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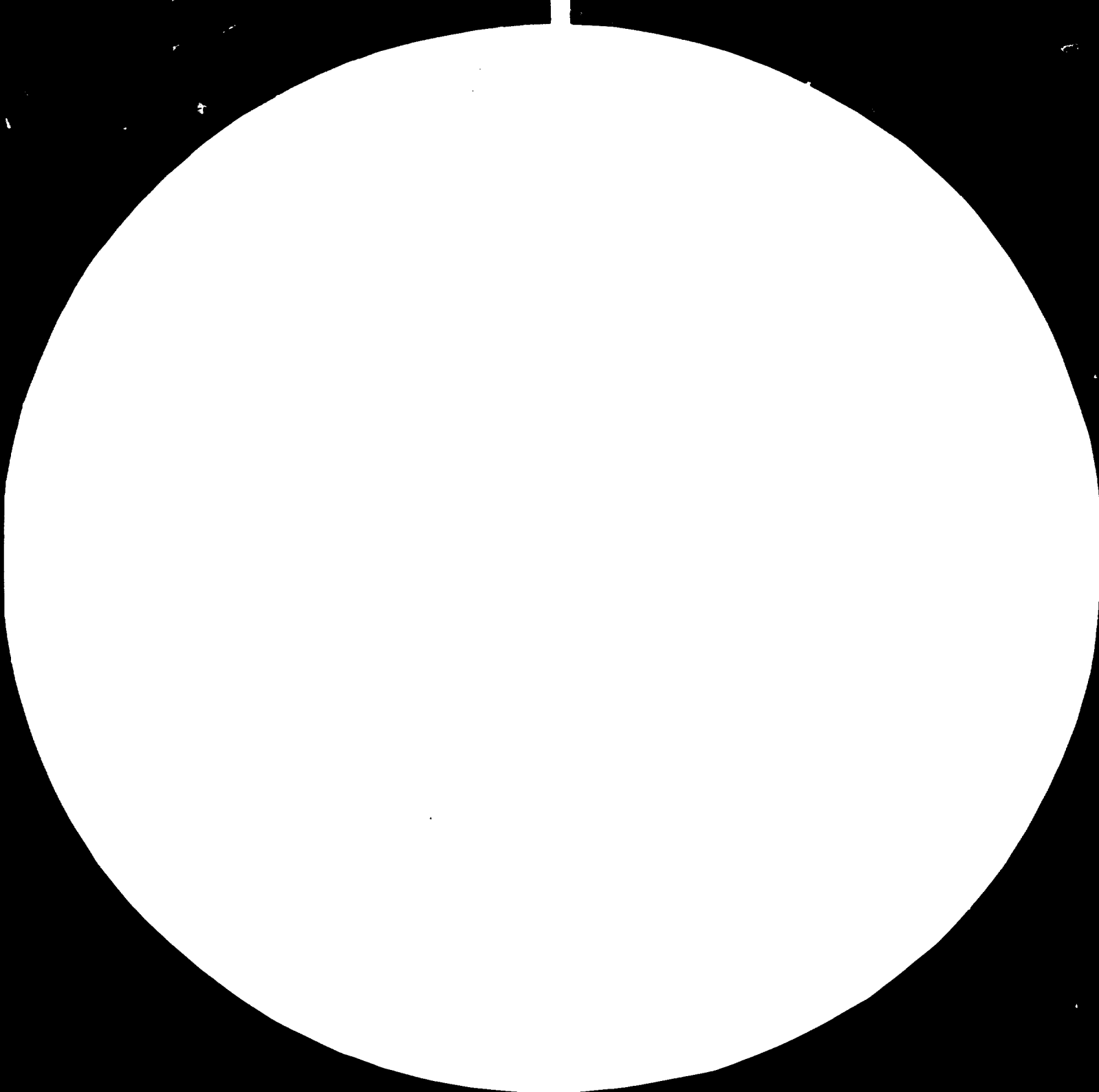
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Dec. 15, 1975

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CENTER FOR DESIGN, ADAPTION AND TESTING
AGRICULTURAL MACHINERY,
ISRAEL ✓

(DP/ISR/73/012/11-02/01)

PROJECT FINDINGS AND RECOMMENDATIONS

Terminal Report Prepared for
the Government of Israel

by

Ehrhard E. Schilling (Prof. Agric. Machinery)

Expert of the United Nations Industrial Development Organization

Acting as Executing Agency for the United Nations Development Programme

This report has not been cleared with the United Nations Industrial
Development Organization which does not therefore necessarily share
the views presented(1)

(1) To be omitted after clearance by UNIDO

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1. SUMMARY

The Center for Design, Adaptation and Testing is planned to do valuable work in the field of development and construction of new and adapted agricultural machinery. This is important in order to save manpower, to raise production capacity, quality and quantity of agricultural production.

The division of testing and engineering services, teams of applied research of other divisions of the Institute of Agricultural Engineering and a pilot plant for prototype and small series production will form the Center.

Recommendations concern particularly the extension of the division of testing, which is involved in developing new machinery and in quality control. It should also be working in the field of adaptation of international rules for standards of testing, safety etc. This can and should be done within one year. Project elements are: Personnel, experts, fellowships and equipment. Recommended contribution by UNIDO \$ 84000.- and by government IL. 330000.-.

