TO BE A GROWER OR TO BE A HORTONOMIST.....

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Abstract

Within the Degree programme Horticulture, the Department of Horticulture plays an important role. This article presents an overview of the educational programme at the Horticultural Department. By this academic programme we educate students to be able to work in or on behalf of the Horticultural Industry. This implicates that besides knowledge of plant sciences, graduates have to have knowledge of socio-economics: they have to become Hortonomists instead of mere horticultural specialists (growers). Graduates are expected to have a broad and in depth knowledge of the Horticultural Industry and of the basic sciences.

1. Introduction

Students with an academic degree in Horticulture have to be able to work in or on behalf of the Horticultural Industry, with all its different branches. In order to be able to do this, students need a wide range of basic knowledge on the subjects of Horticultural Industry, both plant sciences and socio-economics. On the other hand students have to be specialist in one particular field (e.g. marketing, information technology, plant protection, plant physiology), which requires in depth knowledge on one of these fields of interest.

During the last 15 years students were faced with cutbacks in financial support and in their study time. But still they have to master a lot of knowledge, within a 4 year study-programme. From their first trimester on they have to organize their study very strict, in order to be able to obtain their degree. This puts pressure on both students and teachers.

Both students and teachers have to master more and more knowledge. Especially with the modern computer-information systems, more and more knowledge is available and accessible. The rate at which information becomes available is still increasing. Both teachers and students have to make a selection between important and less important information. Is it necessary that students know how a rose crop is grown in the greenhouse? Or do they have to understand the basic principles (e.g. plant physiology, climate control) of growing crops in protected cultivations? Is it necessary that a student recognizes the disseases that occur in vegetables or should the student be familiar with the causes of and the ways to solve these problems?

Besides the choices concerning the content of subjects, teachers have to choose specific teaching methods in order to use the limited contact hours with the students as optimal as possible. The way the knowledge is presented (lectures, working groups, practical work) and the tools (book, video, slide, sheats etc.) have to be chosen carefully.

In the past the emphasis in horticultural teaching, was put on plant production and harvest yields. The traditional plant sciences formed the basis: plant breeding, soil science, plant-nutrition etc. Plant physiology was used to deepen the knowledge. The horticultural cultivation systems have become more and more complex, and with that the complexity of the problems and questions has increased. This requires a multidisciplinary approach in analysing and solving these problems. Know-how is necessary on topics of

environmental issues, sociology, marketing etc. Knowledge of different fields of science have to be understood and integrated. More understanding is needed instead of mere recipies. Graduates have to have insight in the complexity of at least part of the Horticultural Industry; they have to become Hortonomists instead of mere horticulturalists. Students have to learn this and teachers have to present the basic principles and strategies on how to become a Hortonomist.

2. General structure of degree programme at WAU.

The total Degree programme takes 4 years. The duration of academic year is 42 weeks (3 trimesters, total of 1680 slh. (study load hours) per year). In total the students have to complete 12 trimesters (± 6560 slh.). These slh. include the contacthours (lectures), experimental work and self study. E.g. a course of 80 slh. has 24 contacthours. About 25 - 30% of these hours is followed at the Horticultural Department.

The degree programme consists of two parts:

1. the first year: the preliminary year,
2. 'doctoraal' of three years.

In practice students use their total available study time (5 years of financial support). The extra, fifth year is mostly used for extra courses. After each trimester there is a periode of 4 weeks, in which the students complete most of their subjects by means of a written examination.

In the preliminary year, students start with the basic sciences and basic aspects of horticulture. This year is meant to be motivating and orientating. In the following 'doctoraal' years the knowledge of these courses is extended and becomes more specific. The students have to integrate the different courses and sciences and they have to obtain a multi-disciplinary approach and way of thinking.

This structure can also be found in the overview of the subjects given at the department of horticulture (figure 1).

3. Education given at the department of horticulture

Figure 1 shows that horticultural subjects are given throughout the study. It starts with an overview of Dutch Horticulture in the first year and it ends with a Major in Horticulture (thesis-work) in the last year.

3.1 Preliminary year

In the first year students obtain an overview of the different horticultural branches (e.g. fruit-production, floriculture) and of the most important cultivation systems used (course title: Dutch Horticulture, figure 1). This course introduces students to the specific features of horticulture and the differences between the branches. The course consist of lectures and self study (70 slh.), taxonomy of horticultural crops (10 slh.) and experimental work on propagation methods and the influence of environmental factors on growth and development (40 slh.).

In the final trimester of the first year students fulfill a practical period on a nursery, in which they get in touch with the daily problems of a grower. The students choose a horticultural branch and work for four weeks on a nursery or farm. This course element is completed by a written report, which is discussed with one of the staff-members.

3.2 Second year, first 'doctoraal' year

The first trimester is filled with basic sciences, given at other departments. In the second trimester horticultural students are obliged to follow the course Principles of Horticultural Production (figure 1). In this course the basic sciences (like plant physiology) are directed towards horticultural crops and products. Emphasis is put on specific horticultural features like the possibilities to control growth and development by manipulation of environmental conditions and the (mostly) short-lived storage or shelf-life period of

horticultural products.

During the third trimester the students can again do a practical period, this time of six weeks, on a nursery, a research station or commercial company. The working place should be in a different horticultural branch than during the practical period of the first year. During this period the students must write a report in which they have to compare knowledge in literature and practice, on a chosen subject. This report is again discussed with the staff-member concerned.

