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# Transborder Farming in Small-scale Land Use Systems

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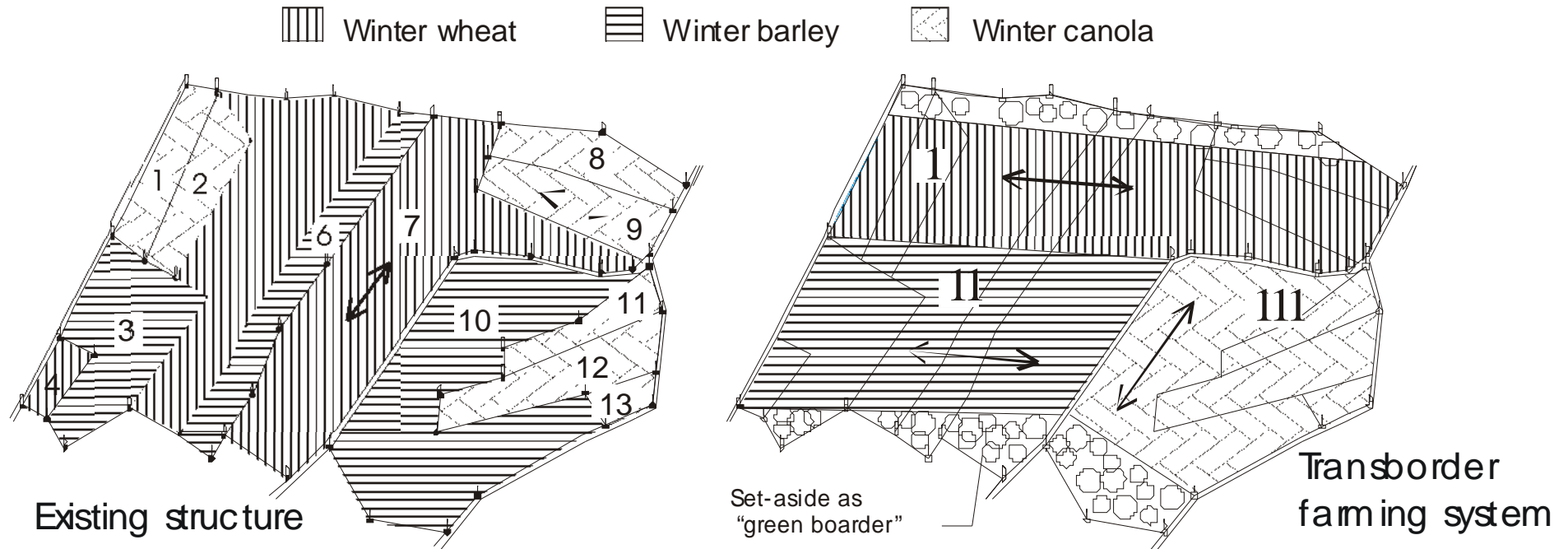
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# **Transborder Farming in Small-scale Land Use Systems**

1. Aims of investigations
2. Methods
3. Realization and results
  - 3.1 Area without field marks
  - 3.2 Area with field marks after a former land consolidation
4. Conclusions