An expert in cost analysis (1 m/m) should be attached to the teams of applied research, to guide the analysis of the cost structure of developed machinery.

The pilot plant has to be established. Its construction and running in will last 5 years and the estimated costs (in prices of 1975) will be Recommended contribution by UNIDO \$ 152000.- and by Government IL. 5050000.-

The expert recommends particularly and strongly the extension of the division of testing and engineering services and the mission of an expert in cost analysis.

The export of new developed machinery and/or the transfer of know-how concerning the development and production of prototypes is possible and recommended - not only to countries with similar conditions.

2. INTRODUCTION

2.1 Project background

The origin of the project is the increasing shortage of manpower in all areas of economic life in Israel. The main points the project is concerned with are:

- a) The necessity of increasing the agricultural production in general involves increasing its mechanization.
- b) The interest of the local industry in developing and producing new products is limited especially if these are highly sophisticated and specialised machines,
 - where the number of units to be produced will be low,
 - where chances for export are difficult to calculate, and
 - the maintenance and service of which is complicated and has to be kept ready for some years.
- c) The main tasks of the Institute of Agricultural Engineering are to promote the mechanization of the agricultural production, but its capacity is in some fields too small to meet the needs and requirements.

The main subjects of the work of the Institute are:

- a) Developing agricultural machinery for all fields of the agricultural production.
- b) Quality control of imported agricultural machinery and of machinery which is locally produced.

The Government of the State of Israel decided in 1971 to establish a Center for Design, Adaptation and Testing in the frame of the Agricultural Engineering Institute of the Agricultural Research Organization of the Ministry of Agriculture with the aims to promote the work of the Institute and its cooperation with the local agricultural machinery industry and the farmers.

2.2 Summary outline of official arrangements

Based upon recommendations of a UNIDO expert the Government of the State of Israel requested for UNIDO assistance to establish and to initiate the above mentioned center. The main activities accomplished so far are:

- a) The assignment of \$40,000.- for measurement equipment,
study tours for the technical staff
and two experts missions of 4 men
month total.
- b) The job description of the two technical assistance experts to be sent by UNIDO were as follows:
 1. Expert in laboratory and field testing methods and prototypes construction.
 2. Expert in agricultural machinery construction, cost analysis and production and standardization problems.

Time schedule

1971 First request to UNIDO

1972 Mai UNIDO expert on exploratory mission in Israel
(Prof. Pelizzi)

1972 Aug. UNIDO accepted proposed project

1975 Apr./Mai UNIDO expert in testing methods in Israel
(first part of splitted mission)

1975 Aug. Equipment ordered in frame of the project arrived
at the Institute

1975 Sept./Oct. Study tour for 3 members of local staff

1975 Oct. Request for worldbank - assistance in establishing
a prototype factory was rejected

1975 Nov./Dec. UNIDO expert in testing methods in Israel (last
part of splitted mission)

Finances (Project Budget)

a) UNDP contribution: Grand total \$40,000

	<u>Granted \$</u>	<u>\$ used till Dec. 1975</u>
(10) project personnel	10,000	*
(30) Training	4,700	*
(40) Equipment	25,000	22,075
(50) Miscellaneous	300	*

b) Government Contribution: Grand total IL 134,000.

Government share was fulfilled through wages of personnel,
buildings and equipment.

* To be updated at UNIDO, Vienna.

2.3 Objectives of the project

Major short-term objectives

- a) Development of the Division of Testing and Engineering Services.
Project elements are equipment, fellowships and consultants (for specification see 4. recommendations)
- b) Definition of the organization of the Center for Design, Adaptation and Testing. Setting the rules for collaboration with the local industry, the farmers and the Extension Service of the Ministry of Agriculture.

Major long-term objectives

- a) Establishment of the new unit (pilot plant) of the Center of Testing.
- b) Realization of the collaboration between the units of the Center and promotion of its contact to the local industry.
- c) Publication of the results of the work of the Center for Design, Adaptation and Testing.

It is to presume that the agricultural machinery developed under these conditions will find the interest of the local industry and the local farmers. Increasing of the agricultural production, saving of manpower and higher quality of the products can be expected.

This will be of interest for all countries with similar conditions for the agricultural production and may even be adaptive in other cases.

3. FINDINGS

Mecanization and quality problems in the agricultural production, the situation of the local agricultural machinery industry, and the contribution of the Institute of Agricultural Engineering and the Extension Service of the Ministry of Agriculture will be analysed. An evaluation of the main project activities will be made.

3.1 The agricultural Situation

The agricultural production is in line with the running "five year plan" for agricultural development (1972-1976). For the general pattern of agriculture and of farm mechanization see Ref. 1 and 2.

The Israeli farmers through their cooperative associations and organizations are involved in the whole line of food supply from the field products to the market in fresh or processed form.

The following should be regarded:

- a) Wide variety of agricultural production
- b) Intensity of agricultural production (in some parts of the country three harvests a year)
- c) Selective harvesting in some crops
- d) High demands in quality of the products
- e) Shortage of manpower (special problem: hand labour in intensive crops like those with a long time harvest).
- f) Imported agricultural machinery often does not meet the local requirements in functional aspects and rigidity.

- g) The farmers (kibbuzim, etc.) operate workshops and some of them factories for maintenance, repair and production of agricultural machinery. In the last case the development work is done by themselves, with the aid of the Extension Service or with the aid and in close connection with the Institute of Agricultural Engineering.

