

**KRIŽEVCI COLLEGE OF AGRICULTURE  
CONTRIBUTION TO SUSTAINABLE AND ORGANIC  
AGRICULTURE EDUCATION**

**VISOKO GOSPODARSKO UČILIŠTE U KRIŽEVCIMA  
PRILOG OBRAZOVANJU ZA ODRŽIVU I EKOLOŠKU  
POLJOPRIVREDU**

**Renata Husinec, Marijana Ivanek-Martinčić, Tatjana Tušek**

**ABSTRACT**

The paper presents an overview of the role of the Križevci College of Agriculture within the professionally-oriented higher education and its contribution to sustainable and organic agriculture education. It gives a brief description of the past and present-day College focusing on its current agriculture study courses, i.e. the three-year professional courses (bachelor level), two-year specialist graduate professional course titled Sustainable and Organic Agriculture (master level) and specialist seminars as part of lifelong learning.

Key words: Križevci College of Agriculture, professional higher education, study programs, sustainable and organic agriculture

**SAŽETAK**

Rad daje pregled uloge koju ima Visoko gospodarsko učilište u Križevcima u području stručnih studija za poljoprivredu u Hrvatskoj i doprinos visokoškolskom obrazovanju za održivu i ekološku poljoprivredu. U radu se također donosi kratki opis povijesnoga razvoja križevačkoga Učilišta i opis suvremenih studijskih programa na razini stručnog i specijalističkog diplomskog studija te specijalističkih seminara u sklopu cjeloživotnoga učenja.

Ključne riječi: Visoko gospodarsko učilište u Križevcima, specijalističko visoko obrazovanje, programi studija, održiva i ekološka poljoprivreda

---

Talk given at 2<sup>nd</sup> Mediterranean Conference on Organic Agriculture – *Contribution to Sustainable Ecosystem*, Dubrovnik, April 2-4, 2008

The Križevci College of Agriculture (KCA) belongs to the oldest agricultural colleges in the South-eastern Europe, established in 1860 in Križevci, an old town with diverse culture, and countryside close at hand.

The College delivers professional study programs to educate under graduate and graduate students of agriculture for the benefit of the citizens of the North Croatia counties and the rural community.

The basic mission of the College today is to provide leadership regionally and nationally through professionally-oriented higher education and training, and to create and disseminate knowledge of integrated agricultural and environmental systems to students, industry and society.

## HISTORICAL BACKGROUND

The College represents a continuity of the former Royal Agriculture and Forestry College, the cradle of higher education in agriculture and forestry institutions in Croatia. The town of Križevci and the College have always enjoyed close links, since the College beginnings to the present day. Križevci together with the College were the source of many progressive ideas and of promoters of advanced agriculture and culture, such as Milutin Cihlar Nehajev, Gustav Bohutinsky, Milislav Demerec, Franjo Marković and Antun Nemčić, who passed on their knowledge and work to numerous generations in Croatia, Europe and other parts of the world. The most important contribution to its reputation was given by the College staff, whose enthusiasm and numerous scientifically recognized ideas in agricultural development in those days won the College the leading place in education and science in this part of Europe.

The College of Agriculture of that time delivered all the teaching and practical programs required for the first-rate training of agricultural professionals. Its experts were also involved in research work, creating the first cultivars and hybrids of some field crops, and achieving significant results in agricultural management. The reputation of the former college in Croatia simply comprises:

- Introduction of high-quality plant cultivars
- Beginnings of plant breeding and selection
- Introduction of high-quality animals
- First livestock breeding programs

- First institutes, laboratories and research stations
- First Croatian scientific journal *Gospodarska smotra* (1909)
- First agriculture and forestry manuals and textbooks in Croatian

When the Faculty of Agriculture and Forestry was established in 1919 in Zagreb, the College equipment and literature were moved there, and many teachers and professors went along. The Higher Agricultural School was founded in 1960, while the present-day college was established in 1998.

