

# Networks and Innovation in Agriculture

W. Sukkel,  
Uruguay delegation  
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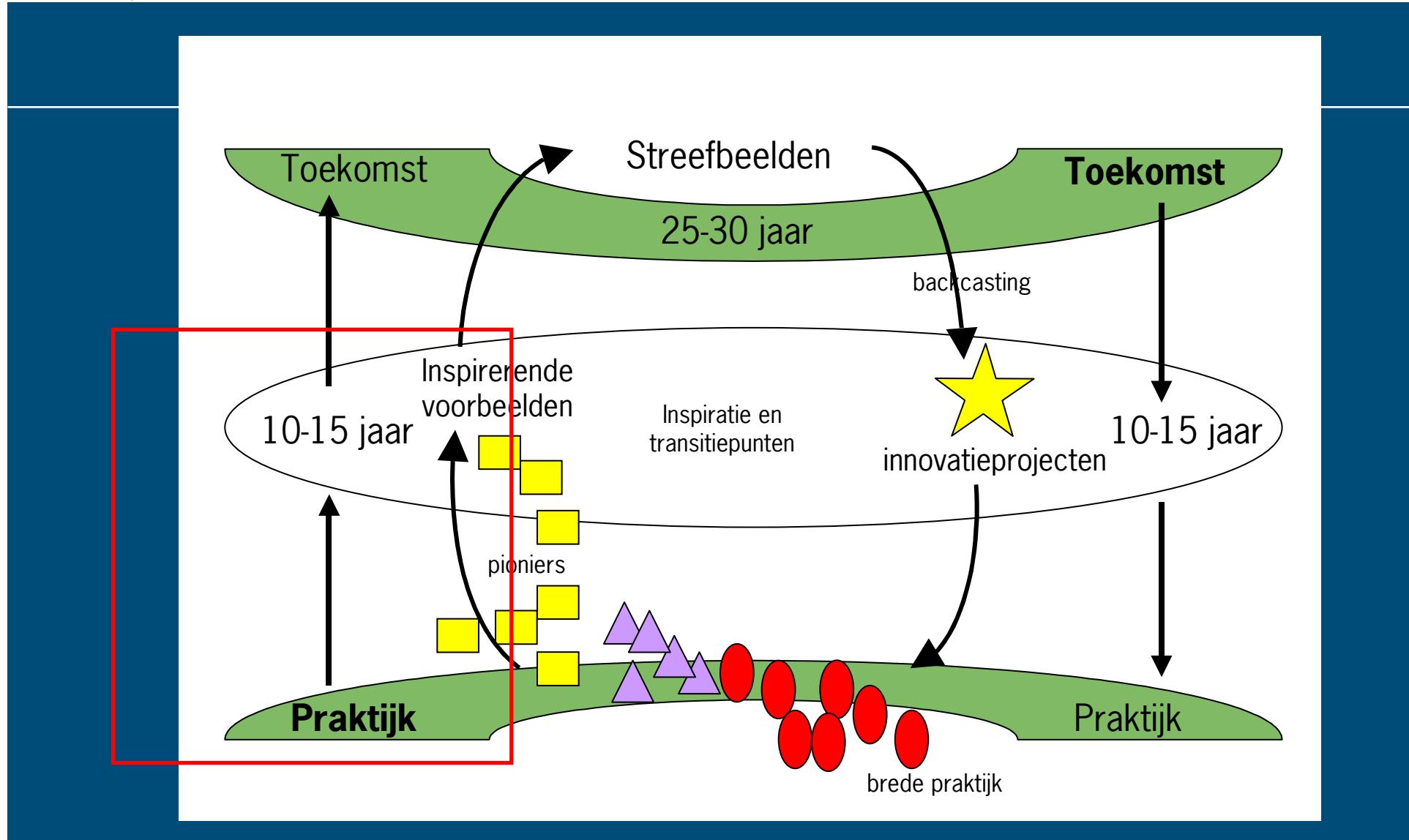
## Personal introduction

- Wijnand Sukkel
- Agronomist Specialist organic plant production
  - Research Coördinator: Organic open field production
  - RC: Energy use and ghg emissions in organic agric.

Team Farming Systems Research

Applied Plant Research (PPO)

Wageningen University and Research Centre (WUR),



## The Agricultural Treadmill (Cochrane)

- Many farms all produce the same product
- None can influence price so everybody produces as much as possible for the going price
- New technology gives innovators windfall profits
- After some time others follow
- Increase of production and efficiency and decrease of price
- Who hasn't yet adopted the new technology has to follow otherwise he loses income
- Who cannot follow will stop. Their resources are absorbed by the innovators, scale enlargement

## New coordination mechanisms (2)

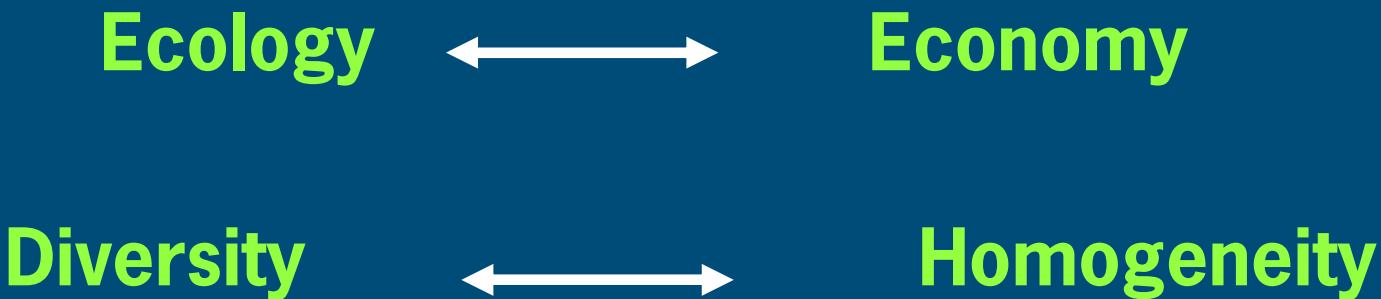
	HIERARCHIE	MARKET	NETWORK
<i>Driving force</i>	Power	Rational choice	Agreement
<i>Means</i>	Regulation Intervention	Supply/demand	Collective action
<i>Enhanced by</i>	Strengthen intervention power	Liberalise market	Facilitate Participate
<i>Pre condition</i>	Obedience	Driven by preferences	Inter-dependance

Courtesy: Niels Röhling

## New coordination mechanisms (1)

- We deal with production, consumption, and everything in between
- Not only productivity, but also ecology, employment, social justice, .....
- Stakeholders not only farmers but also consumers, transporters, retail, environmental organisations, policy makers, etc.