3.2 Agricultural machinery industry in Israel

Findings based on discussions with leading personnel of various factories.

- a) Small scale workshops as parts of agricultural cooperations.
- (a) Personnel situation: No engineer or technician, up to 20 workers.
 - (b) Products: They are specialised in simple machinery or mechanical aids suitable mainly to local conditions.
 - (c) Product development: Close connection is to the farmers and the Extension Service. The collaboration with the Institute is from "none" to "intensive". In the last case they work on highly qualified projects.
 - (d) Export: They produce mainly for the local market.
 - (e) Notice: It must be pointed out that in this case the close connection between agricultural production, their mechanization problems and the development of technical solutions at the same place in connection with the Institute will be a good solution but bears problems in case of highly specialised machinery.

- b) Medium scale manufacturers as main local agricultural machinery industry.
- (a) Personnel situation: 1 to 4 engineers and technicians, up to 80 employees. 70-80% of them work in the production line.
 - (b) Products: Total production is agricultural machinery and in a few cases also other products with a share less than 25% of total income. These factories are specialised in one or a few products from simple implements to highly sophisticated machinery. Some of them buy part of their components from abroad or are also importers of agricultural machinery and tractors.
 - (c) Product development: Many of the local manufacturers are developing their products on their own. They work with the Extension Service because of the close connection to the farmers, and have occasional contacts to the Institute. These contacts are mainly in the last stages of the development because of competition reasons. Some of them see the role of the Institute as an institution of quality control through the Testing Division.
 - (d) Export: 50-70% of the locally manufactured agricultural machinery is for export mainly to countries with similar climatic and soil conditions. Because of cost calculations the machines are exported in parts and are assembled in the receiving country, where new places for employment are produced in this way.
 - (e) Notice: The opinion of the local industry concerning the collaboration with the Institute is different and varies from:

1. refusal: "Their work is too theoretical and slow, bears competition problems, and they sell their results too cheap, so that everyone who owns a "hammer" can buy and produce them without giving maintenance and service (most important to the farmers)".
2. partly agreement: "collaboration in the last stages of development, testing services, quality control".
3. agreement: "By buying complete solutions for a special problem we don't need a development center in our factory and save money. Contacts with the Institute means to be up to date in the world wide standard of mechanization of the agricultural production and of its elements".

c) Large scale factories

- (a) Personal situation: More than 4 engineers and technicians also specialised in fields other than agricultural machinery and more than 100 employees.
- (b) Products: Agricultural machinery - but highly specialised machinery - is in minority, their main products are units for packing, processing etc. and other non-agricultural machinery.
- (c) Product development: The capacity of the development departments is mainly in use not for agricultural machinery. In this field they like the collaboration with the Institute.
- (d) Export: The export is in some products more than 50%.
- (e) Notice: These manufacturers are sufficiently equipped with production units so that they are able to build specialised agricultural machinery. The investment for completing the

machines, for advertising (international exhibitions etc.), for maintaining and servicing them are difficult to calculate. This keeps them from joining a development project before evaluating the possible number of production which is almost impossible in the international market situation.

As it was mentioned in 1972 by Peiper, U.M. and G. Pellizzi the Government of Israel assists the agricultural machine industry as follows (Ref. 1):

- a) The Government bears 50% of the cost of research and development of new products.
- b) To increase the export, a direct contribution of 15% of the added value (to the \$) on every exported item is given by the Government.

3.3 The Institute of Agricultural Engineering

The Institute of Agricultural Engineering is one of 7 institutes of the Agricultural Research Organization and is divided into the following divisions:

- Division of Agricultural Mechanization
- Division of Environmental Engineering
- Division of Production Engineering
- Division of Testing and Engineering Services

Research and allied activities cover a wide range from soil preparation, seeding, plant protection, harvesting, storing to processing and packaging in the field of general crops, vegetables, fruit and flowers. Animal production is also included in these activities (Ref. 3 and 4).

For research work they make temporary groups from the members of different divisions to receive optimal results.

3.3.1 Division of Testing and Engineering Services

The main tasks of this division are as follows:

- a) Quality control of imported and locally produced agricultural machinery and
- b) Instrumentation and measurement services for research and development of new agricultural machinery developed by other groups of the Institute.

(1) The division of Testing and Engineering Services was, among others, involved in the work on the following subjects (since Mai 1974).

<u>SUBJECT</u>	<u>OBJECTIVES</u>	<u>ORDERED BY</u>
1. Greenhouse air heaters	Characteristics of heat and air supply	Importers and manufacturers
2. Knapsack - motorsprayer	Specifications verification	Importer

3.	Automatic watering system for chicken	Working characteristics	Jewish Agency
4.	Covering nets for plant nurseries	Light transparency	Manufacturer
5.	Thermostats for greenhouses	Accuracy and Differential	Importers, Manufacturer
6.	Blowers for isolating roofs of greenhouses	Working characteristics	Importer, Extension Service
7.	Green bean harvester	Working characteristics	Extension Service
8.	Grain combine harvester	Comparative tests	Extension Service
9.	Fertiliser spreader	Characteristics	Importer
10.	Cattle feed distributing trailer	Distributing accuracy	Manufacturer
11.	Electronic monitor for cotton pickers	Working characteristics	Manufacturer
12.	Infrared chicken brooders	Comparative tests	Importer, Manufacturers, Extension Service

13. Tomato harvester	Working efficiency	Extension Service
14. Cucumber harvester	Working efficiency	Extension Service
15. Cattle feed mixing and distrib. wagons	Working characteristics, comparative tests	Extension Service
16. Instrumentation services for many projects of research and development		Institute's various working teams

(2) Measurement equipment

The quantitative determination of the functional characteristics of agricultural products and machinery has to be measured. The rigidity of construction and power requirements have to be equally determined. To be able to characterize quantitatively these, one needs facilities for the measurement of most basic physical phenomena. Moisture content, thermodynamic characteristics, size of particles, flow of different material, vibration characteristics etc. are of major importance.