### KRIŽEVCI COLLEGE OF AGRICULTURE TODAY

KCA with its 800 students and 52 staff delivers full-time and part-time professional study courses in agriculture of three years in duration (180 ECTS credits), a specialist graduate (master level) professional study course of two years (120 ECTS credits) in sustainable and organic agriculture, top-up courses of one year (60 ECTS credits), and a range of short courses and specialist seminars within the framework of lifelong learning (LLL), all in accordance with the Bologna process. The College has recently developed new professional courses, both bachelor and master or specialist level in Entrepreneurship economics and Management in agriculture.

The KCA curricula focus on the traditional agriculture programs including agricultural production and entrepreneurship skills which help students better understand different agriculture systems and give them the educational background necessary to be able to adapt to a rapidly changing Croatian economy facing accession to the European Union.

The College is now offering the specialist graduate professional study courses in sustainable and organic agriculture where students learn to manage both plant and animal production in a more environmentally friendly way.

The courses are taught in an integrated way through lectures and exercises, seminars and discussions, student projects and integrated assignments on the College farm, homework assignments and field trips to farms of varied production. Class activities may include working in the fields, and listening to guest speakers from other HE institutions and industry in Croatia, and from abroad.

The courses are offered in lecture halls with good technical support and modern teaching aids, including IT and computer resources, laboratories, specialist studios, engineering workshops and the College farm (95 ha). KCA has the library with the two reading rooms fully equipped with computers and the access to the Internet. The farm facilities include a variety of livestock including cattle, dairy, poultry, sheep and horse units; shops for the maintenance of farm equipment, the nursery and the small greenhouse; the garden and the orchard where students can develop new skills and competences or address current issues in agriculture.

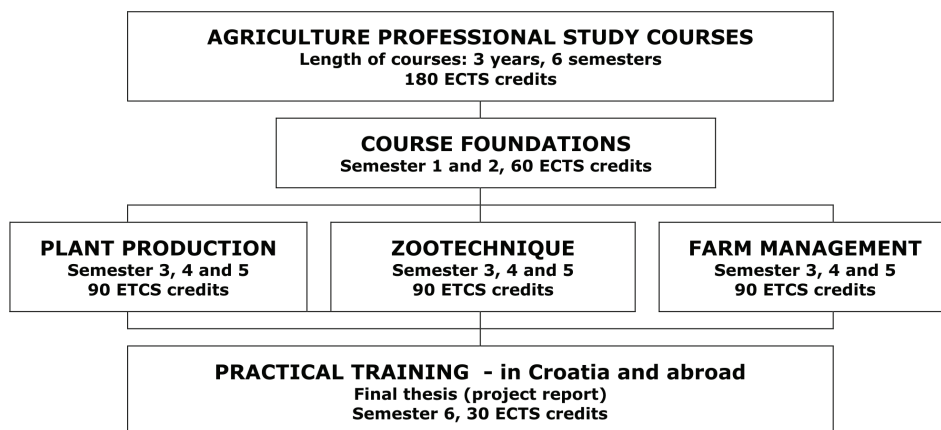
The KCA staff is qualified and most teachers maintain their professional practice and research within their disciplines. Another important aspect of education is commitment to quality assurance.

European dimension is enabled through international cooperation which includes international projects and exchange of students and staff with institutions from EU as well as field trips and study tours.

## PROFESSIONAL STUDY COURSES IN AGRICULTURE

The KCA professional bachelor program in agriculture takes 3 years or 6 semesters and is organized on full-time and part-time basis. Each semester includes 30 ECTS credits, with seven modules. The academic year includes 60 ECTS credits. The principle of 60:40 in favour of exercises and practical training is respected.

There are several compulsory modules in this study program which are strongly oriented towards sustainable farming and the ways in which resource use can be minimised and local biodiversity preserved. The optional modules may also include some organic program or are focused on some aspect of ecology. KCA offers modules such as *Agricultural sociology and bioethics* (the first module to be introduced at Croatian HE institutions covering topics in bioethics), *Principles of ecology and agro-climatology*, *Organic agriculture*, *Farm Waste Management* and *Land reclamation and sustainable management of soil* (the first module to be introduced related to sustainable development) which include a wide range of sustainable and organic agriculture topics.



