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

WATTLE RESEARCH INSTITUTE, UNIVERSITY OF NATAL, PIETERMARITZBURG:

Silviculture Section: This Section, headed by Mr. J.A. Stubbings, has carried out harvesting of experiments on thinning, weeding, and fertilizing of wattle. The emphasis in silvicultural work on wattle is now directed towards the regeneration of plantations by means of transplants raised from selected seed, and its attendant problems, and the effects of cultural treatments on the quantity and quality of timber yields are also being studied.

Dr. Schönau is continuing his mensurational studies on black wattle and eucalypts, and has completed a general volume table for wattle in imperial measure and one for *Eucalyptus grandis* in imperial and metric measure, with the latter of which are included volume tables for trees with different average thicknesses of bark. Timber/Bark weight ratio tables for wattle, percentage utilization tables for wattle and *E. grandis*, and a provisional volume table for *E. macarthuri* have also been prepared.

The Section is pursuing studies on coppice behaviour in *E. grandis* and the relation of timber yields from seedling stands of this species to those from subsequent coppice crops. In addition, a long-term thinning experiment for sawlog production from *E. grandis* in the Natal Midlands has been established.

In collaboration with the Plant Breeding and Genetics Section, progeny trials of various *E. grandis* and *E. saligna* selections have been laid out to test and compare their growth and yield performance under Natal conditions.

Plant Breeding and Genetics Section: Under the direction of Miss K.M. Nixon, this Section has continued to lay down trials for the assessment of selected progenies as part of an integrated programme of selected seed production for

the wattle industry. All of the earlier trials have been established on the Bloemendal Field Experiment Station of the Institute near Pietermaritzburg, but a trial of nine families has been planted, with replications, on sites near Pietermaritzburg, Rietvlei, Seven Oaks, and Glückstadt in Natal, Melmoth in Zululand, and Piet Retief in the Transvaal. The main objectives of this trial were to investigate genotype environment reactions and to compare, in various environments, trees raised from seed from a half sib seedling seed orchard with those raised from commercial seed.

A considerable quantity of selected seed from a half sib seedling seed orchard has already been made available to growers, and the first yield of seed from a full sib seedling seed orchard has recently been obtained. A second full sib seedling seed orchard has been planted, and a clonal seed orchard is being established by budding.

In addition to the work described above, studies are being continued on S_1 inbred lines from selected trees, and on progenies obtained from controlled intercrossing of S_1 inbred parent trees and of clones of selected parents.

Selections for progeny trials with some of the main commercially-grown *Eucalyptus* species will shortly be started.

Dr. A.A. Moffett, former head of this Section, has returned to work in the Institute on a part-time basis and is assisting in the collation and coding of breeding records.

Plant Physiology and Pathology Section: Dr. F.C.J. Zeijlemaker, who is in charge of this Section, has recently confirmed that the fungus *Phytophthora nicotianae* var. *parasitica* is the causal organism of the black-butt disease of black wattle, which is both widespread and a source of considerable loss to the wattle industry.

Investigations of an unusual disease condition in black wattle, which has been tentatively named 'blind pocket disease', have failed, so far, to determine a causal pathogen. The condition is characterized by numerous longitudinal pits in the wood of the stem into which pegs of bark proliferate, and resembles the 'bitting and pegging' symptom of some virus diseases of trees. Neither bacteria nor fungi have been isolated from diseased tissue and attempts to transmit the disease artificially to healthy trees have been unsuccessful.

Work on tissue culture of wattle was continued, and a medium was developed which induced the formation of appreciable quantities of callus tissue from the cambium side of wattle bark. Experiments on the vegetative reproduction of wattle by rooting buds on culture medium are in progress.

A dieback disease of *F. grandis* which is fairly widespread in southern Natal is being investigated as are other disease conditions in eucalypts in Natal and the south-eastern Transvaal.

