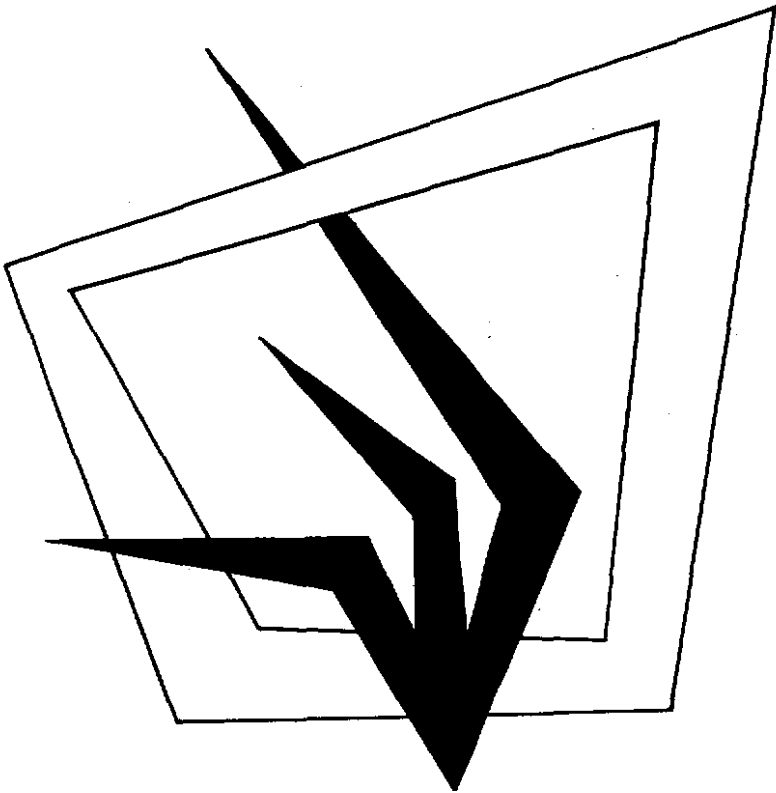


**BULLETIN OF THE
GRASSLAND SOCIETY OF
SOUTHERN AFRICA**



Volume 2 (2)

February 1992

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*BULLETIN OF THE
GRASSLAND SOCIETY OF SOUTHERN AFRICA*

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ARTICLES

FORMATION OF A DEVELOPMENT AGRICULTURE GROUP WITHIN THE GRASSLAND SOCIETY OF SOUTHERN AFRICA

Grant Hatch

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INTRODUCTION

Conventional grassland wisdom holds that communally-owned land is characterised by resource degradation, low productivity and poverty. Private land ownership, in contrast, is characterised by a well-managed resource base, production-orientated systems and wealth creation. It could convincingly be argued that this situation merely arose out of the consequences of colonialism in southern Africa and apartheid in South Africa, where large numbers of people were concentrated on small areas of land, with the resultant resource degradation. The reasons for this dichotomy are, however, infinitely more complex and it could in fact be argued that traditional systems of communal land tenure stimulate resource degradation, *a la* the Tragedy of the Commons scenario.

WHAT ROLE COULD THE GRASSLAND SOCIETY PLAY?

Growing concern has been expressed at the extent of resource degradation in tribal or communally-managed rangeland areas of southern Africa. This concern was reflected in the interest shown in issues relating to rural agriculture and communal grazing systems at the Grassland Conference held in Pretoria in May 1991. Given the interest within the Society and the wealth of expertise, the Grassland Society is well qualified to address the problems facing developing agriculture. There are, however, a number of important considerations. Grassland research has in the past concentrated on the commercial, production-orientated agricultural sector devoting little attention to developing agriculture. Development agriculture operates under different land-tenure systems and with different user objectives. The problems facing agriculture in developing areas are therefore multi-disciplinary in nature, encompassing the disciplines of agriculture, sociology, economics and politics. Given these differences there, however, remains the ideal opportunity for the Grassland Society to become involved in the challenges facing agriculture in developing areas. Involvement may be to provide expertise to assist in agricultural development, and indeed to learn from the experiences of other disciplines.

Against this background, the formation of the Development Agriculture Group was approved by the Grassland Society Council meeting held during the annual congress held in Stellenbosch in January 1992. This sub-committee would be similar to the Developing Areas Branch currently operated by the South African Society for Animal Production. The Development Agriculture Group will complement SASAP's Developing Areas Branch. The sub-committee consists of four members, viz. Grant Hatch, Craig Morris, Dr David Grossman and Dr Amie Aucamp.

AIMS OF THE DEVELOPMENT AGRICULTURE GROUP

The aim of the Group is to provide a multi-disciplinary forum for those working in, and interested in, agriculture in developing areas; where ideas, knowledge and experiences can be shared.

ACTIVITIES

An annual symposium will be organised during September of each year, where specific aspects of developing agriculture may be addressed through both paper presentation and discussion groups.

The first symposium will be held in September 1992 at the Oxbow Lodge, Lesotho and will address the role of the grassland scientist in developing agriculture. This will include an examination of various land tenure systems and the resource problems associated with these systems. The Symposium would be held over 3 days with invited papers presented by speakers from a number of organisations. Considerable emphasis will be placed on group discussion, both following paper presentations and through informal meeting. The Symposium will include visits to areas under various land tenure systems in Lesotho. It is envisaged that the proceedings of the Symposium will be published and a working document be developed, which will outline the role of grassland scientists in the field of developing agriculture and provide direction to any future research effort.

NURSERY PROPAGATION OF DESMODIUM

W.R. Nelson

National Product Manager (Seedling Propagation Systems), Starke Ayres (Pty) Ltd, P O Box 499, Pietermaritzburg 3200

ABSTRACT

Desmodium is a legume suitable for pastures. Field establishment is often difficult as the seedlings develop slowly. Propagation in a commercial seedling nursery should cause no problems provided adequate moisture is available for germination.

