

FORUM BOTANICUM

Vol. 22, No. 10

October 1984
Oktober

ISSN 0015-847X

NEWS-LETTER OF THE SOUTH AFRICAN ASSOCIATION OF BOTANISTS
NUUSBRIEF VAN DIE SUID-AFRIKAANSE GENOOTSKAP VAN PLANTKUNDIGES

BOTANICAL RESEARCH INSTITUTE, REVIEW OF WORK, April 1983 - MARCH 1984
(continued from last issue):

EXPERIMENTAL ECOLOGY SECTION: In 1983, the Experimental Ecology Group was formally recognized as a fully-fledged section with a new enlarged post structure. The section, under Dr. M.C. Rutherford, is consequently expanding its research activities and several new research facets are in the advanced planning stage. For one of these facets, a Plant Exploration Section's post is being fully utilized within the Experimental Ecology Section in an area of common research interests. Research results for the reporting period are limited to those from four currently registered facets, grouped as follows:

Plant production studies in savanna. Research on primary production within the South African Savanna Ecosystem Project has led to an investigation of how to extrapolate production data from primary data sites. Dr. M.C. Rutherford has been testing, in the north-western Transvaal, a regional savanna productivity model which predicts mean annual production of savanna components under both natural conditions and radical land use changes. Main modifications to the model have been application of improved soil factors. Current model resolution is adequate to express spatial variation of production on a medium mapping scale.

Ecophysiological research in fynbos. A series of experiments has been undertaken by Miss F.M. Pressinger to optimize germination in Protea repens for use in competition experiments. Cold treatment prior to sowing resulted in increased and earlier germination, whereas dilute solution of hydrogen peroxide caused earlier but reduced number of germinations. Experimental measures of competition between neighbouring Acacia saligna seedlings showed that water stress and high mortalities occur in seedlings less than four days old. Biomass and leaf area of older seedlings were greatest and water potential least negative at low population densities combined with relatively high water additions.

Aquatic ecology. Dr. C.F. Musil's work on the classification of the water plant

communities of Natal has been completed and the account of the results is in press. His major work on growth of Eichhornia crassipes has also been completed. Four papers dealing with a model for predicting growth of E. crassipes in eutrophied aquatic systems have been submitted for publication. These concern:

- (a) generating kinetic coefficients for the model in green house culture;
- (b) testing and refining the model under field conditions;
- (c) testing a model for predicting growth rates from plant nutrient concentrations; and
- (d) applying the model to an eutrophied South African impoundment.

PLANT EXPLORATION SECTION

The section, under Mr. M.J. Wells has continued to concentrate its attention on food plant research and on related aspects such as the conservation of germ plasm. Good progress was made on the developing food plants projects, as well as on projects that are due for completion or are being phased out i.e. work on barrier plants, timber sources and weeds.

Taxonomy of Ficinia. Several new species of Ficinia have been distinguished and are being written up by Mr. T.H. Arnold.

National Weed List. Extra categories and information, including extra common names, have been added to the list. Checking and preparation for publication by Mrs. H. Joffe and Mr. Wells is almost complete. Three papers analysing the weed list have been published (Bothalia 14, 3&4: 945-948; 961-966; 967-970 (1983)).

Timber use. The results of a survey by Miss C.A. Liengme of timber use by the Tsonga of Gazankulu have been published (Bothalia 14, 2: 245-258 (1983)).

Ethno-botany. A survey by Miss Liengme of ethnobotanical research in southern Africa, including an extensive bibliography, has been published (Bothalia 14, 3&4: 621-630 (1983)). It shows that the peoples whose plant uses are least well known are the: Swazi, Transvaal Ndebele, Mpukushu and Khoi. The plant aspect most in need of study is wood use.

Barrier plants. Information-gathering on 220 priority indigenous barrier species was completed. A paper by Miss L. Henderson on barrier plants in South Africa has been published (Bothalia 14, 3&4: 635-640 (1983)) and a more comprehensive work detailing the characteristics of 504 garden hedge, security barrier and windbreak plants is in preparation.

Conservation of germ plasm. Although the drought curtailed collecting, plantings were made of Citrullus lanatus and Sorghum bicolor, and these yielded 624 seed collections that were either stored in the seed bank and/or distributed to other researchers. This work was carried out by Mrs. K.J. Musil and Mrs. J. Hoffman under the guidance of Mr. Arnold.

