

INTRODUCTION TO DISCUSSION

E. R. ORCHARD, University of Natal

Mr Chairman and gentlemen, we have been given a plan of action, a line of approach to one of our important problems and a forecast of the course of things to come. It is a scheme for putting into effect better planned and co-ordinated fertility research and it is the result of some clear and logical thinking. It offers a sounder basis than anything we have had hitherto. Above all, it is a practical and workable plan. Whether it will be accepted and implemented is another matter. Even if it is not implemented in the near future I am confident it will be accepted in due course, for the simple reason that it is the best and most logical workable basis that we know of.

One may ask why has this unifying element viz. the nature of individual soils not been used to a greater extent before as the foundation of our planning of research and production. The answer is that hitherto there has not been sufficient information in South Africa about our soils to justify, with any degree of confidence, formulation of a major plan of action using soil characteristics as the basis. The further question arises, have we in fact sufficient information available at present to warrant the approach Dr de Villiers has advocated here today? This question deserves some consideration. I propose to deal with it at some length. Forgive me if I must go a long way back and start with a somewhat academic principle which nevertheless lies at the heart of all scientific progress. It is the question of what constitutes a sound basis on which to generalize and predict. No scientific discipline can make real progress until its workers, by careful study, have classified the things they deal with and until they understand what are the underlying reasons for, and the laws which explain, observed facts. An example will illustrate my point: once the majority of chemical elements had been classified, the properties of certain other elements, yet to be discovered, could be predicted. This was possible only because the classification system reflected regular patterns of behaviour among the elements and this knowledge led to great forward strides in chemistry.

The case of soils is no different — once we understand why soils have the properties we observe, why they occur in the places where we find them, by what criteria we can classify them, then only does the grand overall scheme and pattern of things become clear and can our knowledge be used for purposes of prediction. The ability to generalize and predict with reasonable accuracy provides the springboard for real progress. By contrast, to acquire knowledge by the process of trial and error is a slow and painful business. If, for example, 100 widely scattered field fertilizer experiments on a variety of soils and with a single crop were to be conducted, one would expect to find a considerable range of responses to the various nutrients. It would be difficult to draw any worthwhile conclusions and generalizations from such data. If however, the soils at the 100 experimental sites are classified the response data could possibly reveal recurring patterns of behaviour, at least for certain of the soil types. The value

of the findings would then be considerably enhanced because a basis is thereby provided for predicting responses at other sites where pedologically similar soils occur. Once an acceptable basis for generalisation is revealed we can make deposits in the data bank and open a separate account for each agriculturally important soil.

Although there still remains a great deal to be learned about our soils Dr de Villiers has implied that we now have a more secure basis on which to proceed to better co-ordination of research in soil fertility. He calls for comment on his proposals and it is for dissidents to come up with a better alternative. He regards the soil type (or series) itself as the important entity playing its co-ordinating rôle and the series is regarded as a fitting unit or receptacle for storing classified information.

Dr de Villiers het 'n wye ondervinding en kennis van die gronde van die Republiek en ook SWA opgedoen in die loop van bodemopnames en laboratoriumwerk. Daar is min wat ons gronde ken en verstaan soos hy; hy is ook mede-outeur van „Soils of the Tugela Basin”* wat nou by die drukkers is. Hy vind dat baie van die landboukundig belangrike gronde wat in die Tugelakom voorkom ook wyd elders in ons land verspreid is. Hy en sy kollegas, op grond van hul werk en ondervinding, het 'n grondklassifikasiesistelsel aangebied wat voldoen aan en aanpas by die besondere eienaardighede en behoeftes van ons land en wat tegelykertyd op deeglike en erkende pedologiese prinsiepe berus. Dit is ook aangepas by die behoeftes van diegene wat in die landboupraktiek staan soos bv. voorligtingsbeambtes en ander wat nie bodemdeskundiges is nie. Dit was nie 'n maklike taak nie — dit is opgestel vir Natal waar die toepassing alreeds goeie diwidende inbring. Soos ons gehoor het, word dit ook reeds in die Transvaalstreek toegepas en ek is seker dit sal mettertyd op 'n nog wyer basis aanvaar word namate die voordele beter begryp word. Dr de Villiers sal dit binnekort verder uitbrei en voorlê as 'n omvattende nasionale klassifikasiesistelsel. Hy beklemtoon dat die klassifikasiesistelsel 'n middel tot 'n doel is en nie 'n doel in sigself nie.

Hy plaas voor ons die begrip om die grondeienskappe te gebruik eerstens as basis vir 'n voorraadopname van bestaande kennis; tweedens as basis vir beplanning van ons navorsing en in besonder die koördinasie van navorsing op die gebied van grondvrugbaarheid en akkerbou, en in die laaste plek om ons te voorsien van die rekeningnommers in ons bank van kennis en gegewens waar bestaande en toekomstige kennis opgeberg kan word en waar diegene wat bevoegd is om tjekboekies te besit, op die kennis kan gaan trek. En om vir 'n tjekboekie te kwalifiseer sal dit nodig wees om 'n sekere minimum bevoegdheid op te doen in die kuns om die grondseries te kan herken — die sleutel en handboek hiervoor sal kortliks beskikbaar wees vir die wat belangstel. Sy hooftema vandag was 'n pleidooi vir meer direkte en beter gekoördinerende navorsing op die gebied van grondvrugbaarheid. Hiermee is ons

* VAN DER EYK, J. J., MACVICAR, C. N. & DE VILLIERS, J. J., 1969. Soils of the Tugela Basin. The Town and Regional

Planning Commission, Pietermaritzburg, South Africa. (Pub. Jan. 1970).

dit almal eens en dit is onnodig om verder vir reeds bekeerdes te preek. Die waarde van sy bydrae is die aanbieding van 'n basis waarop die koördinasie kan geskied — 'n wetenskaplik aanneemlike en prakties uitvoerbare voorstel waarop hy reeds jare al werk om dit tot stand te bring.

In die loop van die bespreking hoop ons om te vernem of die voorstelle ook byval by ons kollegas vind. En indien wel, of dit ook amptelik en deur 'n 'hoër outoriteit' erken en aanvaar sal word; deur die Departement Landbou-tegniese Dienste, Streke, deur Navorsing en Voorligting, en deur privaat instansies en boere. Indien dit aanvaar sou word nadat dit blootgestel is aan die kritiek en kommentaar van die wat daarby betrokke is, is daar net een stap verder, nl. om dit in werking te stel. In my opinie lê die pad oop voor.

Mr Chairman: Dr de Villiers has emphasised the need to recognize the soil as the prima donna whose temperament and whims must be understood and accepted if the soil fertility aria in the agriculture opera is to enjoy a long run to full houses. The highest priority before us is the challenge to contain soil erosion. This also needs a co-ordinated plan of action and its proper basis should be none other than the soil properties themselves. We understand today better than ever before which soils are markedly unstable and erodible and why they erode. We have learned by our mistakes of the past but we now have a sounder scientific basis on which to plan to meet the challenge. If our pedologists are given the opportunity, they can make their contribution also in this field as they are making it in planning irrigation projects and our general agriculture, including the fertility aspects.