



Institute of Farm Economics

agri benchmark Cash Crop

- Methods, Tools, Selected Results –

Klaus Nehring

Haycock Hotel, Wansford/Peterborough • June 8th 2009

sponsored by:



Content

1. Core Competences

The typical farm approach

Farm data

TYPICROP – Data management

2. Selected results

1. Core Competences

agri benchmark Cash Crop network
(scientists, consultants, farmers)

Typical farm
approach (panel)

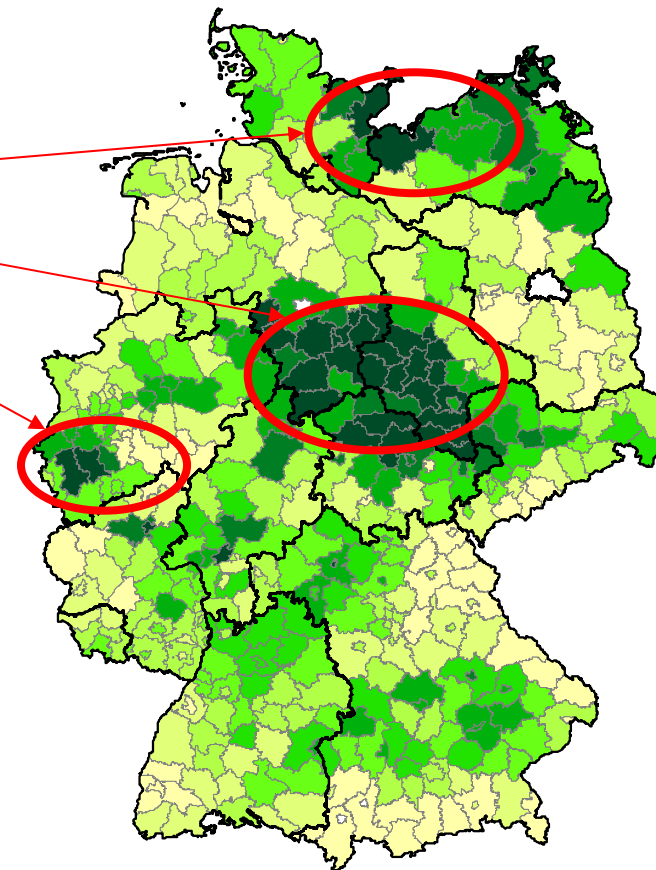
Comprehensive
Tools

- Identify **competitive position** of single crops on-farm, **farming systems** and of **national farming in general**
- Establish a **globally uniform data base**

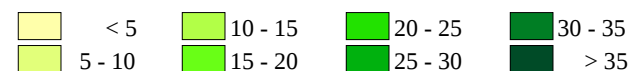


The typical farm approach

Hot spots
in wheat
production



Share of wheat acreage in total arable land (in %)



What is a Typical Farm

A typical farm...

- ≡ represents the origin of a major share of the national output in a given crop
- ≡ can not be identified with an existing farm
- ≡ is defined by a certain production system and a combination (if any) of enterprises
- ≡ has certain structural features re. ownership of land as well as labor organization (family vs. hired)

A standard operating procedure (SOP) to define typical farms was developed and is used by all partners involved.

The typical farm approach

DE 1600 MVP

DE 1300 SA

DE 2

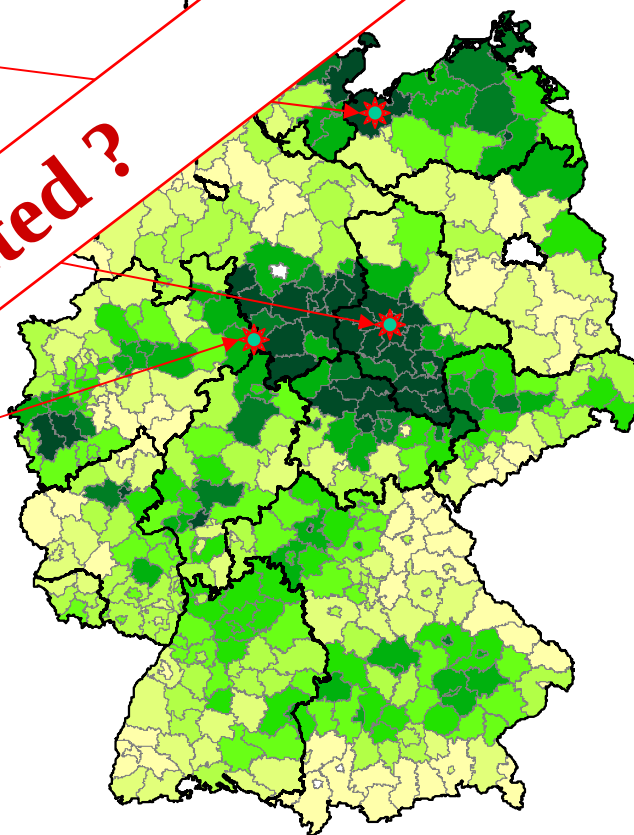
What data is collected ?