Chemistry Section: Mr. D.C.F. Garbutt, the Head of this Section, has detected an antifungal component in extracts of diseased wattle bark, but no active compound has yet been isolated in pure form. Fractionation of the antifungal material resolved it into three major and several minor components, each of which was found to hold a part of the antifungal activity, and when they were recombined the original activity was restored. Large-scale extractions of the antifungal substance are being undertaken in order to obtain sufficient material for further analytical studies. It is hoped that the recent acquisition of a modern chromatographic detector system will advance this work.

Investigations into techniques designed to reduce the time involved in the current method of tannin determination are in progress.

Mr. Garbutt, who has had some experience in grafting and budding of nut trees, has developed a successful technique for budding of black wattle and this is now being used in the establishment of clonal seed orchards, and the propagation of selected trees.

Entomology Section: The Acting Head of this Section, Mr. R.B. Borthwick, is carrying out a detailed study on the biology, ecology and control of Scarabaeidae occurring in wattle and eucalypt plantations. Work is also being carried out on methods of controlling termites in plantations and borers attacking un-debarked wattle timber.

Studies on the biological and chemical control of the wattle bagworm (*Kotochalia junodi*) have been hampered by lack of infestations suitable for spraying trials.

Dr. A.D. Connell, who has recently left the Institute to join the C.S.I.R., initiated work on the control of the brown wattle mirid (*Lygidolon laevigatum*)

by means of systemic insecticides and these investigations are being pursued by Mr. G.A. Hepburn, former head of the Section, who has returned to work in the Institute on a part-time basis.

Extension Section: The Extension Officer, Mr. V.R. Davidson, is actively occupied in assisting wattle growers to rationalise their plantation acreage in the light of a reduced demand for vegetable tanning materials on world markets. In addition, he conveys the results of research at the Institute to growers of wattle and eucalypts and furnishes a general advisory service to them, especially in respect of economic methods of growing and harvesting, in which latter duty he is assisted by the Silviculture Section.

DR. PETER GOLDBLATT will be leaving the University of Cape Town at the end of April to take up a position with the Missouri Botanic Gardens in St. Louis, U.S.A. He intends continuing his work on the genus *Moraea*, which is under revision, and will maintain his interest in the cytology and morphology of the South African petaloid monocots, although he will be working mainly on non-South African plants.

CURATORSHIP, COMPTON HERBARIUM, KIRSTENBOSCH: Due to the retirement of Miss W.F. Barker in September 1972 after 43 years as Curator of the herbarium, applications from suitably qualified and experienced taxonomists with a knowledge of South African flora, are invited. (Salary: 4200 x 150 + 4800 x 300 - 5400, and a vacation savings bonus).

Details about the duties, conditions of service, etc., and application forms are obtainable from the Director, National Botanic Gardens of South Africa, Newlands, C.P. Closing date: 31st July, 1972.

UNIVERSITY OF NATAL, DEPARTMENT OF PASTURE SCIENCE & AGRO-METEOROLOGY:

Head of Department: Prof. J.D. Scott

Associate Professor: Prof. P. de V. Booysen

Senior Lecturers: Dr. N.M. Tainton

Dr. J.M. de Jager.

The Department of Pasture Science offers courses leading to the degree of B.Sc. Agric. with Pasture Science or Agricultural Production as a major.

Candidates taking the Pasture Science option are trained for research and those taking Agricultural Production look to the Agricultural Extension Services or Commerce as their field of work. Courses in Pasture Science include studies on Pasture and Veld Management and Land Use, Morphology and Taxonomy of grasses and legumes, Pasture Crop Physiology, Advanced Plant Ecology and Pasture Research Techniques. Research projects are carried out in the final year of Pasture Science. A feature of the Agricultural Production major is Planned Land Utilisation in which every candidate plans the farming and land use of a particular farm.

Post-graduate courses are offered in both Pasture Science and Agricultural Production. Research on veld management including burning, mowing, fertilizing and grazing is carried out while detailed studies on Physiology of Growth and Aut-Ecology of the more important grasses are part of the research programme.

The sub-department of Agro-meteorology offers a 4 year degree course in Agro-meteorology - the study of the environment in which all agricultural production takes place. A wide field of research is being covered in the study of crop and pasture production in relation to the environment.