INTRODUCTION

Desmodium, either green or silverleaf, is gaining popularity as a pasture although establishment by direct sowing can be difficult (Barnes 1988). At least part of the problem appears to be the difficulty of maintaining adequate conditions for the survival of the seedlings during their early establishment phase. Propagation of seedlings in a commercial seedling nursery could overcome these problems.

I was told that some commercial nurseries had tried desmodium propagation but without much success. This suggested that some specific seed treatment is required to obtain good germination. Hardseededness is a common problem with legumes, resulting in slow or erratic germination. This is normally overcome by a hot water treatment. Occasionally inhibitors are present in the seed coat. Germination occurs only after sufficient moisture is present to leach the inhibitor.

GERMINATION TESTS

Germination trials with silverleaf desmodium (*Desmodium uncinatum*) were conducted. These consisted of a control, hot water and leaching treatments.

The hot water treatment resulted in no germination. Soaking the seeds in tap water for 12 hours followed by germination on absorbent paper in petri dishes resulted in 70% radical emergence within 48 hours. However, simply placing the seed on absorbent paper in petri dishes resulted in 69% radical emergence within 48 hours.

Sieving the seed and repeating the radical emergence test with seed 1.4 mm and larger resulted in 77% emergence. Green-coloured and visibly-damaged seed accounted for 10% leaving a further 13% ungerminated for no obvious reason. In all tests the damaged and green-coloured seed failed to germinate.

Similar results were obtained with greenleaf desmodium (*Desmodium intortum*), although a generally higher percentage of radical emergence was obtained. Basic germination tests with both species sowing seed dry into Speedling trays filled with Kompel Seedling Growing Medium followed by thorough saturation, resulted in good germination and growth of desmodium seedlings.

A strongly-coloured water-soluble compound leached out of seeds sown in petri dishes and seed soaked in water. Although no difference in germination was obtained between soaked and dry-sown seed in the petri dish tests, it is possible that poor field and nursery germination occurs because of inadequate leaching of this substance.

No trials were conducted on *Rhizobium* inoculation, but normal nursery sowing machinery would be adversely affected by the inoculant applied to the dry seed. A more convenient means of applying inoculant would be as a drench treatment shortly after germination.

SUGGESTIONS

I am not aware of any commercial nurseries currently propagating desmodium. The relatively low germination rate suggests that two to three seed should be sown per cell, particularly if sieved seed is not available. Sowing pregerminated seed is an option. Thorough drenching of the medium immediately after sowing, but taking precautions to prevent prolonged waterlogging, will assist in ensuring an adequate emergence of seedlings. Styrodip treatment of trays to effect adequate pruning of the vigorous root system will be essential.

Nutrition of the seedlings could be reduced once nodulation has occurred. For optimum nursery growth, it is unlikely that seedlings will show adequate growth unless fertilized normally.

Desmodium plugs must be thoroughly saturated before being transplanted. A root stimulant such as Kelpak seaweed concentrate could be considered. Care must be taken not to bend the root plug when transplanting. Consolidating the soil around the roots by pouring about a litre per plug is suggested. As with other pasture species suitable for transplanting, the higher the number of plants per hectare, the quicker the rate of cover.

Desmodium should present no difficulties to nurseries. In regions where desmodium proves particularly difficult to establish by direct sowing, transplanting plugs should be a viable option.

REFERENCE

Barnes G.R. 1988. Desmodium: a low-cost pasture for the eastern Cape coastal region. *Journal of the Grassland Society of southern Africa* 5: 138-142.

CORRESPONDENCE

SCIENTIFIC COMMITTEE ON PROBLEMS OF THE ENVIRONMENT (SCOPE)

Mrs G Snell

South African ICSU Secretariat, P O Box 2600, Pretoria 0001

At a recent meeting of the South African National Committee for SCOPE the members discussed the creation, amongst the local scientific committee, of a better awareness of SCOPE and the role of the National Committee. With this in mind, we would like to use this opportunity to briefly inform you about the objectives of SCOPE and South Africa's participation in its activities.

SCOPE is an interdisciplinary body of the International Council of Scientific Unions (ICSU) and was created in 1969 to assemble, review and assess the information available on man-made environmental changes and the effects of these changes on man; to assess and evaluate the methodologies of measurement of environmental parameters; to provide an intelligence service on current research; and by the recruitment of the best available scientific information and constructive thinking, to establish itself as a corpus of informed advice for the benefit of centres of fundamental research and of organizations and agencies operationally engaged in studies of the environment.

The National Committee for SCOPE strives to keep the local scientific community informed regarding SCOPE activities and to promote national cooperation and integration in these activities where possible.

PROJECT PROPOSALS

A STUDY OF THE AUTECOLOGY OF MAYTENUS SENEGALENSIS IN THE LOWVELD OF NATAL

Rich Hurt

Game Production Unit, Roodeplaat Grassland Institute, P/Bag X9059, Pietermaritzburg 3200

INTRODUCTION

Maytenus senegalensis (Lam.) Exell is a woody invasive plant which is fairly widely distributed in northeastern Natal. Initial observations on the distribution of the species indicate that it occurs in a wide range of habitats, and that it coexists with a variety of woody species, although there appears to be an association between *Maytenus* and *Euclea* spp. *Maytenus* is currently a problem plant in Zululand due to its invasive nature which appears to be due to the fact that it simulates a typical pioneer plant that is easily able to establish in disturbed patches. Thereafter, its strong competitive nature prevents other plants from replacing it under the prevailing disturbance regimes (*i.e.* burning; browsing/grazing). It is difficult to assess whether the establishment of *M. senegalensis* is in fact part of a successional sequence which is initiated by a major disturbance impact (*e.g.* long-term grazing intensity, or an interaction between grazing pressure and physical disturbance).

Limited browsing of young foliage has been observed in late winter and early spring (personal observations) when the quality of other sources of forage is usually low. Such levels of defoliation, however, are too low to have a significant effect on the vigour, and thus the competitiveness, of the species.

Fire also appears to have little effect on survivorship of established plants, and extensive coppicing usually results after burning. Large patches of the species suppress grass production, and subsequently fire intensity declines rapidly from the clump periphery.

