

Variety breeding for organics: experiences in the Netherlands

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26 November 2014

Organic Research Centre's 9th producers
conference

Introduction

- The problem: Lack of suitable varieties for organic agriculture
 - Adaptation required to specific growing, processing and marketing conditions
- How to stimulate breeding for organic agriculture in the Dutch context?
- Various initiatives
- Conclusions

The context: NL = seed country

- Companies hesitate to invest in organic breeding
 - Organic seed market is still too small to recover investments
- Concentration into a few companies
 - Diminishes the perspective of an assortment of varieties adapted to organic cropping systems
 - Example: Monsanto-daughter De Ruiter Seeds stopped organic seed production
- Other chain partners are interested to support organic breeding (for example wheat and potato)
 - Depends on the specific (organizational) structure of their production chains
 - Vegetable production chain has its own characteristics

Various initiatives

- Potato breeding (phytophthora resistance)
- Spring wheat breeding (baking quality)
- Vegetables
 - individual farmers with Bingenheimer Saatgut AG
 - Odin trials on OP varieties

Potato breeding (phytophthora resistance)

2007: Urgent need: dramatic late blight!

Reduction in acreage by 20%. Broad support from all stakeholders for a large programme: breeding, cultural practices and marketing

2008:

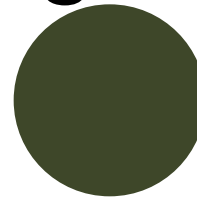
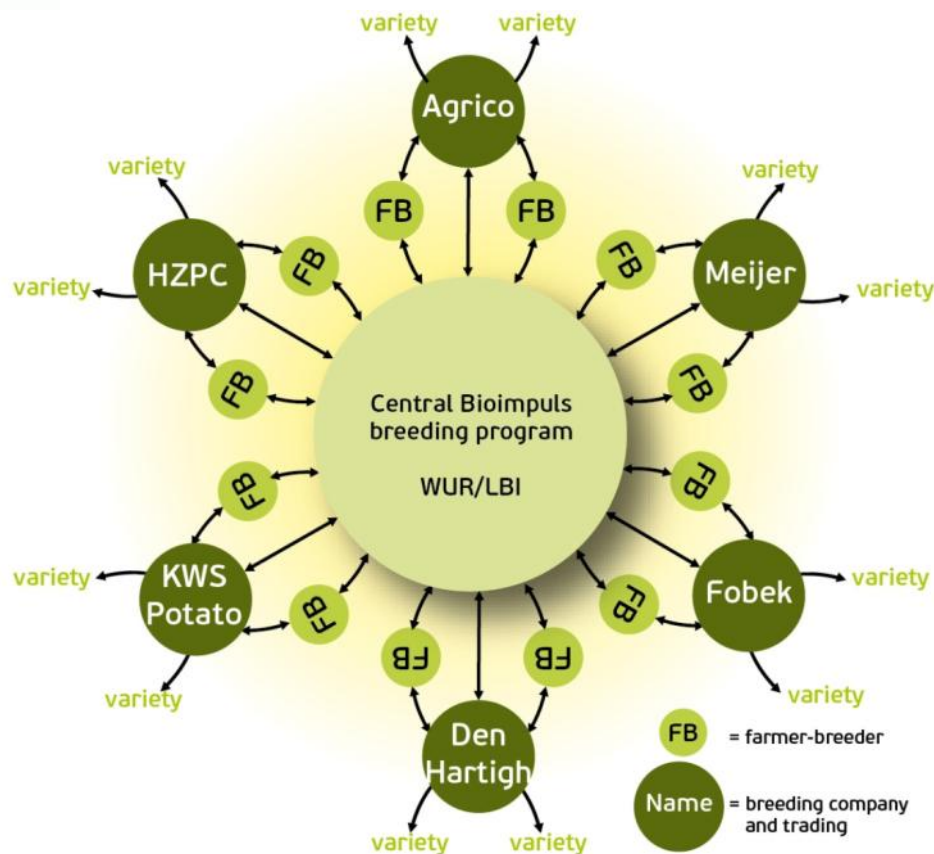
Farmer course,
Creating infrastructure
for breeding