Typical farm:

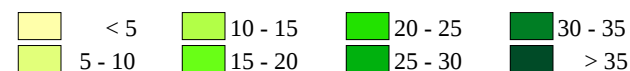
- Panel with farm advisors
- Denotation ... Germany

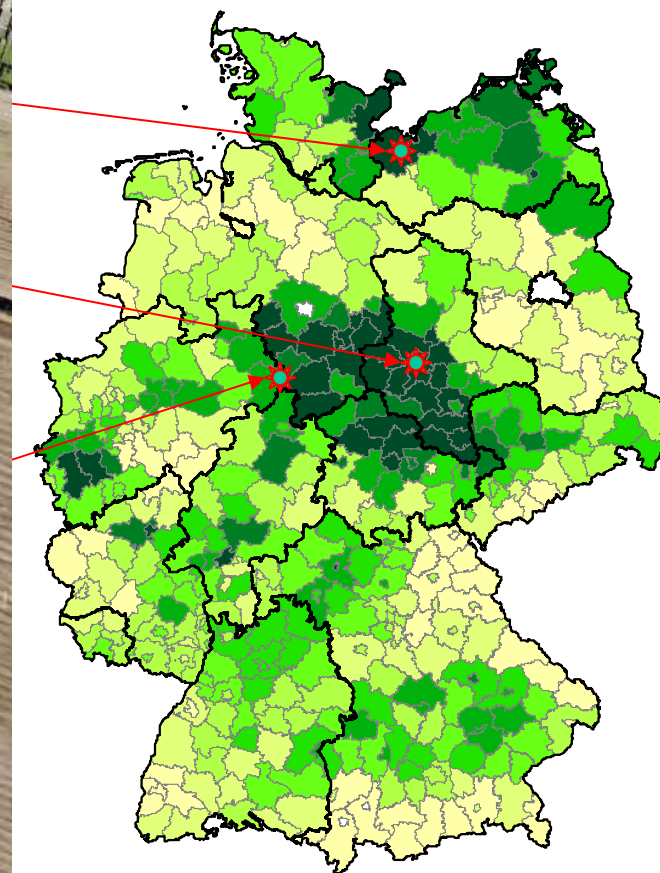
1300 ... acreage in ha

SA ... Abb. for region

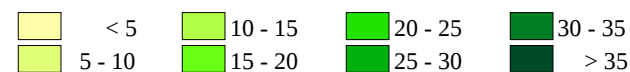


Share of wheat acreage in total arable land (in %)





Share of wheat acreage in total arable land (in %)

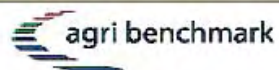


DE 1600 MVP

Section 1:

- Farm basics
- Framework conditions
- Acreage & Land use
- Land cost
- Subsidy payments
- Other enterprises





Farm Name:

Select language:

Year: 2008

TYPICROP

farm and land

cropping system

background data

machinery and building

prices and overheads

network

end

result farmstory

result profit and loss



For a better understanding of Cash Crop
Farming worldwide

Ver 4.0

Land use and natural conditions

back

Farm Name:DE1600MVPYear:2008

Total farm acreage:		1.600,0 ha	
Acreage arable land:	1.347,0 ha		
Arable land owned:	87,0 ha	Double cropping:	0,0 ha
Arable land rented:	1.260,0 ha	Irrigation:	0,0 ha
		Perennial crops:	0,0 ha
		Pasturecropping:	0,0 ha
		Fallow:	0,0 ha
Acreage grassland:	224,0 ha	Info landuse:	
Grassland owned:	23,0 ha		
Grassland rented:	201,0 ha		
Other land:	29,0 ha	Soil type:	sL bis IS
Elevation:	0 m	Climate:	
Av. market distance	15 km	Av. rainfall per year:	670 l/m²
Av. field size:	40,0 ha	Rainfall distribution:	
Av. distance farm-field:	0 km	Weblink weather data:	

DE 1600 MVP

Section 2:

- Buildings
- Tractors
- Towed machinery
- Self-propelled machinery



Tractors

Farm name: DE1600MVP

Year: 2008

Type of tractor	no.	hp	Utilis.	Repairs p.a.	Hist. price	Purchase	Dep.	Salvage value	Rep. ?	Rep.price	Allocation
		hp	h/year	EUR	EUR	year	year(s)	EUR		EUR	
John Deere 6980	1	240	1200	0,00	75.000,00	2004	8	30.000	☒	105.000,00	Cash Crop
John Deere 6960	1	240	900	0,00	75.000,00	2002	8	30.000	☒	105.000,00	Cash Crop
John Deere 8320	1	260	900	0,00	90.000,00	2005	8	30.000	☒	120.000,00	Cash Crop
Fendt 928	1	280	900	0,00	115.000,00	2007	8	60.000	☒	150.000,00	Cash Crop
Case 7220	2	180	800	0,00	75.000,00	1999	10	15.000	☒	80.000,00	Cash Crop
Case 5120	1	150	1200	0,00	65.000,00	1998	10	15.000	☒	80.000,00	Cash Crop
K700	1	350	300	0,00	40.000,00	1983	99	1	☐	0,00	Cash Crop
K701	1	380	300	0,00	40.000,00	1987	99	1	☐	0,00	Cash Crop
MTS 501	2	90	350	0,00	12.000,00	1988	99	1	☐	0,00	Cash Crop
									☐		

€/l, %, €/h, €/year

DE 1600 MVP

Section 3:

