

Breeding pure line varieties of spring wheat for organic agriculture in the Netherlands



Edwin Nuijten
Louis Bolk Institute, the Netherlands
e.nuijten@louisbolk.nl

SUMMARY *The availability of spring wheat varieties for organic farming is very limited. Efforts have been made to find ways to obtain more suitable varieties and make their future availability more reliable. A consortium of farmers, bakers and a trader has been set up to stimulate this development, in cooperation with breeders. A number of key elements have been identified to make such an approach feasible.*

Breeding spring wheat in the Netherlands

The availability of suitable spring wheat varieties for organic farming is very limited. For Dutch organic farmers baking quality is important, which is not important for conventional farmers and breeders. Only one conventional Dutch breeder is breeding spring wheat and is not breeding for baking quality. The Dutch organic wheat sector is too small to make a breeding program profitable. For new varieties, Dutch farmers rely on breeding programmes in other European countries. As a result, new suitable varieties are only found by chance.

Designing a strategy to stimulate breeding

How can the organic wheat sector have more reliable access to suitable spring wheat varieties? Meetings have been set up by the Louis Bolk Institute with farmers, breeders, millers, traders and bakers. In 2009 an idea was proposed to set up a breeding program aimed at breeding new varieties suited to the needs of Dutch organic farmers. Through a levy on the bread it is possible to collect this amount each year, and it is not a drastic increase of the bread price, unlike raising a licence fee for farmers (Table 1).

Table 1: The alternatives to finance spring wheat breeding

OPTIONS	EFFECT	WHO
Raise licence fee	3.1% increase in production costs	Farmers
Acreage Levy	Too expensive	Farmers
Levy on meal / flour	2% increase in flour price	Bakeries
Levy on bread	1% price increase per loaf	Consumers

All partners signed a consortium agreement, making their commitment visible. The next step was to link up with existing breeding expertise. To set up a breeding program, material from three breeders was tested in 2009. Because of suboptimal field conditions (low N), none of the materials appeared to be promising. When the subsidy for the facilitator was also cut, the consortium came to a standstill.

Variety screening instead of breeding programs

In 2013, the question was raised how to continue. All consortium members still showed commitment: The farmers and the trader because yellow rust resistance became an even more important issue; the bakers because they wanted to use more regionally produced wheat. Instead of a breeding program, it was proposed to

screen varieties and potential lines for registration, increasing the chances of success. Variety screening trials were set up in 2014 and 2015 to see which varieties showed potential. Varieties were chosen based on information from the trader and closely involved breeders. Lessons learned are described in the box.

Future perspectives

The next step will be to include breeding lines in the evaluation trials. A smart approach with low costs for adjusted VCU-testing for organic farming needs to be developed. Ideally, in the future in particular advanced breeding lines that show potential for organic agriculture will be tested. One issue is how to pay the extra costs for variety registration if such breeding lines are not of interest for conventional farming.

Lessons learned

To make a chain based approach feasible, several key-elements are important.

- *A problem needs to be urgent for involved stakeholders, a recognised need is not enough*
- *Alternative financing models can trigger the chain partners to believe in the possibilities and show commitment*
- *A (neutral but well-informed) facilitator to keep common commitment is important, as stakeholders have diverse interests*
- *Complexity of the market chain and differences in business culture influences the rate of success*
- *Governmental policy and support, and economic importance of a crop are beneficial*

