

# 4rd European Conference on Copper in Plant Protection

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**“Plant health care system and healthy ecosystem: How organic fruitgrowers work to improve both together”**

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## Background

Since 2004: BÖL-project 03OE178/06OE100 „Working net“ = Network for the improvement of the production system in organic fruit growing

Fruitgrowers – Consultants – Researchers – Associations - Experts

Improvement of the production system

- Find sustainable solutions for the existing challenges
- Improve the fruit growing systems towards the Principles of Organic Agriculture

**→ Make the organic fruit farms fit for future!**

# Once upon a time the concept was simple ...

- **Healthy Soil**
  - **Healthy ecosystem**
- **Healthy plant**

# Nowadays there are question marks....

- **Healthy Soil**

- **Healthy ecosystem ?**

→ **Healthy plant ?**

# The Strategy for Plant Health Care in Organic Farming



## Resilient Farming System

**Functional  
biodiversity**

**Agricultural  
measures**

**Inputs**  
*e.g. plant protection products*  
**Tillage**  
*Input of energy*



- Farming systems aim always to **reduce their dependency** of off farm inputs
- The intelligent **combination** of measures **is responsible for the efficacy of the strategy**

# The Strategy for Plant Health Care in Organic Farming

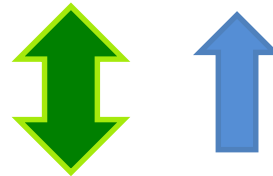
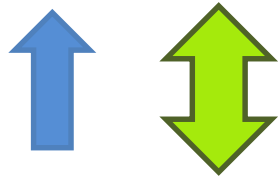


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Landscape and agricultural ecosystem



# Biodiversity - an Essential Part of the Strategy for Plant Protection in Organic Farming



Enhancement of predators



Enhancement of functional diversity of soil microorganisms



Genetic diversity of varieties



*Crop rotation* and crop mixtures

Organic Farmers are pioneers in the development and the implementation in practice of measures for the enhancement of functional biodiversity.

# The economic injury level for a broad spectrum insecticide (pyrethrum) in Organic Farming

Functional biodiversity is of high economic importance for the farmer!

Loss of yield expected when the insecticide is not applied



Cost of the application

Damage expected for functional biodiversity  
= Losses of yield expected in consequence (short and middle term)

The expected damage is generally tolerable if

- the application takes place early in the season when few beneficial insects are present
- the application covers only a part of the field/orchard
- the field/orchard is small and the surroundings are rich in biodiversity



