

Organic Knowledge Update

Propagation material and organic breeding

February 2011

Vigorous propagation material and organic breeding in the Netherlands

Organic cultivation depends on robust and healthy propagation material and the availability of suitable plant varieties. To be able to facilitate organic farmers and growers, Wageningen UR and the Louis Bolk Institute carry out a variety of research aimed specifically at organic propagation and breeding.



Thrips can damage cabbage leaves

Dutch research on organic propagation material and breeding

The circumstances in organic cultivation are often very different from those in conventional agriculture. Nutrient levels in the soil are often lower and the availability depends on soil temperature. At the same time, pests and diseases cannot be treated with chemicals.

Specific organic breeding programs and tailor-made research into the vigour and health of propagation material are essential to organic cultivation. To facilitate organic farmers, Wageningen UR and Louis Bolk Institute carry out a variety of research aimed specifically at organic breeding and propagation material.

→ Aspirations

Conventional seeds and propagation material are still widely used in the organic sector. In the future the sector wants to switch to 100% organic propagation material and seeds. This switch can only be made when sufficient healthy and vigorous material can be produced. The harmonisation of the European rules and regulations is also important, to create a level international playing field. Developing organic plant varieties is a further step; varieties that are optimally suited to (low-input) circumstances on organic farms.





Selection of potato cultivars during field trials

Current affairs

Currently, the sector is discussing whether a separate organic breeding program is necessary and preferable. Farmers need a diversity of organic species that perform

well under low-input circumstances, but have only limited options available at the moment.

Separate organic breeding programmes are costly. At the moment organic cucumber

seeds are especially difficult to come by, after production in the Netherlands has ceased. At the same time organic growers are obliged to use organic seeds!



Research projects

- **Nitrogen plasticity in organic potato** The organic sector needs organic potato cultivars that are able to deal with low nitrogen input and variable nitrogen availability, and have the ability to recover after a period of nitrogen stress. This project aims to identify plant traits that are correlated with these abilities. These traits will lead to selection criteria for breeding potato cultivars that are better adapted to organic cultivation.
Contact: Marjolein Thiemens-Hulscher MSc, M.Thiemens@louisbolk.nl
- **Onions and mycorrhizas and their relationship to roots and *Fusarium* basal rot** The aim of this project is to better understand the relationship between mycorrhiza-interaction, root systems and *Fusarium* resistance when breeding onions for low-input conditions. If plants become resistant to *Fusarium* basal rot, how does this influence mycorrhiza-interactions, growth and nutrient uptake?
Contact: Dr Olga Scholten, Olga.Scholten@wur.nl
- **Thrips resistance in cabbage** Cabbage varieties differ markedly in their susceptibility to thrips, but the genetic background of these differences is unknown. This study looks at the inheritance of resistance to thrips and at plant traits related to thrips resistance.
Contact: Dr Roeland Voorrips, Roeland.Voorrips@wur.nl
- **Preventing internal Xcc-infections of organic Brassica seed** *Xanthomonas campestris* pv. *Campestris* (Xcc) is the causal organism of black rot. Xcc is considered the major problem in organic production of Brassica seed. Previous studies showed the importance of flower infection to internal Brassica seed infections. This project studies the colonisation route of Xcc from flower to seed in order to find new ways of controlling infections.
Contact: Dr Jan van der Wolf, Jan.vanderWolf@wur.nl
- **Rapid analysis of the vigour of organic propagation material** Physical sanitation treatments, which are used as an alternative for chemical treatments, can damage the vigour of the seeds or planting material. This project aims to develop rapid tests to determine both stress tolerance of seeds and seed potatoes and damage induced by sanitation treatments.
Contact: Dr Steven Groot, Steven.Groot@wur.nl
- **Detectability of *Clavibacter* in organic tomato seeds** Research into a treatment of tomato seeds that allows for efficient detection of *Cmm*, without compromising germinative power. At the moment detection is difficult as saprophytic micro-organisms make *Cmm* contaminations difficult to detect.
Contact: Dr Jan van der Wolf, Jan.vanderWolf@wur.nl
- **Improved storage of celery seeds** This project develops methods for maintaining the quality of primed seeds in storage. This is important to enhance germinative power.
Contact: Dr Steven Groot, Steven.Groot@wur.nl





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Bioconnect aims to further develop and strengthen the Dutch organic sector by initiating and implementing research projects. Within Bioconnect organic entrepreneurs (from farmers to shop-keepers) work together with research institutes, colleges and universities and consultancy organisations. This leads to demand-driven research that is unique to the Netherlands.



The Ministry of Economic Affairs, Agriculture and Innovation sponsors these research projects.



Wageningen UR (University & Research centre) and the Louis Bolk Institute together carry out these research projects. About 140 projects dedicated to organic agriculture are currently under way.



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