Research Institute of Agriculture: Scientific Activities of Last Decades 1990-2009

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Abstract. Latvia University of Agriculture Agency "Research Institute of Agriculture" in Skrīveri is the only place in Latvia where breeding of perennial grasses (both for conventional and organic agriculture needs) is performed, and cold resistant, productive and illness-resistant perennial varieties are introduced. In the course of recent years, producers have been offered new varieties of tetraploide red clover and alsike clover, and perennial grasses as well. The Institute scientists are engaged in production of selective perennial grass seeds; they uphold and study collection of genetic resources, arrange expeditions with the aim to collect the gene pool, and carry out economic evaluation of varieties, and check them, both within conventional and organic agriculture, assess difference, uniformity and stability among cultivated plants that will be included into the European Catalogue. The trial fields of Research Institute of Agriculture offer many practical ideas and ascertain the correct implementation of theory into the conditions of production: however, the Institute runs 117 ha of state land of which 43 ha are certified for the organic agriculture, in addition taking on lease 50-60 ha more.
Key words: Research Institute of Agriculture, breeding of perennial grasses, development.

Introduction

The history wheel relentlessly goes round changing generations and leaving behind numerous historic events, national changes, and completed and uncompleted works. The last, nearly twenty years have brought many changes both into national and the Agricultural Institute's life.

The principal activity directions of the Agricultural Research Institute during last 20 years were:

- scientific activities dealing with fundamental and constructive research within the field of agricultural sciences;
- selection of perennial grasses, the variety sustaining seed farming, and sale of variety seeds;
- maintenance of the national genetic resources, annually organizing expeditions and gathering perennial grasses of natural varieties, offering the collected material to the Latvian Gene Bank, and making research and describing these varieties;
- participation in educational work within higher education and doctoral study programs organized by the LLU Faculty of Agriculture;
- farmer, consultant and other agricultural specialist training, popularisation of scientific conclusions and research results;
- organic farming;
- offering the laboratorial and advisory service.

During this period we have entered the new 21st century. Slowly and implacable a new scientist generation replaces the old one lifting on the top new men who think progressively according to modern demands. New information technologies, mechanization, plant growing and selection methods enter our life and alter our thinking. Only crops remain the same, we grow them in order to bake our daily bread, to put something into the feed bunks of our cattle, to get milk.

Thanks to the reinstatement of independent Latvia and transition from a centralized management system to a market orientated economy, the state funds to research institutes have rapidly diminished, the land and production equipment were privatised implacably leading to narrowing of research work and decrease of scientist staff. During the years 1986- 1996 from the Institute lost Selection and Experimental stations, the housing facilities and public utilities went to the municipality, and more than three times has decreased the number of the Institute staff. The ten years brought to the Agricultural Institute quantitative changes and were concluded by the 50th anniversary of the Institute in 1996.

In connection with the anniversary we carried out a fundamental summarization of the 50-year scientific work of our Institute, and a book "50 years of research at the Latvian research Institute of Agriculture "Agra"" reflected this. Great work was performed, but the minds of our scientists and workers were preoccupied with concerned thoughts. *The 60th anniversary celebrated, but what about the 60th anniversary, and, if we live up to that day, what is the future of our Institute?*

It became clear that new change-winds blow, and to follow the rapid changes both on the national and agricultural level, our Institute beside quantitative changes had to go through qualitative changes as well.

The ideas of changes had to ripen in every scientist's mind first: if one is not aware of the necessity of changes, it is very hard to implement them. This factor influenced the Institute in a most direct way. According to the Law 'On Scientific Activity', all power of science institutions belong to a general meeting of scientists, and the council which is elected at the meeting. Certain time was needed until each scientist realized that his/her point of view and vote can influence all the essential questions concerning the development of our Institute – selecting the administration, the principal activity directions, the distribution of funds, elaborating the development strategy.

Most of our scientists, at these hard for the Institute times, think not only of the narrow interests of their research projects, but also of our Institute's development, therefore we could adopt many essential decisions permitting to distribute our scarce finances in a most optimal way: both to answer the research needs and to ensure the structures serving to science – procurement department, laboratory and administration.

Speaking about funds we would like to add the following: in the course of the last decade every new year brought to the Institute an empty purse since the actual financial order foresees funds to research projects mostly for one year, and the next year finances are allocated by tender procedures annually. Therefore during the first months of every year (until the first funds are assigned and enlisted) the entire collective has to tighten the belts. It is wonderful that our employees are patriots and have endured. The actually started base of the fund assignation, hopefully, will improve our situation.

Last ten years as heavy as poverty burden seem also our Institute scientists' minds because we have to choose the direction of our development and activities, and assume what legal status of the organization and structure would be the most adequate entering a new millennium.

