

Science at Latvia University of Agriculture –achievements and future perspectives

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The beginnings of agricultural science in Latvia can be found in 1862 when Riga Polytechnic was founded. In 1863 the Agricultural department was created. Riga Polytechnic graduates Jānis Bergs, Paulis Lejiņš, Arvīds Leppiņš, Pēteris Nomals and Jānis Vārsbergs were active scientists and later took part in the academic life of the University of Latvia and were the founders of Jelgava Academy of Agriculture.

In 1919 the University of Latvia was founded, and the Faculty of Agriculture was included in it. Some months later the Faculty of Veterinary Medicine was founded and in 1920 the Department of Forestry was created within the Faculty of Agriculture. In the academic year of 1938/1939 the Faculty of Agriculture had 19 departments: Department of Plant Science headed by J.Vārsbergs, Dept. of Plant Pests and Diseases –M.Eglītis; Dept. of Apiculture – P.Rizga, Dept. of Constructions – A.Raisters; Dept. of Horticulture – J.Sudrabs; Dept. of Crop Cultivation – J.Apsītis; Dept. of Agricultural Chemistry and Soil Science – P.Kulītāns; Dept. of Agricultural Machinery – A.Leppiņš, Dept. of Agricultural Technologies – P.Delle; Dept. of Animal Science – P.Lejiņš; Dept. of Forest Biology – V.Eihe; Dept. of Forest Exploitation – A.Teikmanis; Dept. of Forest Organization and Taxation – R.Markus; Dept. of Forest Technology – A.Kalniņš; Dept. of Forestry – N.Zemītis, Dept. of Microbiology – A.Kirhenšteins, Department of Dairy-farming – F.Neilands; Dept. of Swamp and Peat Utilization– P.Nomals and Dept. of Management and Agrarian Policy – P.Kreišmanis.

At the same time there were several departments within the Faculty of Veterinary Medicine, such as the Department of Anatomy headed by L.Kundziņš, Dept. of Pathology and Parasitology – R.Grapmanis, Dept. of Inner Diseases – P.Apinis, Dept. of Surgery and Midwifery – V.Brencēns, Dept. of Infectious Diseases – M.Rolle and the Veterinary Clinic headed by V.Brencēns.

Up to 1939 the Agriculture series of the University of Latvia Proceedings had 4 volumes (144 printed sheets) with 51 publications of 25 authors. 11 promotions were held – 9 in agricultural sciences and 2 in forestry sciences. Only one promotion work was presented outside the faculty. Augusts Kirhenšteins was the first to get Dr. agr. at the University of Latvia. The first habilitation work was presented by Kārlis Pols. In total 25 habilitations were held at the LU Faculty of Agriculture, and 6 *Dr. honoris causa* were awarded, int.al. to J.Mazvērsītis (1928), P.Lejiņš (1932) and the prime minister K.Ulmanis (1934).

In the middle of 1930s it was decided to create a branch of the University of Latvia in Jelgava- a city with famous culture, knowledge and science traditions. Jelgava Palace was destroyed in World War I and renovation was suggested by the Jelgava Council. On 26th of June, 1936 the Cabinet of Ministers decided to transfer the Faculty of Agriculture and establish a new higher education establishment – the Academy of Agriculture.

On 23th December, 1938 the president Kārlis Ulmanis promulgated the law on the foundation of Jelgava Academy of Agriculture, which became effective on 1st July, 1939. Pāvils Kreišmanis was elected as the first rector. An intensive period of construction followed afterwards and the Academy was moved to Jelgava.

Academy has been visited by the president Kārlis Ulmanis, the Rector of the University of Latvia Mārtiņš Priņmanis, the Minister of Education Jūlijs Auškāps and the Minister of Agriculture Jānis Birznieks. Jelgava Academy of Agriculture began its work on 28th October, 1939.

The peaceful and creative academic and scientific work was ended by World War II. Many of the academic staff left to the West or suffered from repressions. Jelgava Palace was destroyed again and Latvia Academy of Agriculture returned to Riga. The studies and scientific work were slowed by the lack of premises, books and inventory. Rector J.Pieve, professors J.Apsītis, A. Kalniņš, J.Bērziņš and P.Rizga contributed greatly to the restoration of academic life at Latvia Academy of Agriculture.

Professors A.Kalniņš, A Kirhenšteins, P.Lejiņš, P.Nomalis, J.Peive, P.Rizga became members of the newly founded Academy of Sciences. The professor of Latvia University of Agriculture Paulis Lejiņš was elected as the first president of Latvian Academy of Sciences.

At the end of 1950s and the beginning of 1960s Jelgava became an academy city once again.