- Labor
- Finance
- Fuel & Energy
- Prices & Overheads



Labor force

back

Farm name: DE1600MVP

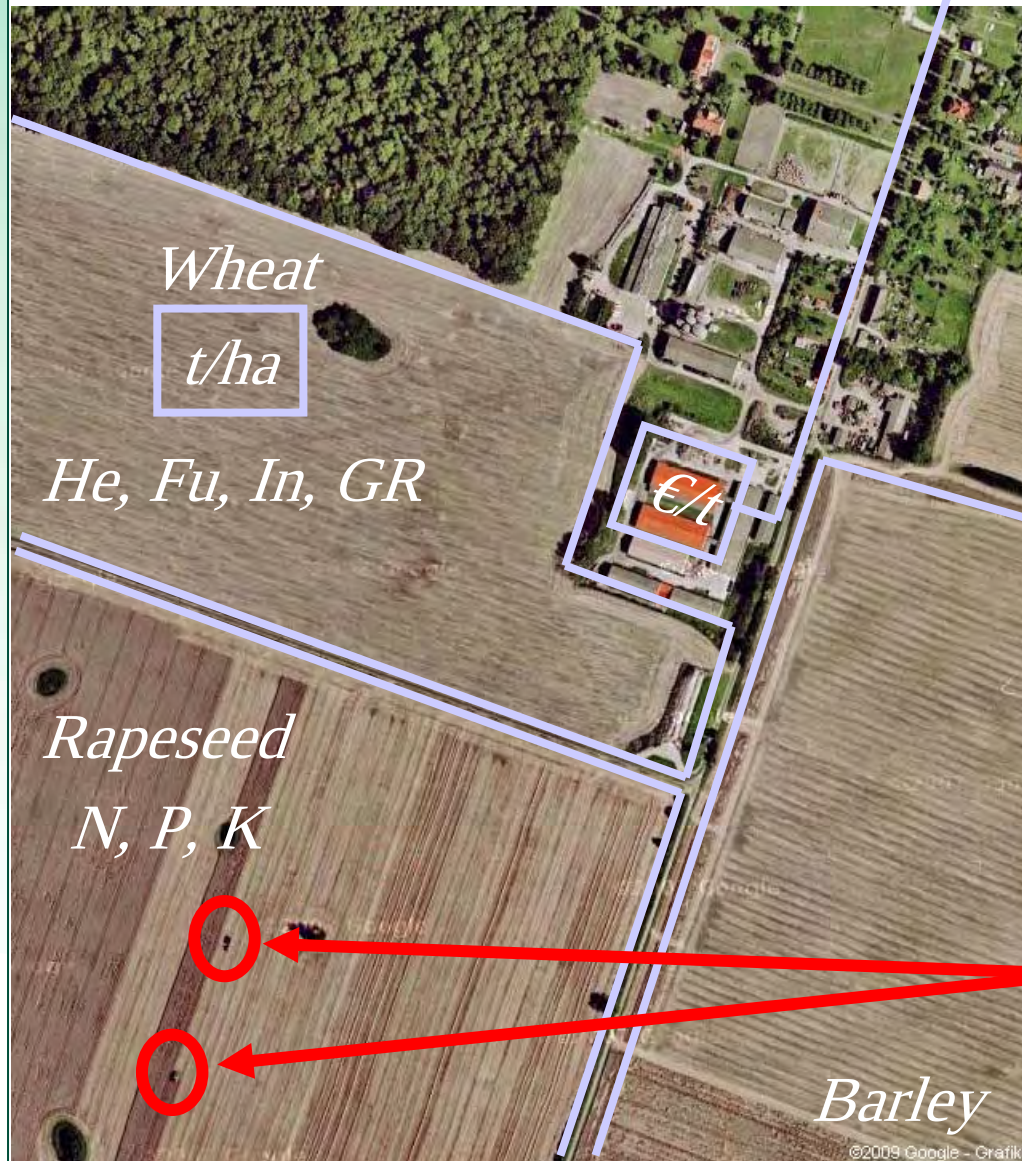
Year: 2008

Category (please chose)	Labor type (please specify)	Quantity	Total hours h/worker p.a.	Total labor cost EUR/worker p.a.	Allocation
hired labor	tractor driver	7	2300	21.000,00	Cash Crop
hired labor	clerical worker, employes	1	2200	23.400,00	Cash Crop
hired labor	other	1	100	1.000,00	Cash Crop
hired labor	metal worker	1	2400	26.400,00	non Cash Crop enterprise

DE 1600 MVP

Section 4:

- Rotations & Crops
- Yields
- Prices
- Direct inputs (Seed, Fertilizer, Pestizides)
- Production system
- Contractor, Irrigation



Production system



back

Farm Name: DE1600MVP

year: 2008





Typ 2





winter barley

[copy data to other crop](#)

previous crop: winter wheat

Month	Period	Operation	Tractor	Towed	Selfpropelled	Capacity ha/h	Work depth cm	Fuel l / ha	Operator
duplicate recordset			Delete recordset						
3	mid	Fertilizer	Case 7220	Güstrower gez. Di		21	0	1,2	tractor driver
4	beg	Fertilizer	Case 7220	Güstrower gez. Di		21	0	1,2	tractor driver
4	mid	Fertilizer	Case 7220	Güstrower gez. Di		21	0	1,2	tractor driver
4	end	Plant protection	Case 5120	Amazone 4500 I		6	0	1,4	tractor driver
5	beg	Plant protection	Case 5120	Amazone 4500 I		6	0	1,4	tractor driver
5	beg	Fertilizer	Case 7220	Güstrower gez. Di		21	0	1,2	tractor driver
6	end	Harvest			Mähdrescher MF 7	2,8	0	25	tractor driver
6	end	Transport	John Deere 6960	HW 80 alt		3	0	1,2	tractor driver

Production system



back

Farm Name: DE1600MVP

year: 2008



Typ 2



winter barley

[copy data to other crop](#)

previous crop: winter wheat

Vork depth cm	Fuel l / ha	Operator	Op. quantity	Contractor EUR/ ha	Seed	Input kg/ ha	Fertilizer	Input kg / ha	Herbicide EUR/ ha
0	1,2	tractor driver	1	0		0,00	Kalkamonsalpeter	260,0	0,00
0	1,2	tractor driver	1	0		0,00	NPK 10/15/20	150,0	0,00
0	1,2	tractor driver	1	0		0,00	Schwefelsaures A	150,0	0,00
0	1,4	tractor driver	1	0		0,00		0,0	0,00
0	1,4	tractor driver	1	0		0,00		0,0	0,00
0	1,2	tractor driver	1	0		0,00	Kalkamonsalpeter	150,0	0,00
0	25	tractor driver	1	0		0,00		0,0	0,00
0	1,2	tractor driver	1	0		0,00		0,0	0,00