3.3 Third year, second 'doctoraal' year

The basic knowledge of the first two years is further enlarged in three courses: General Aspects of Protected Cultivation, Aspects of Growth and Development of (woody) Perennials and Quality of Horticultural Products (each subject with 80 slh.) (figure 1). These courses give a deeper knowledge and understanding of the features of horticulture. On the one hand the protected cultivations: e.g. cutflowers, potplants, vegetables with aspects like greenhouse climate control, waterrecycling. And on the other hand the unprotected cultivations: e.g. arboriculture, fruit-production, vegetable growing, with aspects like dormancy and fertilization. Product-quality is a very important feature that distinguishes horticulture from agriculture. In the course Quality of Horticultural Products, different aspects of quality are discussed, including methods to manipulate or improve product-quality.

Another course wich students are obliged to follow in the third year is: Horticultural industry in the Netherlands (80 slh.). In this course students become acquainted with aspects like farm planning and management, horticultural organizations and market structures.

Before students deepen their knowledge in a Major, they must do the practical course Introduction to Horticultural Research (160 slh.). This course teaches students to start their own experiments (e.g. planning, organizing, applied statistics) and how to do literature research. Handling research data by computers and using computerprogrammes to report on the results are also part of this course.

In the above mentioned courses the link between horticultural crop sciences and the basic sciences is formed. The link of this broad and in depth basis with the Horticultural Industry is formed by the 'teeltvakken' of 80 slh., which represent all branches of horticultural industry (an english translation for these 'teelt'-courses is not easy to give, the mostly used terms 'production' or 'cultivation' are not valid, because many more aspects are dealt with in these courses). In the past these courses were plant-oriented. Nowadays the industrial aspects are more important. The horticultural students have to choose at least two 'teeltvakken' in preparation of their Major (grey area in figure 1).

3.4 Fourth year, third 'doctoraal' year

The horticultural students finish their education at the department with a Major of 520-840 slh. In this subject student individually perform experimental work on a specific item. The students have to work independently under the guidance of a staff-member. Their work involves: literature research, setting up experiments, experimental work, writing a thesis and an oral presentation of the outcome. The final examination of the thesis is done by one of the Professors in Horticulture and the staff-member involved.

During their study, students have to obtain academic skills (e.g. analytical observation, integration of horticultural knowledge and basic sciences, communication skills etc.). These attitudes/skills are incorporated in the courses. In the course Literature Research and Communication Skills, for example, students have to analyse, critisize, compare and discuss international horticultural scientific articles. In the course Introduction to Horticultural Research, students learn how to plan their experiments, to perform the necessary experiments, to analyse the results and conclusions and to present them (oral and written).

4. Concluding remarks

In the past ten years the educational programme at the Department of Horticulture of the WAU has been reorganized. First of all courses were structured in such a way that they start at a general-basic level. Subsequent courses are more specialized and deepen the knowledge of the preceding courses.

Secondly more attention is paid to socio-economical aspects, next to plant characteristics. This enables us to incorporate large-scale items like energy-, environment- and employment-problems into the education. By this the students get more insight in the backgrounds of these problems and how to deal with this in the continuously changing Horticultural Industry. Considering that within the Degree Programme of Horticulture the education of the Department of Horticulture is about 25-30% and that students take courses in a wide variety of other sciences, we strongly believe that our graduates have become 'Hortonomists', rather than horicultural specialists (or growers). These graduates will be well equipped to work in the vast changing and expanding Horticultural Industry.

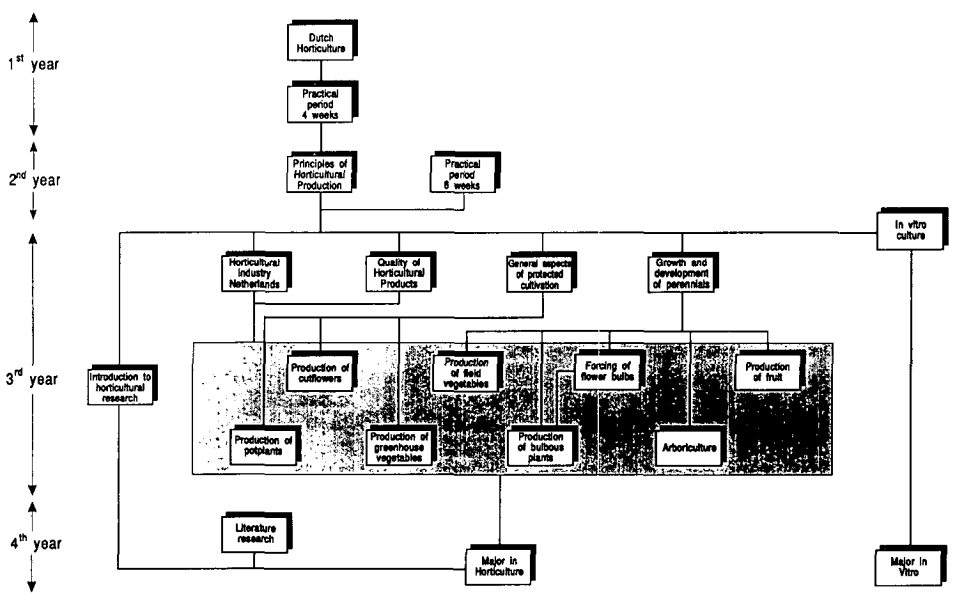

Figure 1: Diagram of the subjects given at the Horticultural Department.