

Spotlight on Agriculture

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The influence of stocking rate on the distribution of individual grass species in the sward

INTRODUCTION

A stocking rate trial at Sandveld Research Station consisted of two cattle frame types and four stocking rate treatments, namely 15, 25, 35 and 45 kilograms live animal mass per hectare. Each treatment is allotted to a six-camp rotational grazing system. Forty quadrates were randomly selected along the diagonal of 48 camps during the year 2002. The grass tufts in each quadrate were counted on a species basis. A total of 240 quadrates per treatment were counted. Index values were calculated for each species, based on the concept of whether a specific grass species is present or absent in the quadrate. This index value indicates the distribution of a species along the diagonals for a specific treatment. Index values of only six grass species that form the bulk of the cattle diet are presented. The percentage contribution of these species to the total grass population is indicated in brackets. For convenience only three of the stocking rate treatments are presented. The results are the averages of the two cattle frame type treatments. This paper attempts to evaluate the distribution of the individual grass species at different stocking rate treatments in the Camel Thorn Savanna.

RESULTS AND DISCUSSIONS

The average index values of the six grass species of all 240 quadrates for the three stocking rate treatments are presented in Table 1. The distribution of the six grass species along the diagonal (average 240 quadrates) from the water point to the furthest point in the camp for the 15, 35 and 45 kg/ha treatments are illustrated in Figures 1 to 6.

Antheplora pubescens (4.64%) is poorly distributed along the diagonals in all three treatments compared to the other grass species. The average index value of all the quadrates for the three stocking rate treatments is in the order of 18, 5 and 5. These index values show clearly the lower occurrence of this species on the whole in the heavier stocking rate treatments. *Schmidtia pappophoroides* (33.65%) is widely distributed along the diagonals of all the camps in all three stocking rate treatments. The average index value of all the quadrates per treatment for the 15, 35 and 45 kg/ha is 71, 71 and 67, respectively. The index values indicate a slight decrease in the occurrence for the 45 kg/ha stocking rate treatment. *Stipagrostis uniplumis* (15.46%) is also widely distributed in all three the stocking rate treatments. The average index values of all the quadrates for the three treatments are 60, 71 and 75, respectively. Quite the opposite to *S. pappophoroides* the occurrence of this species increased as stocking rate increased. Both *E. rigidior* (6.87) and *E. lehmanniana* (6.40) occurred less frequently in the 15 kg/ha stocking rate treatment compared to the distribution of these two species in the 35 and 45 kg/ha stocking rate treatments. The average index values of all the quadrates of *E. rigidior* for the three treatments was in the order of 18, 36 and 31; and for *E. lehmanniana* 16, 22 and 21.