Production system



back

Farm Name: DE1600MVP

year: 2008





Typ 2





winter barley

copy data to other crop

previous crop: winter wheat

Input kg/ ha	Fertilizer	Input kg / ha	Herbicide EUR/ ha	Fungicide EUR/ ha	Insecticide EUR/ ha	Other pest. EUR/ ha	Irrigation l/ ha	Var. cost EUR/ ha	Info
 0,00	Kalkamonsalpeter 	260,0	0,00	0,00	0,00	0,00	0	0	
 0,00	NPK 10/15/20 	150,0	0,00	0,00	0,00	0,00	0	0	
 0,00	Schwefelsaures A 	150,0	0,00	0,00	0,00	0,00	0	0	
 0,00		0,0	0,00	25,12	0,00	10,00	0	0	
 0,00		0,0	0,00	27,60	0,00	12,42	0	0	
 0,00	Kalkamonsalpeter 	150,0	0,00	0,00	0,00	0,00	0	0	
 0,00		0,0	0,00	0,00	0,00	0,00	0	0	
 0,00		0,0	0,00	0,00	0,00	0,00	0	0	
									

text	Unit	Total		
owned arable land	ha	87		
rented arable land	ha	1.280		
land cost arable land	EUR	255.930	Including opportunity cost for own land	
total other expenditures	EUR	90.826		
identification		number	purchase value	depreciation p.a.
tractors		11	674.000	61.800
towed machinery		28	483.101	50.847
selfpropelled machinery		2	340.000	40.000
buildings		1	980.000	24.444
annual depreciation	EUR	177.092		
total original cost	EUR	2.477.101		
share of debts in fixed assets	%	50		
interest rate	%	4,0		
interest cost on total orig. cost	EUR	56.844	Including opportunity cost for own capital	
share of debts in current assets	%	20		
interest rate	%	6,0		
inter. cost var. inputs (< 1 year)	EUR	18.508	Including opportunity cost for own capital	
total interest cost	EUR	75.352	Including opportunity cost for own capital	
total cost	EUR	1.627.421		
decoupled payment	EUR/ha	369		
total decoupled payment	EUR	497.043		
entrepreneur's profit	EUR	595.337		

Simulation

What if fuel prices and labour costs would rise?
How were tillage costs affected by changes of exchange rates?

Take a look for yourself.
Type in different figures in the red-framed cells.

Fuel and labour costs

Your input

Fuel %

Wage level %

Exchange rates

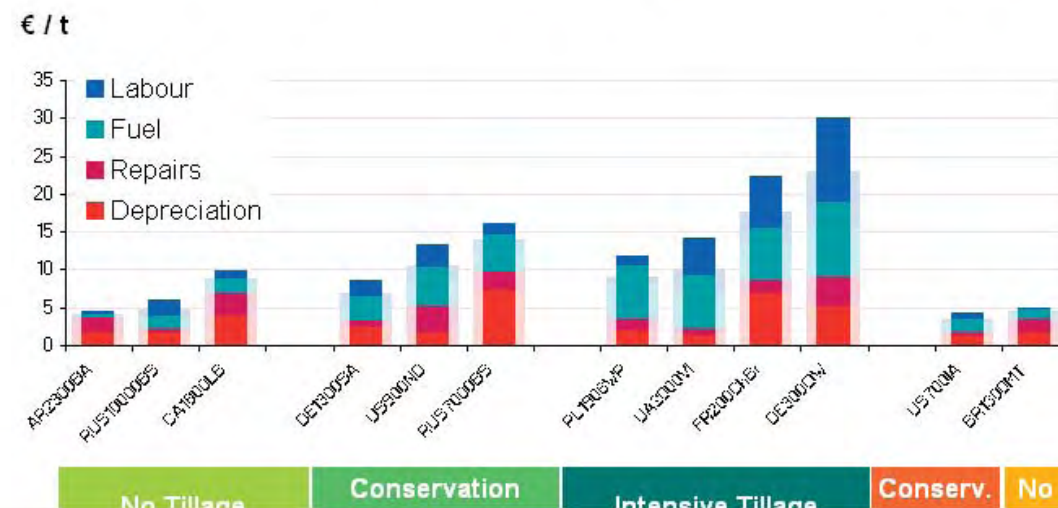
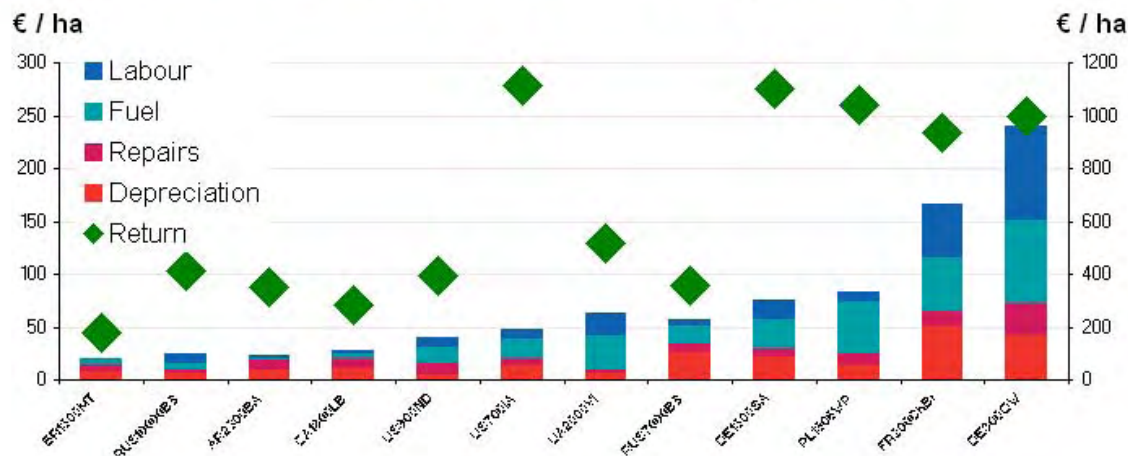
Country

