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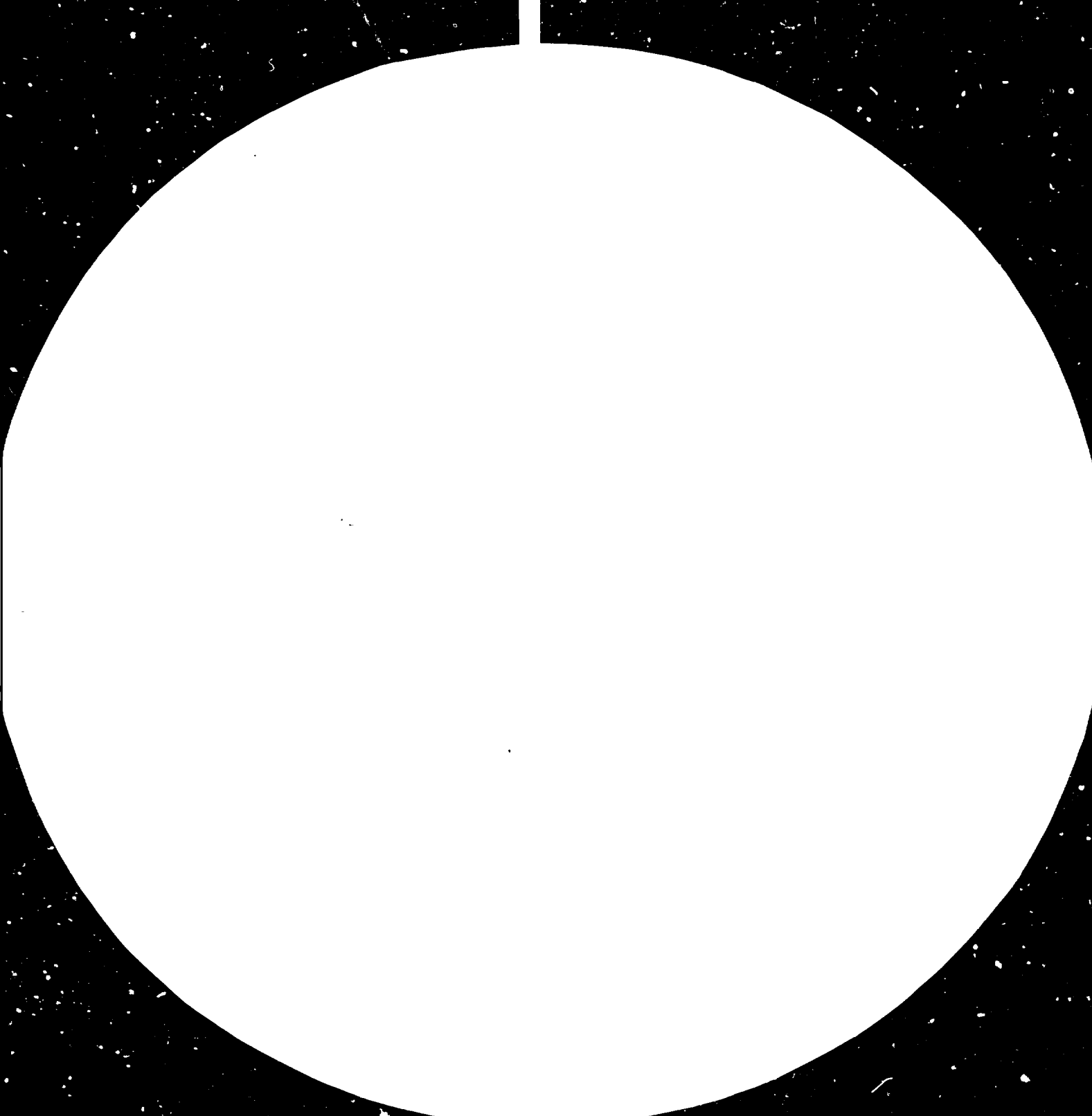
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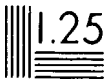
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Resolution Test Chart
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Meeting on Exchange of Experiences and
Co-operation among Developing Countries in the
Development of Agricultural Machinery Industry
Beijing, China, 20 - 27 October 1980

COUNTRY SUMMARY - ZAMBIA*

by

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As far as 1977, it was decided that an Agricultural Machinery Research and Development Unit be set in Zambia to look into farm machinery problems, to study the needs of Zambian agriculture in respect of hand, animal and engine powered equipment on a continuous basis, to investigate and collect information available from countries working on similar problems regarding agricultural equipment, to coordinate the introduction and construction of prototype tools and machines, to adapt existing designs and to develop new ones suitable for Zambian conditions and to undertake operational and qualitative testing of these machines under various agricultural conditions that occur in Zambia and advise on the provision of spare parts, servicing, etc.