Crop plants of African origin. The severe drought precluded field work, but detailed analysis of the material already collected, was continued, and is already enabling Mr. Arnold to categorize and distinguish races of crop plants with greater ease and certainty.

Indigenous food plants. Data on a further 516 species from 58 families, has been added to the national food-plant data bank by Mr. A.A. Balsinhas. Particular attention was paid to Khoisan (Hottentot and Bushman) food-plants, which are the subject of a paper being prepared by Mr. Arnold and Mr. Wells for the Kew International Conference on Economic Plants for Arid Lands (KICEPAL), London, 23-27 July 1984.

Water conservation gardening. A report was produced by Mrs. D.M.C. Fourie on water conservation gardening, listing both exotic and indigenous species of trees, shrubs, climbers, bedding plants and ground covers that are hardy and not water-thirsty. The public demand for the report was so great that it is now being produced as a departmental publication.

PRETORIA NATIONAL BOTANICAL GARDEN

After six years without a Curator we are glad to report that Mr. D.H. Dry has assumed responsibility for the Garden.

Despite the hampering effects of the drought, good progress has been made. 737 new plant collections were received and accessioned by the records team, including a group of South West African plants brought in by Mr. D.S. Hardy. Some of these went directly to the 'rare and endangered' house. A nature trail was constructed along the ridge with vantage-points overlooking various biome areas. The ground in front of the main Reynolds Gate was landscaped and a fine large specimen of Aloe bainesii established there. 220 Proteaceae were planted to improve the fynbos, and new beds created round the dam in the south-west corner. A start was made with developing a watercourse down the koppie to the lowveld section.

It is with deep regret that we record the death of Mr. J. Admiraal. He was

in charge of the Garden from 1952 to 1977, being appointed Curator in 1965, and was responsible for the development of the Pretoria National Botanical Garden during most of its formative stages.

PUBLICATIONS OF THE INSTITUTE

During the year the following were published: Bothalia 14,2 and 14, 3&4 (Proceedings of the 1982 AETFAT Congress); Flora of Southern Africa 21,1 and 33,7,2; Flowering Plants of Africa/Blomplante van Afrika 47, 3&4; Memoirs of the Botanical Survey of South Africa 48; Palaeoflora of Southern Africa, Molteno Formation 1; and Dr. Dyer's Ceropegia, Brachystelma and Riocreuxia. The latter two works were published by the private sector. Altogether, 108 pages were published by staff in Institute, local and overseas journals.

'PEOPLE TO PEOPLE' BOTANICAL SCIENCE DELEGATION: People to People is an organisation in the United States of America founded by former President Eisenhower to foster good relations and understanding and to share knowledge between the peoples of the U.S.A. and those of other countries. Delegations of Americans from all walks of life have therefore visited many countries around the world in their Citizen Ambassador Program.

Recently we in South Africa were privileged to have a delegation of 27 botanists visit this country. The delegation was under the leadership of Professor Frank Salisbury, the wellknown plant physiologist from Utah State University.

The Professional Purpose Statement of the delegation read as follows: The purpose of this visit is to form a delegation of American scientists with interests in plant physiology, plant ecology, and agriculture, some members perhaps highly specialized in their approaches, others more interdisciplinary. Members of the delegation will become familiar with South African research by visiting laboratory and field research sites in company with their South African colleagues. When appropriate, American scientists may present seminars describing their own research. Since the time is relatively short, emphasis in choice of institutions (university, government, and private) should be placed upon quality of the research and relevance to the topics of physiology, ecology, and agronomy and horticulture. An attempts should also be made during the visit to become familiar with the range of natural ecosystems in South Africa and the crops that are suited to these vegetational zones.

The delegation assembled in Washington, D.C. on September 21 where they were hosted to a banquet by the Agricultural Attaché at the South African Embassy. The first place they visited in South Africa was the Potchefstroom University and its Soil Research Centre and Botanical Gardens. After a day's cultural orientation they spent a day with the State Department of Agriculture including a visit to the Horticultural Research Institute, Roodeplaas. Another day was spent in Pretoria this time at the Botanical Research Institute where members of the Department of Botany, University of Pretoria also participated in the program. Then came a few days of relaxation at the Mala Mala Game Reserve.

