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*Institute for Land and Water
Management Research*



WAGENINGEN

THE NETHERLANDS

2052457

Governing Body

Chairman S. HERWEIJER – Director of the Government Service for Land and Water Use
Secretary F. W. HONIG – Director of the Division for Horticulture of the Ministry of Agriculture

Members J. M. J. HANRAETS – General Manager of Grontmij Ltd., Engineering Consultants for Land Improvement and Reclamation

H. J. A. HENDRIKX – General Manager of the Netherlands Land Reclamation Society

J. VAN DE KERK – Chief Engineer of *Rijkswaterstaat*

H. J. LOUWES – Representative of the Agricultural Board

H. T. TJALLEMA – Director of the Division for Arable and Grassland Farming of the Ministry of Agriculture

Advisory Member Professor F. HELLINGA – Professor at the Agricultural University, Wageningen

Director Dr. C. VAN DEN BERG

Foundation

The Institute for Land and Water Management Research (Instituut voor Cultuurtechniek en Waterhuishouding) was founded on 13th September 1955. The object of this Institute is *to undertake research in the sphere of land and water management and its related sciences.*

The Governing Body of the Institute consists of representatives of the Ministry of Agriculture, the Ministry of Traffic and Waterways, and of private consulting firms, while agricultural science is represented by an advisory member.

The establishment of the Institute was desirable for the following reasons:

1. Land management research has not kept pace with the rapid development in the execution of land improvement works. The object of these works is to effect radical ameliorations in a given district. At present most land improvement works are executed in connection with a land consolidation scheme. Land consolidation now comprises both joining fields together and improving water control, levelling uneven sites, constructing and improving roads and building farm houses where necessary. It is true that land management research in the Netherlands has made progress in the spheres of water management and soil science, but large gaps exist in research into soil improvement, land division and the economic aspects of land improvement works.
2. Water control surveys in the Netherlands have been carried out by the following bodies:
Agricultural Research Station and Soil Science Institute of the Foundation of Applied Scientific Research, Groningen – theoretical flow research and its use in various projects,
Central Agricultural Research Institute – lysimeter research,
Working Party for Water and Air Regulation in Horticulture – moisture research to determine requirements of fruit and vegetable crops,

Research Department of the Government Service for Land and Water Use – drainage and infiltration research,

Agricultural Water Control Research Committee for the Netherlands – inventory of knowledge concerning water control.

The desire to co-ordinate and centralize these surveys led to the reorganization of several institutions resulting in the transference of research workers to the Institute for Land and Water Management Research.

3. The need of protecting the western part of the Netherlands against floods led to the plan of closing a number of sea inlets (Delta Plan). This great work, which also entails a carefully controlled distribution of the river water, is being carried out by *Rijkswaterstaat*. The agricultural consequences of these plans come under the category of land and water management and relate, among other things, to the possibility of desalinization of the coastal districts and supplying water to drought sensitive areas.

Method

Separate divisions have been organized to correspond to each of the principal interests of the Institute. These include the following:

Water Management / Soil Improvement / Land Division / Economics / Reconnaissance and Projects

The study of Water Management relates to the transpiration of plants, the supply and discharge of water in the fields, and the effect of these factors on production methods in farming. A hydrogeological survey is carried out in projects where it is possible to determine an improvement which may be effected in the discharge or supply of water. The means used are deep drillings, permeability measurements and soil moisture readings.

Other subjects of investigation include drainage, sprinkling and subsoil irrigation of agricultural and horticultural soils, and the effect of the soil moisture level on growth and production. The field survey is supplemented by fundamental research on groundwater flow, capillary movement of water and meteorological factors.

In the Soil Improvement Survey an important starting-point is the determination of which uneven sites should be levelled in order to make possible machine cultivation of large fields. The investigation into the effect of the alternation of soil strata and the breaking of permanent strata is also important to farm management practices. In order to effect soil improvement the introduction of machinery is very desirable. The mechanization of land improvement works will be studied in close co-operation with the Institute for Agricultural Engineering and Rationalization which is also located at Wageningen.

The Land Division Survey will concentrate on the development of a specific draft technique to be used for land consolidation schemes. Taking into account developments in agricultural me-

chanization a study will be made of the size, shape and accessibility of fields required to suit various conditions. In conjunction with this an enquiry will be made to ascertain which allotment patterns are most adapted to the types of landscapes occurring in the Netherlands. In all these projects attention will be paid to the effect on agricultural practices of improving an allotment pattern.