Research into crop production methods associated with the introduction of improved mechanization and investigation into the farm management factors involved in the introduction of improved mechanization and economic and social benefits could also be looked into. The Research and Development Unit should encourage and advise on local manufacturing of tools and machines and advise on the training of farmers and extension workers regarding farm machinery operating techniques. The Research and Development Unit in cooperation with the University of Zambia have considered the following farm machinery equipment under the Testing Programmes. Detailed information could be made available from Zambia.

- (a) Field Test performance of the ox drawn bar - This test was done to assess the performance of the four tool bars, together with various attachments available within conventional system of tillage, and to establish whether a tool bar is more efficient in each of its rows, than the traditional equipment. Although the conventional implements and the pedestrian controlled tool bars (uni-bars) perform satisfactory, it was obvious (N.I.A. and Mochured) required a great deal more of operator skill and higher degree of outtraining than was available.
- (b) Tinkabi Tractors - To assess the performance of the Swaziland built Tinkabi Tractors in conjunction with the implements available. No serious break-downs occurred although trouble was experienced with the flexible hydraulic pipes, exhaust pipe and draw bar, and mounting assemblies.

- (c) Hoe Testing Programme - Hoes were distributed to farmers and observations were made as to their field performance. This programme is still continuing and the conclusions should be available soon.

The following items have been submitted for field tests - Zig-Zag Harrow, Triangular Harrow, The Ox-Drawn Plough, Ox-Drawn Ridge, Ox-Drawn Cultivators, Plough Shares and Mouldboard.

Manufacture of Equipment

Some companies in Zambia have become engaged in the manufacture of agricultural equipments. Some of the equipments which have been manufactured so far are:

1. Ox-drawn implements - Ox-drawn Ploughs
2. Horizontal rota type maize shellers
3. Triangular Harrows
4. Maize Mills
5. Water Bowsers
6. Trailers
7. Hoes
8. Cultivators
9. Ridges

To determine whether some of the equipment manufactured are suitable for Zambian conditions, tests are carried out at the Farm Machinery Research Unit.

Import and Export of Agricultural Equipment

Agricultural equipment imported ranges from the requirements of the subsistence farmers to those of the very large operators. They are mainly imported from Europe.

The heavy agricultural tractors and associated implements are imported from Europe. Smaller tractors and associated implements are imported mainly from Europe and Asia. Most ox-drawn implements are manufactured in Zambia.

Approximate Number Imported per Annum

300 tractors at 45 h.p upwards. There is a demand for low horsepower tractors but the market has still to be developed. 1,600 tractors mounted implements, mostly ploughs, disc harrows, cultivators, harvesting and shelling machinery.

15,000 ox-drawn ploughs; 3,000 harrows; 1,000 planters and about 200,000 hoes.

To any degree of accuracy, the approximate number in the country at present of the imported agricultural equipment is not known.

Servicing and Marketing Channels

Servicing and marketing of tractors and tractor mounted equipment is done through the private sector.

Marketing of ox-drawn equipment is done through the National Agricultural Marketing Board, who also supply spare parts but don't provide any repair or servicing facilities.

Summary of Exports of Agricultural Implements

No agricultural implements are exported.

Import and Export Regulations

- (a) No duty is levied at the importation of agricultural equipment.
- (b) It is first necessary to apply for an import licence to the value of the intended order and then application can be made for the required amount of foreign exchange.

Extension and Training

The Agricultural Extension Branch, in the Department of Agriculture, in the Ministry of Agriculture and Water Development, Zambia, has over 2,000 Officers in the field to assist and advise farmers.

Farmers are also given training at Farm Training Institutions and Centres and there is a Farm Machinery Centre adjacent to the Central Agriculture Research Station, in Lusaka. There are no facilities for

producing professionally qualified Agricultural Engineers in Zambia, however, the Natural Resources Development College, Lusaka, runs a Diploma Course in Agricultural Engineering with a bias on Farm Machinery and Equipment. The University of Zambia runs a degree course in Agriculture which includes a limited amount of Agricultural Engineering in the syllabus. There are two Colleges of Agriculture running Certificate Courses which also includes Agricultural Engineering aspects in the syllabus.