**Tab. 1 Professional study courses in agriculture (180 ETCS, 3 years)**

In Year 1 students study Course foundations which give them a good basis for further and better understanding of specialist technological modules.

In Year 2 students choose to study three different program units or study courses:

- Plant Production
- Zoo-technique
- Farm Management

The three courses comprise 104 modules: 14 modules at Course foundations level and 30 modules in specific courses. In Semester 1, 2, 3, 4 and 5, apart from theoretical instruction, students have practical training related to professional modules, mainly at the College farm.

In Semester 3 students can choose optional modules, or modules from other courses. In Semester 6 students study *Agricultural policy* (2 ECTS) and are prepared for work placement of 420 hours (28 ECTS) which includes practical training on outstanding farms and agribusiness companies in Croatia and abroad. On completion of the study course and successful defending of final thesis students are awarded the title of Professional bachelor in agriculture.

The College staff co-ordinate 101 modules or 97.12%. Only 3 modules or 2.88% are coordinated by the staff from other higher education institutions and industry in Croatia.

KCA graduates have all kinds of job opportunities:

- Family farms, farm owners and professional managers of agricultural production on these farms
- Professionals working on farms that will be organized in cooperatives, stock companies and different family farm associations
- Agricultural Extension Service
- Trade of seeds, agricultural machinery, chemicals and production materials
- Organization of LLL education courses for agriculturalists
- Processing and trade of agricultural products – buying, selling, export, import
- Auxiliary activities in agricultural inspection

OR

- Possibility to continue studies at specialist graduate professional study course level
- Possibility (conditioned) to continue studies at university undergraduate and graduate level.

#### SHORT COURSES AND SPECIALIST SEMINARS

As part of non-formal education at KCA, different certified short courses and specialist seminars have been delivered for 8 years now, and are tailored to suit new and existing farmers wanting to upgrade their sustainable and organic skills. The aim of the courses is to improve knowledge of professional workers in land based industries and to train farmers in agribusiness and entrepreneurship skills. KCA delivers the following short courses: Sustainable and organic pig raising, Sustainable and organic milk production, The application of organic principles in bee-keeping, Modern vegetable production, Sustainable viticulture and wine making and Sustainable fruit production They are offered on part-time basis and include day or evening

sessions over weekend, around 70 hours of teaching, with practical sessions and farm visits. More than 500 farmers have been trained in this way.

#### SPECIALIST GRADUATE PROFESSIONAL STUDY COURSE (120 ECTS, 2 YEARS) SUSTAINABLE AND ORGANIC AGRICULTURE

The aim of the Specialist graduate professional study course is to enable students to acquire knowledge and understand principles of sustainable and organic agricultural production, marketing and management, their implementation in practice. Students learn how to analyze basic ecological and economic aspects in relation to sustainable and organic production, based on modern marketing and management.

This course is intended for professionals with special interest in the application of new practices and techniques in food production and protection of the environment, agricultural producers on family farms, and employees in food processing industry, managers, and members of government and non-government organisations.

In Croatia concerns about the environment and personal health have increased in recent years. Although the total Croatian organic sector is around 1%, the employment opportunities are expected to increase each year, especially for self-employment on smaller farms that might not be profitable under conventional production.

At this point KCA is delivering the first accredited study program titled Sustainable and organic agriculture (master level) which is targeted at students who completed a three-year professional or university study program (bachelor level). The Program was available for the first time in 2007, and more than 150 students enrolled.

Students can gain a thorough knowledge of organic agriculture through compulsory modules as well as competences in specific topics relevant to their interests through optional modules.

Topics to be covered in the study course include the guiding principles and current status of sustainable and organic agriculture in Croatia and Europe, the certification of organic products, and key principles and practices in soil

management, plant production, livestock production, marketing methods and some ethical issues.

The Sustainable and Organic Agriculture is an integrated program of work and study. Lectures, exercises and seminars, together with integrated assignments and practical training are combined to teach sustainable practices and to promote farming that is environmentally friendly. Throughout the course students participate in discussion groups and explore Internet-based organic information resources.