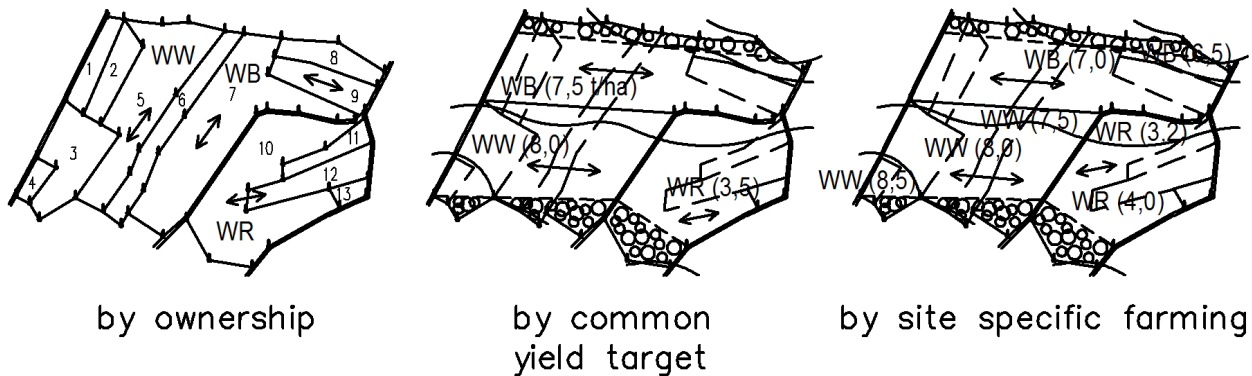
# Example of “Virtual Land Consolidation” from an existing structure to a “Transborder Farming System” using modern information technology



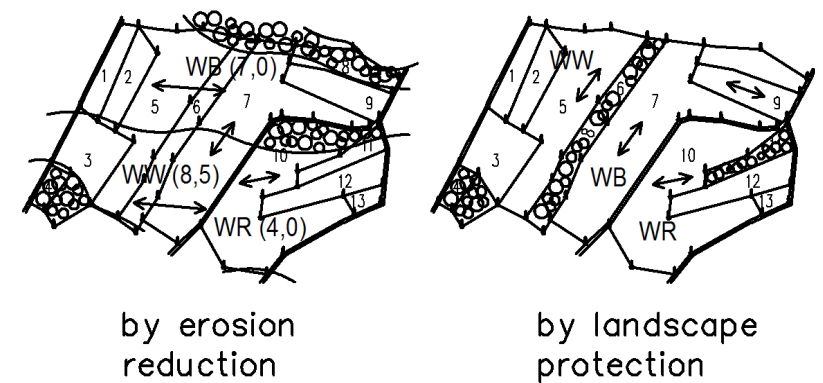
## Steps of realization:

1. Definition of joint areas
2. Safeguard of field borders
3. Lowering field marks (if existing)
4. Settlement of common crop rotation
5. Definition of management targets related to **“yield output”** or to **“environmental protection”**

### Yield orientation (economical)



### Environmental orientation (ecological)



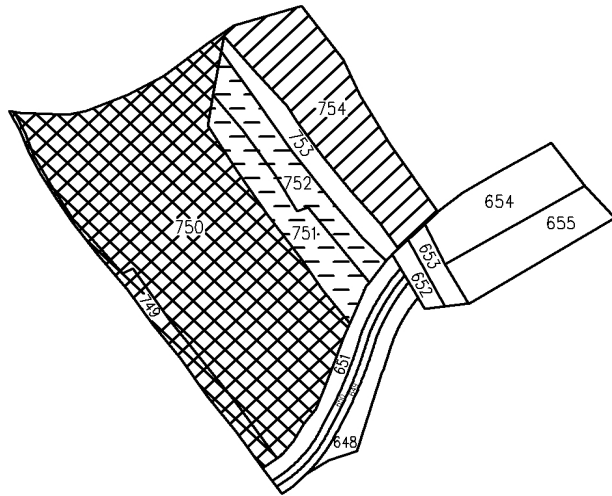
# Management of a “Transborder Farming System”

	Management targets				
	Yield oriented (economical)			Environmental oriented (ecological)	
	by ownership	by common yield target	by site-specific farming	by erosion reduction	by landscape protection
<b>Definition of yield targets and application rates</b>	<b>1</b> Plot owner defines its yield targets and its application rates	<b>2</b> Definition of a common yield target with common unified application rates	<b>3</b> Management depending on information from local yields and site-specific applications	<b>4</b> Combination of field parts regarding topographic issues across existing borders	<b>5</b> Enlarged fields are dependent on a mainly unchanged landscape structure
<b>Management and documentation</b>	Recording of application rates and yields per integrated plot	Expenses and yields are settled depending on the portion of integrated land	Management and documentation with site-specific technique	All measurements are documented by ownership structures	Recording of application rates and yields per integrated plot
<b>Economical effects</b>	High investments with unused yield potentials	Minimum investments still with unused yield potentials	Highest investments in an optimised production process	Little investments and stable conditions	Highest investments with a low production level
<b>Ecological effects</b>	Only slightly changed countryside	Probably local supply problems	Local conditions are taken under strong consideration	Settlement of a maximised reduction of erosion	Social demands are taken into consideration