The following programmes have been completed:

(a) Cashew Nut Processing Plant

The plant was designed for small parch production. Experiments were carried out in Lusaka concerning primary temperature control and modification introduced as necessary. After being proved successful, the plant was transferred to Western Province for operational processes.

(b) Block Making Machine

The objective was to produce a simple machine for making soil cement blocks. The methodology used was the usual designed prototype manufacture and testing procedure, this was designed by National Council for Scientific Research, Lusaka.

(c) Machinery Testing

The objective was to establish suitability by designing and construction under conditions of Zambia. The machinery being tested is subjected to sustain the programmes of work similar to what the user would require of it and under similar conditions, this was done by the Farm Research Unit in Magoye, Southern Province, Zambia. The machines are tested for two to six months, depending on the items being tested.

Intermediate Technology Family Farms Projects,
Mechanization and Advisory Programmes

The objective is to train workshop operators on Agricultural Settlements, to build and demonstrate appropriate agricultural machinery, to introduce proven concepts and techniques appropriate to rural areas and to train farmers. The methodology used is to place competent artisans working within the context of the rural setting. An Institution called Family Farms Limited in conjunction with Christian Aid (U.K) and an Intermediate Technology Development Group.

This programme has been going on for 2 years. Some of the results of this programme include the manufacture of ox-carts, manufacture of water pumps and pedal powered pumps, pedal powered forge, hand tooled bicycle and hand carts, a windmill made from local materials, a planter made from local materials, an ox-drawn chisle and a winnowing machine.

Village Workshop Pilot Project

The objective is to encourage rural artisans to improve their skills and set up privately run Village Workshops for the repair and maintenance of simple equipment. The methodology used is to identify people having the appropriate skills and aptitude to encourage further development by a mixture of in-situ and centralised training to make loan finance available when trainees have demonstrated their ability to make good use of it. The Institutions assisting with this programme are the United Nations Development Programme, Food and Agriculture Organization and the Government of Zambia through the Ministry of Agriculture and Water Development; this project is located in Central Province of Zambia as a start, but it is anticipated that after three years, the programme will extend and eventually cover the whole country.

Improved Village Grain Storage Structure

The objective is to give small scale farmers an improved system of storage. The methodology used is that various solid walled bins are compared with traditional structures. The analysis of a storage loss is compared with the costs of construction. This programme is supported by F.A.O. in conjunction with the Department of Agriculture, Republic of Zambia. This programme has been going on for the past two (2) years. The results are as yet to be compiled.

Proposals for Co-operation in the Development of the Agricultural Machinery Industry

The mode of production that was taken up immediately after independence was too advanced for young Zambia. At the time of independence, 1967, the state was so desperate to bring about industrialization that it invested heavily in the manufacturing sector using high level technology. Some private companies moved into the manufacture of ox-drawn equipment. The high copper prices and the subsequent foreign exchange earned was used to import our industrial inputs and spare parts. This was however, reversed when copper prices fell 1975/76 and industries could not get sufficient raw materials.

The new development strategy is to ensure maximum use of human and natural resources in all industries and small scale industries are being encouraged in the rural areas.

A number of Institutions/Organizations are doing their best to encourage Zambians to be self-reliant, industrial and carry out specific projects. These organizations are:

- (a) The University of Zambia
- (b) National Council for Scientific Research
- (c) Some private/or parastatal companies/institutions
- (d) Farm Machinery Research Unit

Agriculture has been given top priority in Zambia's National Development Strategy. It can be only logical that the Agricultural Machinery Industry shall spearhead the expected increased food production. Cooperation can be sought in setting up Agricultural Machinery Industries, based on labour intensive machinery techniques in rural areas ranging from simple scale industries to the technologically feasible large ones. Industries such as implement and hand tools manufacture, wood and textile processing including packaging.

There is a need for the development and manufacture of simple but reliable equipment for rural water supply systems. water pumps (not diesel or electric engines, but water wheel pumps, rain pumps, capillary seepage etc.)

Techniques for making dams in small streams is required as well as a whole range of agricultural machinery and equipment suitable for small scale Irrigation Schemes for rural areas (with minimum technological sophistication).

There is a need to develop vegetable oil extraction equipment. Zambia grows soya beans, sunflower, groundnuts which could be used for oil extraction. Cooperation at national level in these areas in the agricultural machinery industry is welcome. It should be noted, however, that all types of Development Cooperation be channeled through the National Commission for Development Planning, Office of the President, Lusaka, Zambia, as this is the national body charged with the direction of all types of development cooperation programme between Zambia and other Organizations or Governments.

The National Commission for Development Planning works out specific and elaborates proposals in which cooperation can be developed.