2009: Funding 2009-2013

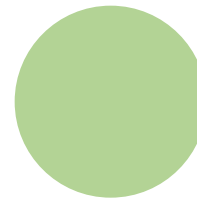
2014: Funding 2014-2019



PPB in potato in NL (Bioimpuls) – organic late blight resistance potato breeding



6 breeding companies

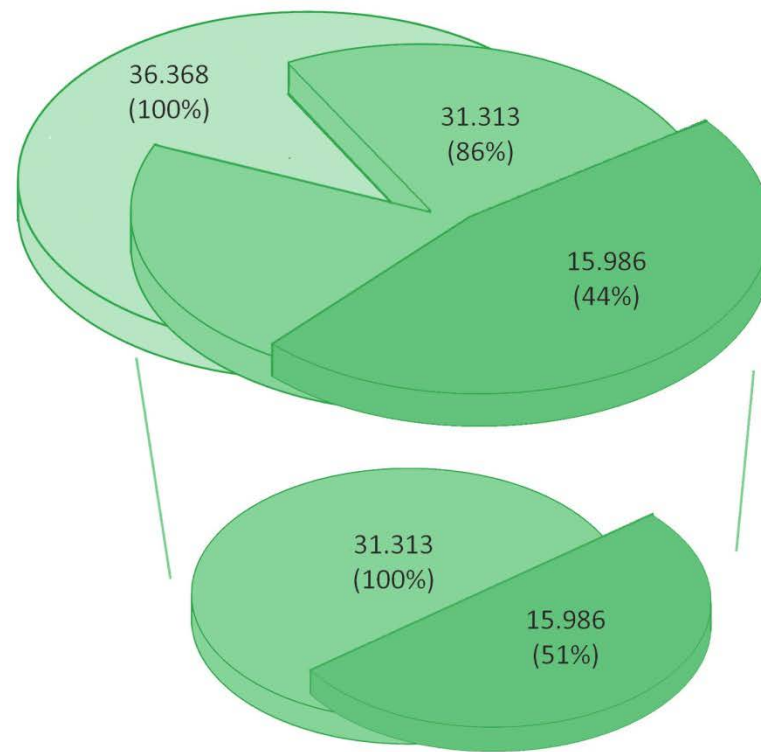
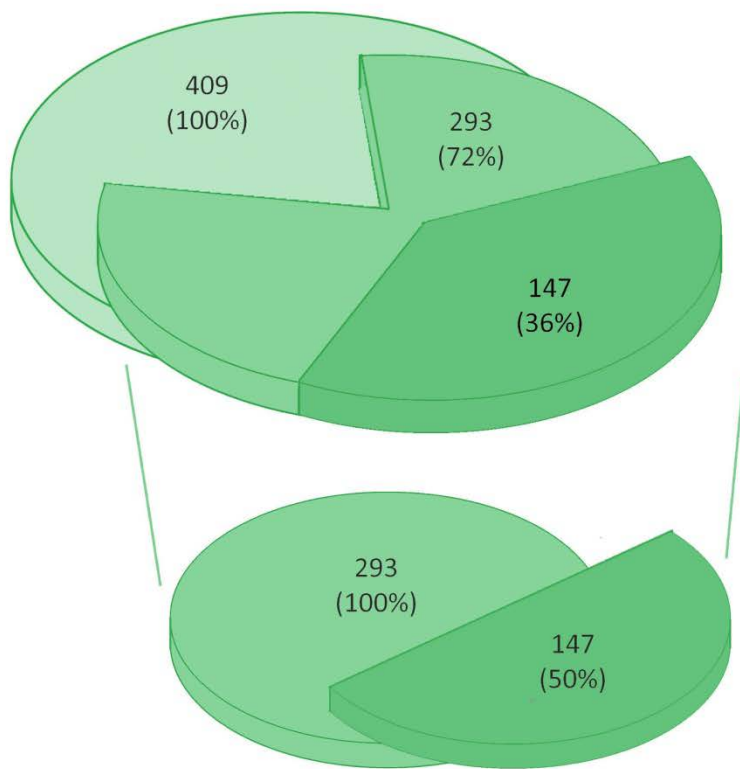