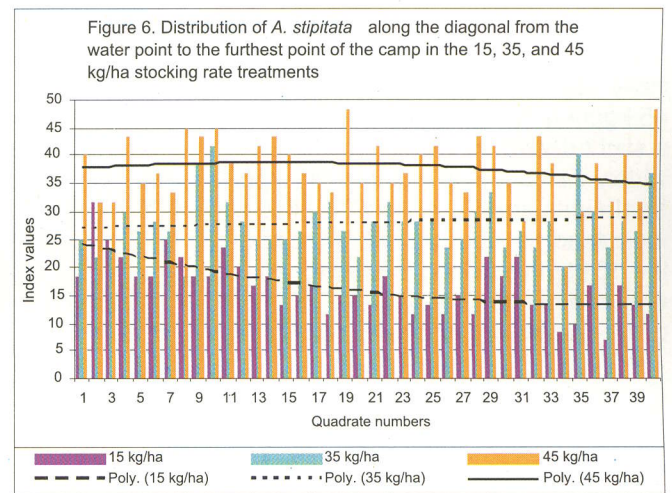
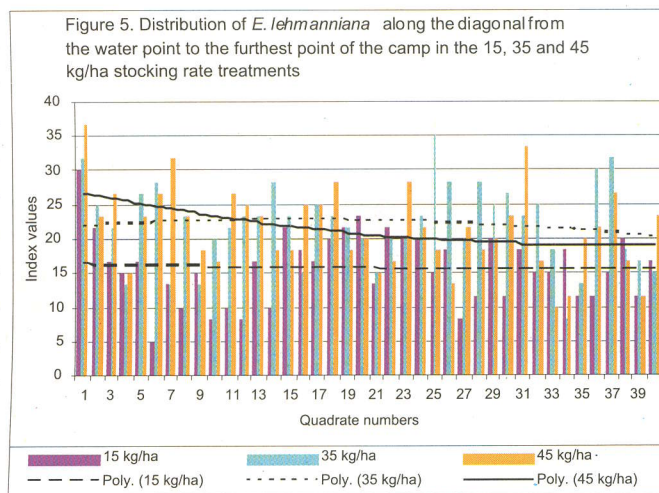
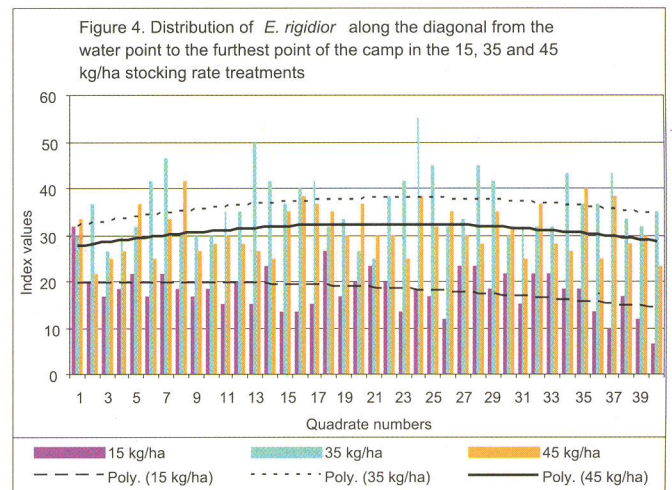
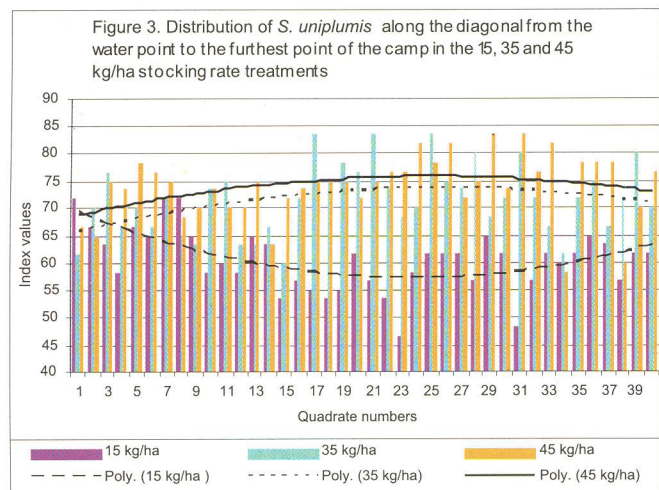
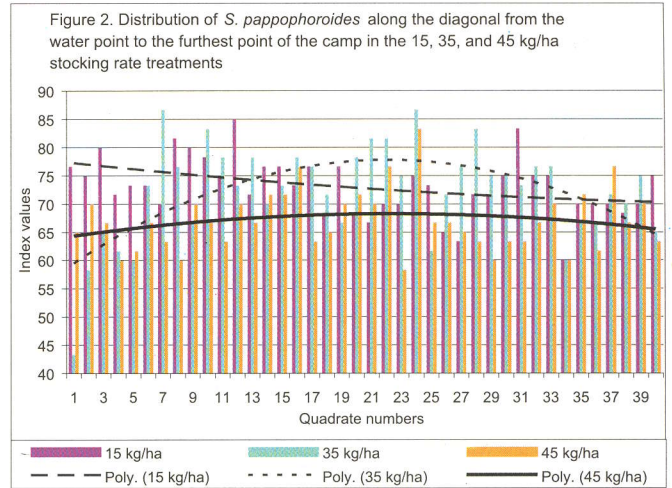
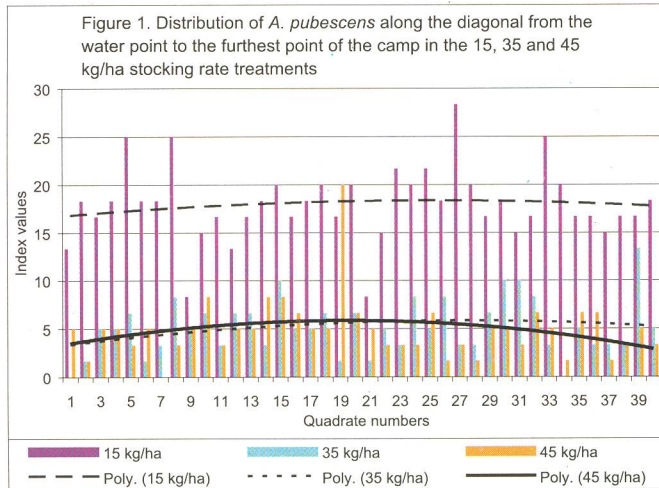
Table 1. Average index values of the six grass species of the three stocking rate treatments

| Species | Stocking rates and average index values | | |
|--------------------------|---|----------|----------|
| | 15 kg/ha | 35 kg/ha | 45 kg/ha |
| <i>A. pubescens</i> | 18 | 5 | 5 |
| <i>S. pappophoroides</i> | 71 | 71 | 67 |
| <i>S. uniplumis</i> | 60 | 71 | 74 |
| <i>E. rigidior</i> | 18 | 36 | 31 |
| <i>E. lehmanniana</i> | 16 | 22 | 21 |
| <i>A. stipitata</i> | 17 | 28 | 38 |

CONCLUSIONS

- *Schmidtia pappophoroides* and *S. uniplumis* contributed the largest portion to the total grass population and was also most widely distributed throughout all the camps of all treatments. The tendency was that *S. pappophoroides* occurred less frequently and conversely *S. uniplumis* more frequently in the heavier stocking rate treatments.
- The *Eragrostis* species occurred more frequently in the heavier stocking rate treatments compared to that of the 15 kg/ha treatment.

- Comparing *A. pubescens*, a highly desirable grass species, and the pioneer *A. stipitata* it is very clear that stocking rate did influence the presence and distribution of the grass species.
- It can be concluded that the percentage frequency of occurrence of a grass species in the sward influences the distribution of a species. However, those grass species adapted to drier conditions such as *S. uniplumis* and the *Eragrostis* species occur more frequently in the heavier stocking rate treatments compared to the lighter stocking rate treatment.



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