OPERASIE BOOMREUSE: Sedert Sy Edele, die Administrateur van Transvaal, mnr. S.G. van Niekerk, op 17 Desember 1971 in sy radiorede, die projek Operasie Boomreuse, van stapel gestuur het, was daar 'n goeie reaksie van die publiek van Transvaal. Gegewens van 95 groot boomreuse is ontvang. Hierdie getal sluit slegs inheemse bome in. Gegewens van uitheemse bome soos bloekoms, eike, e.a. asook insendinge vanaf ander provinsies is nie hierby ingereken nie. Insendinge het ingestroom van heinde en verre, van L.V.'s, sakemanne, onderwysers, geneeshere, boere, huisvrouens, koerantmanne, amptenare, 'n stadsklerk en baie ander, nie net van bosbouers, plantkundiges en natuur-bewaringsbeamptes nie.

Hier volg nou enkele uittreksels uit die gegewens wat tot einde Februarie 1972 ontvang is:-

Die hoogste inheemse boom, volgens insendinge, in Transvaal is 'n Apiesdoring (*Acacia galvini*) van die plaas Buckingham 352 MR distrik Potgietersrus. Dit is 35,4 m (116') hoog, met 'n stamontrek op borshoogte van 6,5 m (21') en 'n kroonspan van 36 m by 31,4 m (188' x 103'). Die gegewens is verstrekk deur

mnr. J. van Rooyen, natuurbewaringsbeampte, wat baie moeite gedoen het om die plaas "Deadbeat" op te spoor wat deur wyle Eugene Marais beskryf is as die tuiste van die reuse aniesdorings van weleer. Sedertdien is met die hulp van mnr. C.J. Reinecke, L.V. vir Pretoria Distrik, vasgestel dat Buckingham 'n gedeelte van die onderverdeelde plaas "Deadbeat" is, en daar bestaan weinig twyfel dat hierdie aniesdoring op of baie naby die presiese plek staan van Eugene Marais se reuse.

Kort op die hakke van dié boom is 'n geelhoutboom (*Podocarpus latifolius*) van die plaas Mariëskop 420 KT, distrik Pilgrims Rest, van 35 m (115'). By die Tshipise warmbron, distrik Messina, staan 'n Njalaboom (*Xanthocercis zambesiaca*) van 32 m (105'). Die hoogste koorsboom (*Acacia xanthophloea*) is 30,5 m (100') hoog en staan op die plaas Antonvilla 7 MT, distrik Messina.

Die hoogste anaboom (*Acacia albida*) is 25,9 m (85') hoog en staan op die plaas Olifantshoek 1 LP, distrik Thabazimbi. Dit is interessant om te weet dat 'n anaboom van 21,3 m (70') op die plaas Groothoek 129 LS, distrik Pietersburg, eienaar mnr. D.S. Pretorius, reeds in 1899 as 'n uitspanplek gedien het vir poskoetse e.a. koetse wat koper vervoer het tussen Messina en Pietersburg. Die hoogste hardekool (*Combretum imberbe*) te vind op die plaas Grovedale 239 KT, distrik Pilgrims Rest is 25,6 m (84'); insender mnr. M.P.S. van Eysen van Hoedspruit. Die hoogste wildevy (*Ficus petersii*) staan op Barberton se sportgronde langs die voetbalveld; dit is 22,9 m hoog.

Maar ons is nie net geïnteresseerd in the hoogste bome nie, ons stel ook belang in die omtrek van die stam en sy kroonspan. Ons grootste kremetartboom (*Adansonia digitata*) staan op die plaas Nonsiang 127 MT, distrik Messina en sy afmetings is: hoogte 25,9 m (85'); stamomtrek 19,2 m (63'); kroonspandeursnee 32,8 m (108'). Maar hierdie boom is by ver nie die dikste nie. Op Glencoe 210 MT, distrik Pilgrims Rest, staan 'n kremetart met 'n stamomtrek van 39,6 m (130"), en op Platrand 401 LT, distrik Letaba staan een met 'n omtrek van 39,2 m (128' 5").