# Enhancement of aphid predators with flower strips

## The idea



## The management of possible side effects



## The technical challenge



**The complete recommendation for another strategy**

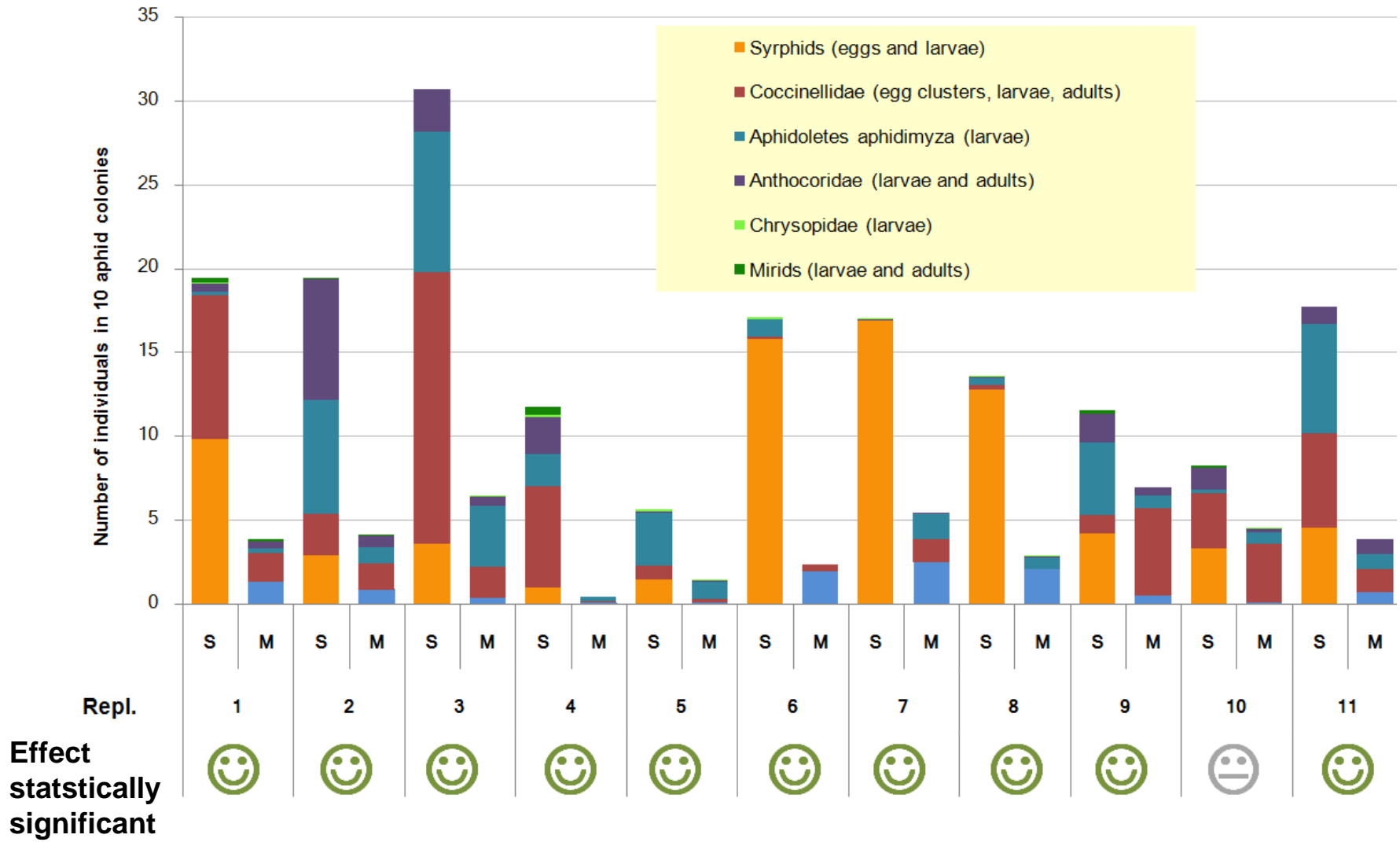


# Trial design

Comparison of orchards (near and distant) and comparison of the occurrence of aphid predators on potted trees infested with green apple aphid



# Results: It works!



The number of all aphid predators was always higher in the plots with the strips (S) than in the mulched orchards (M)

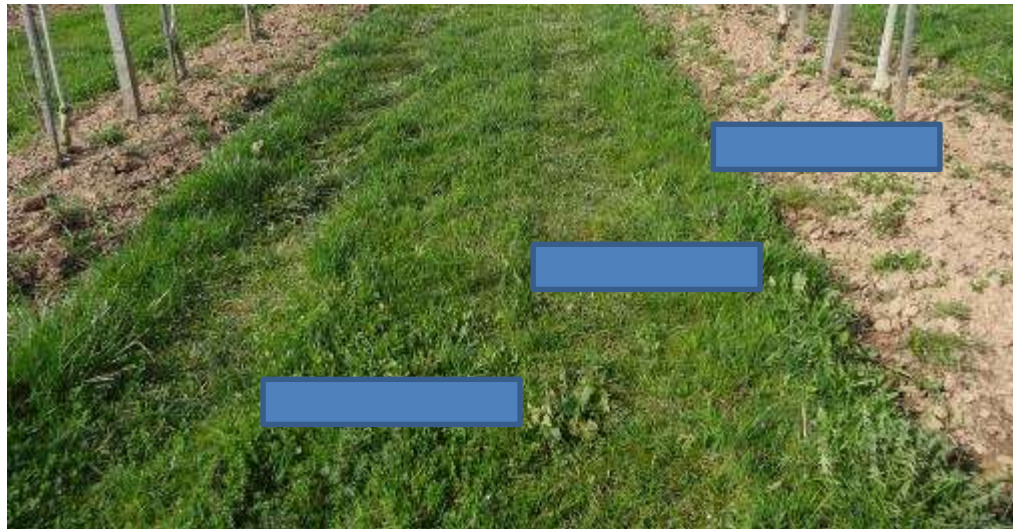


# Management of the side effects?

Assessments of the occurrence and abundance of Common vole and Water Vole

- The alleys were divided into segments
- Traces of activities in each segment were assessed
- It was assessed on which part of the alley the activities concentrated

**We could perhaps develop at a new management strategy...**



# The Strategy for Plant Health Care in Organic Farming

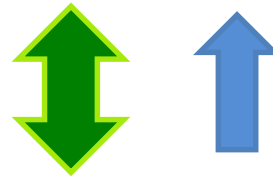
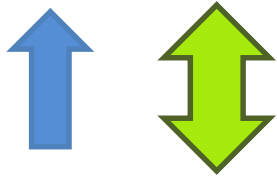


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# Plant Health Care and Environment Health Care

## Can we include this in one strategy?





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Projekt "Potenziale und Praxisprogramm zur Erhöhung  
der ökologischen Vielfalt in ErwerbsoStanlagen und  
Streuobstwiesen" BfN Fz. 3514685A27

leben.natur.vielfalt  
  
das Bundesprogramm



Projekt im Rahmen des Bundesprogramms Biologische Vielfalt.  
Gefördert durch das Bundesamt für Naturschutz mit Mitteln des  
Bundesministeriums für Umwelt, Naturschutz, Bau und Reaktorsicherheit.



