

Studies on Grasses with particular reference to their Winter Fodder Production in the Nilgiris*

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Synopsis: Studies conducted on the Nilgiris on the different grasses with special reference to winter fodder production are reported in this article. Five grasses have been recommended as suitable for the purpose.

Introduction: The Nilgiri hills provide a moderate and equable type of climate with high humidity for a major part of the year. These hills provide an abundance of grazing facilities from a large number of species of grasses indigenous among them. However these grasses are either coarse type or are killed during the winter months from November to March, especially at higher elevations, thus creating condition of grazing and fodder scarcity during the critical period. The role of indigenous grasses and the effect of climatic conditions on them has been dealt with in detail by Ranganathan (1938) and Rege, Devaraj and Seetharaman (1958). The impact of Plant Introduction during the last several decades have resulted in a number of exotic species being acclimatised in this region, the most prominent among them being kikuyu grass, *Pennisetum clandestinum* Hochst. This species with its luxuriant growth and abundant foliage production has now become, more or less the sole species giving sustenance to the cattle of the hills under purely rainfed conditions. This has now spread on the hills on elevations above 5000' and covered all waste places, roadsides etc. This can be said to have almost fulfilled the need for a perennial species of grass to meet the requirements of fodder on these hills.

However, in spite of its prolificity and wide adaptability this suffers from its winter susceptibility. The aerial shoots get scorched up with the first incidence of frost in about November. This grass which will normally produce abundant foliage, does not make any growth during the winter period becoming completely devoid of foliage. However, in places protected from the direct impact of frost such as under canopy of trees, steep slopes etc., certain amount of growth of green leaves is kept up, but such areas are very few. The continued incidence of frost during the next 2-3 months does not permit of any fresh growth of foliage to

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* Received on 23-12-1964.

take place and this period is therefore critical to fodder availability to cattle. That this grass is affected by low temperature has been reported from other countries also such as in New South Wales by Cameron (1963) and Whyte, Moir and Cooper (1959). The onset of the first summer showers on these hills by end of March, revives the grass into fresh spurt of growth and extensive growth of shoot and foliage start again by about April. During this period of non-availability of fodder from kikuyu grass, leaves of other vegetation such as *Acacia melanoxydon*, *Rumex sp.*, *Taraxacum sp.*, etc., are cut and fed to cattle according to Rege *et al*, (loc-cit). This gap in fodder production during the month of November to March requires to be filled up to keep the cattle in the hills provided with enough fodder. Introduction of new species with resistance to low temperature and capable of coming up in higher elevation offers a good way of tackling this problem of winter fodder scarcity.

Plant introduction work has been going on in these hills for the last nearly a century. The Annual Administrative reports of the Government Botanical Gardens, Ootacamund, speak of the successful introduction of many species of grasses, legumes etc., from as early as 1858-59, notable among them being *Dactylis glomerata* reported to have been more successful than any other grasses. More recently the work of Plant Introduction has been carried out by the Botany Section of Agricultural College and Research Institute, Coimbatore in areas such as Ootacamund, Nanjanad and Coonoor and some of the introductions have proved successful from the specific point of view of frost resistance and yielding fodder during winter months. The work is being continued on a more intensive scale at Ootacamund for the last about 3½ years with intensive observations on winter hardiness of the various species, which is detailed below :

Observations: From an initial collection of a large number of species of grasses, 12 were found on preliminary observations to be winter resistant, continuing to remain green and producing new shoots during winter months. These were raised separately in observation beds under rainfed condition and cuttings for fodder were taken as and when they were ready. Particular attention was paid to their yield during November to March and the weight of foliage available during these months were carefully recorded. Palatability of the green fodder was tested by feeding to cattle and recording the avidity with which they took the feed and the quantity of fodder left over.

The Table below gives the mean yield obtained from the different species during the months from November to March :

S. No.	Name of the species	Per Acre	
		Yield of fodder during winter months, November to March (Mean of 2 years, figures) in kg.	Remarks Palata- bility
1.	<i>Agropyron semicostatum</i> (Steud) ...	8072	Fair
2.	<i>Bromus catharticus</i> Vahl. ...	5515	Fair
3.	<i>Chloris gayana</i> (Kunth) ...	1726	Fair
4.	<i>Dactylis glomerata</i> L. ...	2442	Good
5.	<i>D. glomerata</i> var <i>maritima</i> ...	1700	Good
6.	<i>Ehrharta calycina</i> Smith ...	3255	Fair
7.	<i>Eragrostis curvula</i> Nees ...	1038	Fair
8.	<i>Festuca elatior</i> var <i>arundinacea</i> Ue. ...	2310	Good
9.	<i>Panicum chloratum</i> ...	505	Poor and coarse
10.	<i>Phalaris tuberosa</i> L. ...	2912	Very good
11.	<i>Lolium perenne</i> L. ...	2390	Good
12.	<i>Stenotaphrum secundatum</i> (Walt) ...	2322	Fair

It can be seen from the data above that several grasses of frost resistant capacity and with good capacity to yield fodder in winter are available to choose from. This is in conformity with the observations of winter hardiness in species of grasses like *Phalaris tuberosa*, *Dactylis glomerata*, *Festuca sp.*, *Lolium perenne*, *Ehrharta calycina*, reported by Buckley (1960) and Cameron (1963) in New South Wales, the former classifying *Phalaris tuberosa* as the species of outstanding value from the point of view of winter hardiness. The choice of species from the above list however, has to be based on palatability of the grasses. Preliminary observations showed the grass *Phalaris tuberosa* to be in the highest degree of palatability, *Dactylis glomerata*, *D. glomerata* var *maritima*, *Festuca elatior* var *arundinacea* and *Lolium perenne* of good palatability and the next in order. Some of the high yielding grasses like *Agropyron semicostatum*, *Bromus catharticus* and *Ehrharta calycina* have to be rated in the lower strata of palatability on account of their coarse or fibrous leaves. Some of these species are also found suitable under Nilgiris conditions from the observations of Rege *et al.* (loc-cit).

Conclusion: It can therefore be concluded that the five grasses among those listed viz., *Palaris tuberosa*, *Dactylis glomerata var maritima*, *Festuca elatior var arundinacea* and *Lolium Perenne* are good frost resistant, winter productive grasses, worthy of large scale planting in pastures or grazing grounds for providing fodder during the critical months.

REFERENCES

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| Buckley, K. S. | 1960 "Plant testing for Soil Conservation at Inverell—Part III—Winter Growing Species". <i>The Journal of Soil Conservation Service of New South Wales.</i> , 16 (1):77-91. |
| Cameron, D. G. | 1963 <i>Phalaris tuberosa</i> and Soil Conservation., <i>Ibid</i> , 19 (3) 138-152. |
| Ranganthan, C. R. | 1938 "Studies in the Ecology of the Shola grassland vegetation of the Nilgiri Plateau". <i>Indian Forester Vol. LXIV.</i> , Sept., 1938, P. 523. |
| Rege, N. D., S. Y. Devaraj and S. Seetharaman | 1958 "Forest Grazing and Fodder (with special reference to the Nilgiris)". <i>Second Seminar on Soil Conservation, Central Soil Conservation Board, Govt. of India.</i> |
| Whyte, R. O., T. R. G. Moir and J. P. Cooper | 1959 "Grasses in Agriculture" Food and Agricultural Organisation of United Nations, Rome. 1959. P. 357. |