During the whole existence of the LLA, 35-40% of the teaching staff possessed a scientific degree.

A notable research should be done in order to become a Doctor of Science. In 1946 the LLA obtained the authority to award scientific degrees in agriculture, forest management and veterinary sciences, later also in agricultural technologies and economic sciences. 10 – 20 dissertations (promotion works) of researchers from the university or other institutions were presented every year at the Scientific Council of Latvia Academy of Agriculture. At the end of 1970s councils dedicated to agriculture, engineering and economic sciences were established instead of the Scientific Council.

Research at Latvia Academy of Agriculture dealt with actual agricultural problems, agrarian policy and the agricultural development of Latvia. At the beginning of 1960s new state financed scientific laboratories were established: substantive scientific and problem laboratories: Plant and Insects Viral Diseases, Agricultural and Industrial Products Hydrothermal Treatment, Radiobiology, Milk Machine, Region Projecting and Territorial Organization, Agricultural Manufacture and Economy, Tractor and Unit Usage Laboratory. In 1968 the Agricultural Animal Feeding Microelements Scientific Laboratory was established.

Active research work takes place at the Latvia University of Agriculture (LLU). The priorities of the research work have changed in the course of time; nevertheless, they are all connected with the rural areas and agriculture of Latvia.

The priority scientific directions put forward by the LLU from 1975 to 1990 include:

- The development and introduction of technologies in the agricultural production;
- Land amelioration and chemicalization of the agricultural production;
- The economic problems of agricultural and forest management intensification based on specialization, concentration and rational utilization of funds and land resources;
- The automatization of the agricultural production;
- The prediction of the agricultural production development.

The teaching staff and scientists of all the faculties will take part in solving these problems. It was planned to increase the number of scientists in the problem and scientific laboratories. It is planned to turn two scientific laboratories into problem laboratories during the time period from 1976 to 1980, which has been accomplished. Accordingly, the Plant and Insect Viral Diseases Problem Laboratory and the Agricultural Products Hydrothermal Treatment Problem Laboratory have been established at the Latvia Academy of Agriculture.

At the early stage of Latvia Academy of Agriculture research was financed mainly by state, but at seventies - eighties the number of scientific contracts with resorts and enterprises increased.

Each year scientific- practical conference was held and regular scientific proceedings "LLA Raksti" was published

At 1991 Latvia Academy of Agriculture was renamed Latvia University of Agriculture (LLU). The year 1992 was a period of radical changes at the LLU. These changes were connected with the replacement of the Soviet system in all the fields of the country. Many normative documents were developed to reorganize and improve the quality of the studies, research work and other spheres. In 1992 six habilitation and promotion councils approved by the Latvian Council of Science started their work at the LLU embracing the sub-sectors of agronomy, animal production, and economics within the sector of agriculture; the sub-sector of agricultural engineering within the sector of engineering; as well as the sectors of veterinary science and forestry. In 1993 the habilitation council within the sector of engineering, the sub-sector of food product technology, processes and equipment, also started its work; and in 1997 – within the sector of engineering, the sub-sector of water management and land amelioration. At first the most important task of these councils was the equalization of the USSR academic degrees, i.e. candidate of Science and doctor of Science, and the newly adapted academic degrees of the Republic of Latvia, i.e. doctor and habilitated doctor. After the evaluation of the contents of dissertations as well as the scientific activities of the candidates following the dissertation defence, the LLU habilitation and promotion councils equalized the academic degrees of 358 scientists including 7 foreigners. 58 dissertations were defended at the LLU habilitation councils from 1992 to 1998; as a result, 21 scientists attained the habilitated doctor's degree while 37 – the doctor's degree. The teaching staff of the LLU

also defended dissertations outside the university (3 doctoral dissertations in 1996, 2 in 1997 and 1 in 1998).

In 1994 the LLU established an annually renewable regular exhibition *Science for Practice (Zinātnē Praksei)* which was also exhibited in Ulbroka, Vecauce, Priekulji and Vijāni. Since 1995 the annual agricultural exhibitions are organized by the teaching and research farm *Vecauce*.

On 7th November, 1995, based on the suggestion from the LLU, the Latvia Cabinet of Ministers adopted *The Regulation of the Conferment of the State Professor Emeritus Title*. The title is awarded for significant scientific contribution and entitles the recipient to a lifetime grant in addition to the old-age pension. On 13th March, 1996, the LLU Senate approved *The Regulation of the Awards in the Name of Scientists*; 7 awards were established, namely, of Jānis Bergs – in agronomy; of Aleksandrs Ņikonovs – in economics; of Jānis Āboliņš – in food products technology; of Vilis Skārds – in water management and construction; of Arvīds Leppiņš – in agricultural mechanization; of Ludvigs Kundziņš – in veterinary science and of Eižens Ostvalds – in forestry science. Once in 5 years the award is presented to field scientists for fundamental research and unified subject-matter research work and discoveries which have significantly contributed to the development of Latvian rural areas.

