

RESEARCH AND EDUCATION IN CROP SCIENCE IN THE CZECH REPUBLIC WITHIN THE LAST DECADES

J. KUBÁT

RESEARCH INSTITUTE OF CROP PRODUCTION, PRAHA 6

Introduction - Úvod

The 50th anniversary of the Czech University of Agriculture is certainly an important milestone in the long-lasting history of agricultural research and education in this country. It is a great pleasure for me to remember this anniversary and to take part at the international conference organised at this occasion. I am also very pleased to express the most sincere congratulations on behalf of the Research Institute of Crop Production, and certainly on behalf of many of my colleagues who enjoy long-lasting collaboration with the University teachers and scientists.

The Czech University of Agriculture and the Research Institute of Crop Production are not only neighbours. They are rather close relatives: Both were founded approximately at the same time (RICP celebrated its 50th anniversary a year ago) and both have the common parents. The common origin of the agricultural education and research was recently well described by Kúdela (2002). As he pointed out, regular education in agriculture at the university level in this country started in 1892 when the Department of Agriculture and Technique was established at the Czech High Technical School in Prague. Six years later, in 1898, the Research Station of Economy and Physiology was established. The Station was created and headed by Julius Stoklasa, one of the most distinguished professors in agriculture and also scientists in his time. The Station became a predecessor of the State Research Institutes for Crop Production, established in 1919, which were succeeded by the Research Institute of Crop Production (RICP) in 1951. Shortly afterwards, in 1952, the Czech University of Agriculture (CUA) was established as an independent institution.

Need of university research

Establishment of the independent Czech University of Agriculture and the following remarkable support of it by the government has certainly be a very positive action that has substantially contributed to the development of agriculture in this country. A questionable trait at this development was a rather profound splitting of agricultural teaching and research. The mission of the University was focused on teaching, while responsibility of the research institutes was in the research only.

Universities, however, need to maintain and keep together both teaching and research. Both functions are needed, and both of them are important for the education of the university students. The aim of the research is not only in bringing new knowledge but also in its contribution to education of the students. Research is an important part of the upbringing system. It contributes to the training in systematic problem solutions, creative thinking, scientific substantiation and innovative attitude to the basic problems.

Objectives of the research and its quality are very important in the education of the students, in the creation of their initiative and in their motivation. If the research does not really contribute to the new knowledge or practical needs, if it is just formal, it may induce latent careerism of the students. If the research is not oriented to the practical problems it does not create a close relation to agriculture. For this reason, the Agricultural University research should meet the needs of teaching and should contribute to solving topical problems of agricultu-

re, as well. In such a case, basic and applied research mingle. The scientific interest helps the practical agriculture and simultaneously motivates the students to pursue in agriculture (Arnon, 1969).

Collaboration between CUA and RICP

In spite of the split organisation and administration of the CUA and RICP a close collaboration in agricultural research and education continued over the whole 50 years time period. This was mainly thanks to the interest and effort of many scientists from both institutions. The scientists from the RICP were invited to give lectures to the pre and postgraduate students. Scientists and professors from both institutions collaborated within various research programmes, scientific boards, editorial boards, and various commissions. They collaborated in organisation of agricultural research and in organisation of domestic and international scientific meetings, symposia and conferences. One of the examples were altogether 10 International Symposia "Humus et Planta" organised in approximately four years intervals since 1957 to 1991.

The collaboration in research between the CUA and the RICP staff continues in the present time in frame of various research projects funded by different national or international agencies. Hopefully, this trend will continue and enlarge in future.

Last but not least, the CUA educated a number of scientists and technicians, who have been working in the RICP. Almost a half of the university level educated RICP employees were graduated at the CUA in Prague (44,6%) and a major part of the postgraduate studies of the RICP staff was accomplished in the CUA, as well.

We hope that this trend will also continue. Hopefully, RICP will be offering interesting jobs to the talented, well educated and motivated scientists trained in the CUA.

Objectives of agricultural education and research

1. Productivity

The main objective of agricultural research and education in the past was to increase the crop and animal production. The goal was to reach the self-sufficiency in the foodstuff supply. This objective seems to be overcome during the last decade, when agriculture is facing problems with overproduction. However, productivity of farming systems remains an important issue in agricultural research and education.

