

THE TRAINING AND FUNCTION OF THE DUTCH GRADUATE AGRICULTURIST ¹⁾

G. J. VERVELDE

HIGHER AGRICULTURAL EDUCATION IN THE NETHERLANDS

In the Netherlands there is only one training centre which produces graduates in agriculture: the Agricultural University at Wageningen. The education provided at this establishment was raised to university standard in 1918; since then graduates of Wageningen have been awarded the academic degree of „landbouwkundig ingenieur” (graduate agriculturist).

In principle anyone is eligible to study at the Agricultural University, but before he can sit the examinations and obtain the certificates the student must be in possession of a Netherlands secondary school-leaving certificate. The leaving certificate of one of the four agricultural secondary schools in the Netherlands also gives the holder these rights. Equivalent certificates of other countries likewise entitle the holder to enter for the examinations.

The majority of students commence their studies between the ages of 18 and 20, so that their university training follows immediately after their secondary education. Consequently, most students have had no opportunity of doing practical work in agriculture — except those who have had agricultural secondary education, since this involves a good deal of practical training. A relatively small percentage of the students enter the university at a later age. Some of them take advantage of the opportunity, whereby those who are 25 years of age or older may, under certain circumstances be allowed by the Ministry of Agriculture to sit for the examinations without being in possession of the certificates otherwise required.

The course lasts 5 years or more. The first sixteen months (propaedeutic study) are spent in acquiring a general grounding in a wide range of subjects — botany; mathematics; chemistry; physics; meteorology; economics; hydraulics; mineralogy, petrology and geology; mechanics; and general agronomy. It is only after this that the various branches of study diverge. There are fourteen branches, covering agriculture, tropical agriculture, horticulture, forestry, tropical forestry and rural home economics. Some of these branches of study are as follows:

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Agriculture — arable and pasture farming
 animal husbandry
 dairying
 economics
 land and water use
 Tropical agriculture — tropical cultures
 animal husbandry
 economics
 Horticulture — horticultural crops
 garden and landscape architecture.

During his two years of study for the bachelor's degree the student must take a number of compulsory subjects, the purpose of which system is to give him a wide agricultural education in the branch or subbranch he has chosen. The following is an example of such a syllabus for the "horticultural crops" subbranch :

horticultural plant-growing ;
 genetics ;
 botany ;
 plant taxonomy and phytogeography ;
 phytopathology ;
 microbiology ;
 agricultural chemistry ;
 agricultural economics ;
 horticultural engineering ;
 mathematical treatment of experimental results.

If he wishes, the student may supplement this syllabus with other subjects chosen from those taught at the Agricultural University, although according to some the number of compulsory subjects is already too large.

When the student has obtained the "Candidaat Landbouwkundig Ingenieur" diploma (approximately equivalent to B.Sc. (Agr.)) at the end of the two-year period previously referred to, he spends six months doing practical work. This may be interrupted if necessary. The time is spent partly on farms or in market gardens, partly in agricultural industries, in nurseries, in the agricultural advisory service or, in exceptional cases, in the laboratories of research institutions. The students are encouraged to spend part of this practical period abroad. Indeed, in the case of tropical studies a visit to southern countries is almost essential.

The final phase of the course consists of 1 to 1½ years devoted to a more specialized and independent study of from four to six subjects. The student is then usually expected to study or work out a particular problem in each of these subjects; this may take the form of practical work or of theoretical treatment based on the relevant literature. For most subjects the results of this study must be set out in a written paper. The diploma is awarded after a final examination in each subject.

Higher agricultural education is conducted on university lines. Theoretical training is the primary consideration and is given pride of place over the imparting of practical skill, although the latter is not neglected. Furthermore, emphasis is laid on broad-based training rather than on a high degree of specialization. In the course of time there has been a great deal of discussion of the aims and objects of higher agricultural education in the Netherlands, but there is a fair consensus of opinion that the direction followed is the right one. If strong emphasis were to be placed on practical knowledge and ability, the training would lose its university character and sink to the level of secondary

education. On the other hand, though specialization would certainly result in better preparation for certain very specific posts, the careers of many graduates show that they seldom continue to work in one particular job. It is precisely because of the all-round training they receive that there is such a wide choice of situations open to graduates of Wageningen.