## Conflicts



### Need for:

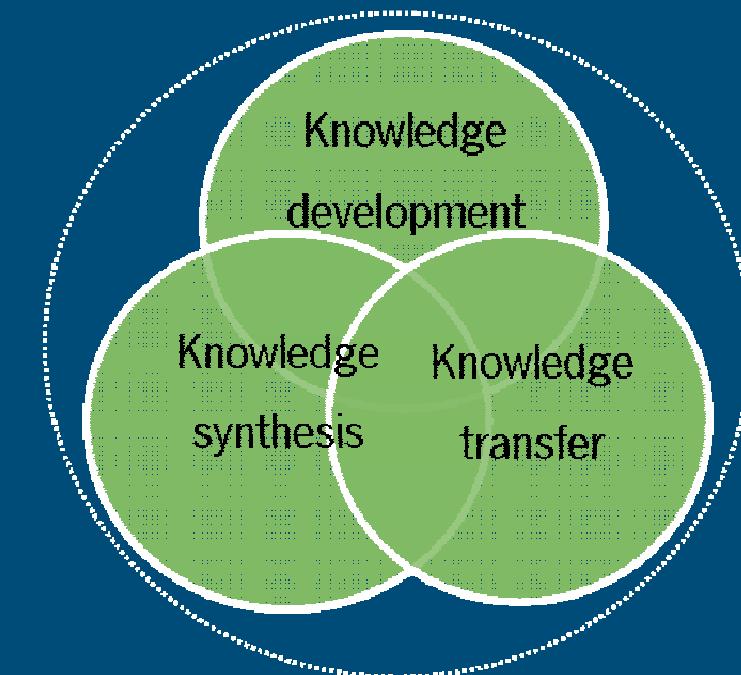
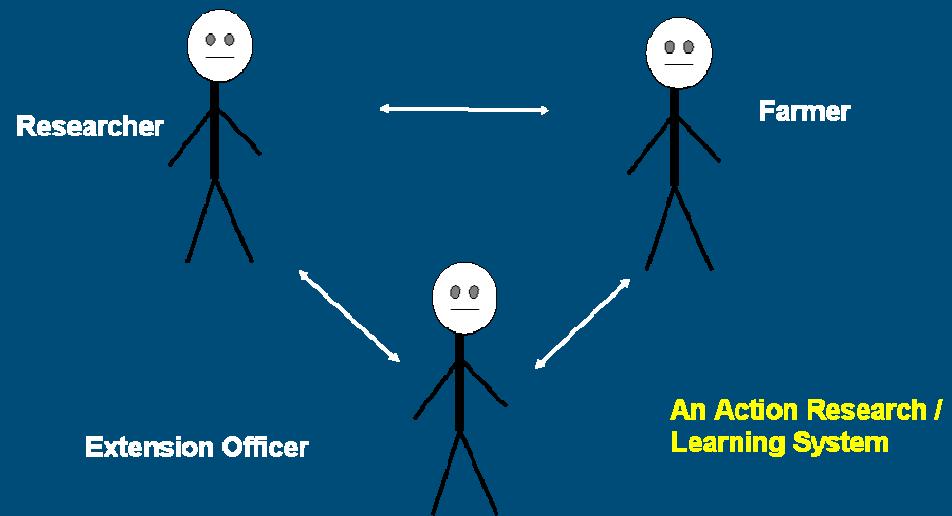
- Farming systems and methods designed to overcome these conflicts
- Social and political solutions



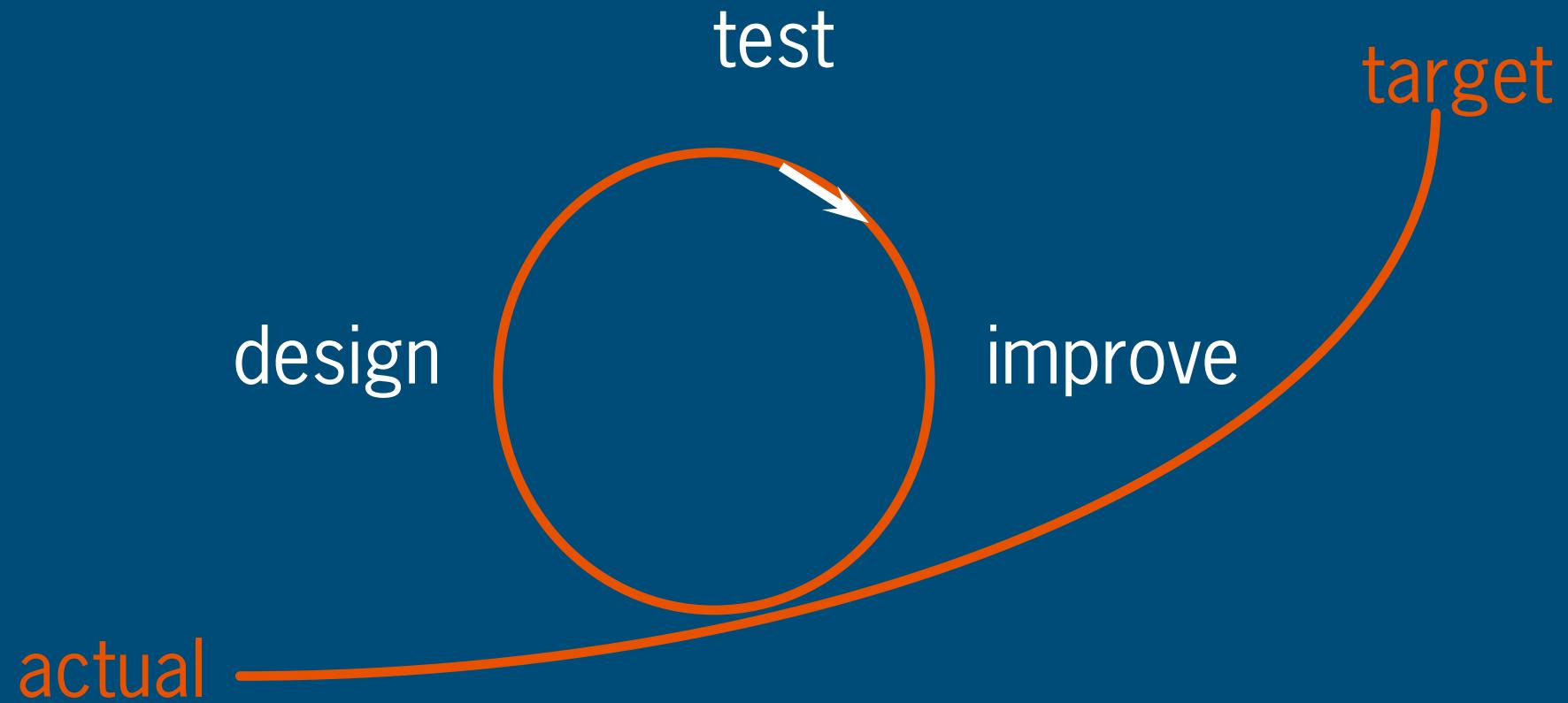
Conventional	Organic
Uniformity	Diversity
Recipy	Concept
Reductionism	Holism
General	Situational
Control	Cooperation
Specialist	Universalist
Reaction	Precaution
Economy	Ecology
Global	Regional