## Required technique in a “Transborder Farming System”

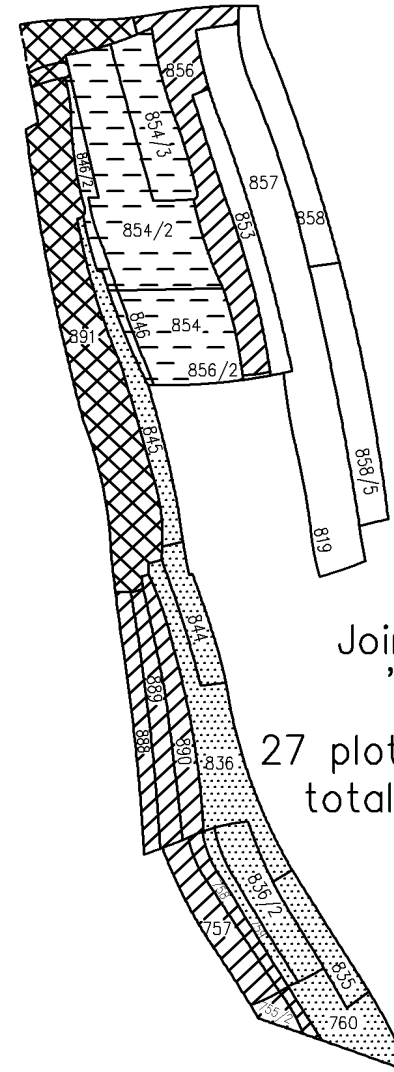
	Management targets				
	Yield oriented (economical)			Environmental oriented (ecological)	
	by ownership	by common yield target	by site-specific farming	by erosion reduction	by landscape protection
	<b>1</b> Local yield detection	<b>2</b> (local yield detection)	<b>3</b> Local yield detection	<b>4</b> Local yield detection	<b>5</b> Local yield detection
	<b>Process documentation</b>	<b>Process documentation</b>	<b>Process documentation</b>	<b>Process documentation</b>	<b>Process documentation</b>
<b>Additional necessary technical equipment</b>	Variable drill technique  Variable fertilising technique ( <i>Variable spraying technique</i> )	Weighing bridge	Variable drill technique  Variable fertilising technique ( <i>Variable spraying technique</i> )	Variable drill technique  Variable fertilising technique ( <i>Variable spraying technique</i> )	Variable drill technique  Variable fertilising technique ( <i>Variable spraying technique</i> )

# Realization of Transborder Farming Systems “Nürnberger Land”



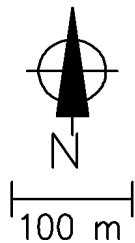
Joint transborder field  
"Ballnteich"

13 plots, average size 0,70 ha  
total field size 7,841 ha



Joint transborder field  
"Unterm Grund"

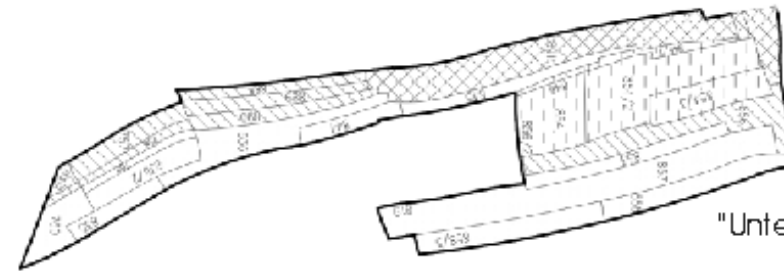
27 plots, average size 0,52 ha  
total field size 13,410 ha



