

Organic plant breeding and seed production in Baltic States: developments and challenges

I. Belicka, M. Bleidere

Abstract - In this paper the current situation in plant breeding, variety testing for organic agriculture and organic seed production in the Baltic States, tasks for future are described.

INTRODUCTION

In order to provide successful implementation of EU regulations 2092/91, 1257/1999 and 1452/2003 regarding organic agriculture in the new Baltic Member States (Estonia, Latvia, Lithuania) the project "Environmental friendly food production system: requirements for plant breeding and seed production" (ENVIRFOOD) was realized. During the four-day seminar the Baltic States' plant breeders, specialists of variety testing and seed producers met with experts in organic plant breeding and seed production from Denmark, Germany and the Netherlands. In lectures and round-table discussions they exchanged knowledge about conventional and organic plant breeding, variety tests, seed production and food processing. Better acquaintance with European experience, exchange of national results and achievements help to develop scientific concepts for breeding and seed production for organic agriculture. Observation of the current situation and problems in the plant breeding, variety testing for organic farming and organic seed production in the each Baltic State is published in the Proceeding of the Seminar – "Environmental friendly food production system: requirements for plant breeding and seed production" (ENVIRFOOD) and disseminated (available on the website:

http://www.orgprints.org/5190/01/ENVIRFOOD_2005.pdf).

Compiled information about problems and prospects in future for development of organic plant breeding and organic seed production seed is reflected.

PLANT BREEDING FOR ORGANIC FARMING

Current situation

Organic farming has shown increasing popularity in the Baltic States during recent years. In 2004 area under organic cultivation took 46000 ha (5.5%) in Estonia (Tamm, 2005), 43902 ha (1.8%) in Latvia and 42961 ha in Lithuania (Leistrumaite, 2005). According to the long-term national agricultural development strategy, the area under organic farming should account for about 15% of the total cultivated area by the year 2015 in the Baltic States. Due to this, the question of the kind of varieties organic farmers should be using becomes increasingly important. At present time organic farmers are using varieties bred out for conventional agriculture. A number of varieties of cereals, pea, winter rape, potatoes have been recommended for organic farmers.

1

These varieties are on the National List of Recommended Varieties.

Are the varieties used in conventional agriculture also suitable for use in organic management? What kind of specific traits should varieties used in organic agriculture have? The suitability of existing conventionally bred varieties for organic agriculture can be evaluated reliably only under organic conditions.

First varieties adapted to organic farmers should be selected much earlier since farmers cannot afford to wait for 10 or more years. By the opinion of plant breeders the breeding of field crops is necessary for organic farming in the Baltic States. Organic farming systems should be supplied with varieties better adapted for the new conditions that arise due to the new approach to plant management. This includes a greater need for varieties contributing higher yield stability, competitiveness against weeds; nutrient efficiency and tolerance to diseases are in the choice of variety of much higher importance than in traditional farming (Ruzgas, 2005; Skrabule, 2005; Tamm, 2005). Nevertheless the possible amounts of organic breeding will be limited due to the little share of organic farming in total agriculture.

How great is investment of the Baltic State breeders in undertaking breeding for organic farming?

By the inquiry Latvian plant breeders have acquainted themselves or started acquainting themselves with scientific literature, have taken part in scientific conferences, workshops and other international activities connected with organic farming. Mainly breeders have been involved in testing crop variety suitability for organic farming. Breeding material assessment according evaluated selection criteria are dependent only on breeder's own initiative and enthusiasm yet (Skrabule, 2005). Similar situation is in the Estonia and the Lithuania. Latvian field crop breeders are able to begin breeding of several crops for organic farming. Some contribution has been done in this direction. Latvian Council of Science has accepted for years 2006-2010 new project: "Creating of well adapted crop varieties by using traditional and biotechnological methods for conventional and organic farming".