An attempt has been made to evaluate the effect of herbicides on the species (G Coetzee, pers. comm.), and herbicide evaluation and registration trials have been attempted in the Hluhluwe Game Reserve in the past. It appears, however, that little success has been achieved.

Due to the fact that it (1) forms more-or-less monospecific stands, (2) is difficult, if not impossible, to control using conventional methods, and (3) reduces forage production, encroachment of conservation and agricultural systems by *M. senegalensis* in Natal constitutes a major management problem. Until a greater understanding of the ecology of the plant, its habitat requirements, its growth patterns, and inter- and intraspecific interactions has been obtained, effective management recommendations regarding its control cannot be made to land owners.

OBJECTIVES

The objectives of this project are to initiate an autecological study of *Maytenus senegalensis* in the Lowveld of Natal, and to develop recommendations for the management of the species once a greater understanding of its life history has been obtained.

STUDY AREA

The study area will be the Lowveld of Natal and part of the eastern Transvaal. Specific study sites will be established on farmland in this veld type along a moisture and altitudinal gradient from the coast inland. This gradient will include sites in the Hluhluwe Game Reserve.

STUDY PROCEDURE

The study will be conducted in five phases which will involve both field sampling and glasshouse experiments.

- (1) A broad survey will be conducted to establish the present distribution and extent of encroachment of the species in the Lowveld of Natal, and comparisons will be made with occurrences of the species in the eastern Transvaal.
- (2) Seasonal phenological patterns will be assessed, and information will be obtained on seed dispersal as well as pre- and post-dispersal predation. Seed will be collected for experimental purposes.
- (3) Laboratory trials conducted at Cedara will assess dormancy mechanisms and germination requirements of the species. Growing conditions in the Lowveld will be simulated in a controlled growth chamber.
- (4) Glasshouse trials conducted at Cedara will establish the effects of intraspecific competition on the establishment of the species. Complementary field trials will establish the effects of interspecific competition (*i.e.* grasses as well as woody plants) as well as light competition on the establishment of the species. These trials will also serve to formulate hypotheses on the successional status of the species.
- (5) Potential control methods will be evaluated and tested in the field in the light of the results of the above four phases.

DURATION OF STUDY

The study is expected to last three years, after which progress will be re-evaluated.

SOCIETY NEWS

AWARDS PRESENTED AT CONGRESS DINNER, 23 JANUARY 1992

PRESTIGE AWARD – CHARLES HUNTER DONALDSON

As a founder member and prolific contributor to the publications of the GSSA, both as an author (and mostly senior author at that) and as a member of the editorial advisory panel, Charlie Donaldson probably needs little introduction. The purpose of this report is to highlight some of the lesser known contributions which he has made to the theory and techniques over the past 35 years.

It is believed that it is also necessary to place this nomination within the perspective of Charlie's personality profile – he is a modest person, more comfortable in getting on with the job in a "behind the scenes" fashion than in striving for the limelight. This trait, coupled with his sometimes less than tactful forthrightness, have not always endeared him to "establishment" figures. Charlie has, nevertheless, spoken up at times when he thought that the best interests of the Discipline were not being served.

Charlie has an almost encyclopedic knowledge of a wide spectrum of veld and pasture matters. In these days of increasing specialization, his holistic knowledge, insight and experience are at a premium. Recently he has been based at the Grassland Research Centre, where this bounty has been willingly shared with the numerous young researchers who constantly beat a path to "oom" Charlie's always-open door.

He is probably best known locally and abroad for his thorough and comprehensive work on the ecology of bush encroachment in the Molopo area; landmark work which set the standards and direction for years to come. His vision and perception are illustrated by the breadth and depth of research undertaken in the area, ranging from autecological studies on woody and herbaceous species, through to veld reclamation, pasture species selection and evaluation and research on the agronomic aspects of *Antheophora pubescens* and *Cenchrus ciliaris*. There is surely hardly a student of ecology or pasture science, or a bushveld farmer who does not of the work of Charlie Donaldson. A little-known fact is that this work was to be used for doctorate purposes, but that Charlie was summarily transferred prior to the completion of his studies.

Apart from the above, Charlie researched and published on the following aspects of veld and pastures in a career starting at Glen in 1955.

- * Factors affecting the germination of *Themeda triandra* (he predated the others by discovering the importance of boron).
- * The first veld map of the Orange Free State region.
- * Observations on the immediate effects of drought in the 1960s.
- * The feeding value of milled woody species.
- * Goats and cattle in mopani veld.
- * Long-term nitrogen and phosphorus fertilization of veld.
- * Germination of *Atriplex*.
- * Plant-based drought indicators.
- * Bitterbos in the Orange Free State.
- * Observations on the karoo caterpillar.

- * Lehmann lovegrass in South Africa and Arizona.
- * Effect of fire on *Merxmüllera* and *Aristida diffusa* dominated veld.

The farmer, as end user and sponsor of research, was always uppermost in Charlie's mind. He published, in addition to the above scientific articles, popular articles on the following wide array of subjects.

- * Planting dryland perennials in the Orange Free State.
- * Irrigated grass-clover mixtures.
- * Resting of veld.
- * *Antheophora* and *Cenchrus*.
- * Summer and irrigated winter pastures for the Transvaal.

His practical bent is further illustrated by the hand-operated hay rake and the "Donaldson penetrometer", amongst others.

Charlie is never selfish with his knowledge and is always keen on assisting and developing those who work under him. Never part of a significant research team, soldiering on in relative isolation, he was always innovative and highly perceptive, generating original ideas throughout his career. Many is the time that a "leading light" would postulate some "new" approach, and Charlie would quietly mutter something to the effect that he had already done just that. His transfers, which occurred with monotonous and almost predictable regularity despite strong protestations, undoubtedly led to loss of continuity and duplication of effort that cost the country dearly.

He is currently engaged in writing up a wealth of hitherto unpublished data on a variety of topics and we look forward to its appearance.

From the very first to the most recent publication of the GSSA, there is hardly an issue which does not have a paper by C H Donaldson. More recently, his findings have been presented in the form of posters as well.