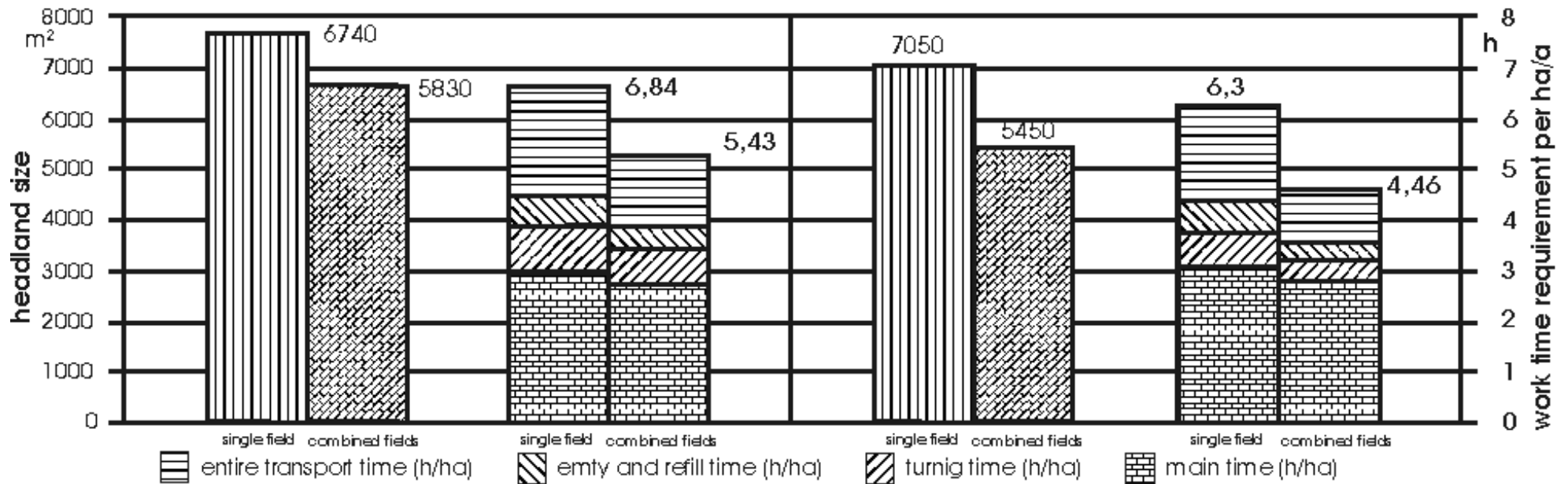
# Headland and working time effects in two “Transborder Farming Systems”