Reliable results may be obtained only with an instrument chain where all links are well matched to each other. The large number of links as: transducers, signal conditioners, power supplies,

registration equipment, analysers and the interfaces between them makes the measuring chain rather complicated and valuable. A well designed measuring set-up will optimize the use of manpower and enable automatization of the calculation of the final results. The nature of agricultural engineering research requires outdoor and field testing and measurement. The mobility of the measuring systems is therefore a must.

The division possesses at the moment a number of transducers, recorders and interfacing equipment. The lack of suitable mobility and of analysing equipment is a great obstacle which need to be overcome.

(3) Personnel

The personnel of the division of testing and engineering services consists at the moment of the following:

Head of division:	1 engineer	(M.Sc. Eng.)
Researcher :	1 engineer	(Mainly working on seeding and planting equipment in the northern regions of the country where he lives)
s t a f f :	2 technicians	(highly scilled)
	2 workers	(Possessing degrees in engineering from Eastern Europe)

The number of staff members is by all means insufficient. The fact that because of political problems at 25% of the annual working time is lost, an adequate compensation is required. Specific training in special fields is also needed.

At present only limited pinpoint tests can be carried out whereas systematic experimental work for measurement and analysis of the findings is required.

3.3.2 The other divisions of the Institute

- (1) The divisions are working on engineering aspects of all problems of agricultural production. Among those are mechanization of field crops, vegetables and orchards, environmental control of greenhouses and cold storage and production and marketing engineering.
- (2) Their work is spread over basic and applied research problems, the outcomes of which are used in the design and the development of prototypes of non-existing agricultural machinery (Ref. 3 and 4).
- (3) The topics of work origin from agricultural needs as expressed by farmers and Extension Service experts. They may also arise from the outcomes of basic research activities. Last not least they are initiated by imported equipment and machinery which meets the requirements only partly. In these cases the imported implement needs to be changed and adapted by further development guided by local condition requirements.
- (4) Prototype construction is at the moment done either in the Institute's workshop or in private owned or cooperative factories (Kibbuzim). Shortage of manpower, both in the factories and in

the Institute force the factories sometimes to send a small working team to the Institute's workshop to construct a prototype of their interest.

- (5) The quantitative evaluation of working characteristics of the prototype and the first generation of its production line type is done by the division of testing in cooperation with the developing team.
- (6) The final product of the Institute may be the full line production by:
 - a) the manufacturer, who cooperated in the development as mentioned
 - b) a manufacturer, who adopted the fully developed prototype or
 - c) the transfer of know-how under royalty contract.

3.4 Extension Service

The Extension Service of the Ministry of Agriculture serves as consultant to the farmers in all fields of agricultural production. In the field of agricultural machinery they advise the farmers in selection of machines, in buying and working in. Their advice is often based on experience gained by the Institute through the division of testing and engineering services. The Service helps the workshops of the cooperative settlement in developing and constructing special implements mainly for their own use. In the opposite direction the Service conveys the the needs and wishes of the farmers to the industry and the research institutes.

It herewith forms the vital link between the farmers and these institutions which are responsible for importing, manufacturing and developing agricultural machinery.

3.5 The Center of Design, Adaptation and Testing

- (1) Fig. 1 shows the structure of the development of agricultural machinery nowadays by the Institute and its partners in industry and workshops in farmer's cooperatives from the finding of ideas to production, maintenance and servicing. Quality control of imported agricultural machinery is included. All divisions of the Institute or its working teams and its workshop take part in the development of new machinery. Yet, not in full capacity because of their engagement in basic research and testing of imported machinery and equipment.

- (2) The flow chart in fig. 1 gives the background for the activities of the planned Center of Design, Adaptation and Testing. This is lined out in Fig. 2. The Center is involved in:

Applied Research

Development

Prototype Manufacturing

Prototype Testing

Release for production

Production, Maintenance, Service
of highly sophisticated machinery

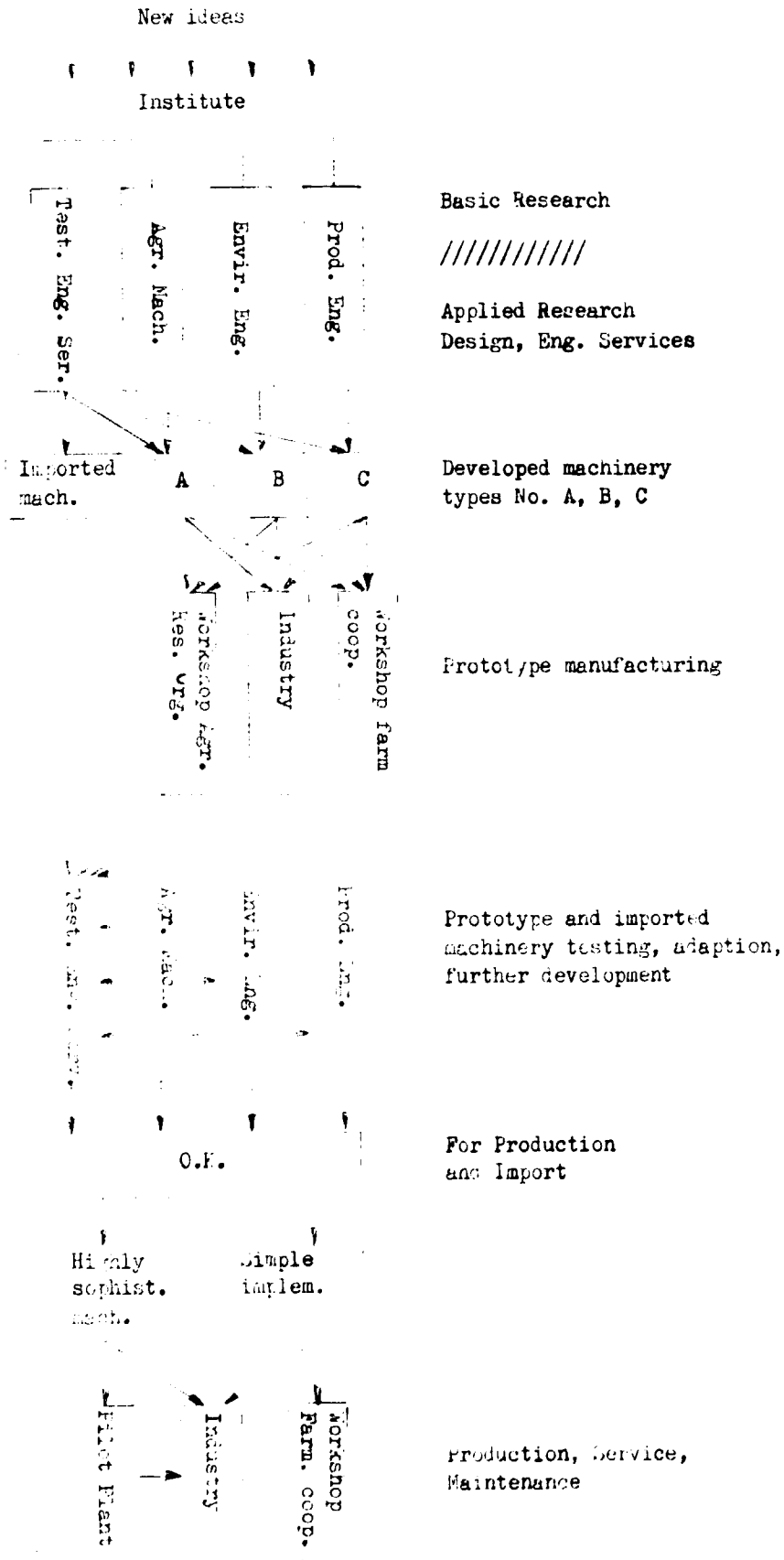


Fig. 1: Simplified Flow Chart for Prototype Development, Testing and Production

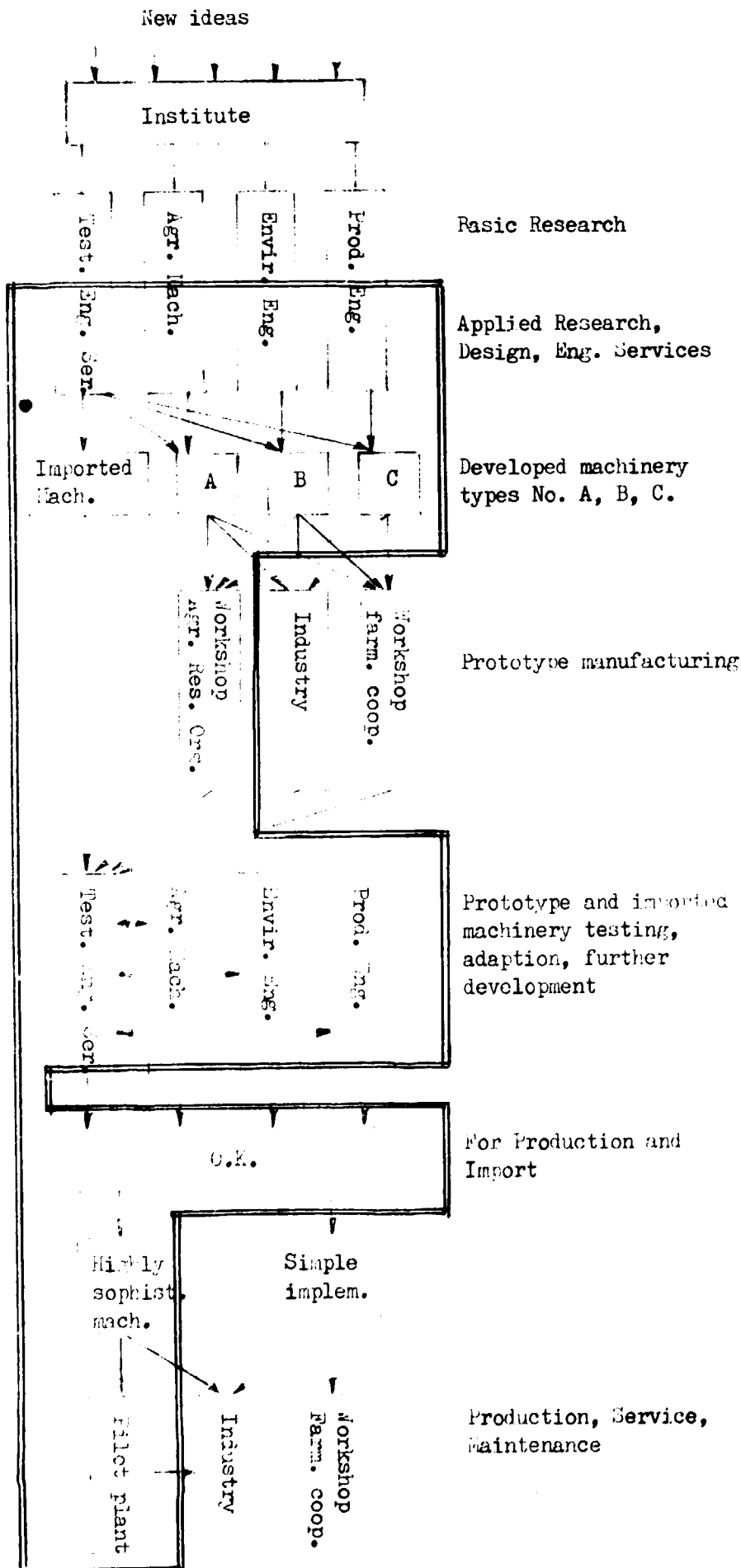


Fig. 2: The Center of Design, Adaptation and Testing

- (3) Effective work of the Center depends on
- (a) Development of the Division of Testing and Engineering Services.
 - (b) Establishment of a pilot plant for prototype manufacturing, and production of small series, maintenance and servicing of highly sophisticated machinery.
- (4) Development of the Division of Testing and Engineering Services.
- Working groups should be set up and should be specialised in:
- (a) International testing rules, procedures and results (reports);
Adaptation of these activities to Israel;
Continuous contacts to international institutions and foreign countries.
 - (b) Electronic measurement of physical phenomenae and evaluation of test results.
 - (c) Non-electronic measurement of physical phenomenae and evaluation of test results.
 - (d) Maintenance and Service of the measuring equipment;
Development of special measuring equipment not available on the market.

New buildings are not necessary.

Equipment: Further development and enlargement of the available measuring systems is badly needed. The purchase and equipping of a mobile measurement laboratory is of greatest importance.

Personnel:

<u>Working_group:</u>	<u>Head</u>	<u>(a)</u>	<u>(b)</u>	<u>(c)</u>	<u>(d)</u>	<u>Total</u>
Personnel at present	1	-	1	1	2	5
Personnel recommended	1	2	3	2	2	10

Qualification of the staff:

Head: Mr. Peiper, M.Sc.Eng., has the engineering background and experience to head the recommended developed division of testing and engineering services. Necessary is special training in management techniques.

Group a: 1 Engineer and 1 technician or draftsman are necessary. At present, all members of the staff work nonsystematically 5% of their time in this field.

Group b: 2 Engineers and 1 technician or 1 engineer and 2 technicians are necessary. Special training (fellowships) is needed.