For his contributions to knowledge as well as to practical management of particularly the semiarid parts of the country, we have pleasure in nominating Charles Hunter Donaldson for the GSSA Prestige Award for 1992.

CONGRESS AWARDS

Awards presented for papers delivered at Congress 27 went to Mark Hardy and Craig Morris for papers with the best scientific content, and to Nico Smit for the best presentation.

GRASSLAND SOCIETY OF SOUTHERN AFRICABALANCE SHEET AT 31 OCTOBER 1991

	<u>1991</u>	<u>1990</u>
	<u>R</u>	<u>R</u>
<u>CAPITAL EMPLOYED</u>		
Retained income	57 383	51 692
Life membership fund	1 898	598
Contingency fund	5 500	-
	<u>64 781</u>	<u>52 290</u>
	-----	-----
<u>EMPLOYMENT OF CAPITAL</u>		
Fixed assets	5 309	4 918
<u>Current assets</u>		
Stock	13 509	18 777
Accounts receivable	3 154	1 451
Conference Deposit	750	-
Cash - on hand	417	130
- bank	1 145	707
- 32 day call deposit	12 260	5 000
- fixed deposit	-	5 000
- call account	40 543	20 000
	<u>71 778</u>	<u>51 065</u>
	-----	-----
<u>Current Liabilities</u>		
Accounts payable	12 161	3 560
Membership received in advance	145	133
	<u>12 306</u>	<u>3 693</u>
	-----	-----
Net Current Assets	59 472	47 372
	<u>64 781</u>	<u>52 290</u>
	-----	-----

GRASSLAND SOCIETY OF SOUTHERN AFRICAINCOME STATEMENT FOR THE YEAR ENDED 31 OCTOBER 1991

	<u>1991</u>	<u>1990</u>
	<u>R</u>	<u>R</u>
<u>INCOME</u>		
Gross Profit from trading account	1 753	6 614
Subscriptions		
Ordinary members - 1989	-	1 950
- 1990	1 627	27 559
- 1991	35 863	-
Associate members	2 760	-
Member institutes	6 340	6 315
Life Members	1 300	598
Interest received	6 530	5 010
Annual congress - surplus	8 438	2 302
Donation - JAVA	-	2 000
- O West	60	-
Prestige farmers days	838	3 961
Namibia day	3 154	-
	<u>68 663</u>	<u>56 309</u>
<u>EXPENSES</u>		
Audit fee	500	75
Bank charges	379	243
Banners	372	205
Cartographer	1 118	1 751
Commission - Lester Hall	176	-
Depreciation	846	821
Donation - Grassland society trust	20 000	13 800
Honorarium - Editor, Grassland Gleanings	1 800	600
Levy - Bureau for Scientific Publication	6 720	10 080
Postages, telephone & stationery	4 984	5 592
Printing - Bulletin	5 479	946
- Journal insert	-	4 811
Repairs & maintenance - computer	-	229
Secretarial fees	6 900	4 500
Subscriptions	270	40
Travel and accommodation	6 628	3 718
	<u>56 172</u>	<u>47 411</u>
Net Profit for the year	12 491	8 898
Transfer to life membership fund	1 300	598
Transfer to Contingency fund	5 500	-
Retained income for year	5 691	8 300
Retained income beginning of year	51 692	43 392
Retained income end of year	<u>57 383</u>	<u>51 692</u>

GRASSLAND SOCIETY OF SOUTHERN AFRICATRADING ACCOUNT FOR THE YEAR ENDED 31 OCTOBER 1991

	<u>1991</u>	<u>1990</u>
	<u>R</u>	<u>R</u>
<u>Sales</u>		
Acocks notes	5 923	19 158
Journals	553	655
Ties, badges and scarves	545	50
	<u>7 021</u>	<u>19 863</u>
<u>Cost of Sales</u>		
Opening stock	18 777	-
Purchases - Acocks notes	-	30 417
- ties	-	1 609
	<u>18 777</u>	<u>32 026</u>
Closing stock	13 509	18 777
	<u>5 268</u>	<u>13 249</u>
Gross profit	<u>1 753</u>	<u>6 614</u>
	-----	-----

RECENT CONGRESSES, CONFERENCES AND SYMPOSIA

GSSA/TRANSVAAL GAME ASSOCIATION PRESTIGE FARMERS DAY AND GAME SYMPOSIUM

Mike Peel

Game Production Unit, Roodeplaat Grassland Institute, P O Box 4143, Nelspruit 1200

The GSSA co-hosted a Prestige Farmers Day on game production with the Transvaal Game Association on 25 and 26 October 1991. The first session of the prestige farmer's day/game symposium covered a wide variety of topics relevant to game farming in South Africa. Aspects of these presentations are discussed in this report.

Mr Dries Bruwer, President of the Transvaal Agricultural Union, stated that all branches of the agricultural industry were equally important and that no one branch could be placed above another. To this end the game industry, with its money generating potential, has an important role to play in the South African economy. The game farmer was saluted for his contribution to the increase in game numbers in South Africa which has positive spin-offs in the form of, for example, hunting and tourism. The importance of the contribution of the local biltong hunter to the industry was emphasized. The need for a coordinated marketing drive in the industry was stressed, and that the possible advantages of bodies such as co-ops and closed corporations warranted investigation. As far as the future of the industry was concerned, he stated that a whole farm approach, with diversification to limit risks, should be implemented. The ongoing support of the Transvaal Agricultural Union to the game industry was pledged.

Dr David Grossman welcomed delegates with a brief resume of the developing researcher-farmer interactions in the game industry. Game related research increased markedly from the mid-1960s. This research was aimed mainly at obtaining scientific results. The problem, however, was that results were not reaching the farmer. The need to broaden the forum to the farmer became apparent. The latest development in this regard has been to co-ordinate prestige farmers days such as this, with the primary goal of promoting an exchange of knowledge and ideas between farmers and researchers.