Joint transborder field  
"Ballnteich" 7,8 ha

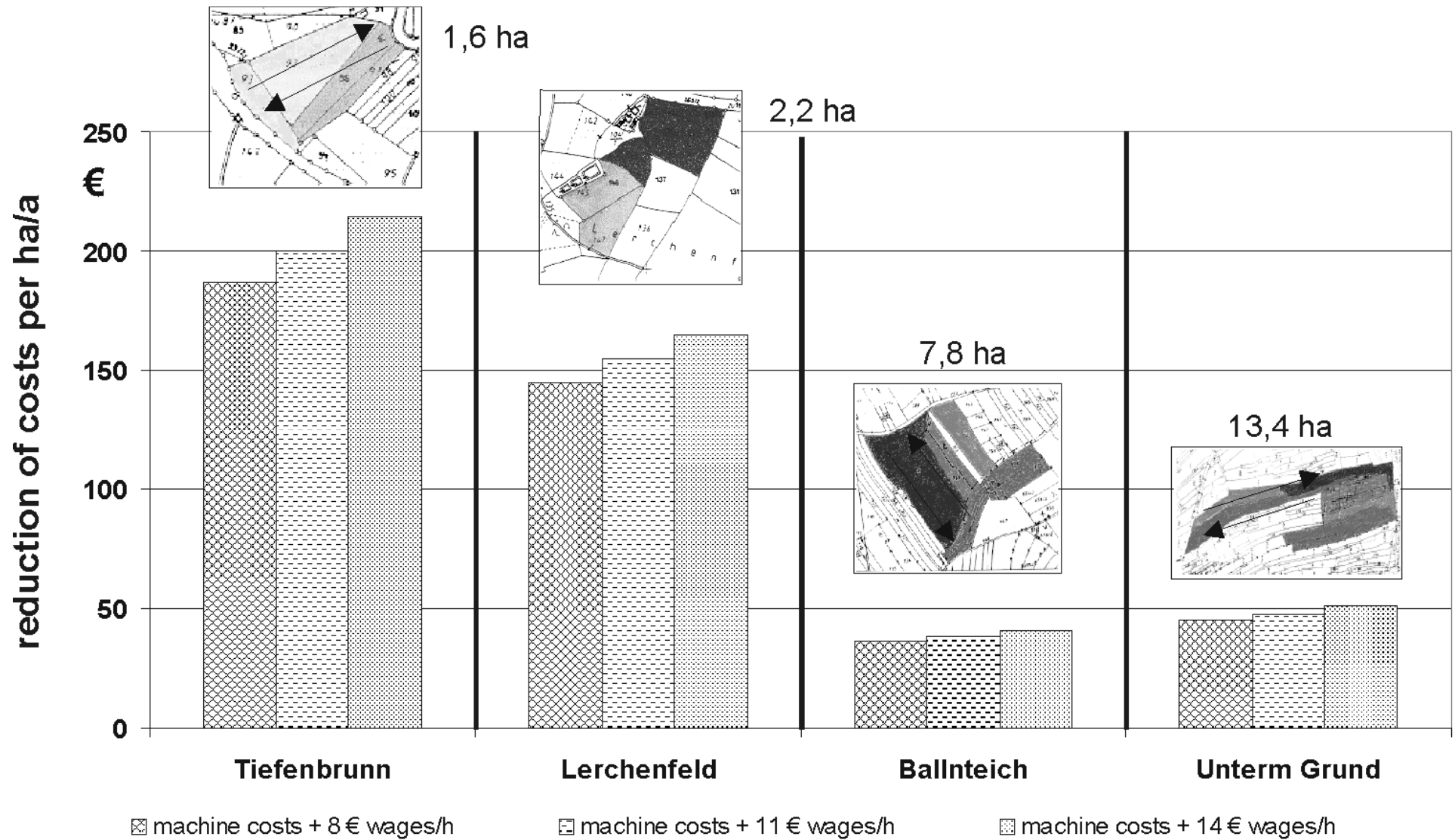


Joint transborder field  
"Unterm Grund" 13,4 ha





# Reduction of costs in four “Transborder Farming Systems”



## Very first (careful) evaluations of different “Transborder Farming Systems”

	Management targets				
	Yield orientated (economical)			Environmental orientated (ecological)	
	by ownership	by common yield target	by site-specific farming	by erosion reduction	by landscape protection
<b>Suitability</b>  (idealised targets)	<b>1</b>	<b>2</b>	<b>3 + 4</b>		<b>5</b>
	Only an <b>exceptional</b> situations, if owners or landlords agree only to this way of transborder farming	<b>Cheapest step</b> getting into transborder farming with necessary additional fertiliser application on different plots	<b>Reduction of heterogeneity within the joint transborder fields by taking all local conditions into account and reducing the risk of erosion !</b>		<b>Possible way</b> of farming if the society requires the remaining of the existing structures

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## **Conclusions**

Transborder farming opens new perspectives in the future management of small-scale farming areas with:

- Optimized use of the information technology.
- Creation of larger structures for land cultivation with advantages in soil protection, reduced labor consumption and less expenses.
- New chances in the combination of economical and ecological management targets including a minimization of erosion.
- Precision farming also in small-scale farming systems.