Meanwhile it cannot be denied that, for a number of posts, there is a need for a greater factual knowledge of all the special affairs with which the agriculturist comes into contact. Moreover, in research work particularly, there is also a demand for a large number of specialists. A commission recently gave its opinion on the question of how higher agricultural education could best meet these requirements. It recommended that the factual knowledge required for a particular post, and the necessary specialization, should be catered for by a period of post-graduate instruction after completion of the university course proper. In the past the graduate received this post-graduate training while actually working in his job, but under the new system this would be done more systematically and efficiently in the environment of the Agricultural University. The training for research specialist might be further improved by encouraging the student to prepare a thesis, by increasing the opportunities of becoming assistant to a professor, and by awarding scholarships to enable graduate agriculturists to work in research institutes in other countries.

EMPLOYMENT PROSPECTS FOR GRADUATE AGRICULTURISTS

Since 1940 the number of students at the Agricultural University has greatly increased, in comparison with the previous period. Accordingly, in the years following World War II the number of young graduate agriculturists becoming available has constantly been much higher than was the case before the war. This large supply coincided with a period during which the political situation in Indonesia constituted a serious barrier to the employment of graduate agriculturists in that country. A few dozen did, in fact, continue to go to Indonesia each year, but mostly on short-term contracts. Moreover, since many of those already working there returned to the Netherlands, Indonesia has, on the whole, ceased to offer any prospect of employment for graduate agriculturists since the war. This state of affairs, therefore contrasts strongly with the position before the war, when a high percentage of Wageningen graduates found employment in Indonesia.

In view of this situation a study of the employment prospects of graduate agriculturists, in the Netherlands and elsewhere, was undertaken in 1948 by the Netherlands Society of Graduates in Agriculture, an organization to which the great majority of the graduates belong, and which promotes and protects their interests. In general, a growing demand for graduate agriculturists in the Netherlands was predicted for the immediate future. This forecast has since been amply fulfilled, an important factor in its fulfilment being the levelling-out of salaries which occurred after the war, as a result of which an employer who engaged an agriculturist incurred only limited additional expense if he employed a university-trained one. The prospects of finding posts in the tropics were deemed very uncertain. Nevertheless, even in recent years tropical regions have continued to provide a substantial field of employment, both for graduates in tropical subjects and for others. A number of Wageningen graduates have obtained permanent posts in various tropical regions, such as Africa, while others have

been temporarily sent out as F.A.O. experts for the provision of technical aid to under-developed territories. The wide training received by these people enabled them to adapt themselves quickly to an entirely new environment and to unfamiliar working conditions. Last but not least, a number of young graduates succeeded in obtaining employment in agriculture in Canada, Australia, New Zealand, South Africa and the United States.

The Society of Graduates in Agriculture (*Instituut van Landbouwkundig Ingenieurs*) has already been referred to. This Society runs an employment bureau which assists members to obtain employment and, among other things, makes regular announcements of existing vacancies at home and abroad. Moreover, it is frequently possible to change one's job, or secure initial employment, owing to the large measure of mutual contact and personal acquaintance which exists within this group of about 1500 agricultural scientists all of whom come from the same training establishment.

THE SPHERE OF ACTIVITY OF GRADUATE AGRICULTURISTS IN THE NETHERLANDS

On completion of their studies more than half of the Wageningen graduates enter government service in the Netherlands. They are employed in greatly varying capacities by the Ministry of Agriculture, Fisheries and Food. Apart from filling posts in the administration, they may also be employed as: (a) agricultural attachés; (b) advisory officers for agriculture, horticulture, animal husbandry, dairying, poultry farming, land and water use and matters relating to land ownership and tenancy; (c) instructors in secondary agricultural and horticultural education; (d) research officers at research institutes working on behalf of farms or agricultural industries. In addition, a limited number of graduates are taken on by the Ministry of Social Affairs (in connection with employment prospects) and by the Ministry of Transport and Inland Waterways or its provincial branches, mainly to give assistance or advice in the execution of works involving agricultural interests. A few graduate agriculturists are also employed by the Ministry of Education as teachers in general secondary education, e.g. for biology and chemistry.

