



# Kultursaat and Bingenheimer Saatgut: Network of organic seeds and biodynamic breeding (vegetables – solely o.p.)



**bingenheimer saatgut**

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**Our Summer seeds**

Extend the harvest season and harvest fresh vegetables until autumn.

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Foto: Hendrik Rapp

**Events**

The current and past events of the Kultursaat e.V. can be found here.

[To the events \(in German\)](#)

**Become a member!**

Support Kultursaat e.V. and promote biological diversity!

[Become a member!](#)

**Variety database**

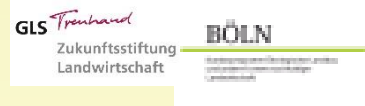
The online variety bank of the association Kultursaat e.V.

[The variety database](#)

<b>Association:</b> Historical Background Objectives Articles of association Support our work Events	<b>Our breeding:</b> Kultursaat/Varianzen Locations Breeding Methods Variety archive Vegetables with character	<b>Variety Marketing:</b> Motivation Activities 2002 until today Varieties with character	<b>Events:</b> Contact us Legal Notice	<b>Kultursaat e.V.</b> Association for Breeding, Research & Crop Maintenance Based on Biodynamics Principles Grosse-Str. 10/109b 67684 Phone: +49 9231 9249860 Monday - Friday 8:00 - 12:00 am
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# Kultursaat at a glance

- Approx. 300 spons. members, of those 30 breeders
- Financing via membership fees, contributions from foundations, public subsidies
- Annual budget approx. 1.4 Mio. €



**Breeders' nurseries embedded in organic cropping enterprises (farming or horticulture)**

1. Annette Maaß  
2. Christina Henatsch  
3. ...  
4. René Groener  
5. ...  
6. Sike Wedemey  
7. ...  
8. ...  
9. Sonja Lange  
10. ...  
11. Sebastian ...  
12. Martin Hagemann  
13. Ute Kirchgaesser  
14. Christoph Matthes  
15. Julian Jacobs  
16. Michiel Groen  
17. ...  
18. Peter Kiefer  
19. Ratzhof  
20. Pflüwen  
21. ...  
22. ...

me)

**Hybrid-Saatgut passt nicht zu Bio – und ist trotzdem weit verbreitet**

Die Großbauern in der Region des Oberrheins betreiben Bio-Landwirtschaft. Das Problem ist: Sie verwenden Hybrid-Saatgut. Das ist ein Widerspruch. Denn Hybrid-Saatgut ist nicht für Bio-Landwirtschaft geeignet. Es enthält Erbinformation von beiden Eltern, was zu einer Ertragssteigerung führt. Aber es ist nicht nachhaltig. Die Erbinformation wird in der zweiten Generation verloren. Die Bauern müssen jedes Jahr neues Hybrid-Saatgut kaufen. Das kostet Geld. Und es ist nicht nachhaltig. Die Erbinformation wird in der zweiten Generation verloren. Die Bauern müssen jedes Jahr neues Hybrid-Saatgut kaufen. Das kostet Geld. Und es ist nicht nachhaltig.

# Organic plant breeding in a broader network

- since about 40 years,
- most cases biodynamic originated,
- cereals, vegetables and fruits.



est. 1989 (32 years)



est. 1988 (34 years)



est. 1984 (38 years)



est. 1977 (45 years!)



est. 1994 (28 years)



est. 2005



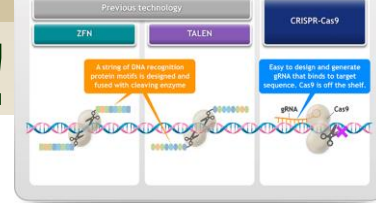
est. 2010

**Apfel:gut**

Ökologisches Apfelzüchtungsprojekt im Saat:gut Verein e. V.



