



**AN ECOPHYSIOLOGICAL STUDY OF TWO KEY GRASS SPECIES, ANTHEPHORA
PUBESCENS NEES AND ERAGROSTIS CURVULA (SCHRAD.) NEES**

by

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MAGISTER SCIENTIAE

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`AND GOD SAID, "LET THE EARTH PUT FORTH VEGETATION, PLANTS YIELDING SEED, AND FRUIT TREES BEARING FRUIT IN WHICH IS THEIR SEED, EACH ACCORDING TO ITS KIND, UPON THE EARTH." AND IT WAS SO.

THE EARTH BROUGHT FORTH VEGETATION, PLANTS YIELDING SEED ACCORDING TO THEIR OWN KINDS, AND TREES BEARING FRUIT IN WHICH IS THEIR SEED, EACH ACCORDING TO ITS KIND. AND GOD SAW THAT IT WAS GOOD.'

GENESIS 1: 11-12

`AND HE WILL GIVE GRASS IN YOUR FIELDS FOR YOUR CATTLE, AND YOU SHALL EAT AND BE FULL.'

DEUTERONOMY 11:15

`THOU DOST CAUSE THE GRASS TO GROW FOR THE CATTLE, AND PLANTS FOR MAN TO CULTIVATE, THAT HE MAY BRING FORTH FOOD FROM THE EARTH...'

PSALMS 104: 14

`THEY WERE TOLD NOT TO HARM THE GRASS OF THE EARTH OR ANY GREEN GROWTH OR ANY TREE,...'

REVELATION 9:4



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YUNIBESITHI YA PRETORIA

TO MY PARENTS

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ABSTRACT

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The effect of competitive stress was studied in two key grass species, Atheophora pubescens Nees ecotype VH20 and Eragrostis curvula (Schrad.) Nees cultivar Ermelo. Increasing competition resulted in a decrease in the total yield per plant in both species. Eragrostis curvula proved to be the superior competitor, while A. pubescens was evidently an inferior competitor exhibiting high sensitivity to both forms of competitive interference. Both intra - and interspecific competition failed to have a significant effect on the pattern of biomass allocation to the vegetative organs in both species, while reproductive allocation was absent. A decrease in net CO₂ uptake rate per unit



leaf area, exhibited by both species, coincided with a decrease in leaf production per plant. Increasing competition resulted in retarded relative growth rates and restricted morphological development.

A field survey conducted in a natural plant community did not support the findings made of A. pubescens in the pot trials.

UITTREKSEL

**'N EKOFISIOLOGIESE STUDIE VAN TWEE SLEUTEL - GRASSPESIES,
ANTHEPHORA PUBESCENS NEES EN ERAGROSTIS CURVULA (SCHRAD.) NEES**

deur

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Die invloed van kompetisie op twee weidingspesies, naamlik Anthehora pubescens Nees ekotipe VH20 en Eragrostis curvula (Schrad.) Nees kultivar Ermelo is ondersoek. Die invloed van kompetisie was deurslaggewend in beide spesies, deurdad die totale opbrengs per plant met toenemende digtheid afgeneem het. Eragrostis curvula was die sterker kompeteerder, terwyl A. pubescens klaarblyklik die swakker kompeteerder was met hoë sensitiwiteit teenoor beide vorms van kompetisie. Nóg intra - of interspesifieke kompetisie het 'n betekenisvolle invloed op die biomassatoewysingspatroon, aan die vegetatiewe organe, van beide spesies gehad, terwyl reprodutiewe toewysing afwesig was. 'n



Afname in netto CO₂ - opnametempo per eenheid blaaroppervlakte, met toenemende digtheid, het ooreengestem met 'n afname in blaarproduksie per plant in beide spesies. Toenemende kompetisie het gelei tot vertraging van relatiewe groeitempo's en beperkte morfologiese ontwikkeling.

'n Veldopname wat in 'n natuurlike plantgemeenskap gemaak is, het die resultate van potproewe met A. pubescens nie ondersteun nie.