Taking into account all the scientific experience of our Institute, the work of the past, the material and technical basis, and the good geographical situation as well, the scientist body decided that our Institute must carry on a leading national organization's position in the perennial plant breeding in the future as well, and basing of this, there should be established a regional centre for agricultural research and agricultural education, retaining our legal independence. Our right choice was confirmed by the fact that a system like this exists in all the Scandinavian countries: beside agricultural universities there coexist independent national research centres that collaborate both with higher educational establishments and agricultural consultation centres, agricultural organizations, and various enterprises as well.

Following a nationally approved education and science integration policy the Agricultural Institute was included into the Agricultural Faculty of Latvia University of Agriculture, as a national non-profit enterprise "Skrīveri Science Centre" in 1997. Starting integration, the Institute was to be engaged in study programs of Agricultural University ensuring their students a place for field practice and several study programs. Thinking about student needs our Institute renovated and furnished a dormitory, and restored a laboratory for agrochemical tests. Regrettably, LLU students spent in Skrīveri only two summers (1997-1998) since the field practice was moved to the LLU study and research centre "Vecauce". Involvement of our scientists into the LLU study programs was limited to several Agricultural Institute doctoral research works. Unfortunately, also our proposal to establish a LLU branch in Skrīveri was not heard by the Faculty of Agriculture.

Long-term field experiments play an essential role in understanding the complex interactions of plants, soil, pests and their management effects on sustainable crop production. Research institute of agriculture has three long-term field experiments. The aims of researches in long-term drainage field experiments "Sidrabiņi" (Dr.agr. J. Vigovskis, Mg. A. Jermušs) are to study the influence of perennial fertilizers and liming on yields of field crops and agrochemical parameters of soil and loss of plant nutrient throught drain water. Since 1982, long-term field trials were carried out under

crop succession with long-term grass, grain (rye, tritikale, spring wheat, barley, oat), potatoes and oilseed rape. The efficiency of mineral fertizers and liming on two different perennial grass swards are studied in long-term experiment "Līči" from 1974 to 2009 (Dr.hab.agr. A. Antonijs, Mg.agr. A. Švarta). The complex crop rotation experiments started in 1969 (Dr.agr. A. Lejiņš, Dr. agr. B. Lejiņa) and gradually expanded in time and space reaching five different structures of crop rotations sowings. The proportion of cereals in the crop rotation in different combinations reaches 50-100%, perennial grass – 16.5-33.3%.

However, involvement of Agricultural Institute scientists in educational processes goes on, thanks to close collaboration with Latvian Rural advisory and training centre (LRATC) Our scientists participate in farmer training organized by CEBC district offices, nearly everywhere in Latvia. The total number of lecture hours exceeds several hundreds, but total number of the audience counts several thousands.

Following the national agricultural development trends the Agricultural Institute during eight years introduced a few new directions of scientific work. PhD student of Latvia University of Agriculture A. Anševica started field experiments "The yield increasing of annual legumes in the green agriculture" in 2007. Dr.agr. L. Borovko investigated the influence of nitrogen and potassium fertilization and the use of growth regulators on yield and seed quality of spring oilseed rape in Latvia conditions (2005-2009), application of biological preparations in spring rape fields under ecological conditions (2006-2009).

Considering that the actual national control system of the field crop varieties will be reorganized, we decided to take part at the competition: to gain rights to control the field crop economical characteristics in Central Latvia region; we won. More than eight years here, in Skrīveri, we test the newest varieties meeting the needs of both the conventional and organic farming (Dr.agr. J. Vigovskis, Dr.agr. L. Agafova, Mgr. A. Švarta, Mgr. A. Jermušs) Tests on field crop varieties are a good basis for farmer summer seminars providing much valuable information to our scientists as well.

Interest in the organic farming recently in Latvia has increased; therefore we, on our own initiative, started research on the organic farming in 2003 (Dr.agr. J. Vigovskis) and formation of material basis for growing seeds, and simultaneously started new research "The providing of plant nutrient and weed limiting for barley in the organic agriculture" (Dr.agr. J. Vigovskis, Mgr. agr. A. Švarta). And it turned out that our initiative hit the jackpot: research on the biological agriculture, the demonstration and the seed growing roused really high interest both in farmers and agricultural specialists, and foreign scientists. We hope that developing and improving this research basis, Skrīveri can turn into a regional scientific and education centre in the field of organic farming.