Die boom met die grootste kroonspan is moontlik die Trassiebos (*Acacia hebeclada*) wat op die plaas Kouwfontein 367 KR, distrik Waterberg, staan. Dit is maar 6,1 m (20') hoog maar het 'n kroonomtrek van 192 m (630'), d.w.s. die boom beslaan 'n gebied amper so groot soos 'n voetbalveld. Die

Die ou oorspronklike stam kan nog uitgeken word vanwaar vertakkinge in alle rigtings versprei wat grond raak, wortel skiet, stamme vorm en takke weer in alle rigtings uitstoot wat weer op hulle beurt die proses herhaal.

Baie van die ander interessante gegewens wat deur ons ontvang is help om mens 'n idee te gee van die ouderdom van ons bome. Mnr. W.J. Fourie van die plaas Tambotienan skryf dat die plaas vernoem is na 'n groot tambotieboom wat langs 'n pan staan en die oorspronklike transportakte wat in sy besit is, is gedateer 1875. Hierdie boom is 14 m (46') hoog met 'n stamomtrek van 5,5 m (18'). 'n Ander baie bekende boom, 'n wildevy (*Ficus ingens*), is die sg. "Moffatboom" soos baie mense dit deesdae noem. Robert Moffat, die sendeling, het dit "The Inhabited Tree" genoem omdat die boom deur 'n groepie natuurlike bewoon is weens leeugevaar. Moffat se beskrywing van die boom dateer voor die dae van die Groot Trek, d.i. aan die begin van die vorige eeu. Die afmetings van die boom soos verstrekk deur mnr. F.A. Fuls, Bultfontein, Rustenburg is: hoogte 10,8 m (35'6"), stamomtrek 6,7 m (21'6"), kroonspan-deursnee 30,5 m (100'). Die boom staan op die plaas Bultfontein 259 JQ, distrik Rustenburg.

UNIVERSITEIT VAN PRETORIA : PLANTKUNDETOER NA KAAPLAND:

Gedurende die afgelope Aprilvakansie (29 Maart - 9 April) het 'n groep personeel, nagraadse en voorgraadse studente van die Departement Algemene Plantkunde van die Universiteit van Pretoria 'n plantkundige ekskursie na die Kaapprovinsie onderneem. Die toer het plaasgevind onder leiding van dr. A. Eicker.

Toerprogram: Die groep het uit 33 lede bestaan en het per bus en kombi gereis. Die reis het op Woensdagaand (29/3/72) om 8 nm. begin. Die H.F. Verwoerddam is gedurende die vroeë oggendure van 30 Maart besoek en dit was 'n indrukwekkende gesig om die massa water te sien neerstort met al die sluise oopgetrek. Tydens die reis na Beaufort Wes is telkens aandag gegee aan die Karroo flora (Skyn hoër Karroo volgens Acocks). Op verskeie plekke is stilgehou en herbariummonsters is versamel. Nadat die groep op Beaufort Wes oornag het, is die reis vroeg die Vrydagoggend voortgesit. Die flora van die Swartbergpas (Karoo-agtige gebroke veld, sukkulente bergstruikveld en skynfynbos) het besondere aandag geniet. Lang stantogte is teen die pas

onderneem en 51 verskillende herbariummonsters is hier geneem. Die middag is ook 'n besoek gebring aan die Kangogrotte en die aand oornag die groep op Knysna.

Saterdag 1 April is die plantkundige aspek van die toer in alle erns aangepak. Onder leiding van mnr. H. Henicken, tegniese beampte van die Departement Natuurbewaring, K.P., is 'n staptog in die duineveld van die Goukamma Natuurreservaat onderneem. Die studente het deeglik kennis gemaak met kusduinstruikgewas asook die fynbos. Veral van belang was 'n waarneming van die interessante proewe wat hier gedoen word met veldbrand en uitkap van fynbos ten einde grasse gevestig te kry. Tydens hierdie dag-lange staptog is 32 herbariummonsters versamel. Die aand oornag die groep in die veld, in die Goukamma reservaat.