In the next future

To satisfy better the needs of organic farmers for adapted varieties the following will be planned: testing the local and listed varieties under organic conditions, starting limited breeding programs for organic farming with selection of promising lines and breeding numbers from exiting germplasm, starting limited breeding programs for organic farming and development of new lines from special crosses (Ruzgas, 2005; Tamm, 2005). Scientific program for collaboration between the Baltic States include: exchange of the genetic material that is especially adapted to organic/low-input agriculture, developing breeding procedures for organic farming, standardization of the market sets and exploration of traits important for organic farming,

organization of annual international seminar and field meeting of field crop breeders of the Baltic States with the main aim to exchange with information, discuss and analyze the joint work regarding to organic plant breeding. The start of breeding programs for organic farming in the Baltic States depends a lot on finding necessary financing. The recommendations for the selection of varieties to organic farmers on the basis of conventional trials could only be an initial solution.

Variety testing for organic farming

Testing of new varieties and registration for organic farming system from the legislation point of view is the same as that for varieties recommended for conventional production. Methods of variety assessment used in conventional agriculture are currently exploited for comparison. In Latvia testing varieties for suitability to organic has been started in 2004. Testing has been done at four test sites on certified organic crop rotation fields. Eighteen varieties of four crops: oat, spring barley, spring turnips and potatoes were tested for yield, maturity, lodging and disease resistance, and quality (Kalinina et al., 2005). Estonia doesn't have organic VCU trials and the present VCU procedure does not allow the introduction of varieties suitable for organic farming. It is necessary to organize one organic VCU trial site. Estonian Agricultural University and Centre of Ecological Engineering have conducted variety research under organic farming conditions (Lauk, Loper, 2005). In Lithuania the first variety testing for organic farming was conducted during the 1997-1999 period at the Lithuanian Institute of Agriculture. In 2004, 18 varieties of winter wheat cereals were assessed under organic farming conditions; some varieties were distinguished as possessing important and valuable traits for practical use in organic farming (Leistrumaite, 2005). Lithuanian State Plant Varieties Testing Centre is carrying out investigations within 9 field crops under conditions of organic farming at 8 sites. Based on tests results varieties are included in the List of Plant Varieties for use in organic farming (Juciviene, Almantas, 2005). Main tasks in future: organic VCU tests must be carried out in the certified organic field, supplement present VCU varieties testing protocols with the traits significant for organic agriculture, and promote the collaboration between official State Variety Testing institutions of the Baltic States.

ORGANIC SEED PRODUCTION

The organic seed production in the Baltic States is now in the stage of development. There is needed a dialogue between producers and seed industry. Unfortunately only small amount of information about seed supply is available in databases of the Baltic States now. Current situation in seed market indicates that even in January 1, 2006, organic seed supply will be insufficient. One of the main reasons of the lack of organic seed demand in the Baltic States is that organic farmers have insufficient education in terms of seed quality importance. The second reason of the lack of demands is that organic farmers are short in funds and cannot buy double certified organic seed. State granted support is needed as the seed production is a resource-demanding branch (Aavola, Bender, 2005; Gaile, Evelone, 2005).

CONCLUSION

It is necessary to develop plant breeding and variety testing for organic agriculture. Organic seed production must be put into practice.

ACKNOWLEDGEMENT

EC is acknowledged for financing Project FP-2003-SSA-1-007003.

REFERENCES

- Aavola R. and Bender A. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp. 81-86, eds I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).
- Juciviene S. and Almantas G. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp. 73-75, eds I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).
- Gaile Z. and Evelone V. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp. 76-80, eds I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).
- Lauk T. and Loper I. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp. 71-73, eds I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).
- Kalinina S., Jegorova V. and Katanenko S. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp.66-71, eds. I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).
- Leistrumaite A. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp. 103-108, eds I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).
- Ruzgas V. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp. 63-65, eds I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).
- Skrabule I. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp. 54-58, eds I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).
- Tamm I. (2005). In: "Proceedings of the seminar-Environmental friendly food production system: requirements for plant breeding and seed production", pp. 58-63, eds. I. Belicka and M. Viklante (State Stende Plant Breeding Station: Latvia).