Group c: 1 Engineer and 1 technician are necessary. Special training (fellowships) is not needed now.

Group d: 2 skilled workers are in the division. No special training is necessary.

(5) Pilot Plant

A pilot plant has to be established for prototype manufacturing and small series production, maintenance and servicing of highly sophisticated machinery.

The request of the government of Israel for worldbank assistance in establishing a prototype factory was rejected (Annex No. 5). Therefore it is now and here recommended as part of the Center of Design, Adaptation and Testing.

For detailed information on the proposed pilot plant see Ref. 5.

4. RECOMMENDATIONS

The following recommendations are based on the project findings. They are put in order of priority (1; 2;... and a; b;...) and correspond with the plans of the Institute of Agricultural Machinery and the Ministry of Agriculture.

The recommendations cannot be fulfilled by the government and UNIDO's further assistance is required, as it is shown in the following details.

4.1 List of Priorities Project Elements and Alternative Proposals

Recommendations and recommended project elements touch the following:

Division of Testing and Engineering Services,
Other Divisions,
Pilot Plant and the
Center of Design, Adaptation and Testing.

(1) Division of Testing and Engineering Services

To be contributed by

(a) Personnel:

2 to 3 engineers, 3 to 2
technicians (or 1 draftsman) =
= 5 in total

- Government

(b) Fellowships:

Management and planing techniques,
electronics, stress and strain analysis,

hydraulics, and indoor climate
control, field testing techniques

(4 m/m)

- UNIDO

(c) Equipment:

1. Selfpropelled mobile measurement
laboratory
2. Transducers for a wide range of
applications
3. Signal conditioners, amplifiers
and recorders
4. Automatic data acquisition and
analysis

- UNIDO

(d) Experts:

Short-time experts for

1. Design and construction of the
mobile laboratory (2 m/m)
2. Special testing of agricultural
machinery (2 m/m)

- UNIDO

(Pos. 2 can be changed in fellowships)

(2) Other divisions

- (a) Personnel
- (b) Fellowships
- (c) Equipment

Recommendations for other divisions
were not included in expert's terms
of reference.

