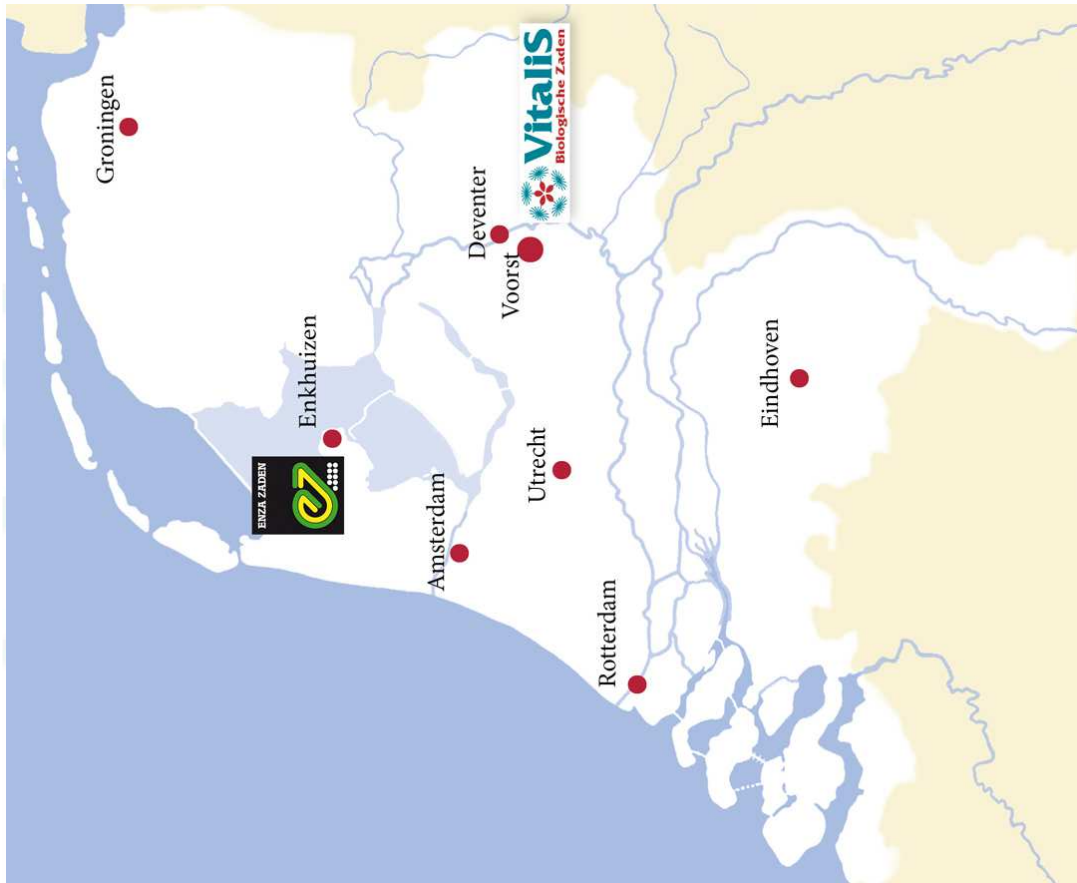


Creating an organic world

Vitalis Biologische Zaden
start 1994
Subsidiary of Enza Zaden





Location Voorst total 11 hectare



Core activities



1. Breeding and selection of organic varieties
2. Production of organic seeds
3. Developing organic seeds treatments
4. Marketing of organic varieties
5. Registration of varieties in annexes



Breeding for resistance



- Pro-active
- Ad hoc
- Long term program

Bremia in lettuce
Downey mildew tomato
Aphid in pepper



Bremia resistance in lettuce

- New resistance genes are crossed in pro-active
- Working with single R gen lines
- Bremia is collected constantly
- Test the (new) lettuce material with new strains
- Create several new varieties with different genes
- A new Bremia strain is nominated by the International *Bremia* Evaluation Board (IBEB) if it appears for a longer time on several locations on several resistant varieties
- The genes that are out in the field the most has the highest changes to be broken