October 1-3 saw the delegation in Bloemfontein where they visited the Departments of Botany, Agriculture and the Institute for Environmental Sciences and the Glen Agricultural College. On October 5 the delegation went on an excursion to the Tsitsikamma Coastal National Park with representatives from the University of Port Elizabeth Department of Botany. The group ended up by spending six days in the south-western Cape. This included visits to the National Botanic Gardens, Kirstenbosch, University of Cape Town, University of Stellenbosch and the Oenological and Viticultural Research Institute, Stellenbosch and two full day excursions to the Karoo Botanic Gardens, Worcester via Bainskloof and Du Toits Kloof and around the Cape Peninsula. The delegation departed from South Africa on 12/13 October.

At many of the establishments visited series of lectures were given by various delegates on their specific fields of interest with local botanists covering their activities.

For the information of those members of S.A.A.B. who were not involved with the delegation's visit a list of all the delegates is given here:-

Professor Frank B. Salisbury, Delegation Leader / Professor of Plant

Physiology, Utah State University, College of Plant Science, Logan, Utah.
Current research interests include photoperiodism, plant responses to gravity and to mechanical stresses, and plant maximum yield in controlled environments.

Dr. Gily E. Bard, Associate Professor, Department of Biological Sciences, Lehman College, City University of New York, Bronx, New York.

Specialization: Vegetational dynamics of succession, natural areas, alien species in natural areas; tree growth in northeast temperate deciduous forests.

Dr. Arthur F. Beyer, Professor of Biology, Midwestern State University, Wichita Falls, Texas. Specialization: Plant propagation; plant systematics; plant ecology; and plant morphology.

Dr. Orville Bissett, Professor of Biological Sciences Emeritus, Colchester, Connecticut. Retired from Central Connecticut State University; has served as curator of the Herbarium for the past eight years.

Mr. A. Clyde Blauer, Associate Professor of Biology, Snow College, Ephraim, Utah. Botanist, U.S.D.A. Intermountain Forest and Range Experiment Station (work centres on range analysis and on characterization, selection and hybridization of browse shrubs). Special interest: Utah flora, especially shrubs and edible wild plants.

Dr. Bruce J. Cooil, Emeritus Plant Pathologist, University of Hawaii, Honolulu, Hawaii. Specialization: Nutrition of crops; transport processes.

Dr. Anson R. Cooke, Group Leader. Biological Research, Union Carbide Agricultural Products Company, Research Triangle Park, North Carolina. Responsible for biological programs of herbicides and plant growth regulators. Specialization: Herbicides and plant growth regulation; effect of ethylene on control of plant growth.

Dr. Alden S. Crafts, Professor of Botany Emeritus, Botany Department, University of California, Davis, California. Specialization: Phloem transport in plants; weed control; mode of action of herbicides; relation of nutrients to toxicity of arsenic; introduced boron as a herbicide.

Dr. R. Dean Decker, Associate Professor of Biology, University of Richmond, Virginia. Teaches introductory plant physiology and introductory biology. Works with high school teachers and students as the director of the Virginia Junior Academy of Science.

Dr. Ralph O. Erickson, Professor of Botany, University of Pennsylvania, Philadelphia, Pennsylvania. Specialization: Analytical studies (kinematics) of plant growth and differentiation; phyllotaxis; geometry of biological ultrastructures.

Dr. Richard H. Goodwin, Professor Emeritus of Botany, Connecticut College, New London, Connecticut. President of the Conservation and Research Foundation; past president of the Nature Conservancy. Specialization: Experimental plant morphology; vegetation dynamics; preservation and management of natural areas.

Dr. Alice B. Hayes, Professor of Natural Science / Associate Academic Vice President, Loyolla University, Chicago, Illinois. Active member of the NASA Space Biology Program. Research interests: Morphogenesis, particularly on the leaf blade.

Dr. Charles Heimsch, Professor Emeritus, Department of Botany, Miami University, Oxford, Ohio. Past president of the Botanical Society of America; also served as editor of the American Journal of Botany. Specialization: Plant anatomy (wood, developmental, systematic).