In the Economic Survey of land improvement works the aim is to evaluate the economic benefit of these works. The survey will be able to provide a basis for comparing benefits and investment costs of various projects as well as alternative methods of their execution.

In the case of Reconnaissance and Projects, the object is to make national or regional reconnaissances of specific land and water management conditions, and incidentally to outline the basic pattern on which a consolidation scheme will be executed, using the results of a detailed survey of the Water Management, Soil Improvement and Land Division departments. This type of investigation needs close co-operation with the bodies concerned in organizing the project.

In addition to these main research divisions, there is a number of service sections.

The physics section studies the physical laws which are important for the Water Management and Soil Improvement survey.

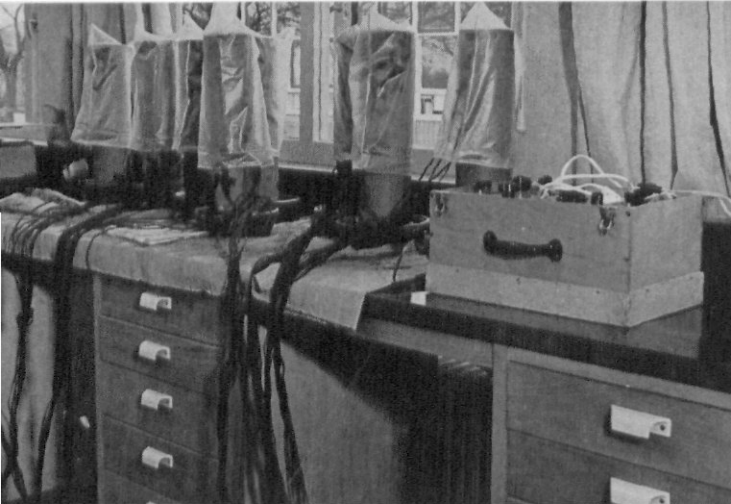
Mathematics are studied in a separate group. The framework of investigations and statistical analysis of the results are worked out on behalf of various divisions.

The laboratory conducts physical analyses of the soil. The most important tasks are the determination of permeability, moisture characteristics, fluctuations of the groundwater table and the study of the structure of the subsoil.

The editorial staff and the library with its modern system of documentation facilitate publicity and documentary work.

Of the means employed in executing the survey, special reference may be made to a lysimeter for grass growth, a number of large trial fields with exactly adjustable groundwater tables and a trial field for investigating the effect of sprinkling on which removable covers can be used to exclude precipitation when necessary.

Land and Water Management research is still in its early stages. On the one hand it is necessary to find solutions for practical problems. The Institute's assistants are interested in the execution of their theoretical solutions in order to retain a thorough grasp of practical vital problems. On the other hand the study of fundamental problems is a task of increasing urgency. Both types of investigation will broaden conceptions as to requirements for the execution of land improvement works. Consequently the aim will be to pass on the knowledge gained in the Institute as quickly as possible to all those who may be interested in its conclusions.



*A view into the Institute's Laboratory:
measurement of capillary rise of water in the soil*

Internal Organization

With the re-organization of the Land and Water Management research system in the Netherlands, several assistants were transferred to Wageningen during 1956, and temporary well-equipped quarters were established. As a result only the division of Water Management is fully staffed at present. Several more co-workers still have to be recruited for the other divisions. It is estimated that by the end of 1957 the staff will number 100, 28 of which will be attached to the science staff. In addition 10 assistants will be assigned to horticultural research stations outside Wageningen or to regional research committees.

The names of the scientific assistants are given overleaf. The subjects studied are also shown.

Director: DR. C. VAN DEN BERG

Deputy director: W. C. VISSER

DIVISION OF WATER MANAGEMENT

Head: W. C. VISSER

Flow research

J. J. KOUWE

Dr. N. A. DE RIDDER

Dr. J. WESSELING

- Use of flow theories in the investigation of water supply
- Hydrogeological survey
- Drainage and infiltration survey

Reaction of crops

Dr. J. F. BIERHUIZEN

P. E. RIJTEMA

N. M. DE VOS

- Fundamental survey of moisture consumption of horticultural crops and their reaction to soil moisture
- Water supply in arable and grassland farming
- Water supply of fruit and vegetables