Dr Joe Venter used the objectives of the World Conservation Strategy (WCS) and the National Environment Strategy (NES) as a basis from which to construct a framework for the determination of game farmers objectives. Briefly, the three main aims of the WCS are (1) to maintain essential ecological processes and life support systems, (2) to preserve genetic diversity; and (3) to ensure sustainable utilisation of species and ecosystems.

The NES has, briefly, the following aims:

- (1) to preserve the plant and animal life of the country;
- (2) to wisely utilise the country's non-renewable resources; and

- (3) to maintain and enhance cultural, spiritual and other qualities which enrich South African life.

Two priorities were highlighted:

- (1) game farmers objectives must be consistent with the aims of the WCS and NES; and
- (2) objectives should emphasize the **sustainable use** of the resource (conservation as opposed to preservation).

Mr Nico Smit presented an informative talk on bush-grass interactions in savannas. Physiognomically, vegetation consists of tree, shrub and herbaceous layers. Within such a system, imbalances between one or more components may occur.

Four of the main points arising from the talk, which have a potentially important bearing on the game industry in South Africa are listed below.

- (1) The existence of both positive and negative interactions are important when striving for optimum resource utilisation.
- (2) Negative interactions, such as large scale thickening up of the woody component, may have a detrimental effect on floristic diversity and productivity. In such a case bush control may be the only solution.
- (3) Positive interactions must, however, be recognized, and the emphasis must be on bush control and not bush eradication.
- (4) Bush-grass interactions differ in nature and mechanism and these need to be characterised and quantified for each savanna type.

Mr Johan Pauw emphasized that game ranching was not an easy option requiring little or no management. An important point to bear in mind was not whether veld management was possible on game ranches, but to what extent it was possible. To address the latter point attention needs to be given to the goals of veld management, the present level and standard practises regarding veld management on game ranches, recommendations made from different regions and their implications.

A primary goal of veld management is to provide quality food at a constant rate in order to optimise animal production. Three studies undertaken in the north, north-western and eastern Transvaal indicate that the goal, as given in the previous sentence, is certainly not being achieved. The speaker ascribed negative attitudes towards the game industry to this poor veld condition on game ranches. The majority of the ranches, particularly in the north-western Transvaal are mixed game-cattle enterprises. I personally think that the poor veld condition is a consequence of the game component never having been taken into consideration when stocking rates were calculated. The following management techniques for game were then discussed.

- (1) Rotation of game through burning. Two problems arise here in that for farms smaller than about 3 000 ha it is difficult to burn large enough areas to prevent game concentrating on burnt areas. Another problem is that there is seldom enough burnable material.

- (2) Closing of water points to force animals to move. This is also not successful on small ranches as distances from one end of a ranch to the other are small enough for animals to cover easily and return to their grazing grounds.
- (3) The placing of licks is cheap, but the success obtained from such an exercise debatable.
- (4) The use of fire to control woody species in sweet and mixed veld was discussed. In addition to the weaknesses mentioned under point 1 above, the efficacy of fire in controlling the woody component, apart from changing their structure, is questioned.
- (5) The use of elephants in controlling woody species is an option. This possibility has associated problems such as competition with other grazers, the owner's responsibility for damage, and the cost of elephant-proof fencing. Bush encroachment must, however, be looked at, not in terms of single causes, but in terms of a combination of grazing methods applied, browse utilisation, veld burning and the possibility of mechanical or chemical control (for which the strictest supervision is required).
- (6) Controlling the stocking rate, as well as the types of animals, is seen to be the most economical long term management option. The Large Stock Unit and rainfall-biomass correlation methods of calculating stocking rate are proposed.

Continuous grazing as such, is no more damaging than rotational grazing, as it is possible to control the numbers and ratios of the species concerned. The game rancher has the tools and techniques to apply veld management. His knowledge, interest, goals, financial and management ability will determine the measure of sophistication he will use to execute his options.

Dr Slang Viljoen discussed the continued rapid growth of the game industry in South Africa. Emphasis was placed on the need to maintain genetic variation (while sustaining genotypic integrity – the question of the introduction of Kenyan lions into Botswana springs to mind).

A number of practical guidelines for the introduction of animals into an area, were laid down.

- (1) Introductions should not be done in a haphazard way. Use available knowledge or consult experts. For example, many herds of animals have been built up from a few animals without any problems (the pre-occupation of many people to bring in new blood is questioned).
- (2) Buy from reputable sellers.
- (3) Limit introductions to larger, more manageable (utilisable) mammals.
- (4) Ensure that the introduced mammals pose no danger to existing, desired (in terms of the rancher's objectives) species.
- (5) Introduced game should have a good chance of survival in their new environment.

There is a call for the setting up of a uniform policy as regards game translocation, based on scientific facts, and agreed upon by the authorities and ranchers alike.

Dr Hymie Ebedes of the Transvaal Region discussed the subject of game capture and translocation. The problem of deaths during capture and transport, methods of capture, transport and tranquillisation were discussed. There seems to be a shift in attitude as regards live sales versus catalogue sales. It seems that catalogue sales, which among other things, seem to entail less stress to the animal than live sales, may become more popular in the future (few companies will insure animals at auctions). A plea for a more professional approach to game capture and translocation, by all concerned, was made.

Mr Piet du Plessis of UNISA emphasised the strong influence that the economy has on the game industry. The greatest single limitation to the game rancher is the cost of setting up a game enterprise. With this in mind the question is whether the game industry can keep its products within the reach of the hunter/tourist.

The game rancher can market his product in a non-consumptive (e.g. tourism) or consumptive (e.g. biltong hunting) way. 65% of the revenue generated by the South African game industry comes from biltong hunting. Further, it is apparent that the biltong hunter is close to his financial limit. The rancher should therefore widen his utilisation base, thus spreading his costs, and making his operation more viable.

In the current economic climate ranchers must **earn** more clients (non-consumptive and consumptive). To this end marketing and promotion must gain new clients for the industry in order to both increase the recovery base and ensure the continued growth of the South African game industry.