# Vision on research and knowledge

- Integration of knowledge development, synthesis and transfer
- Participatory approaches (networks)
- System/holistic approaches



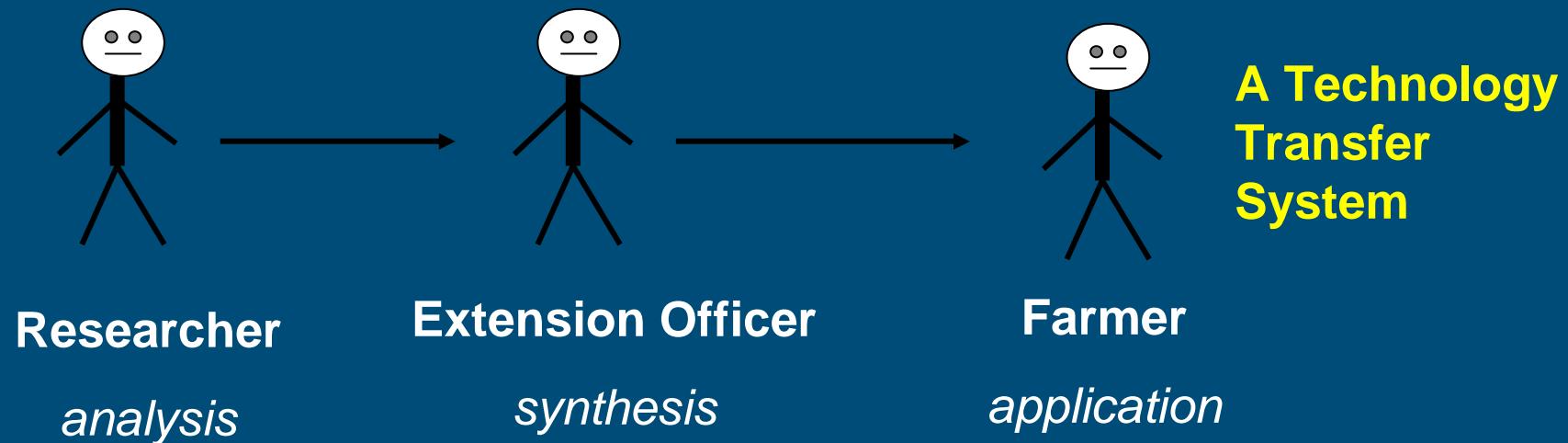
# Testing and improving



Organic Agriculture needs  
a specific approach in (applied) research and  
knowledge transfer

The linear knowledge model does not work for  
the development of organic farming systems