The main research directions from 1990 to 2000 involved:

- The soils and waters of Latvia;
- The feeding of productive animals;
- Agrarian economics and the development of rural areas;
- The gene pool and breeding of plants and animals;
- The prediction of cultivated plants' pests and diseases;
- Renewable energy sources and the resources of raw materials;
- The research of technologic and construction materials;
- The development of food products and their quality;
- The mechanized technologies of crop farming and animal production;
- The precautionary and treatment methods of animal diseases;
- Ecologically and economically balanced forest management.

The prior research areas also change at the turn of the century. They are concerted with the priorities of the country:

- New materials and Technologies,
- Life Sciences and Biotechnology,
- Information technology,
- Ecology and environment protection,
 - Soil quality, conservation and protection,
 - Water resource management and quality,
 - Environmentally benign crop protection and nutrition,
 - Landscape conservation and multifunctionality.

The scientists of the LLU carry out research in the framework of the Latvian Council of Science (LCS) projects and programmes within the market orientated field (MOP), fulfil orders of public authorities and private companies, as well as attract foreign means to the research work by using 10 different funding channels. The total project funding is shown in figure 1. In 15 years' time the funding for science has increased 19.3 times. The amount of means for science has increased the fastest during the time period from 2005 to 2008.

Until the year 2003 the funding of the Latvian Council of Science constituted more than a half of the total funding for the Latvia University of Agriculture per year. The proportion of the LCS funding was particularly high during 2001 when it constituted 70% of all the science budget of the LLU (Figure 2). An average of 26-27 projects has been financed annually until the year 2000. Starting with the project of 2001, the number has risen to 33-35 projects per year. The funding amount of these projects has also been comparatively stable from 1998 to 2006; it has varied within 164 and 194 thousand lats.

The next great funding source is the subsidies from the Ministry of Agriculture (MA). Both the number of projects and the amount of external funding have changed throughout the years. The number of projects and the amount of external funding achieved their highest marks during the year 2006 when the funding uptake of 45 projects constituted 731.6 thousand lats. Owing to the funding from the Ministry of Agriculture, new and modern research equipment was purchased for many scientific and

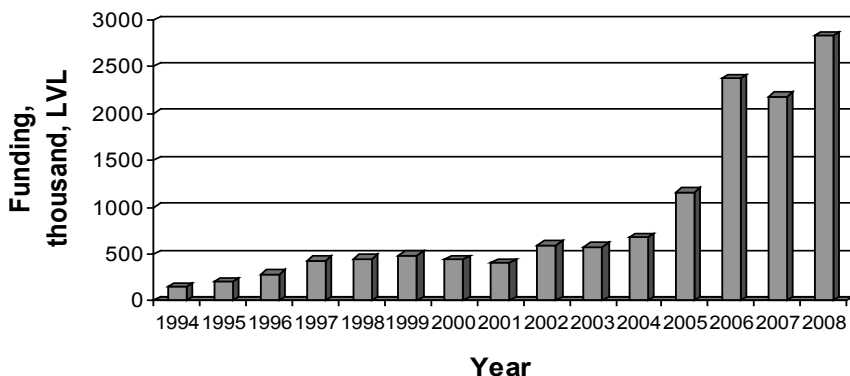


Figure 1. The Latvia University of Agriculture scientists’ research funding uptake

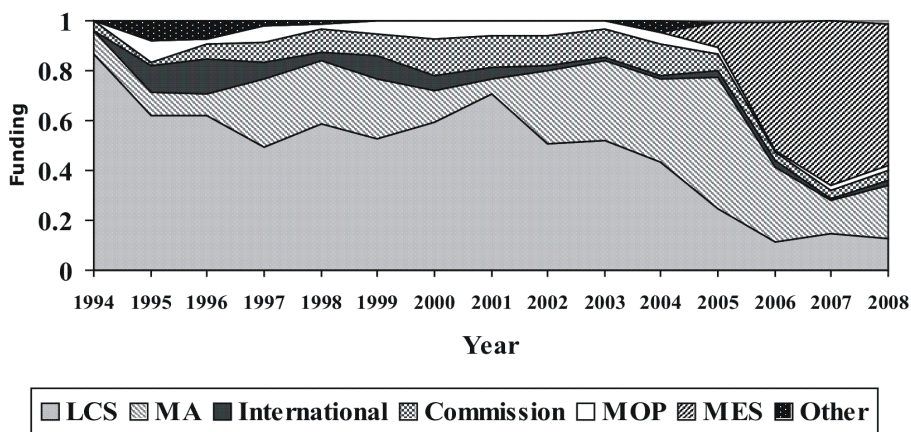


Figure 2. The distribution of science funding means by project groups

scholastic laboratories as well as new agricultural technology was obtained for scholastic and research management.