LBI and Wageningen University



12 farmer-breeders

50% Dutch potato varieties selected by farmer breeders



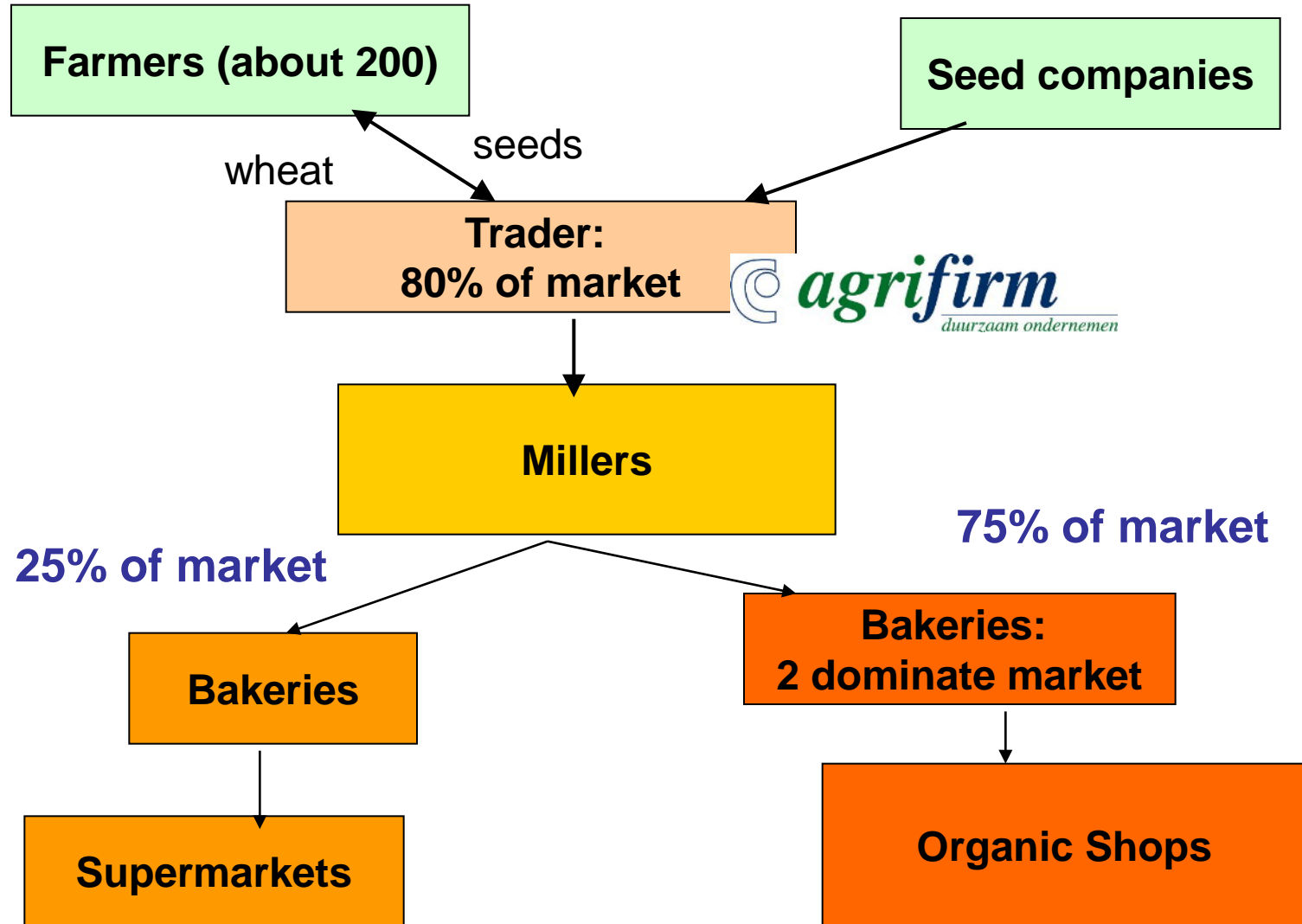
- = Number of varieties grown in the Netherlands
- = Number of Dutch varieties
- = Number of varieties from Dutch farmer breeders