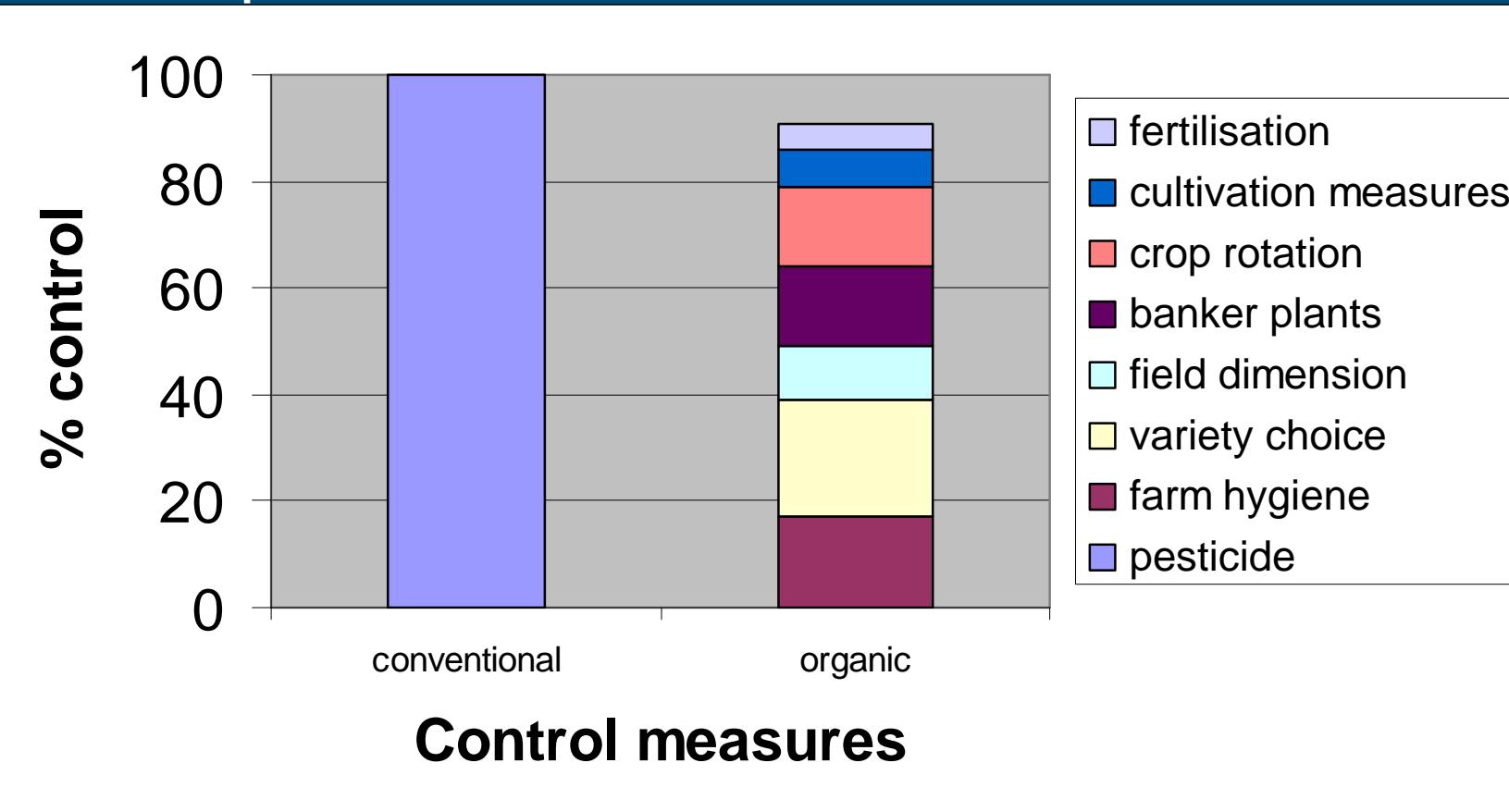
# Linear Model



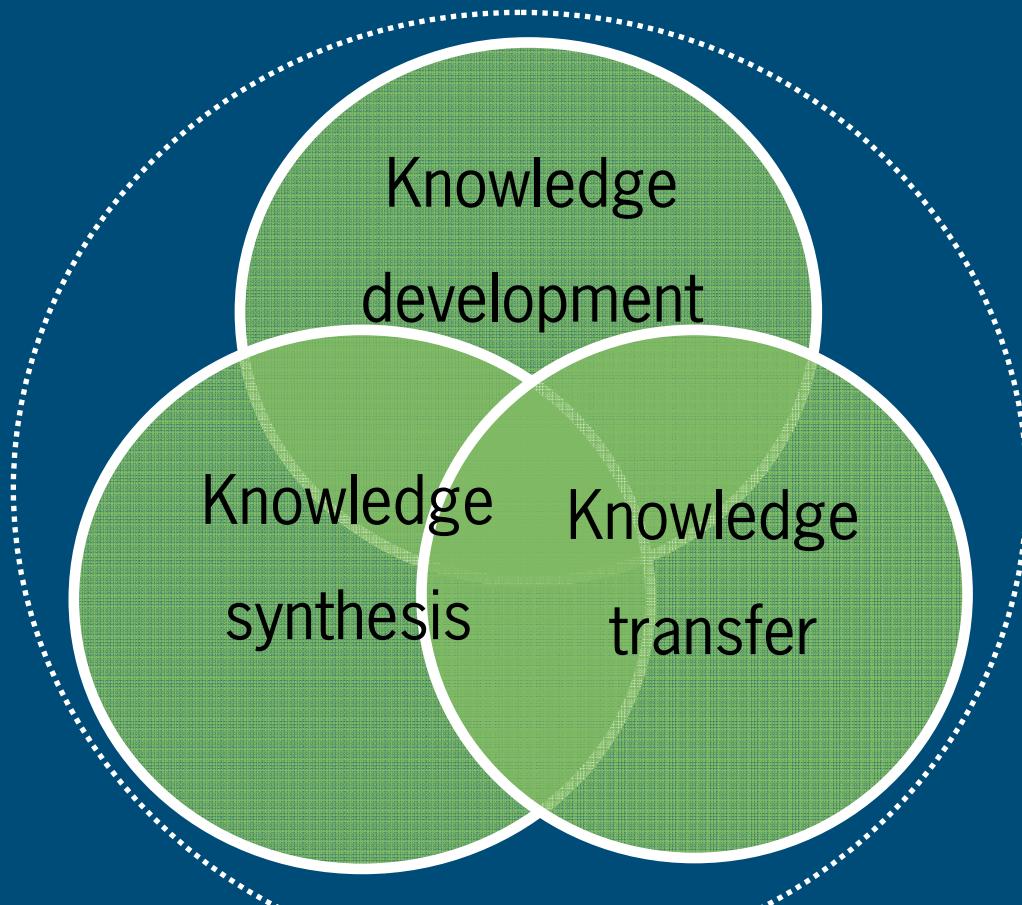
## Consequences values and intentions organic

- Few monofactorial instruments
- Available methods and techniques have complex effects on farm performance
- Application of methods and techniques is situational