The number of Wageningen graduates employed by associations and other private employers, although smaller than the previous group, is nevertheless considerable. Such associations include, for instance, the professional organizations of farmers, marketgardeners and agricultural workers; the co-operative societies for the buying and selling of agricultural and horticultural products; the dairy societies (regional and national associations of dairy undertakings); the inspection services for crops, and the cattle herdbook societies. Among other posts in private industry filled by graduate agriculturists the following may be mentioned: adviser or estate manager to plantation-owning firms; laboratory technician or head of the information service in firms manufacturing production aids and materials used in agriculture; executive experts for land reclamation companies; plant breeder for seed firms. Separate mention need hardly be made of those graduates who choose the ancient professions of estate steward, farmer or landscape gardener; they are however, few in number. Also relatively few are those who have found posts in industries for the processing of agricultural and horticultural products, such as the paper and fibre industry, the potato flour and sugar industries, the brewing and other grain-processing industries, and the food-

preserving industry. Up to 1945 technological training occupied quite a modest place in the curriculum of the Agricultural University. Now that this defect has been remedied, an increase may also be expected in the number of graduate agriculturists who find employment in these industries.

THE FUNCTION OF ADVISORY OFFICERS AND RESEARCH WORKERS

The function of two of the previously mentioned groups of graduate agriculturists in the Netherlands deserves further explanation.

The *advisory officers*, appointed by the government, perform various functions, according to the departments to which they are assigned. The advisory officers for arable and pasture farming or horticulture advise farmers and market-gardeners not only on the cultivation of field and garden crops, but also on matters concerning the farm as a whole. Consequently they must also possess a knowledge of business economics and social conditions. In view of the position of trust they occupy in relation to the farmer and horticulturist, they are given no tasks involving control or inspection. Each of them has at his disposal a staff numbering between 25 and 30 (this often includes one or two graduate agriculturists), to maintain daily contact with farmers and horticulturists and to conduct a certain amount of simple research. The advisory officers for animal husbandry and dairying supply information on only part of the farm, and consequently have only a small staff of assistants. The advisory officers for land ownership and tenancy, and the officers for matters of land and water use, have less contact with the farmer or horticulturist himself, but give assistance in the execution of certain government measures.

The *research workers* employed by institutes for agricultural research are being recruited to an increasing extent from graduates of Wageningen. Up to a few decades ago research work was necessarily entrusted to university men without special agricultural training. Nevertheless, although in the early years of the Agricultural University the student's training was still far from purely scientific, a few graduates with an aptitude for research were gradually able to obtain positions in agricultural research both in the Netherlands and in tropical regions. The number of graduates engaged in research work grew as the research apparatus expanded and directed its work increasingly towards the immediate requirements of agriculture. Where positions of authority in agricultural research are concerned, the graduate agriculturist even enjoys a certain preference, at least when it is not obviously a question of very specialized research. For he is in a better position than others to survey and sum up the problems in agriculture requiring solution and to determine how the results of research can best be utilized in agricultural practice. It is estimated that in the Netherlands alone there are already some 250 Wageningen graduates engaged on research work. By far the greater part of this research is financed by the government, although the manner in which this is done varies. Besides the Agricultural University and several government institutes, there are a number of foundations which maintain research centres, in many cases with the aid of state subsidies and contributions from societies or industry. Some of the activities of the Netherlands Central Organization for Applied Scientific Research (T.N.O.) also come within the province of agricultural research; this organization receives a very substantial state subsidy but may also accept financial contributions from other sources for the execution of research orders.

CONCLUSION

Higher agricultural education in the Netherlands has turned out a large corps of graduate agriculturists just at a time when aids and appliances for raising production and lightening work in agriculture were becoming available in ever-increasing numbers and quantities. As a result practical agriculture has been able to make efficient use of these aids through instruction, advice and research. Since the supply of new aids and appliances is increasing rather than decreasing, the function of the Netherlands graduate agriculturist will be a permanent one, especially in view of the fact that the less developed agricultural regions of the world will also wish to share in the progress eventually.

The graduate of Wageningen faces the future with confidence.