- = Total area of seed potatoes (ha)
- = Area seed potatoes cultivated with Dutch varieties (ha)
- = Area seed potatoes cultivated with Dutch varieties from farmer breeders (ha)

Spring wheat breeding

- In the Netherlands
 - No organic breeders
 - One conventional breeder left (Wiersum Breeding)
- Dutch organic farmers rely on one variety
 - *Lavett*, Sweden
 - since *Lavett* (1992) no other good varieties appeared
- For new varieties, farmers rely on programmes in Germany, Sweden
 - New suitable varieties only pop up by chance
 - A typical Western European wheat programme only dedicates 10% of its effort to spring wheat (roughly € 45.000,-)
 - Modern programmes do not select for “good” baking quality under organic conditions

Organic Bread Chain in NL



What can the organic wheat sector do?

- Dutch organic wheat sector is too small to finance breeding programme
- Seed production can be done relatively easily by farmers
 - However, selection of breeding lines is more complicated due to segregation (contrary to potato)
 - Besides, a farmer would need to invest heavily in special equipment for harvesting small plots, processing and assessing traits related to baking quality
- No way out?



Designing a strategy to stimulate breeding

- Link up with existing breeding expertise and infrastructure
 - Talk with breeders, milling and baking industry
 - Setting up a structure for collaboration
 - Develop alternative financing models

What are the alternatives to finance spring wheat breeding?

Options	Effect	Who
Raise licence fee	3,1% increase 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

Chain based breeding in spring wheat: Lessons learned

- Alternative financing models can trigger the chain partners (farmers, traders, millers and bakeries)
 - A consortium was formed and chain partners showed commitment
- A (neutral) facilitator to keep common commitment is important
 - Stakeholders have diverse interests
- An urgent problem did not exist
 - A recognised need is not enough

Other alternatives

- Two spring wheat CCPs were grown by 7 farmers in 2014
 - Developed by German breeder (Hartmut Spiess, Dottenfelderhof)
 - Processed by Biodynamic baker
 - Takes the wheat produce as starting point
 - Easy collaboration: shared culture
- Landraces of wheat
 - Special quality and taste
 - Low yield, require different baking process
 - More successful in France and Italy

Vegetable varieties

- Different problems compared to potato and wheat breeding
 - Unlike for potato and wheat, the product is often different from the seed
 - Vegetable breeding has a more inward culture compared to potato and wheat breeding
 - For many vegetables F1 hybrids are used

OP vegetable breeding by individual farmer breeders

- A few Dutch farmer breeders, supported by the KulturSaat Foundation in Germany, have made selections in OP varieties of carrot / onion under bio-dynamic conditions
 - Cooperation with Bingenheimer Saatgut AG ensures new selections, when evaluated positively, will be included in the catalogue
- Better connection with the market is needed

Odin project: more diversity in the field and the shop

- Aim: to promote the use of OP varieties with good quality
 - Duration 2014-2016
 - 2014: trials OP varieties with 10 vegetable species
 - Per trial two F1-hybrid varieties as reference
 - OP varieties from NL, D, F, Sw



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partners

Odin project

- Some preliminary outcomes:
 - Gap between OP and F1-hybrid varieties differs per crop
 - Certain OP varieties have yield similar to F1-hybrids
 - Certain OP varieties have better taste
- Benefit OP-varieties: farmers can play a role in variety improvement



Discussion: Key factors

- Shared problem (a recognised need is not enough)
- Initiator from within the chain
- Market chain complexity, and shared culture among chain partners
- Historical context and institutional organisation of breeding activities
- Governmental support and policy
- Economic importance of a crop
- Neutral facilitator
- Breeding strategy (OPV, F1-hybrids, vegetatively propagated)
- Crop traits: ease of selection, reproduction system, and need for investments in assessment tools

Any Questions?