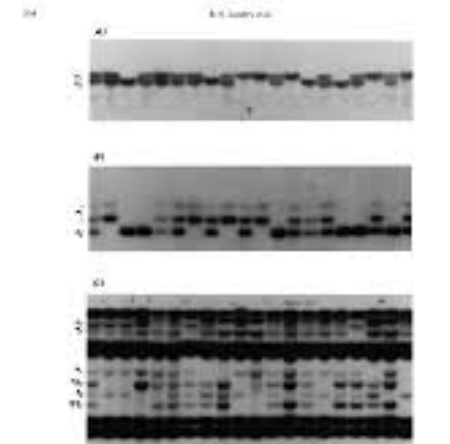
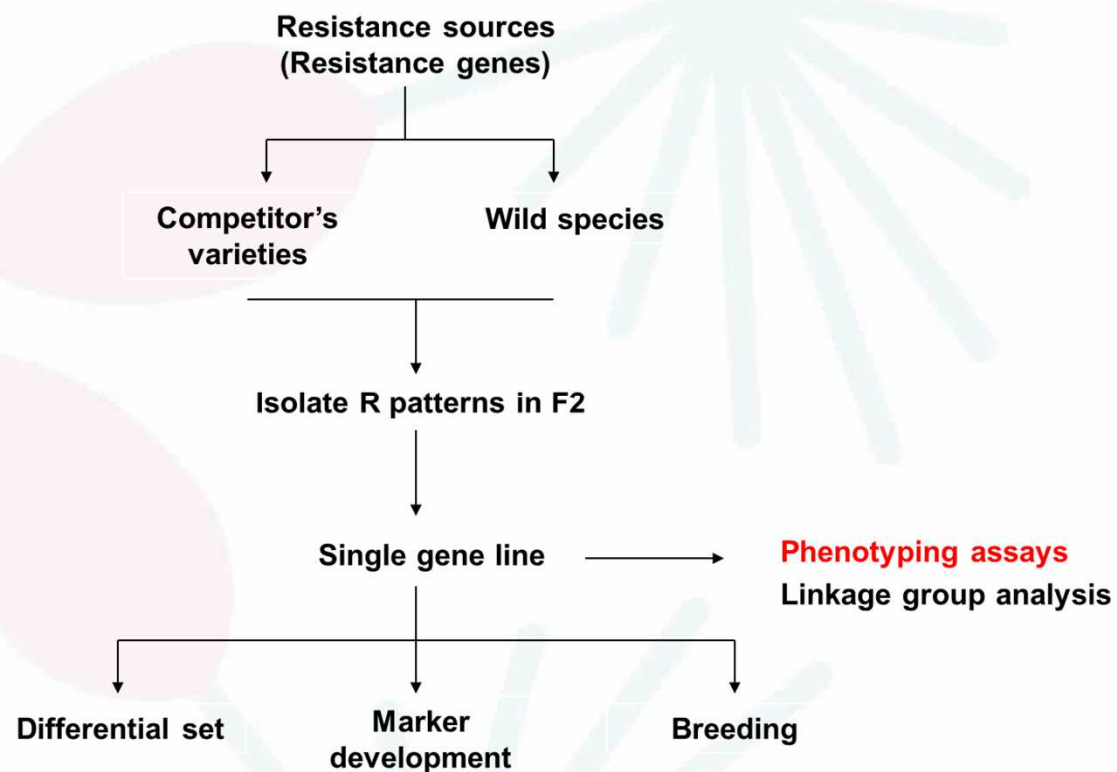


Figure 1: Gel electrophoresis images showing DNA bands for Bremia resistance. Image A shows a single band, Image B shows multiple bands, and Image C shows a complex pattern of bands.



Lettuce Bremia resistance breeding scheme



Wild material



L. serriola



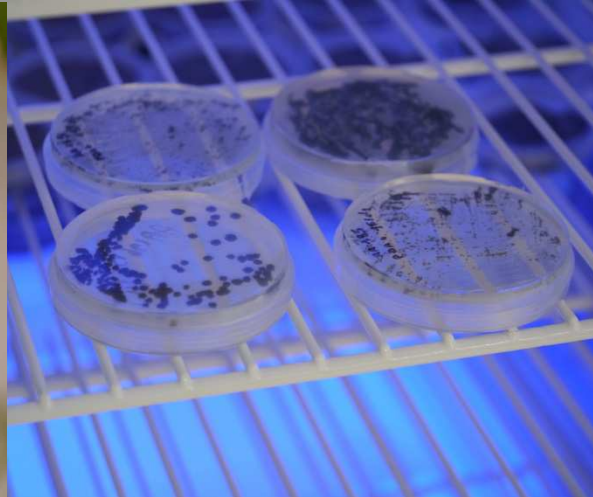
L. virosa



L. saligna



Cladosporium-resistance in tomato



Downey mildew resistance in tomato



2011

Downey mildew in HR: Ff 1-5 resistant varieties

Damage

20-30 % loss of yield.

Leaves and green parts truss infected.

Plant with only a few green leaves

First leave samples send to Enza

1. New strain isolated
2. Varieties tested
- 3 Test a set of resistance gens



Downey mildew resistance in tomato



2011-2012

Several gens give resistance.

Resistance monogen and dominant

Location gen detected and marker developed.

Parentlines tested with marker

Already some parentlines with resistance.

The varieties Annamay and Roterno have resistance.

2012 First crosses are made

2013 First screening material

2014 Second screening material on several locations

2015 First large scale grower trial

2016 Commercial introduction



Aphid resistance pepper



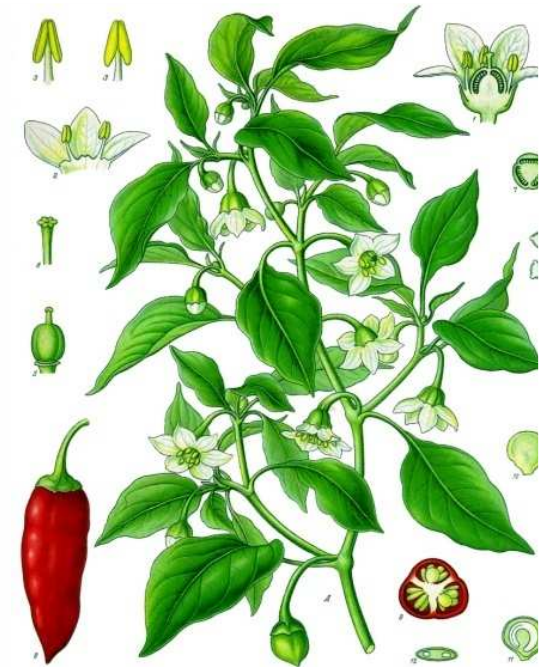
Aphid resistance peper

Test several wild Capsicum lines on resistance

WUR and several seed companies

Start a breeding program with this lines

Timeline 10-12 year



Other diseases



- Cucumber Mildew, CGMMV
- Pepper Mildew and TSWV
- Tomato Powdery mildew, Botrytis, Phytophthora, TYLCV
- Lettuce Fusarium





**BioGreenhouse**

**COST**
EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY


COST is supported by
the EU Framework Programme
Horizon 2020