Basis 200t 1 € = 1,26 USD

Scenario Der € zum USD

1 € = 1,26 USD

Tillage Costs - International Comparison



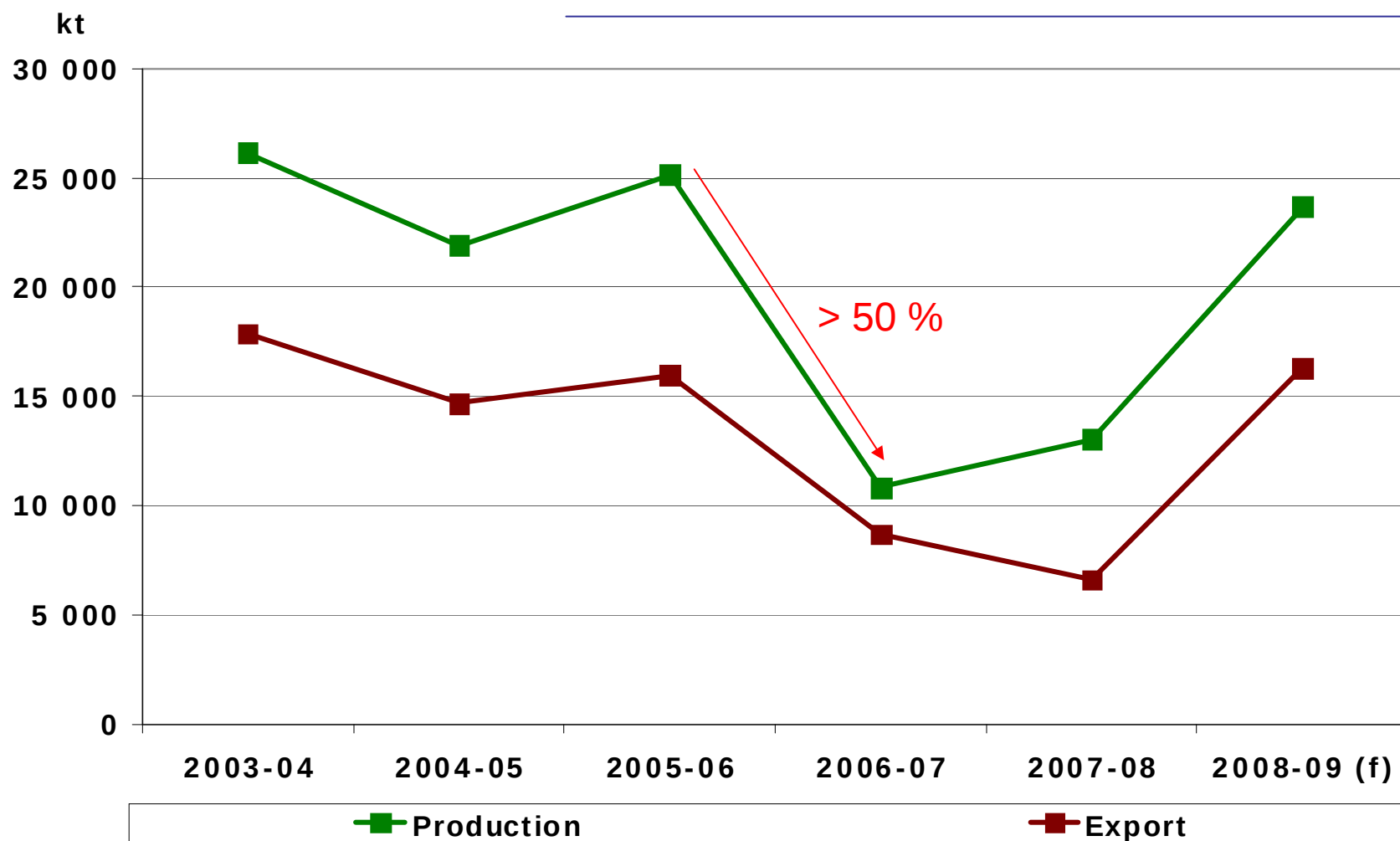
For typical farms we provide information about:

1) Framework conditions *e.g. Wheat production in Australia*

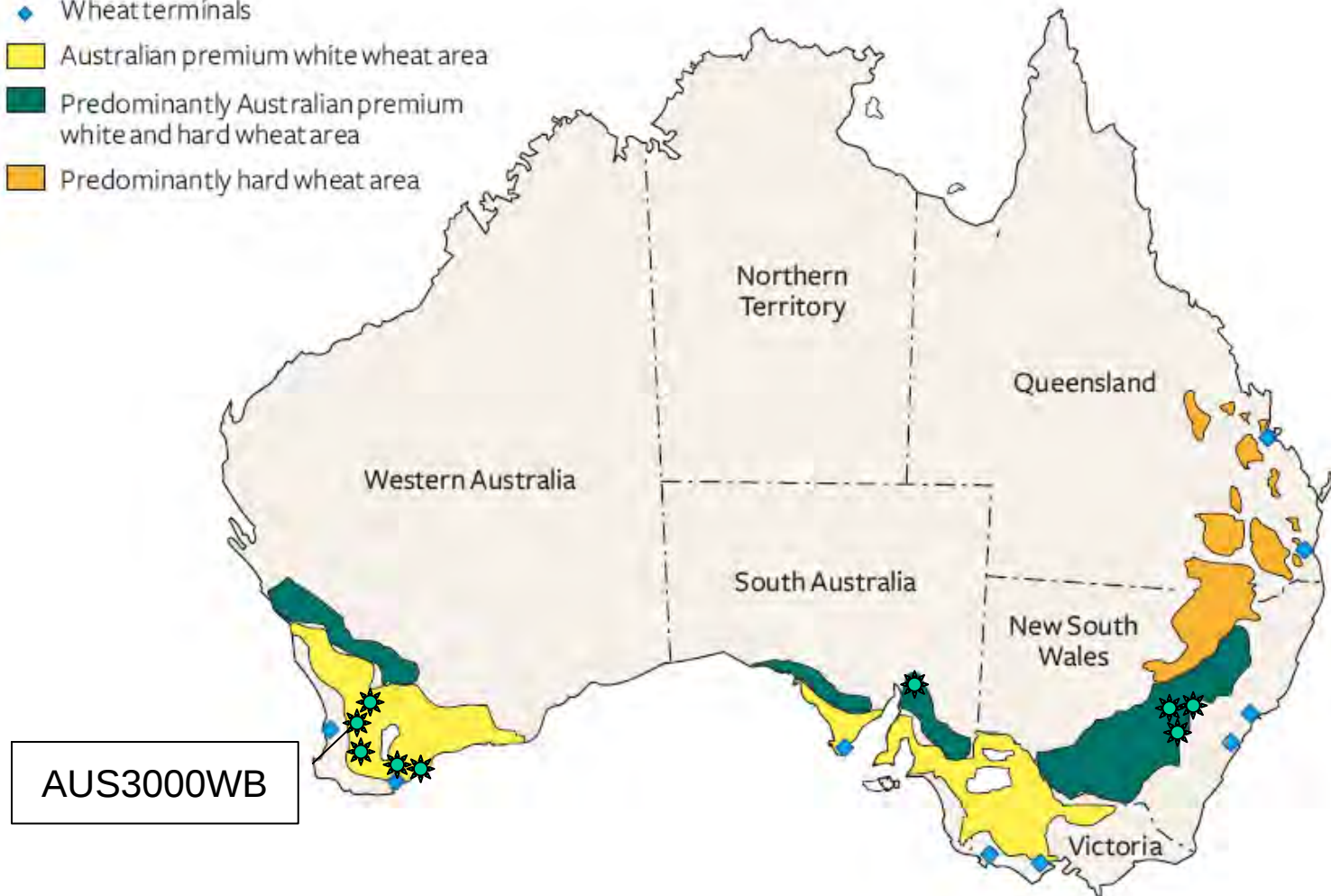
Australia

- Important wheat producing and exporting country
 - 25,000 kt production (average harvest)
 - 75% Export to world market
 - Ranks 3rd in wheat export worldwide
- High pressure on production systems to adopt to new farm environment:
 - drought in major producing regions
 - rising farm gate prices

Australia – Wheat Production / Export



- ◆ Wheat terminals
- Australian premium white wheat area
- Predominantly Australian premium white and hard wheat area
- Predominantly hard wheat area



Central wheat belt – Wheat production 2007

- Mixed farm (80% crop + 20% sheep)
- 320 mm rainfall av. (2007: 150mm)
- No-Tillage
- Wheat:

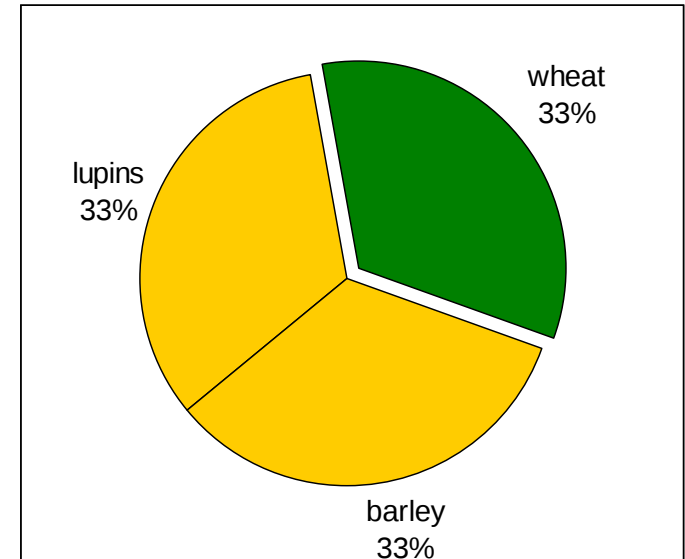
Seeding immediate after rain (April)