Regional water management survey

J. BON

A. J. HELLINGS (Roermond)

J. A. VAN 't LEVEN (Goes)

- Trial site survey
- Regional use of water supply on dry sandy soils, particularly that supplied by sprinkling and subsoil irrigation
- Regional use of water supply on saline soils

DIVISION OF SOIL IMPROVEMENT

- G. P. WIND
A. P. HIDDING
- Improvement of sandy soils
 - Improvement of clay-soils

DIVISION OF LAND DIVISION

- R. MARIS
J. W. RIGHOLT
- Draft technique and systematics of land division projects
 - Analysis of the effect of land division on farm management practices

DIVISION OF ECONOMICS

(appointments for this division will be made in the near future)

DIVISION OF RECONNAISSANCE AND PROJECTS

Special projects

- J. W. VAN HOORN
A. D. OOSTRA
- } Treatment of survey results in the framework of improvement projects

Regional horticultural survey (Water Management)

- J. BUTIJN (Wilhelminadorp) - Specializing in problems concerning fruit growing
C. J. VAN DER POST (Naaldwijk) - Specializing in problems concerning cultivation under glass
G. G. M. VAN DER VALK (Alkmaar) - Specializing in problems concerning vegetable growing

L. F. ERNST

Physical Section

- Theoretical investigations of groundwater flow; comparative permeability investigations with the aid of laboratory and field measurements

PH. TH. STOL

Mathematical Section

- Use of various computational methods in land and water management problems

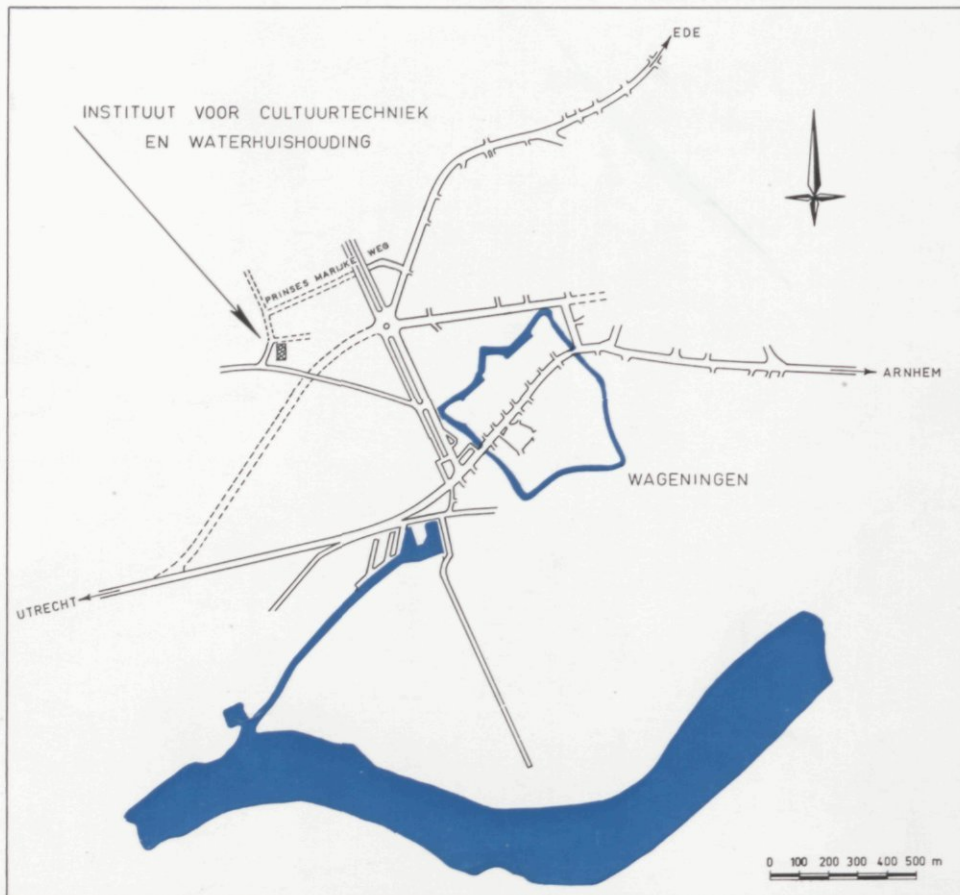
W. P. STAKMAN

Laboratory

- Investigations into soil moisture conditions in various soiltypes

Pot experiments concerning the reaction of crops to soil moisture content





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