SOUTH AFRICAN SOCIETY OF ANIMAL PRODUCTION DEVELOPING AREAS BRANCH SYMPOSIUM

Grant Hatch

Pasture Research, Department of Agricultural Development, P/Bag X9059, Pietermaritzburg 3200

The Sixth Annual Symposium of the Developing Areas Branch of the South African Society of Animal Production (SASAP) was held at Golden Gate National Park from the 15 to 18 October. The theme of the symposium concerned animal protein production systems for rural and urban developing agriculture. The meeting was attended by 130 delegates from a variety of organisations involved in the field of development agriculture. Although the term developing areas and development agriculture were applied throughout the symposium, the terms essentially refer to the rural and peri-urban black areas, located in various "independent" homelands scattered throughout the country. A number of papers were presented on a wide range of topics, varying from aquaculture and small-stock production to extension in developing areas. The diversity of papers presented highlighted the nature of the field within which developing agriculture operates and hence emphasised the need for a generalist approach to the challenges presented in these areas.

The keynote address by Dr J Hofmeyer outlined the problems facing agriculture in developing areas, where population growth is likely to drastically increase the demand for meat. Although increased levels of protein production would be required to satisfy the demands created by population growth, the veld's forage production potential and socio-economic instability could provide constraints to increased livestock production. Protein requirements could, however, be met with fewer animals through improved biotechnology, which would enhance production but at lower cost.

Prof. T. Hecht, Department of Ichthyology and Fisheries Science, Rhodes University examined the potential for protein production through aquaculture. The aquaculture industry, which is expanding rapidly in South Africa, is often seen as a source of cheap protein to feed expanding

populations. Prof. Hecht warned, however, that the capital and management-intensive nature of aquaculture could limit its wide-scale application in southern Africa.

Mr A de Beer, Department of Development Aid, reflected on aquaculture in the east based on his recent visit to fish farming operations in Taiwan. The principles of aquaculture are well integrated into small-scale agricultural production in Taiwan and peasant farmers produce the equivalent of 400 – 600 tons of tilapia per hectare in small ponds.

The potential contribution of agroforestry to increased livestock production was outlined by Dr J Erskine, Institute of Natural Resources, University of Natal, who called for a move from extensive to intensive production systems. Dr Erskine contends that a movement from a communal land tenure system to one based on private land ownership would be a means of increasing production and would facilitate the development of a First World economy in these areas. A specific example of the integration of forage trees into pasture production systems was provided by Mrs Lita Pauw, Grassland Research Centre, who outlined the potential contribution of *Leucaena leucocephala* to livestock production.

Prof. A. Alexander, Department of Biology, University of Natal, examined the potential for protein production from the cane rat. Resistance to "rat" meat could be a problem to consumer acceptance of the meat, although this could be overcome by the adoption of the animal's Zulu name, "vondo". Interestingly, the results of a recent preference study revealed that vondo meat was acceptable to a large proportion of the respondents, many of whom rated vondo meat above that of beef.

Prof. L. Abrams, Faculty of Veterinary Medicine, MEDUNSA, demonstrated a poultry layer system which would provide protein in the form of eggs and cull layers for small holders. The selection of suitable layer hens and provision of adequate high quality feed is crucial to the success of the system.

The potential for the integration of milk goats into small-scale production was outlined by Mr E Donkin, Faculty of Veterinary Medicine, MEDUNSA. A small number of goats may be sufficient to supplement domestic protein requirements and serve as a source of additional income through sales.

Dr David Grossman addressed the role of the grassland scientist in animal production systems for developing agriculture. The need to understand the often complex social systems, within which development agriculture operates, was stressed. Failure to consider such social constraints could result in the failure of research programmes and extension efforts. The direct application of First World technological solutions, many of which are based on high input levels, may be inappropriate in the subsistence context. Dr Grossman called for an adaptive research and management approach to development agriculture. In addition an expansion of university agricultural curricula to include elements of development agriculture and the social systems within which it operates was necessary. Interestingly, the establishment of a School of Rural Community Development at the University of Natal, Pietermaritzburg, may be bold initiatives in this direction.

Dr J Krause and Mr H Ward, ARDRI, University of Fort Hare, stressed alternative approaches to communal livestock systems as a means of increasing livestock production and preventing resource degradation. Dr Krause outlined the concept of community kraals, which occupy small areas of land and would allow increased livestock numbers as they are housed within stalls (zero grazing). The considerable expense of construction (R15-million) could, however, provide limitations to the wider application of this system. Mr Ward proposed the formation of community

companies which would link access to communal land to the principles of private ownership and free enterprise. Members of communities would purchase "shares" in communal land which would control livestock numbers and in theory increase production.

Mr F Mellett, Department of Animal Science, University of Stellenbosch, outlined various methods of meat preservation in rural communities, where access to refrigeration is often limited. The criteria by which black consumers value meat may differ considerably from those of First World consumers and hence the strict application of First World health standards may be inappropriate in South Africa.

Mr C Moore, P H Moeketsi Agricultural High School, Taung, examined the role of agricultural education at the secondary school level as a means of addressing agricultural problems in developing areas and improving the level of livestock production. Mr C Nicholson, AGRILINK, outlined the objectives of an agricultural development programme which aims to provide extension to the small proportion of commercially orientated farmers in developing areas.

The symposium concluded with an excursion to various development projects in QwaQwa. The organisers of the symposium are to be congratulated on the detailed and diverse programme, although insufficient time was allowed for questions at the end of each presentation. The symposium was efficiently organised and the evening functions allowed informal discussion between delegates. The foresight in establishing a body specifically aimed at developing agriculture is commendable, given that it was established at a time when little consideration was given to agriculture beyond the boundaries of white South Africa. It is therefore interesting that the grassland discipline features prominently in development agriculture, given that the social economies of rural communities are pastoral-based. The failure of the veld resource to provide sufficient forage to sustain livestock numbers and provide for the needs of burgeoning populations served as the basis for a number of the papers presented. Although grassland scientists have traditionally restricted their research work to commercial agriculture in the white sector, there is the need for the problems of developing non-commercial agriculture to be examined. Although the objectives and social contexts of the commercial and non-commercial sectors may differ, failure to address the resource problems facing subsistence agriculture will detrimentally affect the output of the commercial component. The grassland discipline needs therefore to become involved in the problems facing agriculture in developing areas, particularly as political change will increasingly focus attention on the aspirations of black people. The adage that the soil-grass-animal continuum responds similarly in a subsistence context as it does in a commercially-based production system can no longer be accepted as a valid reason for ignoring the massive problems facing developing agriculture. The Grassland Society needs to become involved in the challenges of rural development if the Society is to remain relevant within a rapidly changing South Africa. This may be achieved within existing structures, such as SASAP's Developing Areas Branch, or as a separate body convened within the Society.