# Next generation's GMO are coming!



Wang et al. *Horticulture Research* (2019)6:77  
<https://doi.org/10.1038/s41438-019-0159-x>

Horticulture Research  
[www.nature.com/hortres](http://www.nature.com/hortres)

REVIEW ARTICLE

Open Access

## CRISPR technology is revolutionizing the improvement of tomato and other fruit

**Genetic modified organisms are not compatible to organic farming, and NPBTs are advertised with the same promises as some 50 years ago!**



POSITION PAPER

COMPATIBILITY OF BREEDING TECHNIQUES IN ORGANIC SYSTEMS



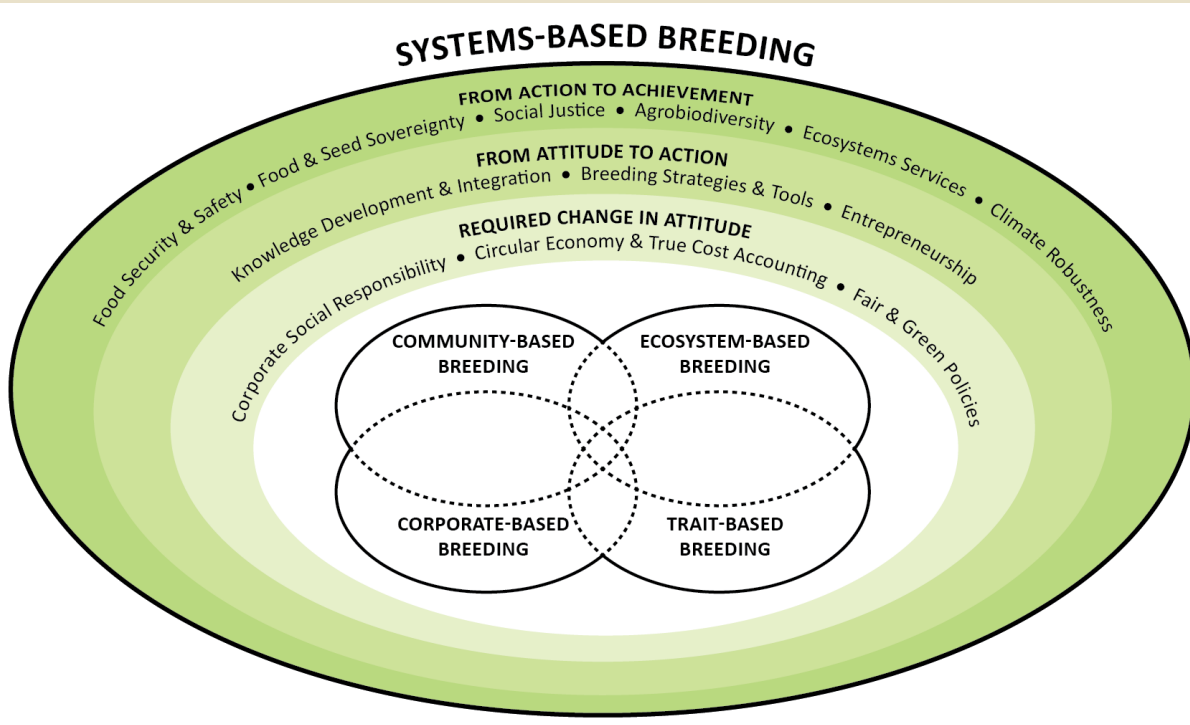
Fig. 2 Timeline of the first application of the clustered regularly interspaced short palindromic repeat-CRISPR-associated (CRISPR-Cas9) system in fruit crops

# Conservation and amateur varieties

Directives 2008/62/EC and 2009/145/EC

- + *More alternatives for registering varieties*
- *Various restrictions*
  - *Regionality*
  - *Quantity in sales*
  - *Package size*
- *Need for more appropriate registration procedures*
  - *Each breeding approach has its own logic*
  - *Different registration procedures for different breeding approaches*

# Systems-based strategies: Appropriate registration procedures for different breeding approaches



Six key-elements (goals):

1. Social justice
2. Food security, quality and safety
3. Food and seed sovereignty
4. Agro-biodiversity
5. Ecosystem services
6. Climate robustness

Lammerts van Bueren et al. 2018. **Towards resilience through systems-based plant breeding. A review.** Agronomy for Sustainable Development.