Dr. J.H.M. Henderson, Professor of Biology, Carver Research Foundation, Tuskegee Institute, Alabama. Research activities: Tissue and cell culture of sweet potato clones; mechanism of action of IAA oxidase and IAA metabolism.

Dr. William J. Hess, Vascular Plant Taxonomist / Curator of Herbarium, The Morton Arboretum, Lisle, Illinois. Currently coordinating research on endangered species within the Indiana Dunes National Lakeshore. Special interests: Woody plants (Rosaceae, Cornaceae, and Tiliaceae).

Dr. William M. Hiesey, Staff Member (Retired), Department of Plant Biology, Carnegie Institution of Washington, Stanford, California. Research interests: Transplant experiments; cyto-genetic investigations; comparative physiological studies in natural and in controlled environments.

Dr. Rex E. Kerstetter, Professor of Biology, Furman University, Greenville, South Carolina. Special interests: Plant biology; ecology; horticulture; and microbiology. Specialization: Plant hormone physiology (particularly auxins).

Dr. John H. McClendon, Associate Professor, University of Nebraska, School of Biological Sciences, Lincoln, Nebraska. Served as an exchange professor to Peking University in 1982 under the University of Nebraska program of exchange with Chinese Universities. Research interests: Photosynthesis in trees; plant cell wall polysaccharides.

Dr. William H. Outlaw Jr., Associate Professor, Biology Department, Florida State University, Tallahassee, Florida. Research interests: Plant Physiology (primarily stomatal biochemistry) using the specialized research tool of quantitative histochemistry; also interested in the conservation of soil and water resources in agriculture.

Dr. Lorentz C. Pearson, Professor of Botany, Ricks College, Rexburg, Idaho. Research interests include the effects of air pollution on plasma membranes and cell organelles; phenology and productivity of desert grasses.

Dr. Hayden N. Pritchard, Associate Professor of Biology, Lehigh University, Bethlehem, Pennsylvania. Teaches courses on vascular and nonvascular plants to graduate and undergraduate students. Consulting biologist for the Ecological Protection Society Inc. Research interests: Marine botany in Bermuda and wetlands ecology in New Jersey.

Mrs. Aileen G. Roads, Chairman, Roadside Beautification for the State of Oklahoma, National Council of State Garden Clubs, Inc., Tulsa, Oklahoma. Past national chairman of the National Council of State Garden Clubs.

Dr. Reed C. Rollins, Asa Gray Professor of Systematic Botany (Emeritus), Harvard University, Cambridge, Massachusetts. Member of the National Academy of Sciences. Research interests: Taxonomy.

Dr. J. William Schopf, Professor of Paleobiology / Dean of the Division of Honours, University of California, Los Angeles, California. Research interests: Precambrian paleobiology; geologic aspects of the origin of life; interrelationship of atmospheric, lithospheric, biological and biochemical evolution; relevance of stromatolites and ancient micro-biotas to problems of Precambrian biostratigraphy.

Dr. Jane Shen-Miller, Research Chemist, University of California, Los Angeles, California. Research interests: Enzyme regulation in gibberellin biosynthesis; germination and radiocarbon dating of ancient lotus seeds; environmental signals on the regulation of plant growth; biomass as supplemental fuel.

Dr. Cherie L.R. Wetzel, Professor of Biology, City College of San Francisco, San Francisco, California. Specialization: Plant embryogenesis and development at ultrastructural level; plant taxonomy and ecology.

Dr. Willard F. Yates, Jr., Professor of Botany, Department of Biology, Butler University, Indianapolis, Indiana. Teaches courses in general botany, systematics, genetics, plant physiology, and plant growth and development. Research interests: Systematics of western United States compositae and cultivated solanaceous plants; use of plant tissue culture methods for propagation; and the use of tissue culture techniques in the preservation of endangered species.

DIE UNIVERSITEIT VAN PRETORIA: Professor N. Grobbelaar is sedert Maart 1982 die Gemeenskaplike Matrikulasieraad se moderator vir biologie wat maak dat hy jaarliks o.a. sowat 40 verskillende matriekbiologievraestelle moet modereer. Hy lê in Maart 1985 hierdie amp neer en sal deur prof. G.K. Theron in dié hoedanigheid opgevolg word.