27de KONGRES VAN DIE WEIDINGSVERENIGING VAN SUIDELIKE AFRIKA

Kobus Ras

Wildproduksie Eenheid, Roodeplaat Weidingsinstituut, P/Sak X9059, Pietermaritzburg 3200

Die kongres was gehou te Stellenbosch vanaf 20-23 Januarie 1992 in die Konservatorium van die Universiteit van Stellenbosch. Die skoonheid en kultuur van die Kaap het deurgaans gesorg vir 'n feestelike atmosfeer waarin die kongres en sosiale geleenthede plaasgevind het. Ou kennisse het weer geleentheid gehad om bymekaar te kom en dit is dan ook verblywend om te sien watter mate van vriendskap onder navorsers en tegnisi in hierdie veld, vanoor die hele land bestaan. Dit dra daartoe by dat hulle gesien kan word as een nasionale span.

'n Wye verskeidenheid onderwerpe was op die program en die voordragte was van 'n hoë gehalte. Dit is 'n weerspieëling van die kwaliteit van die werk wat gedoen word. Die klem het geval op plantegroei dinamika en veldproduksie. In hierdie dae waarin ons steeds met die volgehoue agteruitgang van ons weidingsbronne in suidelike Afrika te make het, kan die noodsaaklikheid van hierdie werk nie oorbeklemtoon word nie. Met ondersteuning van al die ander rigtings in plantnavorsing kan hierdie werk 'n belangrike rol speel in die bereiking van die doelstellings van die nasionale weidingstrategie.

Daar was deurgaans goeie interaksie tussen kongresgangers en voordraers, en van die voorstelle en kommentaar wat ek wil uitlig is die volgende.

- * Daar is voorgestel dat daar gekyk moet word na 'n manier om betekenisvolle verskille in die natuurwetenskappe uit te druk, omdat verskille wat nie statisties betekenisvol is nie, gereeld vir die landbounavorser betekenisvol is.
- * Daar is ook genoem dat toepassing van tegnieke wat huidiglik beskikbaar is, net so belangrik is as om voortdurend nuwe tegnieke te ontwikkel.

'n Groot aantal puik plakkate is gelewer. Hierdie vorm van tegnologie oordrag is beslis nie minderwaardig nie en gaan in die toekoms sekerlik 'n groter rol speel. Daar bestaan egter 'n behoefte vir 'n sessie waarin die plakkaat aanbieders hul plakkate beman, behalwe vir die aanbiedings met oorhoofse projeksies in lokale, sodat die kongresgangers die betrokke persone kan identifiseer. Dit sal aan persone wat in spesifieke plakkate belangstel die geleentheid gee om persoonlik kontak te maak, hetsy by die kongres of sosiale geleenthede. So 'n sessie behoort in die middel van die kongres gehou te word, sodat daar genoeg tyd is om die plakkate te bestudeer voor die sessie en genoeg tyd daarna om kontak te maak en gedagtes uit te ruil.

'n Uitnodiging is ontvang om die 1994 kongres van die WVSA in Zimbabwe te hou. Ek glo almal hoop dat so 'n besoek sal realiseer.

Namens die kongresgangers wil ek die organiseerders, nl. mnr Steve Barnard en sy span van die Elsenburg landbou-ontwikkelingsinstituut, komplimenteer vir puik organisasie en administrasie.

THESIS ABSTRACTS

CONSERVATION IMPLICATIONS OF THE INVASION OF SOUTHERN AFRICA BY ALIEN ORGANISMS

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1991, Ph.D. thesis, Faculty of Science, University of Cape Town. Supervisor : Prof. W R Siegfried and Prof. E J Moll. 3 vols, 808 pp.

Alien species known to be invading untransformed ecosystems in southern Africa, and, more particularly, those inside nature reserves, were identified. The extent and ecological impacts of these invasions were assessed. Their control within reserves was also evaluated.

Research approaches used were: literature review (which included an international review), a detailed questionnaire survey of alien plant invasions in 307 reserves, rapid field surveys of 60 reserves, intensive case studies of four reserves (Cape of Good Hope Reserve, Hluhluwe-Umfolozi Game Reserve, Kruger National Park, Pella Fynbos Research Site), international comparisons with case-study reserves in other savanna and Mediterranean-type biomes, and field evaluation of control methods for alien plants in the two fynbos reserves.

Ecological impacts of alien invasions throughout the subcontinent were determined from historical changes in vertebrate populations, including detailed studies of three native birds (*Bostrychia hagedash*, *Lybius leucomelas*, *Ploceus velatus*) expanding their ranges, partly in response to the spread of invasive alien trees.

The results are presented in eight chapters, comprising 26 published (or submitted) papers, an introduction and a concluding summary. One chapter covers contributions to the theoretical understanding of invasion processes, including a prediction of their interaction with rapid global environmental change.

The conclusion is reached that alien invasions pose a serious challenge to nature conservation in the region. Mostly this comes from alien woody plants but the importance of herbaceous plants has possibly been underestimated regionally. Introduced mammalian pathogens and predatory fishes have also had important effects. Alien invertebrates have been poorly studied (the ant *Indomyrmex humilis*) poses a significant threat). Alien terrestrial vertebrates have generally had only localized effects.

