

RESEARCH NOTE

EFFECTIVENESS OF PARAQUAT ON THE FOGGAGE VALUE OF
ERAGROSTIS CURVULA FOR BEEF CATTLE

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Eragrostis curvula is probably the most widely planted grass for the production of hay and for the overwintering of stock in the high rainfall areas of the Republic. The use of *E. curvula* for winter forage is, however, very restricted since most investigations into its feeding value during this season have indicated that the protein content of the foggage was in the region of 4% to 6% (Rethman, 1973; Barnes, 1968; Nel, 1964).

A method which could increase the crude protein (CP) content of the *E. curvula* when foraged in winter is the chemical treatment, by use of herbicides, of the pasture in late summer/early autumn. One of the most successful herbicides used has been paraquat (1,1' dimethyl-4, 4' dipyridylum dichloride) (Rethman & Gouws, 1973; Cross & Theron, 1970). In view of the lack of knowledge as regards the foraging of *E. curvula* in winter under local conditions, an experiment was initiated to study the effects of paraquat on the feed value of the grass and on the performance of beef steers grazing the foggage.

In mid February 1976, 2,4 ha of established and well-fertilized *E. curvula* pasture (270 kg N, 33 kg P and 70 kg K/ha/annum) was mowed and all the hay removed. On April 8, when the *E. curvula* was ready for the last mowing prior to winter half the area was sprayed with a paraquat solution (350 ml paraquat/200 l H₂O/ha). The remaining area received no chemical treatment and the grass was left to die at first frost (May 10).

Thirty Africander cross Sussex steers, approximately 10 months of age, were randomly allocated to the 2 treatments. From July 20 until September 28 (70 days), both treatment areas were grazed by the respective groups. Grazing was controlled by an electric fence and each area was subdivided into 6 camps of equal size to allow for optimum utilization. On April 8 and at 14-day intervals thereafter, grass samples from both treatments were collected and analysed for CP, crude fibre (CF), Ca and P. Samples were collected only from those areas that had not been grazed. All the steers in the respective treatments had free access to a protein/mineral supplement consisting of 31% salt, 34% yellow maize meal, 20% dicalcium phosphate and 15% urea during the experimental period.

The CP, CF, Ca and P contents of the paraquat treated *E. curvula* were 1,72 (P < 0,01), 1,29 (P < 0,01), 0,002 and 0,019 percentage units (P < 0,01) higher than

for the Control (Table 1). Varying results as regards the effect of paraquat on the CP content of different grasses have been reported. Gouws (1971) recorded no improvement in the CP content of *E. curvula* when treated with paraquat while in the present study the mean CP content of the *E. curvula* was increased by approximately 30% above that for the Control.

Notwithstanding the improved feed value of the treated *E. curvula* foggage (Table 1), the mean body mass of both groups of steers decreased over the experimental period (-3,9 kg and -6,4 kg for the Paraquat and Control groups respectively). The loss in body mass by the steers from the Paraquat group seems contrary to expectations since the mean CP content of the treated foggage was 7,42% compared with the 5,70% for the Control (Table 1). Furthermore, it is generally accepted that a protein shortage in the diet of beef cattle leads to a depressed appetite which invariably results in an inadequate intake of energy. The lack of response by the steers grazing the 2 foggages may be due to the difference in lick intake, the average CP equivalent intake being 183 g and 133 g for the Control and Paraquat groups, respectively.

Table 1

Mean Crude protein, Crude fibre, Ca and P contents of *E. curvula* as affected by paraquat treatment

		Control	Treatment Paraquat	LSD's*
CP (%)		5,70	7,42	0,98 (0,05) 1,33 (0,01)
CF (%)		33,17	34,46	0,49 (0,05) 0,66 (0,01)
Ca (%)		0,128	0,130	0,013 (0,05) 0,017 (0,01)
P (%)		0,044	0,063	0,013 (0,05) 0,018 (0,01)

*LSD = least significant difference.

Barnes (1968) subjected 2-year-old Africander steers to *E. curvula* foggage for approximately 90 days during winter and recorded a loss in body mass for the steers of 41 kg. In contrast, the steers in the Control group in the present study lost only 6,4 kg in body mass, and the steers on paraquat treated foggage lost even less. It appears therefore that *E. curvula* has the potential to be utilized as a winter foggage by beef cattle.

Cognizance should be taken of the N requirements of this pasture on account of the positive correlation between the level of N fertilization and winter feeding value (Gouws, 1971). The results from the present study indicate therefore that the treatment of *E. curvula* in late summer with paraquat holds much promise. Whether this practise has any detrimental effect on the viability of the grass in subsequent years needs more intensive investigation.

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