(d) Experts:

1 expert in cost analysis (1 m/m) - UNIDO

(Job description similar to
DP/ISR/73/012/11-01/01)

(3) Pilot Plant

(a) Buildings and land development - Government

(b) Machines - Gov./UNIDO

(c) Running-in of the pilot plant

1. Personnel

1 manager - Government

2. Experts

1 expert - UNIDO

3. Fellowships

Specialization course for
manager (4 m/m) - UNIDO

4. Running-in of the pilot plant - Government

(4) Center of Design, Adaptation and Testing

In addition to the recommendations mentioned
above the following will be necessary:

(a) Personnel:

1 highly qualified general manager
to coordinate all units - Government

Alternative Proposals

The large scale project, as outlined, will solve best the problems of development of new agricultural machinery and of adaptation of imported machinery (Alternative A).

Alternative proposals:

Alternative B: Similar to alternative A, but instead establishing a pilot plant the Institute's workshop should be further developed, equipped and extended (Project elements are mainly machine tools). Further specification must be made in the future.

Alternative C: Assistance must be given to the division of testing and engineering services and to the other divisions as mentioned above, see (1) and (2).

Alternative D: Similar to alternative C, but without automatic data acquisition and analysis.

4.2 Time Table

1976, Jan. - Dec. : Beginning and End for assistance to the Division of Testing and Engineering Services and other Divisions of the Institute of Agricultural Engineering. For project elements see 4.1 (1) and (2).

1976 - 1980: Pilot plant construction and running-in.

1980: Final establishment of the Center.

4.3 Project Budget

(1) Division of Testing and Engineering Services

<u>S u b j e c t</u>	<u>Amount to be contributed by</u>		
	<u>UNIDU</u>	/	<u>Government</u>
(a) Personnel:			
5 in total annually:	-	/	IL. 330000.-
Follow-up cost	no	/	yes
(b) Fellowships:			
3 m/m (1 m/m=\$4000.-)	\$12000.-	/	-
Follow-up cost	no	/	yes
(c) Equipment:			
1. Selfpropelled mobile measurement			\$8000.-
laboratory			\$7000.-
2. Transducers for a wide range of applications			\$10000.-
3. Signal conditioners, amplifiers, recorders			\$8000.-
4. Automatic data acquisition and analysis			\$15000.-
Total	\$48000.-	\$48000.-/	-
Follow-up costs for maintenance etc.	-	/	yes

(d) Experts:

3 m/m	(1 m/m=\$6000.-)	\$18000.- /	-
Follow-up costs		no /	no

In total to this division \$78000.- / IL. 330000.-

Follow-up costs: Exact estimation

not possible no / yes

(2) Other Divisions

(a) Experts:

1 m/m	(1 m/m=\$6000.-)	\$6000.- /	-
follow-up costs		no /	no

(3) Pilot Plant

(a) Buildings and land development

(Buildings, roads, electric
power and water installation,
planning and supervision, etc.)

- / IL. 1850000.-

(b) Machines

(welders, saws, drills, lathes,
milling machines, work benches
and hand tools, adjustment and
assembly of the machines).

Total IL 1700000.-. 40% UNIDO

and 60% Government contribution \$100000.- / IL. 1000000.-

(c) Running-in of the pilot plant

1. 1 manager	annually	- / IL. 100000.-
Follow-up costs		no / yes
2. 1 expert (6 m/m)	\$36000.- /	-
Follow-up costs		no / no
3. Fellowships		
Specialization		
course for		
manager: 4 m/m (1m/m=\$4000.-)	\$16000.- /	-
Follow-up costs		no / no

(d) Running-in of the pilot plant

(wages, metal constructions
materials, etc.)

- / IL. 2100000.-

In total to the pilot plant:

Investments and running-in \$152000.- / IL. 5050000.-

(Follow-up costs for buildings,
machines, salaries are not
exactly to estimate)

no / yes

The total investment is for a 5 year
plan, based on prices of Dec. 1975.
Salaries are counted for 1 year only.

(4) Center of Design, Adaptation and Testing

(a) Personnel:

1 general manager	annually	- / IL. 100000.-
Follow-up costs for		
salaries		no / yes

Total costs of the alternative proposals

UNIDO / Government

Alternative A

Division of testing, other
divisions, pilot plant,
running-in. Salaries for
one year

\$ 236000.- / IL. 5480000.-

Follow-up costs for
salaries etc.

no / yes

Alternative B

Division of testing, other
divisions, Institute's workshop
(only machine tools will be
submitted in 1/3 of pilot plant
plan: \$33000.- and IL. 340000.-)
Salaries for one year

\$ 127000.- / IL. 670000.-

Follow-up costs for salaries etc.

no / yes

Alternative C

Division of testing, other
divisions
Follow-up costs for salaries ect.

\$ 84000.- / IL. 330000.-

no / yes

Alternative D

Division of testing, but
without automatic data
aquisition and analysis
and without some other
measuring equipment, and
other divisions

\$ 65000.- / IL. 330000.-

Follow-up costs for salaries etc.

no / yes

5. TABLE OF REFERENCES

- (1) Peiper, U.M. and G. Pellizzi: Study Country Background - Israel
(Annexe No. 1 UNIDO OA 220 ISR (11)).