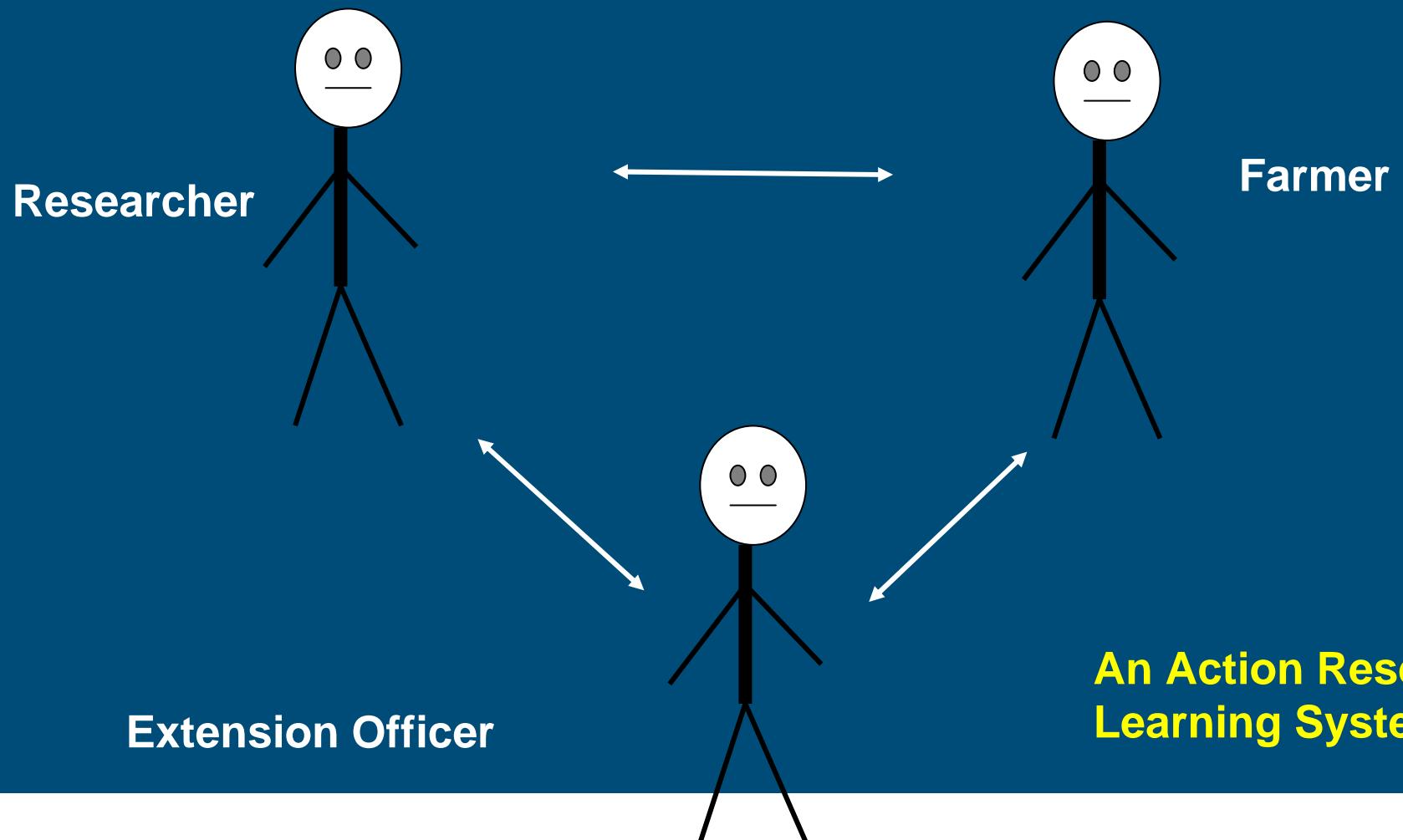
## Control pest x



# Integrate development, synthesis and transfer



# Participatory Approach



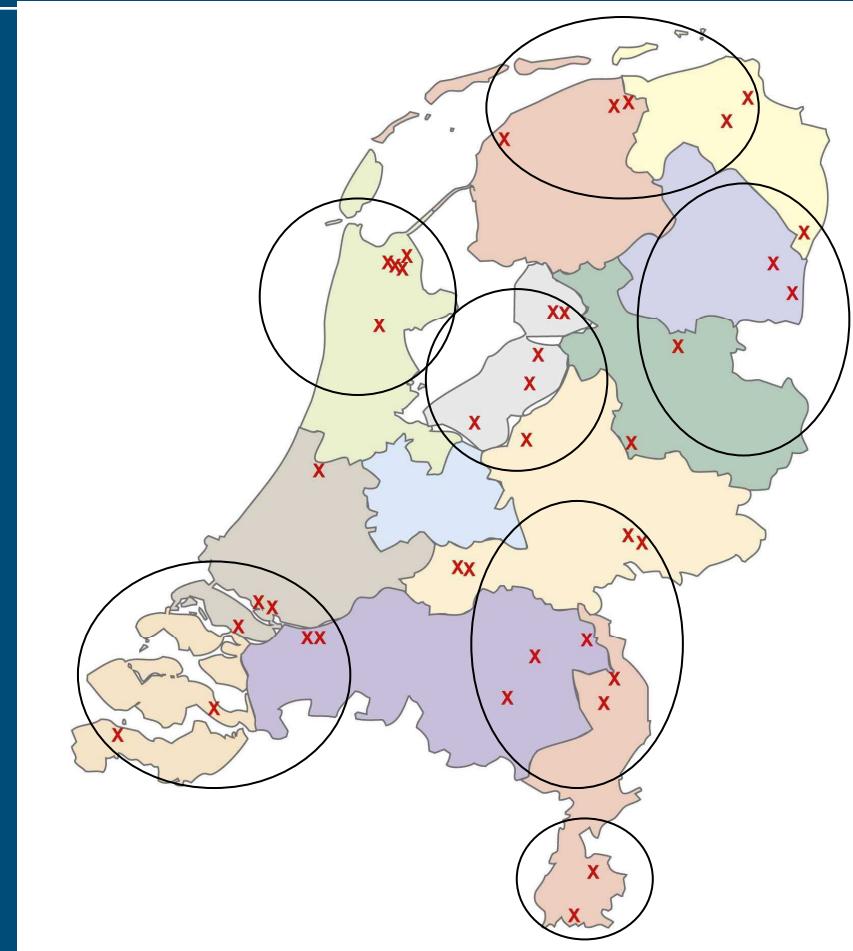
## Partners in knowledge network

- Farmer: craftsmanship, experience knowledge
  - Integrated methods and strategies instead of recipes
- Advisor: integrated practical knowledge
  - Application of methods under different circumstances
- Researcher: Formal knowledge, concepts
  - processes and systems, integration of disciplines
- Changing roles and skills of partners in network
- Basic information through internet

# APR Farmers networks in the Netherlands

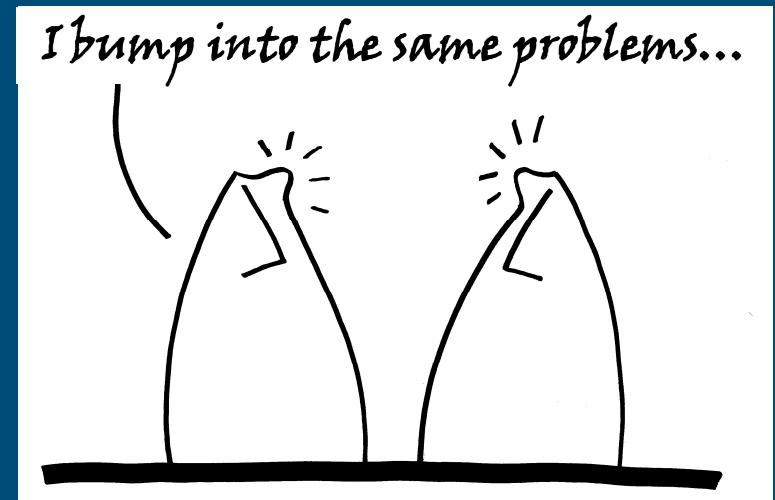
- Farmers networks since 1990
- Momentarily two main projects in plant production
  - BIOM (organic), 50 farmers
  - Farming with Future (integrated), 350 farmers
- Regional and sector groups of 5-15 persons
- Objectives:
  - Farming with Future: Implementation/support of policy (pesticide and nutrient emission)
  - BIOM: development organic farming