The international projects are comparatively small financially; however, very essential scientifically. The amount of external funding for these projects does not exceed 100 thousand lats. Two to three international projects are usually carried out annually. The number of projects was particularly high during 2006 when 7 projects were carried out. The amount of external funding for international projects until the year 2000 constituted 5–10% of the total LLU science funding amount. The scientists of the LLU take part in the scientific collaboration and programmes, e.g. the scientific collaboration projects of the Nordic countries, the programmes within the framework of the EU as well as various bilateral programmes and foreign collaboration projects.

The scientists of the Latvia University of Agriculture have also been collaborating with producers. 10-25 various commission projects are carried out annually at the LLU, the total sum being within 50 to 115 thousand lats.

A significant contribution to the development of science of late years has been provided by the base funding and means of the Ministry of Education and Science (MES) helping to carry out projects that facilitate the development of the university.

As a result of practical research, the lecturers of the LLU submitted and received 31 patents and trademarks of the Republic of Latvia from 1997 to 1999, 38 patents from 2000 to 2008. The main patent submitters include the teaching staff and the scientists of the Faculties of Food Technology as well as Engineering.

From 1996 to 1997 a preparatory work was done for the integration of the Scientific Research Institutes of Latvia Agricultural Mechanization and Power Industry (LVLMEZPI),

Latvia State Agriculture (LVZZPI), Latvia State Animal Production and Veterinary Science (LVLVZPI) and *Agricultural Polymers and Water Management* (LVZPILPŪ) into the LLU and starting from 1st January, 1998, these institutes acquired the status of legal entities within the faculties of the LLU, namely, LVLMEZPI as Ulbroka Science Centre at the Faculty of Engineering; LVZZPI as Skrīveri Science Centre and LVLVZPI as the Science Centre *Sigra* (Sigulda) at the Faculty of Agriculture and LVZPILPŪ as the Scientific Institute of Water and Land Management at the Faculty of Rural Engineering. At present these institutes function as LLU agencies.

The current research priorities defined by the LLU strategy are:

- Multifunctional agriculture;
- Agrobiotechnology: innovative, functional and environmentally friendly technologies of foodstuffs production and processing. Biomass biotechnology;
- Animal welfare and health, high quality, safety and heartiness of their products;
- Power industry – environmentally friendly forms of energy, energy supply safety and effective use of energy;
- Informatics – secure software, integrated information and communication systems and networks, electronic technologies in agriculture and forest management;
- Material science – the acquisition of functional materials, new generation composite materials;
- Forestry science – sustainability, new products and technologies;
- Environmental science – the conservation of natural resources, sustainable management and protection. The climate change regional effect on water ecosystems as well as adaptation, the Baltic Sea and inland waters environment protection;
- Sustainable development of rural areas.

The scientists' research exhibition *Science for Practice (Zinātne Praksei)* constantly functions at the LLU; furthermore, it is regularly renewed.

The first edition of the LLU research papers in English "Proceedings of the Latvia University of Agriculture" has been published. It is a reviewed edition that provides a new, wider range of opportunities for scientists; particularly, the new ones, to communicate with foreign researchers. The edition in English is a logical continuation of 294 research papers published starting with the first LLU collection of scientific papers in 1946 and ending with the ones published in 1999. A disparate continuation with prominent Latvian and foreign scientists on the editorial board.

The LLU Agronomical Analyses Scientific Laboratory is accredited and certified; furthermore, it is competent to carry out the testing of physical and chemical qualities of beer barley, malt, and feed.

With the aim to promote collaboration among scientists and enterprises or entrepreneurs, to protect intellectual property of LLU and commercialize results of research, the Technology and Knowledge Transfer Centre of the Latvia University of Agriculture started its work in November, 2005.

Summary

- The scientific activities, the work in domestic and foreign scientific projects and the participation in the activities of the Latvian Academy of Sciences (LAS) and the Latvia Academy of Agricultural and Forestry Sciences (LAAFS) are significant.
- The scholastic and research directions represented at the LLU correspond to all the main sectors of agriculture, forestry science, food science, agrarian economics, agricultural engineering, hydroengineering and veterinary science.
- 8 promotion councils function at the university. The existent scientific activity monitoring system of the LLU departments is productive and qualitative.

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