- (2) Ministry of Agriculture, Israel: Development of Israeli
Agriculture 1959-1973, Statistical series part 1, Tel-Aviv
(1975).

- (3) Ministry of Agriculture, Israel, Agricultural Research
Organization: Research and Allied Activities 1974 Bet-Dagan
(1974).

- (4) Ministry of Agriculture, Israel, Agricultural Research
Organization: Institute of Agricultural Engineering -
Scientific Activities 1971-1974, Bet-Dagan (1975).

- (5) Ministry of Agriculture, Israel, Agricultural Research
Organization: Proposal for an Industrial Research Project,
Plant for Pilot Production of Agricultural Machinery.
Revised Nov. 4, 1974.



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO

29 June 1973

PROJECT IN THE STATE OF ISRAEL

JOB DESCRIPTION

EP/ISR 73, 012, 11-00 01

POST TITLE Expert in Laboratory and Field Testing Methods

DURATION Two months, with possibility of extension

DATE REQUIRED September 1973

DUTY STATION Bet Dagan, Institute of Agricultural Engineering, with possible travel within the country.

DUTIES The expert will be attached to the Engineering Services Department of the Agricultural Engineering Institute, Ministry of Agriculture, Bet Dagan, and will be expected to:

1. Study and define the organization (equipment, professional and technical staff, etc.) of a modern agricultural machinery testing unit and the test procedures for the local and imported machines and implements;
2. identify the possibilities and the means for collaboration with the manufacturers for improvement of their products;
3. advise the Department in the realization of the most promising prototypes and in the adaptation of imported models.

QUALIFICATIONS Mechanical engineer, specialized in agricultural machinery, laboratory and field testing methods of agricultural machines, and design adaptation and prototypes construction.

LANGUAGE English

UNEP/WHO
1973/10/10

The Government of Israel has decided to establish and develop a Centre for Farm Machinery Industry in the framework of the Agricultural Engineering Institute. The Government, based upon the recommendations of a UNIA expert who conducted an exploratory mission for a short duration in May 1971, has requested UNIA assistance in the establishment and initial operation of the above mentioned unit. The immediate objectives of this assistance are to work out a programme for the Agricultural Engineering Institute for testing locally produced machinery, developing production improvement, identifying machines with maximum local potential in agriculture, assisting industry in standardization and spare parts supply, establishing local manufacture of locally developed products, and developing new products both for local and export markets.

CANDIDATES REQUESTED BY 30 AUGUST 1973

Name and function of project counterpart; starting and concluding
dated of assignment

Name: Uri M. Peiper M.Sc.Eng.

Function: Head of Division of Testing and Engineering Services.

Dates of Assignment to the project:

1971 (start of project) to present and up to the end
of project.

Dates of Assignment: (cooperation with reporting expert)

April, 24 / Mai 15, 1975

Nov., 22 / Dec. 17, 1975

Fellowships awarded to local staff

- (1) A study tour (comp. 32) was arranged for the local staff (Mr. Peiper - Head of Div, Mr. Katz and Mr. Nir) from August, 31st till November, 1st, 1975.

- (2) The special aims were:
 - (a) To study the testing rules and procedures in various European countries.
 - (b) To examine the possibilities of adaptation to the special situation in Israel.
 - (c) To study the measurement equipment and the measuring procedures used in these countries.

- (3) A report is in preparation and will be submitted to UNIDO in January 1976 by the members of the study tour.

List of major items of UNDP / UNIDO - financed equipment

1. 1 Portable Magnetic Tape Record/Reproduce System complete with accessories as: Monitor Meter, F.M. Calibrator, Remote Control Unit, Shock/Vibration Mount, Automatic Tape Degausers, Various Record and Reproduce Cannel Sets with different filters, etc.

Total Price U.S \$ 22.075.-

The aquipment arrived at the Institute on August 1975.

2. Nothing else.

Proposal for an Industrial Research Project, Plant for Pilot Production
of Agricultural Machinery

(Summary of Proposal submitted to the International Bank
for Reconstuction and Development on November 4th 1974)

Mechanization of agriculture is of great importance in Israel where 120,000 workers, or 12% of the labour force, are employed in agriculture.

The total production of agricultural machinery in Israel is about IL. 32 Million per annum. Israel's export of agricultural machinery, mainly ploughs and drills to Africa and Iran, amount IL. 13 million annually. The import of agricultural machinery amounts IL. 55 million annually (not including tractors).

The Agricultural Engineering Institute is the principal institute of applied research and development of agricultural machinery. In the framework of its research, a substantial number of prototypes of agricultural machinery have been developed.

The lack of know-how on pilot line production was the main obstacle that faced the industry and prevented it from using the prototype's ideas for production in large numbers.

A factory for pilot production of a first series of machines would constitute a vital link in the field of agricultural mechanization, between the institutes of applied research and the industry.

It would substantially reduce import and may increase the export of

A 5.2

agricultural machinery to the developing countries where small farming units are the majority of agricultural producers.

The total investment required is about U.S. \$ 1 million.

The project was rejected by the world bank and the Institute was informed about the rejection on August 24th 1975 by the Ministry of Commerce and Industry. No further discussions have been made on the subject till now.