# What are our approaches?

- *on-farm breeding, O.P. varieties*
- *seed saving must be possible (no F1-hybrids),*
- *some heterogeneity to allow crops to cope with climate variability and other stresses,*
- *maximise plant-soil cooperation,*
- *disease tolerance instead of monogenic resistances,*
- *face the challenges of daily farmer practices (harvest quantity, plant health, shelf life etc.),*
- *meet the trade requirements (nitrate content, shape, colour),*
- *food with high quality (taste and nutrition).*

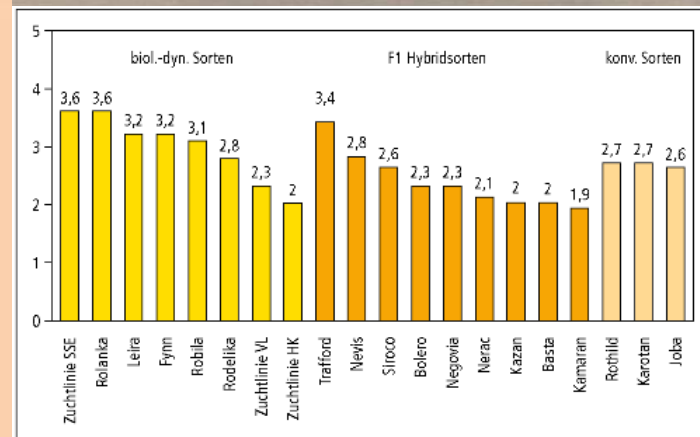


Abbildung 2: Frische Möhren: Ausprägung des Merkmals „Süß“  
(5 = Merkmal sehr stark ausgeprägt, 0 = keine Ausprägung)





# Different registration procedure needed for organic varieties

## Example *„Brokkoli-Pop“*

Development of open pollinating broccoli for organic farming with good agronomic traits and sensory quality

in co-operation with



Gefördert durch



Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz

aufgrund eines Beschlusses des Deutschen Bundestages

Replacement of „old“ hybrids with protoplast fusion  
CMS hybrids: very uniform  
**OP varieties: cannot meet current uniformity standards without inbreeding**

Selection in ‘OP’ populations  
by single plant progeny selection and  
accompanied by analytics and a ‘Sensortool’



# Breeding projects together with the value chain



**Naturata funds breeding in O.P. cauliflower:**

- 9 projects
- direct distribution preferred
- harvest period, uniformity in size, taste



# What Kultursaat needs



Organic breeding from seed to variety:

- the whole breeding process under certified organic conditions
- breeding takes place in the field
- no gmo's (thus also no protoplast fusion)
- no patents on natural plant traits
- no laboratory techniques that do not comply with IFOAM principles
- no techniques to limit natural reproducing ability of plants



## POSITION PAPER

COMPATIBILITY OF BREEDING  
TECHNIQUES IN ORGANIC SYSTEMS

Approved by the General Assembly 2017

*“Seed saving is a vital part of agricultural practice!”*



# What Kultursaat needs



Adapted registration protocols for organic varieties:

- allows a somewhat higher level of heterogeneity in varieties
  - Better tolerance to diseases
  - Ability to cope with climate variability
- distinguishability is important
- description focuses on plant traits; less on disease resistances
- in case of disease tolerance, use intermediary scales (1,5,9 instead of 1 / 9): reflects reality!



Varieties have natural reproducing capacity, allowing two options:

- a) farmers save their own seeds; to adapt organic varieties to their local and regional conditions;
- b) other farmers buy seeds yearly

# What Kultursaat needs



Adapted registration protocols for organic varieties:

- conducted under organic practices
- at multiple places, to ensure distinguishability

Adjusted retesting every 10 years:

- to allow some small changes in phenotype in OP varieties
- to allow adaptability to changes in climate and growing conditions

No limitation:

- package size,
- annual sale,
- or region.



# another glance

Developing alternative breeding strategies:

- population breeding: spinach
  - new populations can be registered via the new organic regulation (2018/848) as ***organic heterogeneous material***
- multi-line mixtures: lettuce
  - need appropriate registration procedures (to be developed)



**Thank you for your attention and  
we look forward to your visit with us!**