UNIVERSITÄT  
HOHENHEIM



Ökologische Vielfalt  
in Obstanlagen

# Förderung

**Das Projekt wird weiterhin gefördert durch die Ministerien der Länder:**

- **Ministerium für Ländlichen Raum und Verbraucherschutz Baden-Württemberg**
- **Ministerium für Umwelt, Landwirtschaft, Ernährung, Weinbau und Forsten Rheinland-Pfalz**
- **Behörde für Wirtschaft, Verkehr und Innovation der Freien Hansestadt Hamburg**
- **Landesamt für Natur, Umwelt und Verbraucherschutz des Landes NRW (LANUV)**  
mit Mitteln des Ministeriums für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz des Landes **Nordrhein-Westfalen**
- **Niedersächsisches Ministerium** für Ernährung, Landwirtschaft und Verbraucherschutz
- **Sächsisches Staatsministerium** für Umwelt und Landwirtschaft

# Partners

- Universität Hohenheim (Leitung und ÖKO-Teil)

(Institute für Landschaftsökologie und Vegetationskunde  
und Angewandte Entomologie - Phytomedizin)



- Universität Bonn (Leitung IP-Teil)



- Kompetenzzentrum Obstbau-Bodensee (KOB) Bavendorf



- Landesverband Sächsisches Obst e.V.



- Obstbauversuchsring Altes Land (OVR) e.V.



- Öko-Obstbau Norddeutschland (ÖON) e.V.



# Koordination des Projektes Universität Hohenheim

## Organisation

### Integrierter Anbau

### Ökologischer Anbau

Organisation teiln. Betriebe: Fachgruppe Obstbau

Organisation teiln. Betriebe: Föko e.V.

- KoGa
- DLR Rheinpfalz
- Regionale AG
- Niederelbe OVR
- Sachsen LV
- Sächsisches Obst
- NRW, Uni Bonn
- Süddeutschland
- Bodensee
- KOB

- Obstbaufachliche Betreuung
- Regionale AG
- UNI Hohenheim
- Sachsen
- Süddeutschland
- RP/NRW
- Niederelbe
- ÖON e.V.

**Implementation of measures to enhance biodiversity in the orchards in the farming systems**

Naturschutzfachliche und anbautechnische Anpassung und Optimierung der Maßnahmen

Validation and improvement of measures under ecological and technical aspects

Definitiver **leitartenbasierter Maßnahmenkatalog** für den integrierten Obstbau

Catalogue of validated measures to enhance biodiversity in organic fruit growing

Naturschutzfachliche Betreuung  
Universität Hohenheim

Validierung **Basiskriterien** für eine Auswertung der Maßnahmen

Empfehlungen für Bausteine zur Integration von Naturschutzmaßnahmen im Obstbau in die **Leitlinien der Integrierten Produktion**

Recommendations for measures for the enhancement of biodiversity in the organic standards

# Chances and challenges for the technical aspects

## Chances:

Enhancement of predators  
„Buffer“ function against outbreaks

## Challenges:

- Vole management
- Increase of pests as e.g. dock sawfly *Ametastegia glabrata*
- *Other bugs?*

*We will see and learn and hopefully manage!*



# The usefulness of genetic biodiversity

- Breeding!
- Biodiversity of varieties, many different varieties  
Biodiversity is a quality!
- Variety mixing, species mix  
Up to now difficult for technical reasons  
New digital chances?



## Lessons learned

We have to consider the whole production chain if we discuss about the improvement of the farming system

Consumers, traders and authorities are „coproducers“





## Lessons learned

**Biodiversity in the field means also biodiversity in the shop!**

Must all organic apples look „spotlessly clean“ or is the taste important? **We test/taste it!**



# Conclusions

- The organic fruitgrowers in Germany are able and willing to work hard to improve their farming system and the impact of the farming system on the environment
- Plant health care and ecosystem health care have a lot of synergies if intelligent strategies are established
- Working on the improvement of the farming system we have always to include the whole production chain. **Biodiversity in the field means also biodiversity in the shop!**
- The organic fruitgrowers need partners who support these aims and discuss with them where there is a need to improve and how to do it best

For the health of plants, environment, bees and farms!

# Many thanks to

You all for listening

All organisations who have financed or are financing a part of this work

- BÖLN
- DBU
- BMU/BfN
- Ministeries of German counties