Na 'n hele aantal jare se harde werk het prof. N. Grobbelaar met die hulp van verskeie honoresstudente daarin geslaag om die toksiese bestanddeel van Sesbania punicea te isoleer. Die ingewikkelde struktuurformule van die toksien, sesbanimied, is daarna deur dr. C.P. Gorst-Alman, P.S. Steyn en R. Vlegaar van die W.N.N.R. opgeklaar. Intussen het navorsers in die V.S.A. vasgestel dat die besonder toksiese sesbanimied oor kankerwerende eienskappe beskik met die gevolg dat die stof teenswoordig intensief deur geneeskundiges bestudeer word. Sesbania punicea is, vanweë sy aanskoulike blomme, as 'n sierstruik na Suid-Afrika ingevoer maar het intussen in versteurde veld tot 'n onkruidplaag ontwikkel en is gevolglik enkele jare gelede amptelik as 'n onkruid verklaar.

Prof. Albert Eicker het onlangs drie maande van sy studieverlof aan die "Pennsylvania State University" in die V.S.A. deurgebring. Hy is daarheen op uitnodiging van prof. Lee Schisler en Paul Wuest, beide bekende wetenskaplikes op die gebied van die verbouing van sampioene. Kort na sy aankoms is hy vereer deur as Besoekende Professor in Plantpatologie aan hierdie Universiteit aangewys te word. In samewerking met prof. Paul Wuest is 'n intensiewe studie van die patogene van die sampioene gedoen. Verskeie sampioenplase veral in die staat Pennsylvania waar die meeste sampioene in die V.S.A. gekweek word, is besoek en is daar aangetaste sampioene versamel. Versamelings is ook in Kanada gemaak. 'n Handboek wat al die siektes en abnormaliteite van die kommersieel-verboude sampioen sal insluit, word in samewerking met die "American Phytopathological Society" beplan. Goeie vordering is reeds met die projek gemaak. Die oorgroote meerderheid van oorsakende organismes van sampioensiektes, insluitende virusse, bakterieë en swamme is reeds geïsoleer, beskryf en geteken. Insekpeste en abiotiese siektes word ook ingesluit.

Tydens sy verblyf aan Penn State Universiteit het prof. Eicker ook aktief deelgeneem aan 'n internasionale kursus oor die verbouing van eetbare sampioene. Hierdie kursus, wat deur ongeveer 300 sampioenkwekers en wetenskaplikes van oor die hele wêreld bygewoon is, is deur die Fakulteit Landbou van bg. Universiteit aangebied. Benewens formele voorlesings het prof. Eicker ook gehelp met van die praktiese demonstrasies tydens die kursus.

Mev. Lydia-Marié Joubert het onlangs 'n W.N.N.R. Spesiale Merietebeurs vir nagraadse studie ontvang. Sy is tans ingeskryf vir die D.Sc.-graad in Plantkunde onder leiding van prof. J. Coetzee (Elektronmikroskopie). Sy het van die W.N.N.R. toestemming gekry om hierdie beursgeld aan te wend

vir oorsese studie aan die Indiana Universiteit, Bloomington, V.S.A. Sy het 2½ maande aan die Universiteit deurgebring waar sy elektronmikro-skopiese studies van die klierhare van Cannabis sp. uitgevoer het.

NEW POSTS AT NATIONAL BOTANIC GARDENS, KIRSTENBOSCH: The National Botanic Gardens is an autonomous state-aided Institution whose newly-revised objectives were unanimously approved by Parliament during the 1984 session. In order to achieve these aims, the management team must be augmented and applications are being sought for two senior posts with duties commencing as early as possible in 1985.

The ASSISTANT DIRECTOR: RESEARCH will be responsible for leading the research team and will concentrate on the biology of endangered plants, the utilisation of indigenous plant species and the solving of allied horticultural problems. The applicant does not need to be a specialist in any specific field of botany, but is expected to be enthusiastic and dedicated and to be able to achieve a high performance in research.

The ASSISTANT DIRECTOR: HORTICULTURE will be responsible for leading the horticultural team and will have to be able to give expert professional and technical guidance to the horticultural staff at Kirstenbosch and the other countrywide regional gardens.

Prime considerations for both posts are exceptional academic qualifications and superior communication and management skills.