LLU agency "Research Institute of Agriculture" in Skrīveri is the only place in Latvia where nowadays is performed the breeding of perennial *Papilionaceous* and *Culmifeour* plants and created cold resistant, productive, disease resistant and perennial varieties (Dr.agr. B. Jansone, Dr.agr. P. Bērziņš, Mgr. S. Būmane, Mgr. S. Rancāne, agronomist V. Stesele). In the course of the last years producers were offered new varieties: thimothy 'Varis' (2009), 'Teicis' (2008), red clover 'Skrīveru tetra' (registered in Lithuania in 2007), meadow fescue 'Silva' (2006), red clover 'Kaive' (2005), tetraploide red clover 'Ārija' (2004), buckwheat 'Aiva'. Our newest grass varieties are included into the variety catalogue of European countries rousing interest in scientists and seed breeders of several European countries, Canada and USA.

Research institute of agriculture is

- holder of breeders' right and maintainer of variety for varieties: red clover 'Skrīveru agrais', , 'Dīvaja', 'Skrīveru tetra', 'Ārija', 'Kaive', 'Jancis', 'Marita', 'Sandis', alsike clover 'Fricis', 'Menta', lucerne 'Skrīveru', 'Rasa', thimothy 'Teicis', 'Varis', perennial ryegrass 'Spīdola', meadow fescue 'Patra', 'Silva', 'Vaira', hybrid ryegrass 'Saikava', and buckwheat 'Aiva';
- maintainer of varieties: red clover 'Stendes vēlais' and 'Skrīveru agrais', cocksfoot 'Priekuļu 30'.

Our scientists established a wide collaborative net both nationally and internationally. Especially close contacts the Institute enjoys with our colleagues from Lithuanian Agricultural Institute in Dotnuva and Estonian Selection Institute in Jõgeva. On the regular basis we exchange various information and the seed source material, and meet at conferences and seminars. We have developed a friendly collaboration with Estonian

and Lithuanian breeders in the sphere of the usage of genetic resources. For this reason, two international expeditions have been arranged, where the researchers from all Baltic States have taken part.

Our *Papilionaceous* and *Culmiferous* varieties are tested in Czech Republic, Slovakia, Germany, Norway, Canada, the USA, Belarus and other countries.

A special activity field of our Institute is farmer and agricultural specialist training. During wintertime we arrange seminars and conferences on the seed farming of field crops, the newest varieties, growing technologies, biological agriculture; in summers – country-days and seminars on related themes. The events have gained popularity, are highly estimated and have grown into tradition. Our scientists and specialists, for their part, are often invited to read lectures throughout entire Latvia gathering, on average, 50 interested persons.

The scientists of research institute of Agriculture monitor master and doctoral research of students involved in our research work: Mg. agr. A. Jermušs "The optimisation of nitrogen fertilizers in spring wheat in two kinds of soil texture after different previous crop" (supervisor Dr. agr. J. Vigovskis). The Institute has gained the status of study practice place.

Our scientists every year attend international conferences and seminars offering 13-15 presentations, representing our country and introducing to representatives of other countries results of our scientific work. Both the experienced and new doctoral students attended international conferences in France, Bulgaria, Ireland, Spain, China, and Poland.

For national conferences and seminars our Institute offers 20-25 presentations. During last five years our scientists have written 3 books; the research results are reflected by 46 international and 90 local publications.

It is already our tradition to take part at various exhibitions. On a regular basis we introduce research results and new varieties to Latvian countrymen at agricultural exhibitions in Vecauce, Viļāni and Priekuļi, and these events are abundantly attended. We have participated also at Ķīpsala exhibitions "Regional development in Latvia 2006" organized by Latvian Development Agency and have received many positive references and acknowledgements. We try hard not to disregard minor events and use every opportunity to tell about ourselves, the direction of our activities, and new varieties and technologies.

Conclusion

The Institute team looks hopefully into future. We hope that by our 70th anniversary we shall have a modern centre of perennial grass selection in Skrīveri and seed production corresponding to the EU requests, ensuring the seed quality and the preservation of variety's identity both in conventional and biological agriculture. Our Institute should be a scientific research centre oriented to research serving to production of the biological agriculture and selection of perennial grasses, and offering advisory service, dealing with preservation of seed varieties and maintaining the field plants and genetic resources.

We hopefully look forward to such opportunities:

- introduction of new scientific work directions (biological agricultural projects, international projects in various agricultural fields etc.);
- long-term collaboration with LLU and regional higher education establishments within various adult education and lifelong learning projects on a district and national levels;
- participation in monitoring of doctoral and master study papers, arranging the student field practice;
- significant regeneration of the actual material and technical basis, more effective use in order to start various business activities.

We hope that the Agricultural Institute, in perspective, will be a many-sided scientific technologic centre concentrating science, production and sale – the educational and consultative centre.

Published Books

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