

# A new scope for the Netherlands Journal of Agricultural Science

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## Introduction

During the last century a large increase in productivity per unit area and per unit labour has been achieved in agricultural production. In crop production this was accomplished by the successful introduction of new techniques, new crops and cultivars, the use of chemicals (chemical fertilizers, chemical crop protectants and growth regulators), and the adaptation of crops to the use of these techniques by breeding. Especially the coherent use of a technology package containing a balanced input of water, chemical fertilizers and chemical crop protectants, and the use of highly productive cultivars has been successful (De Wit, 1992). Similar rapid developments took place in animal production based on increased knowledge about the physiology of the animal and a strong animal-breeding programme, and supported by an intensive feed production industry. At the same time tremendous changes have occurred in the food processing industry and in consumption behaviour. Starting with small scale, local production facilities the food industry has developed into a high-tech multinational industry. From relative food scarcity a situation has been reached in which food is abundantly available throughout the year at a reasonable price. It contains all the nutrients required by humans. The diet has in fact become a life style factor.

Agricultural science has greatly contributed to this tremendous technical innovation of agricultural production. Here agricultural science is defined to comprise not only the sciences that deal with primary production, but also food science and the social and environmental sciences in the context of agriculture. In fact the entire production chain from farm to fork and its social and physical environments are taken into account.

The impact can be illustrated by the following examples. In 1890, it took in the

Netherlands 300 man-hours of labour to produce 1.5 tons of wheat per hectare; 100 years later this labour input was reduced to 15 man-hours per hectare, with an average yield of 8.5 t ha<sup>-1</sup> (De Wit *et al.*, 1987). Such a development has taken place in all other major crops. Similarly, milk production increased to about 8000 kg per cow per year and a single farmer can now handle as many as 100–150 cows (the average number of cows per dairy farm increased to 60). At the same time the caloric intake through food products has reached a saturation point in most western countries.

Agricultural sciences in the Netherlands have had a strong focus on a reductionistic approach aiming at elucidating mechanisms of soil processes, crop production, animal production and food production and consumption. The rapid advancement of these sciences, supported by the general progress in biological and other sciences and by the strong increase in the quality of scientific tools have yielded a tremendous insight into the basic processes underlying food production. The application of analytical non-destructive and destructive tools of the life sciences, nowadays also with nanotechnology and the application of molecular DNA techniques, will allow agricultural scientists to continue to contribute to the development of agricultural sciences. The wide application of simulation and modelling techniques, enhanced by increasingly powerful computers, has made it possible to generalize the information and to test the relative importance of different aspects of production systems and to discriminate between them.

## Changes in research structures, research questions and research culture

Recent history of agricultural research in the Netherlands has learned that the classical linear four-layer model of curiosity-driven research at universities, strategic research at institutes, applied research at national research stations and 'adjusting research' at regional demonstration farms is no longer effective to address the research questions of the future. In the Netherlands the government responded to this by bringing all types of agricultural research together into one large organization, namely Wageningen University and Research Centre, with the aim to realize close collaboration within and across the divisions Plant sciences, Animal sciences, Social sciences, Land use and environmental sciences and Food and agrotechnological sciences. This should improve the response to current problems, stimulate the acquisition of research funds, improve the efficiency of these funds, enhance the utilization and transfer of knowledge, and create an optimal environment for training and research.

Partly due to the success of agricultural sciences, the socio-economic environment of agricultural production systems has changed tremendously. The most obvious changes are the strong reduction in number of farmers, the transition in the markets from producer-driven towards customer-driven, current worries of policy makers about the sustainability of the agricultural systems and of the general public about the ways production is realized, including worries about animal welfare, genetic manipulation, quality of the environment and safety of the products.

So research questions are changing from how to optimize yield into how to opti-

mize the supply chain, its products and the production environment. Research nowadays needs to play an important role in the prototyping, designing, testing and analysing of promising cropping and animal farming systems and food products that are needed to make agriculture sustainable in an environmental, agronomic, political, societal and economic sense. Multidisciplinary approaches have long been recognized as crucial to solve problems in agriculture; they were already essential in those days when yield maximization was still the main issue. Such approaches, however, are even more important (and should include many more scientific disciplines) when researchers face these new questions. Yet they remain rare as the scientific community considers them of lower quality and status. Even the strongly recommended integration of beta and gamma sciences is more pronounced in the mind of the policy maker than of the scientist. Multidisciplinary research needs incentives and platforms to really become productive. The Netherlands Journal of Agricultural Science (NJAS) wants to become such a scientific platform with the help of the leadership of Wageningen University and Research Centre, which should provide the incentives to create the multidisciplinary programmes that cross the current barriers between the expertise units.