**BIOM network**  
**40 farmers,**  
**7 regional groups,**  
**arable and**  
**vegetable crops**



## Main Principles

- Development, synthesis and transfer of knowledge is integrated
- System approach
- Learning by doing and seeing
- Knowledge input of partners is valued equal
- Learning from colleagues, advisors, researchers



# Research Arable and Vegetable crops

- Experimental systems
  - Nutrients Waterproof (organic matter, nutrient management)
  - Taste of Tomorrow (pests, diseases, weeds, soil)
- Thematic projects (soil, pest/weeds/diseases, nutrients, ghg emissions, product quality)
- Thematic innovation groups

## Innovation groups

- Thematic group of innovative farmers
  - Weed control
  - Pests and diseases
  - Soil and mechanization
  - Soil and fertilisation
  - Product quality
  - Market and entrepreneurship
  - Small farm holdings
  - Energy use and ggh emissions

## Innovation groups

Source of inspiration and innovation

Brings together inventors, innovators, researchers etc.

Support and facilitate initiatives

Ownerships by the farmers!!!

## How do you get new ideas???

- Bring different knowledge sources together! practical knowledge, craftsmanship, formal knowledge, ....
- Exchange knowledge and experience: colleague's, researchers, advisors, suppliers, chainparties, .....
- Take notice of new developments,

## Functions innovation groups

- Guiding research projects
- Preparing research proposals
- Testing and improving innovations on farm
- Expert group for sector and policy makers
- Signaling: problems, developments, chances
- Vision development for organic agriculture
- Knowledge transfer

## Ingredients

- Regional and/or thematic farmers groups
- Research is demand driven
- Farm visits, meetings, excursions, demonstrations
- Involvement various stakeholders
- Farm Registration
- On farm research



## Objectives and functions

- Farm development (People, Planet, Profit)
- Support and stimulation of innovation
  
- Identification bottlenecks (research, policy)
- Input for setting organic research agenda

## Functions developed during project

- Provide policy information, statistics
- Lobby, interest care
- Platform for cooperation
- Testing and improving methods
- Research facilities for on farm research

# Demand driven agenda

- Farm continuity and basic income
  - Added value and cost reduction
  - Entrepreneur skills
- All within the framework of:
  - sustainable development
  - intentions of organic agriculture

## Results general (organic farmers networks 1997 – 2003)

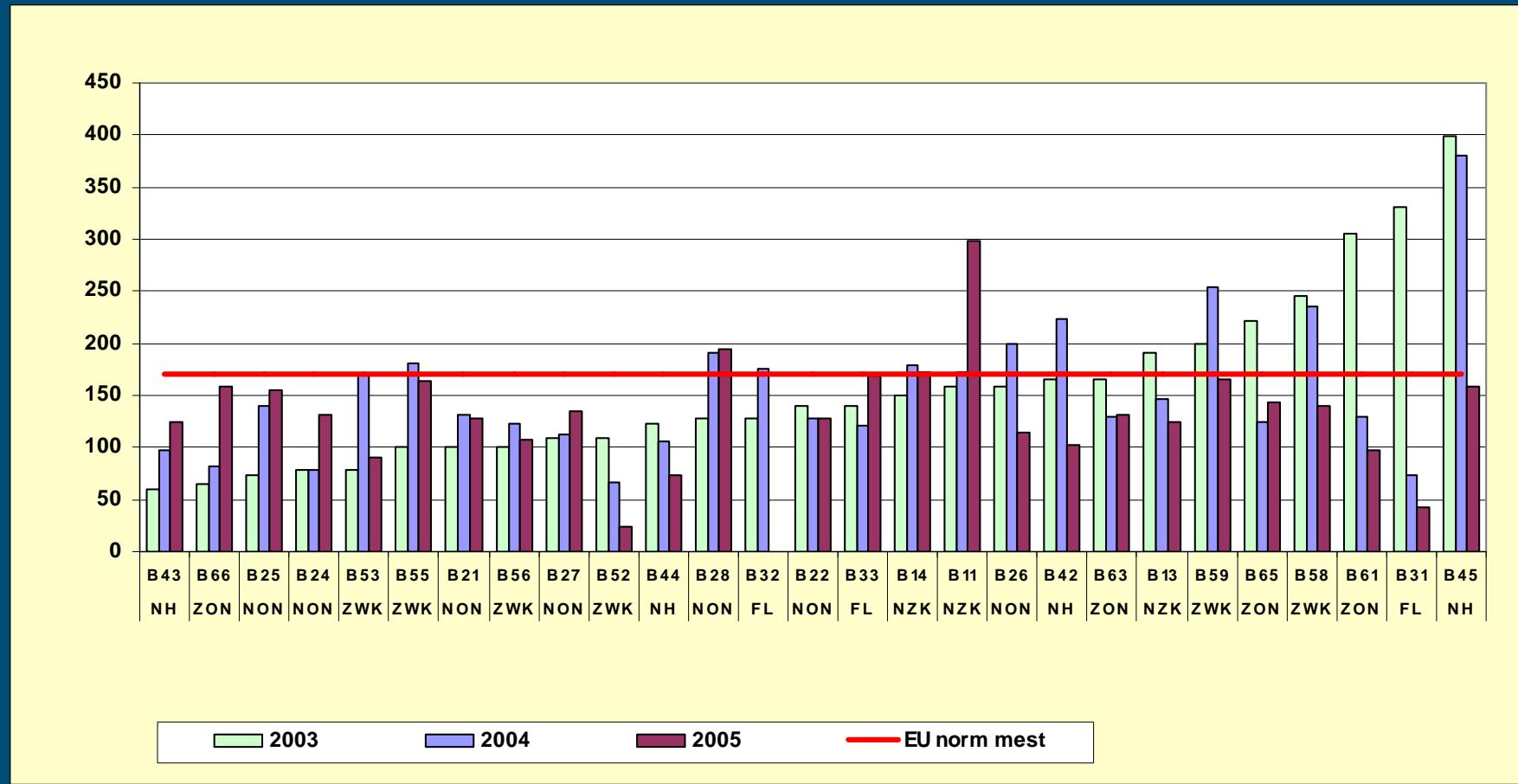
- Fast knowledge circulation
- Improved cooperation
  - Studygroups, price information system, trade, po's, ..
- Improved insight in bottlenecks and performance
- Improved research agenda
- Higher awareness of environmental effects
- New market initiatives
- Higher performance participating farms
- Innovated farming methods