Productivity of agriculture has always been a precondition of the development and maintenance of prospering human societies. We should never forget that ancient and relative to their time, sophisticated civilisations disappeared once they could no longer maintain their agricultural production. Periods of lack of food and even famine plagued the past generations in the middle Europe, as well. For this reason, productivity of agriculture was one of the most important pillars in the development of the societies. Thanks to the development in agricultural science and technology, we are lucky to live in a region where there have been no problems with foodstuff supply for many decades. The growth in productivity of agriculture in this country within the past decades can be illustrated on the avera-

ge yields of the main cereals, wheat, rye and barley, since 1918 (Fig. 1).

There were several reasons for this development: selection of the local varieties and breeding new varieties, crop rotations and improved tillage, protection of the cultivated crops to pests and diseases and certainly also improved nutrition of crops by means of organic and mineral fertilisers.

2. Sustainability.

Similar or even more effective development in the productivity enjoyed many of the industrialised countries in Europe and all over the world. As a result of that, agricultural production is no more the main objective of the agricultural research. Ever more research in agriculture is targeted towards the sustainability of agricultural production and to the environmental issues.

Sustainability became a rather frequented word, during the past few years. There are numerous definitions of it, however, the most important aspect of sustainability is a continued farming system productivity on which the well-being of future generation must rely. It depends on maintaining soil fertility and the wholesome water supply. In another words, men should improve the productivity of land, while, at the same time, handling this resource on to the children in the same state as the preceding generation handled it to them.

Soil fertility develops in a long term. Many of the changes that affect soil fertility are more insidious and take place gradually over time spans of many tens of years. Therefore, long-term field experiments, though not perfect, are the only practical way of assessing the long-term sustainability and productivity of husbandry systems producing natural products. Long-term yield and nutrient uptake records are direct indicators of productivity and sustainability. Besides of that, there are numerous indirect indicators of sustainability, e.g. nutrient balance, content and quality of soil organic matter, soil biota, its activities, etc. These characteristics can be determined in the selected plots of the long-term field experiments. Long-term field experiments are therefore, valuable experimental objects that may also help to solve newly arising problems in agronomy and environment.

3. Agricultural research and overproduction

Problems with overproduction rose questions concerning the necessity of agricultural research. It was well demonstrated that hampering of the overproduction by means of diminution

of productivity of farming systems is not suitable from the economy point of view (Arnon,1969). It is more reasonable to diminish production by decreasing of the cropped area or set aside the less fertile fields.

Maintenance of a high level agricultural production necessitates effective agricultural research. New problem always arise that may threat stability of the production (new pests and diseases, e.g.). Besides of that, the demand for better quality and diversity of food increases with the increasing standard of living. Agricultural research objectives diversify in introduction of new products and new possibilities of utilisation of the traditional products. Finally, it is impossible to apply "stop-start" system, which means to stop agricultural research at the first indication of overproduction and to restart it again when the problems in production appear.

Conclusion

In conclusion, the importance of the university level agricultural education does not diminish in the present time and it will certainly continue in the future. Obviously, scale of the expertise widens and diversifies. The development of the society accelerates and imposes new demands on the university educated experts, who will be well trained in systematic problem solutions, creative thinking, scientific substantiation and innovative attitude to the basic problems. The innovative research within the education systems is obviously indispensable and, certainly, its role will increase in future. The University graduates should not be only worker or even employees, but thinkers. This is a great challenge for all the teachers and scientists of the Czech University of Agriculture.

References:

- Arnon I. (1969): Organisation and administration of agricultural research. Great Yarmuth, Galliard Ltd. 1968, 342 p. (translation in Czech, 1969)
- Johnston A.E. (1994): The significance of long-term experiments to agricultural research. In: Bent T. Christensen and U. Trentemøller, eds. Ministry of Agriculture and Fisheries, Danish Institute of Plant and Soil Science, Tjele, pp. 19-23
- Kůdela V. (2002): Předchůdci Výzkumného ústavu rostlinné výroby. VÚRV, pp. 18-29
- Spieritz H.J. (2001): Challenges for crop science to meet societal needs in the European area. In: Jirátko, Skládal, Doležalová, eds. Crop Science on the verge of the 21st century – opportunities and challenges. VÚRV Prague, pp.85-88.
- Report of the Czech Statistical Office, (1998): Historie a současnost zemědělství očima statistiky, 48 p.

Fig. 1: Average yields of wheat, rye and barley in 1918 to 1997 in the Czech Republic.