## Current position of NJAS

NJAS is the Quarterly Journal of the Royal Netherlands Society for Agricultural Sciences and therefore aims to be a medium for international publication of research carried out by its members. Almost all of the ca. 7200 members of this Society are alumni of Wageningen University. This University provides curricula and PhD programmes in plant sciences, animal sciences, land use and environmental sciences, social sciences and food and agrotechnological sciences. A rapidly increasing proportion of the graduates is foreign, both at the MSc and the PhD level.

Over the years, NJAS has played an important role in the transfer of the knowledge created by the Dutch system of agricultural science, especially in the fields of plant, soil and animal science. NJAS is listed in the Science Citation Index as one of the top 10 journals in agronomy and has a fairly high citation index (Struik *et al.*, 2002). NJAS has a wide distribution, partly due to the fact that many members of the Royal Netherlands Society for Agricultural Sciences are also subscribers to the journal.

NJAS has a rather wide scope (Struik *et al.*, 2002). The contents of NJAS have changed continuously. Its image is probably not so clear and the submitted papers vary with trends in science. Its contents are not a proper reflection of the disciplines of Wageningen University and Research Centre and at present certainly do not cover all research fields in which the members of the Royal Netherlands Society for Agricultural Sciences are active. Given the differences in scope between NJAS and Wageningen University and Research Centre, the link of the journal with its mother organization is rather weak. This became more obvious after the shift of interest from the classical agricultural sciences to the life sciences within plant and animal sciences and the shift from the sciences focused on primary production to the food and agrotechnological sciences, the environmental sciences and the social sciences.

## The future scope

NJAS would like to become the main scientific platform for research that can be classified as typically representative for the Wageningen school of science. This includes at least the following (Struik *et al.*, 2002):

- multidisciplinary in its approach;
- interdisciplinary (including beta-gamma interactions) in its methodology;
- quantitative (based on system analysis and modelling) in its analysis.

The Royal Netherlands Society for Agricultural Sciences also wants to make the journal interesting to all its members by becoming a publication medium for all sciences of Wageningen University and Research Centre. Yet it also wants to keep serving the current readership and authorship. Future contents should also include papers on such issues as bio-nanotechnology, genomics, social sciences, interaction between beta and gamma sciences, the delta approach in management of the 'green and blue environment', and other disciplines.

To achieve that objective the editorial board will solicit a balanced mix of disciplinary papers in all fields of science of Wageningen University and Research Centre, multidisciplinary papers, review papers, and specific contributions aiming at integration of disciplines. It will also stimulate authors to write reflections on societal trends related to their field of research and to link their knowledge to the needs of their stakeholders.

NJAS will especially welcome papers in which system approaches are described as the search for agricultural systems that combine multiple objectives including production of healthy food, income generation, preservation of environment and natural resources, landscape management, etc. requires such approaches. Only in that way we can integrate the commodity driven technical solutions into a sustainable land use system that is productive. Researchers are challenged to demonstrate their T-shaped skills to analyse complex systems and to reintegrate their analytical knowledge into a holistic system. They are also challenged to link their knowledge network to all stakeholders and to write in the different languages of these stakeholders and the general public.

To underline the new scope the journal will be published under a different name, which from today will be: NJAS – Wageningen Journal of Life Sciences.

## Our future readership

Changes will hopefully not affect the interest of our current readers. We will keep serving them with papers of high standards, written by scientists of international standing and properly scrutinized by expert referees.

At the same time we hope that the contents of future volumes will appeal to a new category of readers, namely those interested in papers in which the latest disciplinary knowledge is applied to and integrated in complex systems. Such papers will be written by scientists who make use of the progress in many different disciplines and of their capability of looking beyond their own discipline by integrating their knowledge

with that of colleagues realizing that the most rapid progress is made where disciplines meet.

## Our future editorial policy

The editorial board has solicited the support of the current scientific directors of the different expertise groups of Wageningen University and Research Centre. They have agreed to stimulate the submission of manuscripts containing multidisciplinary and interdisciplinary information, not only at lower levels of aggregation, but certainly also at higher levels of aggregation, including cropping and farming systems, animal systems and land use systems and results of co-operation between beta and gamma sciences. The contents of NJAS will reflect the Wageningen tradition of high quality science in the broad fields of the five expertise fields and the problem-oriented nature of the University, while maintaining its traditional linkage with agriculture and with the developing countries.

Without loosing the linkage with the members of the Royal Netherlands Society for Agricultural Sciences the journal would like to widen the authorship and make more use of foreign referees and international members of the editorial board.

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