Salaries are negotiable and apart from the standard fringe benefits, there is a possibility of housing accommodation at a nominal rental at Kirstenbosch.

Applicants should forward a full curriculum vitae and the names of at least two referees to:

The Director (Confidential), National Botanic Gardens,
Private Bag X7, CLAREMONT, 7735

To reach him not later than 15 November 1984.

Further information can be obtained from Mr. A.W. Jordaan at the above address or at (021) 77-1166.

CONGRESSES / MEETINGS:

Forest Products Research International - Achievements and the Future:

An international symposium to commemorate 25 years of timber research at the Council for Scientific and Industrial Research (CSIR) in Pretoria, South Africa, will be held from 22 to 26 April 1985. The symposium is being organized by the CSIR's National Timber Research Institute (NTRI) and will consist of a number of seminars, each with its own subject of discussion. One seminar will deal with Fundamental Properties of Wood, and the IAWA, at its business meeting on 5 October 1983, decided to hold its regular meeting for 1985 in South Africa as part of this seminar. All papers on Wood Anatomy, Ultrastructure and Related Properties will be included under this seminar.

The international symposium is gaining support from all over the world. Over 100 papers have already been offered for the various seminars by experts from 24 countries in North and South America, Western and Eastern Europe, Scandinavia, the Far East and Africa, and also Australia, New Zealand and the United Kingdom. An equal number of papers is expected from South African participants.

Excellent co-operation is also being received from the leading international forest products research organizations.

The seminars on Natural and Synthetic Adhesives, Composite Products, Timber Drying, and Research Management are all being organized as official subject group and working party meetings of the International Union of Forestry Research Organizations (IUFRO).

The International Academy of Wood Science (IAWS) is offering its Academy Lecture, a high point in its annual activities, as part of the symposium proceedings.

If you are interested in attending the symposium contact The Symposium Secretariat S.315, CSIR, P.O. Box 395, PRETORIA 0001, South Africa.

International Association for Vegetation Science: The Working Group for Data-Processing of IAVS is making the preliminary announcement of a symposium on 'Models in vegetation science' from 17-22 June, 1985, in connection with a summer course on 'Methods and models in vegetation dynamics' from 5-14 June 1985, for Ph.D. students and young Ph.D.'s to be held at University of Uppsala, Sweden.

Suggested items

- Models in vegetation dynamics at various space and time scales
- Models for the dynamics and maintenance of species diversity
- Models of species and community response to environmental gradients and disturbance regimes
- Models in plant population dynamics
- Phenological models
- Models of vegetation and species geography in relation to climatic variables
- Models in community analysis

IAVS Colloquy: A colloquy entitled "Vegetation and Geomorphology" will be held at the Town-hall Bailleul, northern France from 1st - 4th April 1985 and will cover any subject from the relations of vegetative landscapes with major accidents of geomorphology to the effects of microtopography on the variations of the plant-communities. Price of participation including meals 250 FFfr. The Council of IAVS will assemble on 31st March in Bailleul. Contact address: Station de Phytosociologie, Hameau de Haendries, F-59270 BAILLEUL, France.

S.A. Society for Plant Pathology: The Society's congress for 1985 is to be held at the Hogsback and the University of Fore Hare, Alice, Ciskei, from 22-24 January 1985. Buses will transport delegates from the hotels at the Hogsback to the lecture venues at the University of Fort Hare.

You are reminded of the following congresses/meetings:

1984, December 5-7. Electron Microscopy Society of Southern Africa, Conference, at University of Stellenbosch, Stellenbosch. Information: Dr. R. Day, Institute for Electron Microscopy, P.O. Box 70, Tygerberg 7505. Tel. (021)-932 0311.

1985, January 14-19. S.A.A.B. Annual Congress at Potchefstroom University for Christian Higher Education, Potchefstroom. Information: The Secretary: Organizing Committee (Dr. G.J. Bredenkamp), Department of Botany, Potchefstroom University for C.H.E., Potchefstroom 2520. Tel. (01481) 22112 x 420 (Dr. Bredenkamp or Miss Coetzee), or x 278 (Prof. D.J. Botha).

=====

REDAKSIE/EDITOR

Mnr. E.G.H. Oliver
Posbus 471
STELLENBOSCH
7600