foggage with animals with low nutritional requirements.

SPECIES CHARACTERISTICS AND THEIR MANAGEMENT

SUITABILITY, PERSISTENCE AND PERFORMANCE

Temperate species

Dactylis glomerata (cocksfoot)

Cocksfoot is well adapted to foggaging and is widely used for foggage. The plant has an erect growth habit which helps keep the herbage dry and so reduces dry matter losses through rotting. The grass has a potential for growth in autumn. However, cocksfoot has a tendency to suffer from winter "burn" and can be susceptible to treading damage and overgrazing. Maximum benefit will be gained if utilised relatively early in winter.

Tall fescue (*Festuca arundinacea*)

Tall fescue has all the advantages of cocksfoot without its disadvantages. Its potential for growth in autumn is higher than that of cocksfoot.

Perennial ryegrass (*Lolium perenne*)

This species, although high yielding in autumn, tends to suffer rather high dry matter losses from rotting and decay of the leaves. If used early in the winter, these losses are not significant.

Tropical species

Tropical pasture species with potential for foggage include:

- Kikuyu (*Pennisetum clandestinum*);
- Dallis grass (*Paspalum dilatatum*);
- Smuts finger grass (*Digitaria eriantha*);
- Nile grass (*Acroceras macrum*).

Quality changes

- **The crude protein levels of many species tend to remain fairly constant over winter.**
- **Crude fibre levels tend to remain static over winter with little difference between green and frosted material.**
- **Tall fescue has the ability to maintain a fairly constant level of dry matter digestibility over the winter period.**
- **Tall fescue has the advantage, over other species, of increased carbohydrate (energy) levels during the autumn-winter period. This enhances its palatability.**

The crude protein levels of many species tend to remain fairly constant over winter.

Resistance to cold

The ability to withstand cold is species dependent and grasses like cocksfoot, tall fescue and perennial ryegrass are fairly resistant to cold. Perennial ryegrass may suffer from winter kill, especially if in a rank condition. Although many of the tropical species are susceptible to low winter temperatures, species like smuts finger grass, kikuyu and Nile grass are fairly resistant to cold.

PROBLEMS ASSOCIATED WITH FOGGAGING

Losses

Losses associated with foggaging take two forms; dry matter losses and nutrient losses. These losses may be eliminated or reduced by various means. Reduce dry matter losses by:

- selecting cold resistant species;
- growing plants with an erect growth habit;
- planting in rows;
- managing for young leafy growth of medium height or density;
- practising some form of rotational or strip grazing;
- applying moderate levels of N fertiliser.

Reduce nutrient losses by:

- selecting plants which retain their quality over winter;
- the application of moderate levels of N and potash fertiliser;
- managing for young, leafy pasture of high quality.

In general, the total losses associated with foggaging are not considered to be any higher than those incurred during the production and feeding out of field cured hay or silage.

Damage to soil and pasture

Soils of low infiltration rate suffer treading damage under wet conditions and, should this situation arise, stock should be removed to alternative sites until soil moisture is reduced.

Overall effect on pasture production

The overall effect, of foggaging a pasture, on total pasture production, appears to be minimal. Foggaging may well effect savings in labour and machinery costs when compared to making hay or silage.

FEEDING VALUE AND ANIMAL PERFORMANCE

Correct management and selection of pasture species for foggage production will produce herbage of relatively high quality capable of supporting growing animals and dry stock with little or no supplementation. Grasses such as cocksfoot, tall fescue, perennial ryegrass, kikuyu, Smuts finger grass and Nile grass fall into this category.

Most of these pastures would, if grazed at a young stage early in winter, support producing animals without supplementation. Mass gains of 0,2 to 0,6 kg per head per day have been recorded for young steers grazing cocksfoot and tall fescue foggage, while heifers on foggaged kikuyu have achieved gains of 0,6 kg per head per day. The necessity to supplement foggage would depend on the quality of the herbage, the class of stock being fed and the animal performance required.

ADVANTAGES AND DISADVANTAGES OF FOGGAGE

Advantages

Compared with hay and grass silage the advantages of foggage include:

- No transport or handling costs represent savings on machinery and labour.
- Foggage provides for out of season grazing.
- If the correct species are "closed off" for foggage at the correct time, fair animal performance can be expected. This is often not the case with hay and grass silage.

Disadvantages of foggage

- **Foggage can only be "kept" until active growth commences, otherwise the pasture will deteriorate.**
- **Under dryland conditions the amount of herbage "put up" can be adversely affected by a dry autumn.**
- **Weathering losses and trampling losses can be high.**