Alien plant invasions affect all biomes, with riparian ecosystems being regionally threatened. Mesic biomes and habitats are usually more invaded by alien plants than xeric equivalents. 281 alien vascular plant species were recorded invading vegetation within nature reserves (an average of 12 species per reserve) with an additional 200 species being possibly present but unrecorded (an average of 18 species per reserve). By 1984, the 54 plant taxa recorded invading reserves most frequently were estimated, on average, to be present in 30% of the 1 km x 1 km grid cells of the

reserves they were invading. The average future potential extent of these invasions was estimated to be 51%.

Control had, on average, been initiated for two plant species in each reserve and 18% of these operations had already resulted in complete eradication. Reported control costs were particularly high for the woody plants which pose a serious threat to the highly endemic flora of the fynbos biome, on average R48 284 per reserve (R1.80 per hectare = US\$1.20 per hectare) in 1983. These high costs were validated experimentally. A computerized optimization model, aimed at minimizing the costs of controlling the most intractable shrub invader of the fynbos, *Acacia saligna*, was developed from the results of a field experiment at the Pella site. Practical field-scale control of these invasions was assessed to be feasible, using the results of repeated monitoring of permanent plots in the Cape of Good Hope Reserve. Control strategies and regional priorities, based on the theoretical and practical insights gained from this study, are proposed.

Even though the intensity of invasions is likely to increase in the foreseeable future, in part as a result of rapid man-induced changes in global climate, it is predicted that these invasions can be controlled if the correct approaches are adopted timeously. Failure to control them, will ensure that the extinction rate of native species will markedly increase and that ecosystem functioning will be altered significantly at a local scale and, conceivably also, at a regional scale.

DIARY

9 APRIL 1992

Event: GSSA Prestige Farmers Day,
Kudus on Private Land in the
Eastern Cape
Venue: Glenconnor Farmers Hall
Contact: Daan Buijs, Game Production
Unit, Bathurst Agricultural
Centre, P/Bag 1, Bathurst 6166
(Fax: (0464) 25-0883)

13 - 15 MAY 1992

Event: GSSA Pasture Farming Forum
Venue: Berg-en-dal, Kruger National
Park
Contact: John Fair, P O Box 1058,
Harrismith 9880
(Tel: (01436) 2-1511)

30 JUNE, 2 JULY 1992

Event: GSSA Prestige Farmers Days,
Burning in bushveld
Venue: Swaziland and eastern Transvaal
Contact: Rich Hurt, Game Production
Unit, P / B a g X 9 0 5 9 ,
Pietermaritzburg 3200
(Tel: (0331) 3-3371)
(Fax: (0331) 43-1253)

6, 8, 10 JULY 1992

Event: GSSA Prestige Farmers Days,
Veld and Pasture Management
Venue: Greater Zimbabwe, Harare,
Bulawayo
Contact: Felix Hobson, Pasture Research,
Eastern Cape Region, P/Bag
X15, Stutterheim 4930
(Tel: (0436) 3-1240)
(Fax: (0436) 3-2890)

SEPTEMBER 1992

Event: Symposium of the GSSA
Developing Agriculture Group,
"The Role of the Grassland
Scientist in Developing
Agriculture"
Venue: Oxbow Lodge, Lesotho
Contact: Grant Hatch, Pasture Research,
Dept of Agricultural
Development, P/Bag X9059,
Pietermaritzburg 3200
(Tel: (0436) 3-3371)
(Fax: (0436) 43-1293)

6 - 8 OCTOBER 1992

Event: Third Symposium on Science and
Technology
Venue: Harare International Conference
Centre, Zimbabwe
Contact: The Secretary, Third Symposium
on Science and Technology,
Research Council of Zimbabwe,
P O Box 8510, Causeway,
Harare, Zimbabwe

27 - 30 OCTOBER 1992

Event: 3rd International Wildlife
Ranching Symposium, Wildlife
Ranching: A Celebration of
Diversity
Venue: CSIR Conference Centre,
Pretoria
Contact: Conference Coordinators C.153,
CSIR, P O Box 395, Pretoria
0001
(Fax: (012) 86-2856)

18 – 22 JANUARY 1993

Event: Grassland Society of Southern Africa Congress 28
Venue: University of OFS, Bloemfontein
Contact: Prof. W van Rensburg, Dept of Pasture Science, University of OFS, P O Box 339, Bloemfontein 9300
 (Fax: (051) 401-2117)

8 – 23 FEBRUARY 1993

Event: XVIIth International Grassland Congress
Venue: Massey University, New Zealand, and Rockhampton, Australia
Contact: Executive Secretary, XVII Grassland Congress Organizing Committee, Agronomy Department, Massey University, Palmerston North New Zealand

28 JUNE – 2 JULY 1993

Event: VIIth World Conference on Animal Production (WCAP)
Venue: Edmonton, Alberta, Canada
Contact: WCAP 1993, Faculty of Extension, University of Alberta, Edmonton, Alberta, Canada T6G 2J7
 (Fax: (403) 492-0627)

EMPLOYMENT OPPORTUNITIES

TECHNICIAN

The Game Production Unit (GAPRU) of the Roodeplaat Grassland Institute requires a technician to assist with research and extension work in Natal. The incumbent will be based at Cedara, and will work mainly in the Natal region, although *ad hoc* work will be conducted in other parts of the country. The primary field of research of GAPRU (Natal) is vegetation dynamics and game population dynamics. The research programme is structured to provide land users with technology to maximise game production and utilization.

The successful candidate should have an appropriate degree or diploma in nature conservation or life sciences, should be computer literate, and should have experience in research. The salary is negotiable, depending on qualifications and experience. Normal service conditions and fringe benefits apply. Applicants should send a *curriculum vitae* to Richard Hurt, GAPRU (Natal), P/Bag X9059, PIETERMARITZBURG 3200, following which arrangements will be made for interviews.

ADDRESSES

GENERAL AND FINANCIAL

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3209 SCOTTSVILLE**

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Contact times: 08:30 to 10:30, Monday to Friday

PUBLICATIONS

**Editor : Journal of the GSSA
Private Bag X05
0039 LYNN EAST**

Fax: (012) 808-2155

**Editor : Bulletin of the GSSA
P O Box 10327
3209 SCOTTSVILLE**

Fax: (0331) 90-1241