## Results agronomic

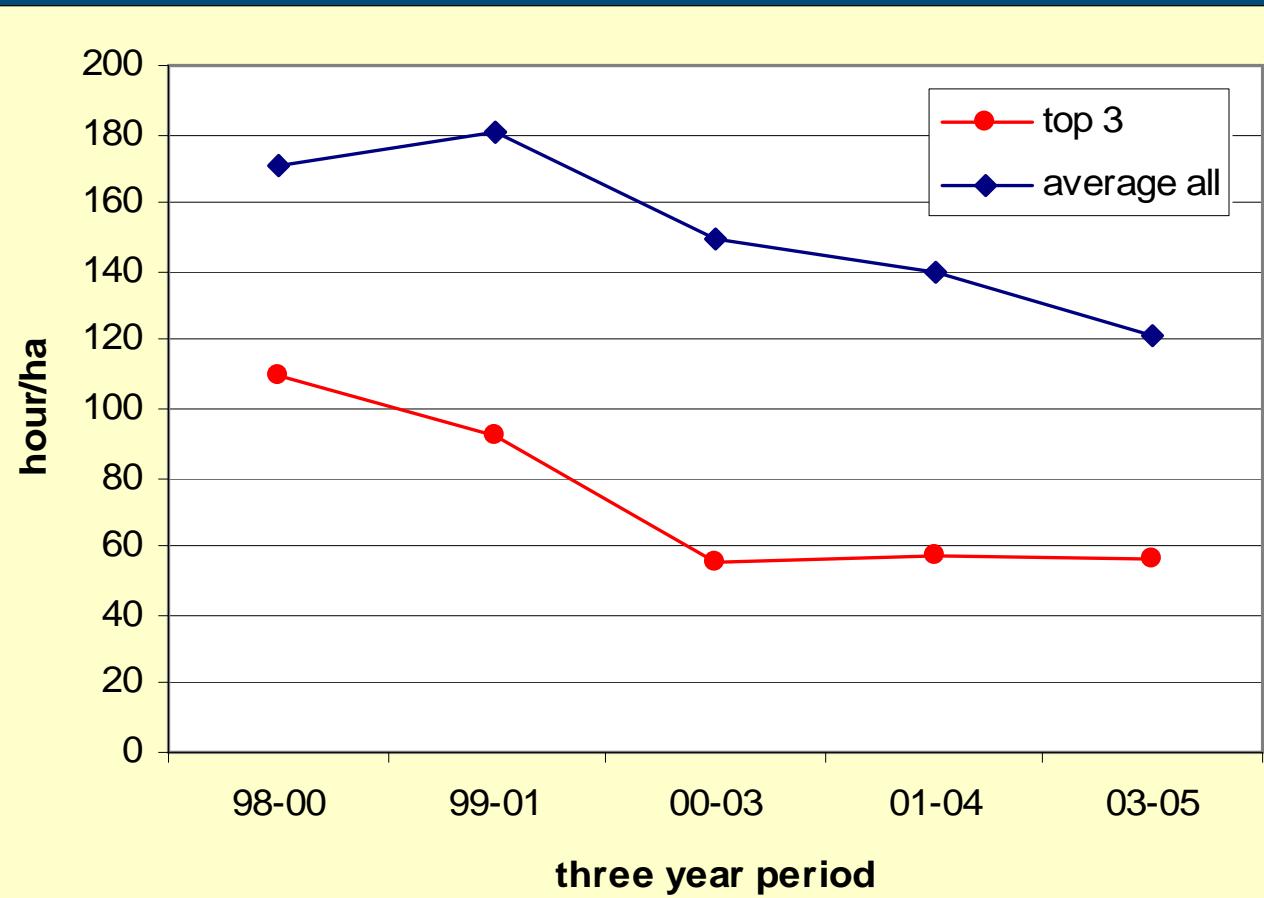
- Reduction hours handweeding
- Leveled of extremes nutrient inputs
- Improved yields
- New techniques developed