Die Sondag het hulle die Knysna en Tsitsikamma kuswoude besoek tot sover as die Stormsrivier. Die studente het dit veral interessant gevind om so 'n verskeidenheid fungi, lichene en mosse op die woudvloer aan te tref. Bykans 100 monsters van lichene en fungi is versamel. Die nag is weer in die veld deurgebring.

Maandag die 3de April is die reis voortgesit na Bettysbaai. Vir die volgende drie dae, d.w.s. 4, 5 en 6 April is 'n ekologiese opname gemaak van die fynbos-flora van 'n kloof te Bettysbaai. Hierdie gebied is deur die Departement van Landbou-tegniese Dienste onsvgesit as 'n natuurreserwe en 'n gebied waar navorsing op Proteas gedoen word. Die gebied is onder beheer van dr. M.M. Vogts. Tydens die opnames is 11 kwadrate van 5 meter x 10 meter willekeurig oor die hele gebied, tot bo in die kloof, uitgesit en plante is gemonster, is 'n bedekingswaarde toegeken en geïdentifiseer. Met die identifikasie van die plante in die veld is die vriendelike medewerking van mnr. Danie Spreeth, lektor van Stellenbosch, mnr. Charlie Boucher, van die Navorsingsinstituut vir Plantkunde, Stellenbosch en dr. M.M. Vogts verkry. Sonder hierdie persone se gewaardeerde hulp sou die opnames nie so suksesvol gewees het nie. Tydens die opnames is ongeveer 100 herbariummonsters versamel. Die resultate van die opnames sal verwerk word en aan dr. Vogts beskikbaar gestel word.

Vrydag 7 April is die reis voortgesit na Kaapstad. Aangesien die stad en skiereiland in 'n digte mis gehul was, is afgesien van die plan om die kusp pad om die skiereiland te volg. Interessante plekke in die stad self is besoek

o.a. die kasteel, parlamentsgebou en parade. Die middag is in die Nasionale Botaniese Tuine van Suid-Afrika te Kirstenbosch deurgebring en die aand oornag die groep te Worcester, nadat 'n vlugtige besoek aan Paarl gebring is. Die volgende dag is die reis via Tulbagh en Ceres voortgesit. Die restourasie aan baie van die huise wat tydens die aardbewing vernietig is, is in volle gang. Teen die berge om hierdie dorpe is tekens van grondverskuiwing en rotsstortings nog duidelik waarneembaar. Die studente se aandag is ook gevestig op die flora van hierdie gebied (karroo-agtige gebroke veld en renosterbosveld) en 30 herbariummonsters van die flora, veral in die Michelspas tussen Tulbagh en Ceres is versamel. Die aand oornag hulle te Beaufort Wes en vertrek die oggend van 9 April om 1.00 vm. terug na Pretoria waar hulle 6 nm. arriveer.

DEPARTMENT OF SOIL SCIENCE, UNIVERSITY OF NATAL, PIETERMARITZBURG.

This very active Department is headed by Professor E.R. Orchard.

Associate Professor: M.E. Sumner.

Senior lecturers: Dr. J.M. de Villiers

Dr. J. le Roux.

During the last 20 years the Department has trained 60 students for Bachelor degrees, 24 Master's degrees and 10 Doctor's degrees. Staff and students have produced 80 scientific papers.

Fields of research interests within the Department -

(1) Soil survey and soil classification: During the early 60's a project to study, describe and classify the soils of the Tugela Basin was started which culminated in a comprehensive report in 1969. The system of soil classification adopted has since been accepted as the basis for the national classification.

(2) Soil acidity and its amelioration: Highveld sourveld soils have been studied in detail, these are acid, highly weathered and leached. Despite very low natural fertility they are potentially highly productive, and stable to erosion. They have a high phosphate fixing capacity and require high phosphate and lime application.

- (3) Field experimentation - fertilizer and lining treatments: Extensive field experiments with maize have been carried out. In 1955 an unfertilized plot yielded 5-10 bags per morgan and in 1970 117 bags per morgan.
- (4) Ionic equilibria studies with particular reference to the potassium status of Natal soils.
- (5) Clay mineralogy: Crystalline and amorphous clay-size components of these soils have been determined quantitatively.
- (6) Soil-water relationships.

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