In this course students study how to establish an organic farm, or convert a conventional farm to organic practices. They also study organic management of pests, diseases, and weeds, and the application of the knowledge to sustainable production of vegetables, field crops, legumes, herbs, and fruits.

The program is offered on a part-time basis. Course participants come from a wide range of backgrounds, including KCA former students, farmers, growers, and other agricultural and food sector workers who wish to develop their career and businesses in sustainable and organic agriculture.

To enrol in the course can the students who completed undergraduate university study courses (three or four years), students who completed three-year professional study courses in the field of biotechnical sciences, and the students who completed two-year college and a top-up course with additional 60 ECTS (conditioned mobility).

The study course has a uniform modular structure. The length of the course is 2 years (120 ECTS). It comprises 23 modules: 11 compulsory and 12 optional modules, of which students study 6.

Compulsory modules *include Agricultural ecology and environmental economics, Information technologies in agriculture, Sustainable management of the soil, Mechanisation systems in sustainable and organic agriculture, Marketing and management of produce in sustainable and organic agriculture, Ecologically acceptable methods of plant protection, Selected chapters in animal nutrition, Production and utilization of fertilizers in sustainable and organic agriculture and Zoo-technique.*



Optional modules include *Arable crops production in sustainable and organic agriculture*, *Sustainable and organic cattle production of meat and milk*, *Integrated and organic vegetable production*, *Animal physiology and toxicology– selected chapters*, *Integrated and organic production of fruits and vine grapes*, *Organic pig raising and alternative poultry products*, *Analyses of soils, fertilisers and plant material*, *Hygiene, welfare and systems of animal keeping*, *Sustainable and organic production of seed and planting material*, *Quality assessment and bio-dynamics of animal products*, *Sustainable and organic sheep and goat raising* and *Sustainable and organic production and technology of fodder*.

Semester 1 is for Course foundations and all modules are compulsory. In semester 2 and 3, students study two compulsory and three optional modules. They choose three out of six optional modules per semester. In semester 4 students spend 220 hours on some outstanding farms, in enterprises and other land-related industries as part of specialist professional practical training or work placement. They write final thesis which is closely related to practical training. On defending the thesis students complete the course and are awarded the title of Professional specialist in sustainable and organic agriculture.

The College qualified staff coordinate 18 modules or 78 %, only 5 modules or 22 % are coordinated by the staff from other HE institutions and companies.

Although all lecturers at KCA do not have a wide range of direct experience within the organic agriculture industry, some have been involved in several scientific and technological projects, supported by the Croatian Ministry of science, education and sport covering some aspects of sustainable and organic agriculture: *Genetic aspects of rational and environmentally safe wheat production*, *Breeding high quality wheat for sustainable agriculture*, *New cultivar for sustainable agriculture*.

At this point KCA staff has been working on the Micro trial of newly released wheat lines for sustainable and organic agriculture and two international projects:

1. Development of professional BSc and MSc courses and short professional courses in farm production and management JEP-19052-2004 (TEMPUS)
2. *Gene bank of vegetable seeds*, South East European development network (SEEDNET)

Organic farming in Croatia is currently an increasing sector in the agricultural industry. The sector is expected to continue its expansion and requires high level graduates with the technical and management skills. With such a growing job market, there are many career opportunities for KCA graduates including farmer, farm manager, sustainable agriculture consultant, produce manager, advisor and inspector.

## CONCLUSION

The current educational programs of the Križevci College of Agriculture show a strong commitment to teaching and learning in sustainable and organic agriculture, shifting from teacher-centred approach to student-centred approach. Curriculum development and quality assurance should be a constant institutional task, although it is uncertain what impact will have labour market changes on Croatian professional higher education. Therefore, it is important for KCA to recognize challenges and opportunities that increasingly globalized society offers and to develop such programs that will create new career opportunities for its graduates, including a network of double degree bachelor and master courses.

Authors' address – Adresa autora:

Renata Husinec,  
E-mail: rhusinec@vguk.hr  
Marijana Ivanek-Martinčić and

Received - Priljeno:

October 15, 2008

Tatjana Tušek  
Križevci College of Agriculture,  
1, M. Demerca, 48260 Križevci, Croatia