## N input animal manure (kg/ha)

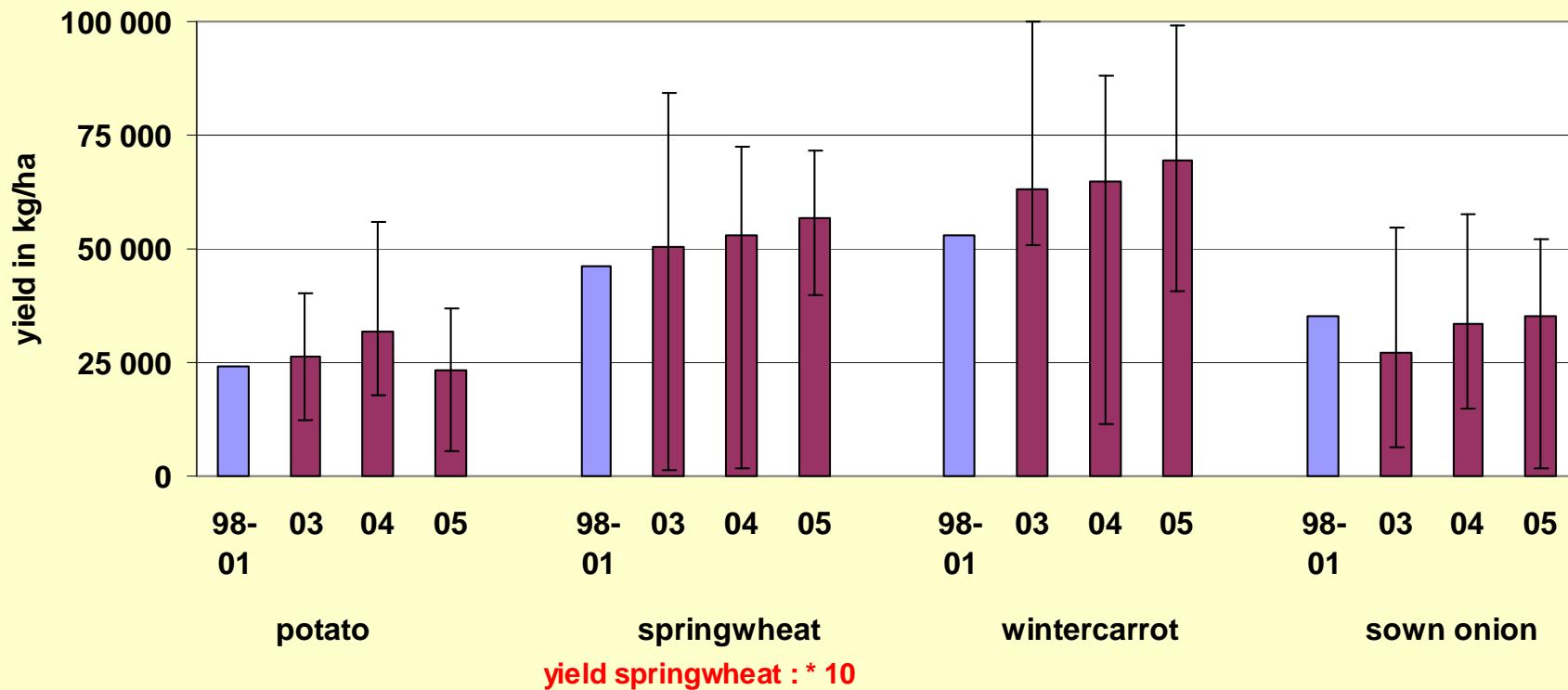


# Hours of handweeding in wintercarrots





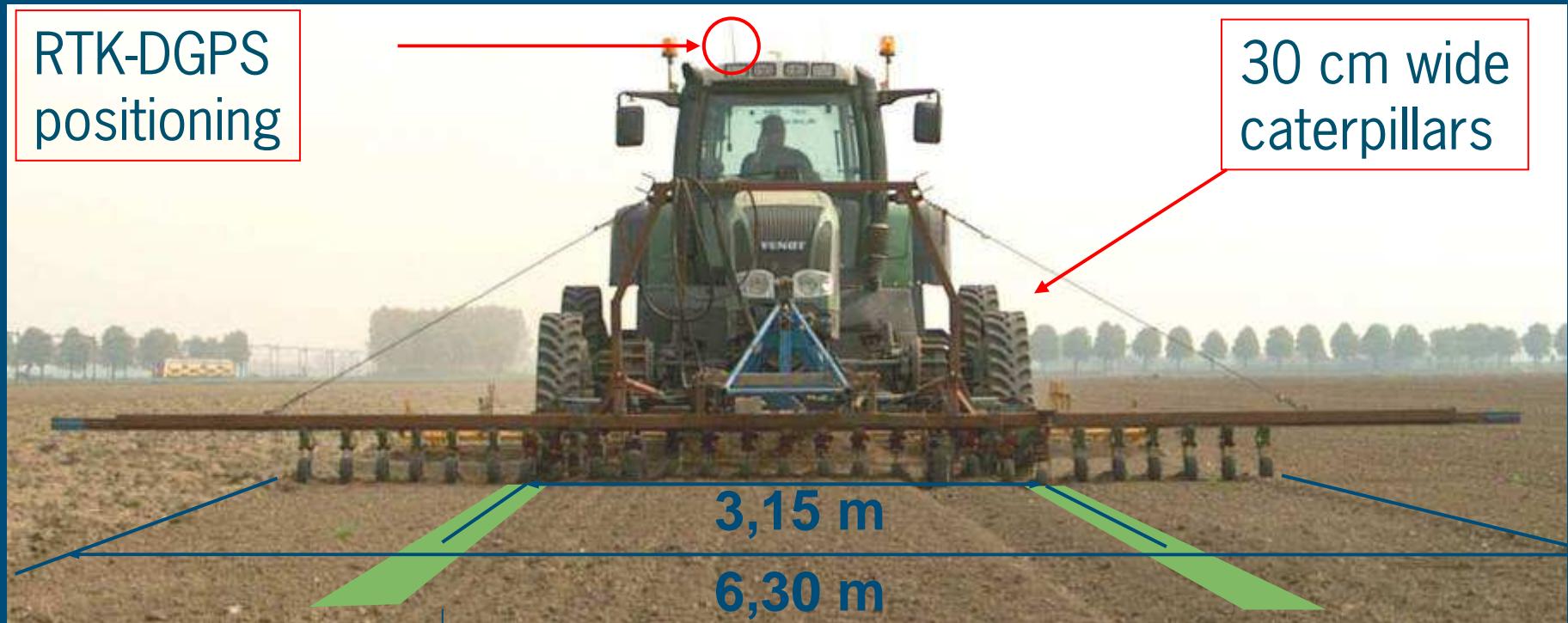
# Gros yield



# Innovative techniques



# Fixed track systeem



## Group pests and diseases

- UV light and ozone
- Sprinkling for control of downy mildew
- Onion oil against carrot fly
- Beetle eater
- Natural enemies against pea aphids
- Functional biodiversity



## Group soil and mechanisation

- Zero tillage techniques
- Fixed track systems
- Ridge tillage
- Minimal soil compaction



## Groups market and product quality

- Honest food
- Marketing of tasteful potatoes
- Export of organic produce
- Taste of carrots and red beet
- New vegetable products
- New pumpkin varieties
- Pumpkin storage



# Monitoring and evaluation

## ■ Accountability

- Output
- Outcome
- Impact

## ■ Learning process

# Monitoring and evaluation, indicators

- Direct application
- Strategy effect
- Research effect
- Policy effects
- Attitude effect
- Learning effect
- Network learning effect
- Network effect

## Shortfall

- Input and dependance of animal manure
- Accumulation and losses of nutrients
  
- Product quality
- Yield stability
- Nature, landscape, biodiversity

## Critical succes factors

- Skills of workers
- Selection of participants
- Objectives and targets supported by participants
- Involvement of right stakeholders
- Win-Win situation for all involved
- Take care of hardware, software and orgware

## Critical success factors

- For a successfull application in practice (farmers point of view), the farmer has to
  - Know (knowledge of techniques and methods),
  - Be able (in technical and economical terms, labour, risks, costs etc.)
  - Have the will (vision and motivation) and
  - Be allowed to do so (“socially desired” behaviour, acceptance in network)
- All these issues have to be taken care of



APPLIED PLANT RESEARCH

# Questions?

