

REPORT FROM EUROPE: THE DUTCH WAY OF RESEARCH¹

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Every English grower will have at least heard of the Naaldwijk glasshouse research station and many will be familiar with the experiments in the 24 compartment multi-factorial unit but it is not always appreciated that Naaldwijk is not the only glasshouse research station in Holland and that its main work is with vegetable crops.

In 1981 cost of running the station was \$3.3 million but this figure did not include fixed charges paid directly by the MoA or the cost of research workers seconded to Naaldwijk. Income from sale of produce and services such as routine soil analysis amounted to just under \$1 million; the \$2.3 million deficit was covered by government grant whilst the horticultural industry contributed about 50% — nearly \$1.5 million — collected from the auctions and some other organizations such as the Commodity Board for Ornamental Crops.

Total staff employed is about 174 with one director, 103 staff in the various research departments, 24 in the glasshouses and grounds, 24 in administration and 12 employed on technical services. In addition, Naaldwijk houses the General Advisory Service for Vegetable and Fruit Crops under Glass with four employees and the Regional Horticultural Advisory service with 50 employees. There are also many temporary workers at the station such as students in their practical year of which there were 20 in 1981.

Naaldwijk research station was founded in 1900 as a regional experimental station for crops in the Westland and in 1927 its name was changed to 'Experimental Station for the South Holland Glasshouse District' (the Province still makes a separate contribution to the Station's annual finances) which indicated a considerable expansion of activities. In 1948 national status was achieved with the emphasis on glasshouse vegetable and fruit crops while in 1978 the name was again changed, to its present title.

The present location dates from 1925 when it extended to 4.5 acres but by purchasing five surrounding holdings soon after the last war the Station grew to its present 17.5 acres and it now has nearly 8 acres of glasshouses. It is of course sited in the heart of the Westland which has about half of Holland's 20,000 acres of glass. All Naaldwijk's glasshouses are part of the research facilities with some having been especially equipped for certain types of research such as projects on plant pests and diseases, glasshouse climate and energy saving. Five larger boiler installations housed in two boiler rooms supply heating to all the glass and buildings.

These latter include workshops for the nursery, grounds and technical service, a small laboratory and computer building, several laboratories for routine soil analysis, for chemical and physical research and a botanical laboratory. The intensive co-operation with other research institutes in Holland and abroad means that Naaldwijk has a fair share of seconded staff in addition to 'co-workers' from the Institute for Soil Fertility (IB), the State Institute for Variety

Research (RIVRO), the Institute for Mechanization, Labour and Buildings (IMAG), the Phytopathological Institute (IPO) and the Agricultural Economics Institute (LEI).

There is also a close co-operation with other research stations in Holland which carry out work on glasshouse vegetable crops such as those at Venlo, Breda, Vleuten and Sappemeer. Such work is both co-ordinated from and processed at Naaldwijk. There are also close contacts with such organizations as the Central Bureau for Horticultural Auctions, the Commodity Boards and the Association of Horticultural Study Groups (NTS). However, the most important aspect of co-operation is considered to be that with the state advisory services, this close liaison ensuring that research workers are kept informed about developments in commercial horticulture whilst advisors are given up to date information on research results which can be quickly passed on to growers.

Naaldwijk is active in the publishing field with 300 titles now to its credit, mainly scientific publications relating to completed research projects. In co-operation with the advisory service Naaldwijk staff publish 300 articles a year in the Dutch trade press whilst a monthly journal is sent to all the 8,000 growers in the South Holland Glasshouse District. There is of course an annual report and this is published in three versions. An English language edition is sent mainly to other research organizations both at home and abroad and is generally more detailed than the abbreviated version sent to every South Holland grower but this does concentrate on the main findings and contains an extensive list of reference addresses. The third version of the annual report contains a project by project report of all the Station's research work carried out within the particular year and is mainly for internal use although interested growers and others involved with the industry can obtain copies free by special request.

Research work at Naaldwijk is carried out within five departments: soils, water and nutrition; horticulture and glasshouse climate; physiology; pests and diseases; and economics, labour and mechanization. There are some common starting points for all five departments with the emphasis today on reducing production costs as opposed to the former main aim of increasing crop yields. Labour and energy savings are equally important aspects nowadays whilst other major targets are improved quality, widening the range of crops grown and reducing pesticide use.

The soils, water and nutrition department handles all the routine soil tests as well as having a research team working on improving analytical methods, particularly to speed up obtaining results. Changing growing methods mean an accent also on crop nutrition research whilst much attention is also devoted to the quality of soil and water, especially with this latter salt content and more efficient methods of irrigation.

In the horticulture and glasshouse climate section, work is carried out on virtually all the vegetable crops grown under glass as well as a number of ornamental crops. The work of this department covers numerous aspects such as soil

¹One Dutch Guilder = \$0.333 U.S.

and air temperatures, crop timing, cultural operations, harvesting, grading and storage. New or alternative crops and their potential for commercial production is another major facet of this department with new varieties also being trialed. With the glasshouse climate work is aimed at formulating optimum conditions for different crops and improving environmental control techniques and equipment. Energy saving is also being actively pursued with projects on the use of thermal screens, insulated glasshouse cladding and heating pipe layout.

Scientists in the physiology department are looking at the effects on certain life processes of plants, such as growth rate, flower development and use of CO₂ enrichment. Photosynthesis and the effects of light interception by thermal screens are also under investigation. The pests and diseases section is looking at virus diseases of glasshouse vegetable crops including ways of preventing infection. New plant protection chemicals are tested with a special accent on residue research as Holland has become a very environmentally-conscious nation. Thus biological pest control is another major project.

With economics, labour and mechanization, a relatively new department, organization and labour content of various crops are being studied with the scope for mechanization and automation being explored at the same time. Great attention is being paid to nursery management and this

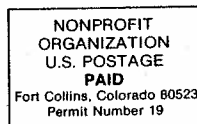
department contributes to the development of data service systems.

Amongst the routine research and services carried out by Naaldwijk are 50,000 soil analyses each year. These are charged for as are the special research topics connected with projected nursery developments such as soil structure and drainage surveys, nursery planning, water management in polders, shade determinations in glasshouses and many more. Although comparisons are odious it is no understatement to declare that the UK can learn much from the Dutch approach to glasshouse research and development, not least the way information is presented to growers at open days!

Editor's Note: *The total funds available for greenhouse research in the entire United States is probably close to the total for the one research station described above. The numbers of people actively engaged in Floricultural research and extension, with strong, active programs, in the U.S. are less than the total staff at Naaldwijk. Are we — as Imrahil spoke to Gandalf in Tolkien's "Lord of the Rings" — "... to sit upon our sand castles while the tide is flowing?"*



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