

Summary of a Statement made at a Meeting in Campinas by Dr. B.L. Nestel

Mar. 13/72

Dr. B.L. Nestel from the Canadian International Development Research Centre, (IDRC) explained the interest of his organization in supporting work on Cassava. Currently IDRC was involved in a five-year program totalling approximately \$3,000,000 for supporting cassava. The centre of this program was based at CIAT, (International Centre for Tropical Agriculture) in Colombia and the CIAT program had linkages to both Canadian Institutions and to research centers in Developing Countries not only in Latin America but also in Asia and Africa.

About half the support was centred at CIAT where a substantial program was getting under way with the objective of producing a high yielding mosaic-resistant variety or varieties of cassava that were ecologically adapted to a wide range of different conditions. A feasible productivity target appeared to be 80 - 90 tons/ha. per year. High yield seemed to be related to a large leaf area index but little was known about the factors affecting the distribution of dry matter between roots and tops. Whilst some knowledge existed on the effects of plant density and angle of planting on total yield, the results from fertilizer treatments on cassava were highly variable.

The most serious disease of cassava appeared to be mosaic, especially in Africa where this disease was of very much more importance than it was in Latin America. In the latter area, *Pseudomonas* was widespread and caused severe damage in some areas.

Limited knowledge appeared to exist regarding the nitrogen status of the cassava root. 40 - 50% of the nitrogen in the cassava root appeared to be in the form of protein nitrogen with an unknown portion of the residue existing in the form of cyanogenic glycosides. Recent evidence indicated that these could be of some significance in bringing about chronic poisoning due to interference with the metabolism of sulphur containing amino acids.

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At a meeting held at CIAT earlier this year when cassava specialists from throughout the world participated in a program review, the need for a germ plasm bank was accepted without question, however, the mode of setting up such a bank was not resolved. Because of the large number of cultivars existing and the ease with which inter-specific crosses can be made, a great deal of effort will be required to devise methods of rapid evaluation of germ plasm resources. A possible tool in the breeding program is the use of tissue culture for preservation of germ plasm and also for freeing rapidly growing meristematic material from mosaic so that such material can be safely transmitted from one country to another. The Canadian component of the IDRC cassava program offered the opportunity for carrying out more esoteric research such as tissue culture and at the same time optimising both physical and personnel resources.

Other research activities which were in progress or under consideration in the Canadian component of this program involved global studies of supply and demand prospects for cassava as both human and animal food and also for industrial starch. However, such studies were not attempting to look at market prospects for fortified cassava products.

The use of newer chemotaxonomic techniques to facilitate evaluation of the various existing germ plasm collections was also being studied in the laboratory in Canada as was the metabolism of the cyanogenic glycosides both in the fresh plant and in the processed plant. Post-harvest studies on discolouration in fresh material were also about to commence. A particular interest was also being taken in microbiological studies to increase the protein content of cassava being used for animal feeding. These studies appeared to complement rather than duplicate other work to be described at the Rio meeting and particular emphasis was being placed on the use of starch factory residues and on nitrogen-enriched cassava silage both for use as animal feed.

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The third link in the Canadian-CIAT program was the establishment of outreach linkages to cassava programs in other parts of the world. The first such link was a bridge between CIAT and the Agronomic Institute at Campinas to study various approaches to heat and chemical treatment of cassava cuttings to free them from the mosaic virus. Discussions were underway to link this work with virus studies in Africa, possibly using a Canadian Institution as the laboratory centre for comparative studies since there was no risk of virus diseases being introduced into Canada from cassava. Discussions were under way with regard to comparative agronomic trials in certain African and Asian countries and on further fermentation work in the Far East. The outreach aspect of the program was only beginning to commence and was expected to expand as the core program at CIAT itself started to identify possibilities for collaboration and growth.

Dr. Nestel concluded his remarks by briefly referring to some of the recent medical work emanating from Nigeria and Zaire which indicated that chronic cassava toxicity might play a significant role in certain neurological and metabolic diseases in humans. Whilst there was strong circumstantial evidence for associating cassava with nutritional ataxic neuropathy in Nigeria, its role in the genesis of goitre in Zaire was more controversial. In both diseases, the cyanogen group was reputed to combine with the sulphur containing amino acids particularly cystine and cysteine and through this to lead to a series of metabolic disorders involving the sulphur-containing amino acids and additionally, perhaps vitamin B₁₂. Both the epidemiology and the metabolic processes associated with these diseases were somewhat obscure. They appeared to be diseases of some significance in certain African communities and were probably associated more with the processing technique than with the original CN level in the cassava. Because of the many uncertainties surrounding these diseases, the recentness of their discovery and their apparent importance in certain communities, IDRC was exploring the possibility of supporting an inter-disciplinary examination of the factors associated with these conditions.