N-Fertilizer: 35 kg N/ha

Plant protection: 2x herbicide, fungicide seed dressing

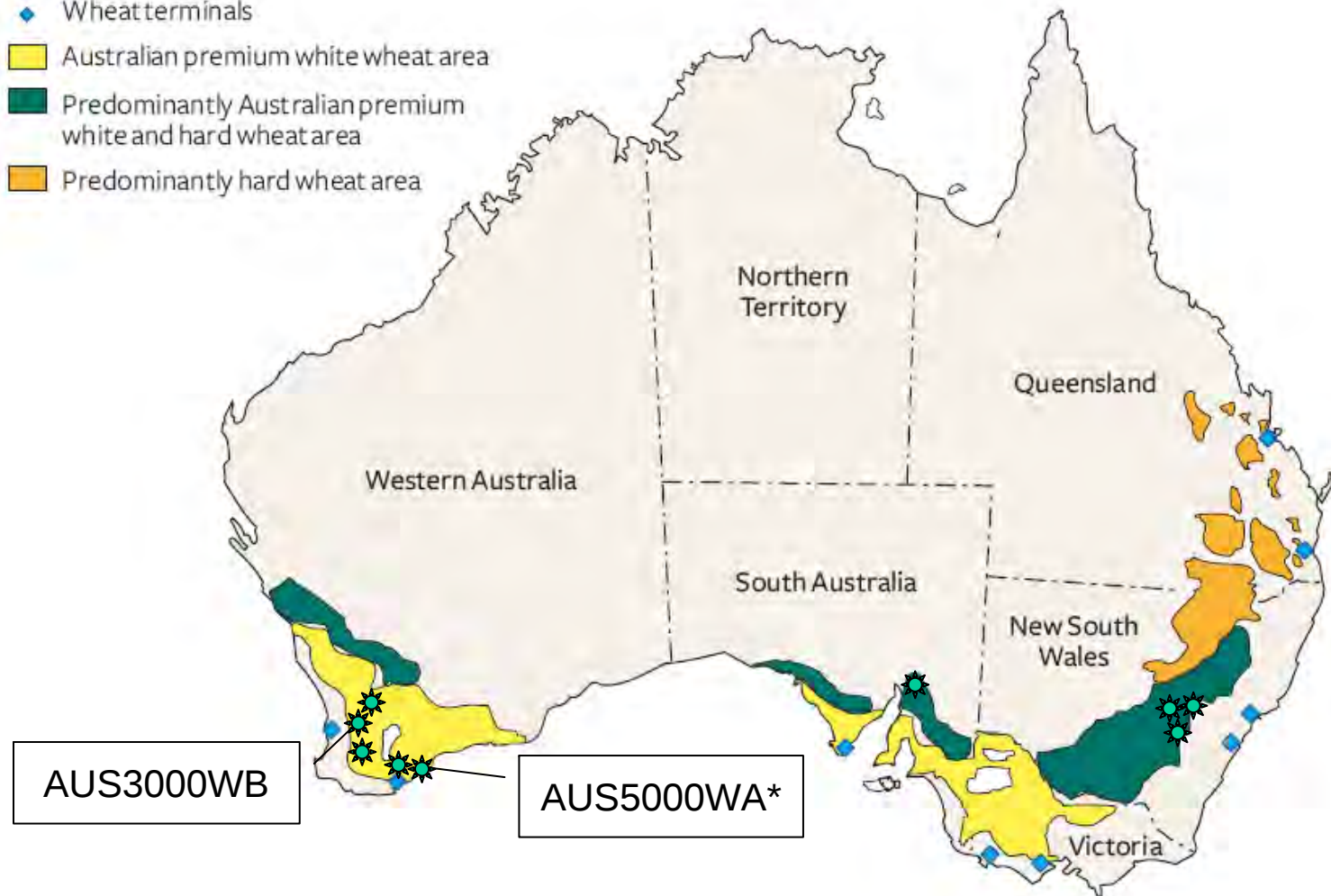
Yield level : 1,85 t/ha

Revenue: 475 USD/ha





- ◆ Wheat terminals
- Australian premium white wheat area
- Predominantly Australian premium white and hard wheat area
- Predominantly hard wheat area



Esperance – Wheat production 2007

- Specialized Cash crop farm
- 620 mm rainfall av. (70% May-Oct)
- No-Tillage (leading technology)
- Wheat:

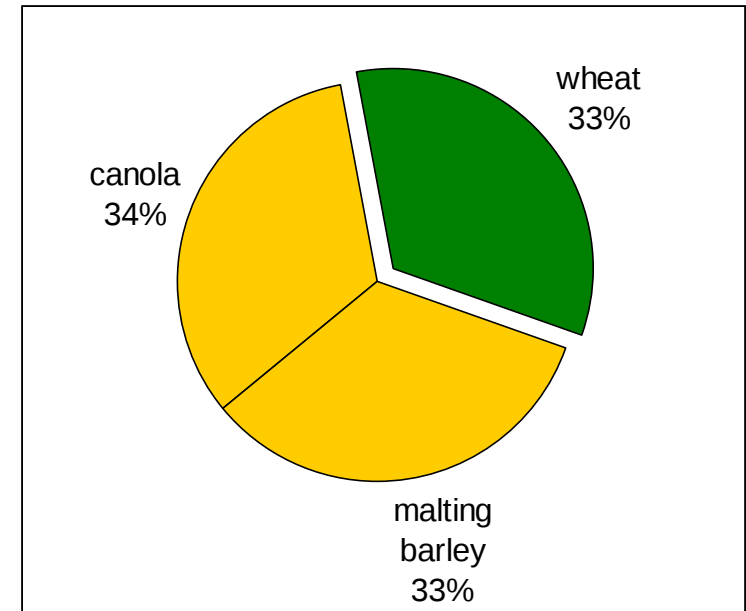
Seeding in April

N-Fertilizer: 120 kg N/ha

Plant protection: 3x herbicide, 1x fungicide, 1x insecticide

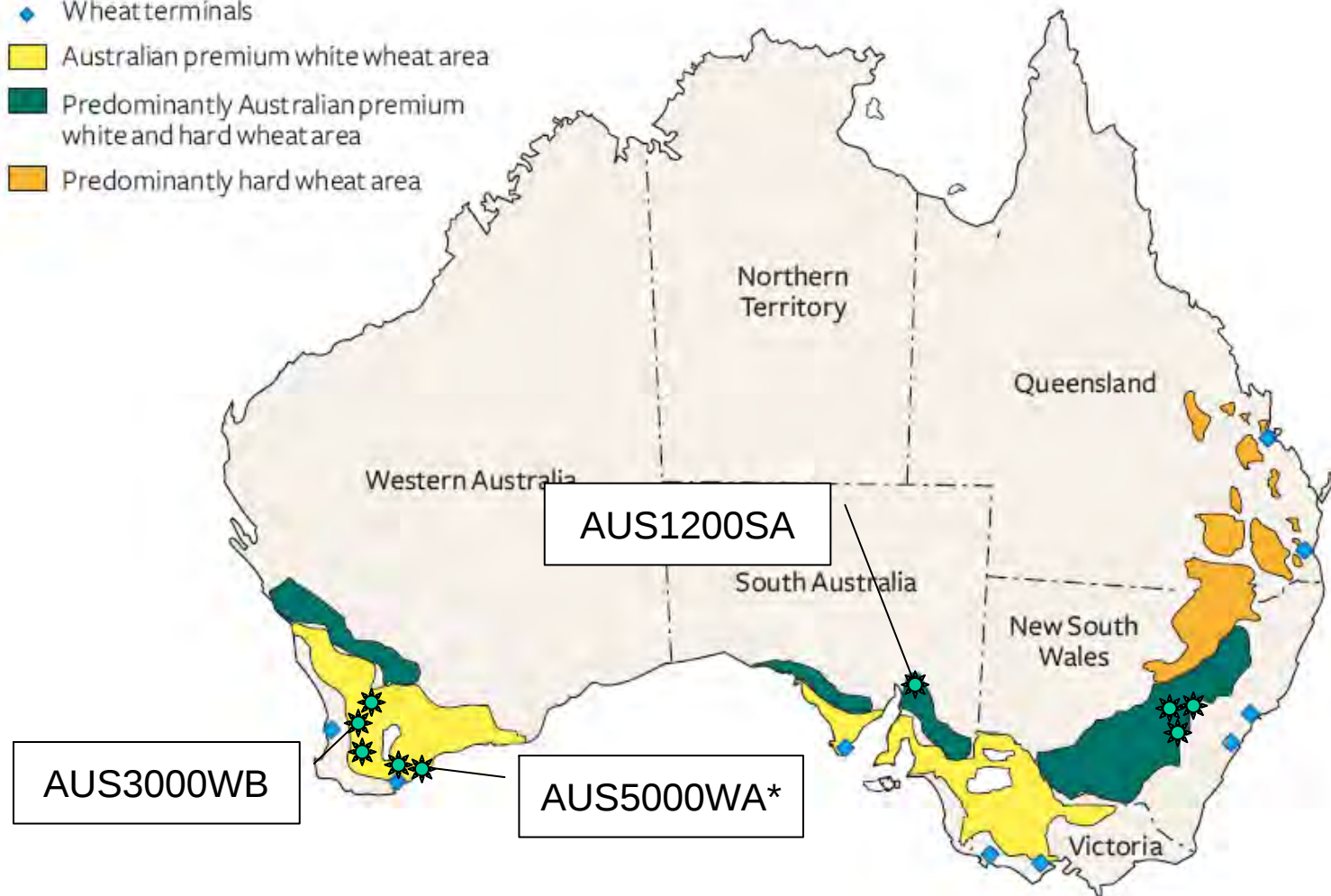
Yield level : 4,0 t/ha

Revenue: 1030 USD/ha





- ◆ Wheat terminals
- Australian premium white wheat area
- Predominantly Australian premium white and hard wheat area
- Predominantly hard wheat area



South Australia – Wheat production 2007

- Mixed farm (90% crop + 10 % sheep)
- 350 mm rainfall
- No-Tillage, used machinery
- Wheat:

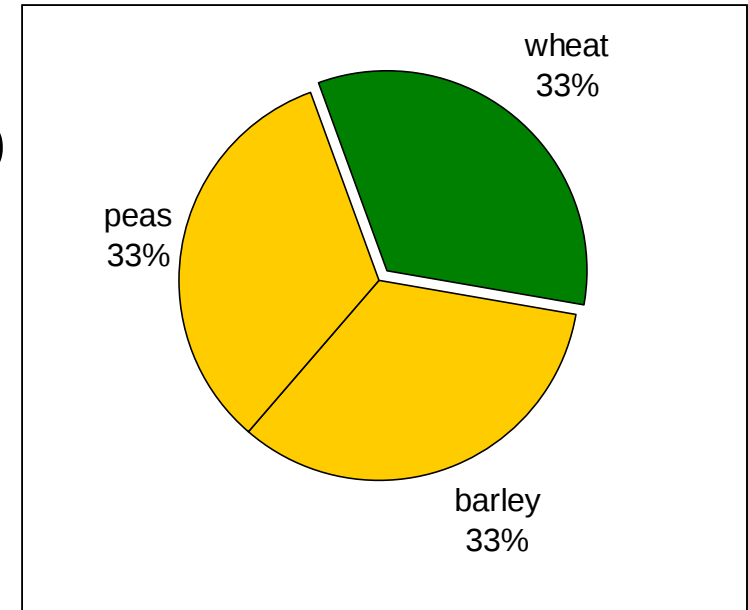
Seeding in May

N-Fertilizer: 15 kg N/ha

Plant protection: 2x herbicide, fungicide seed treatment

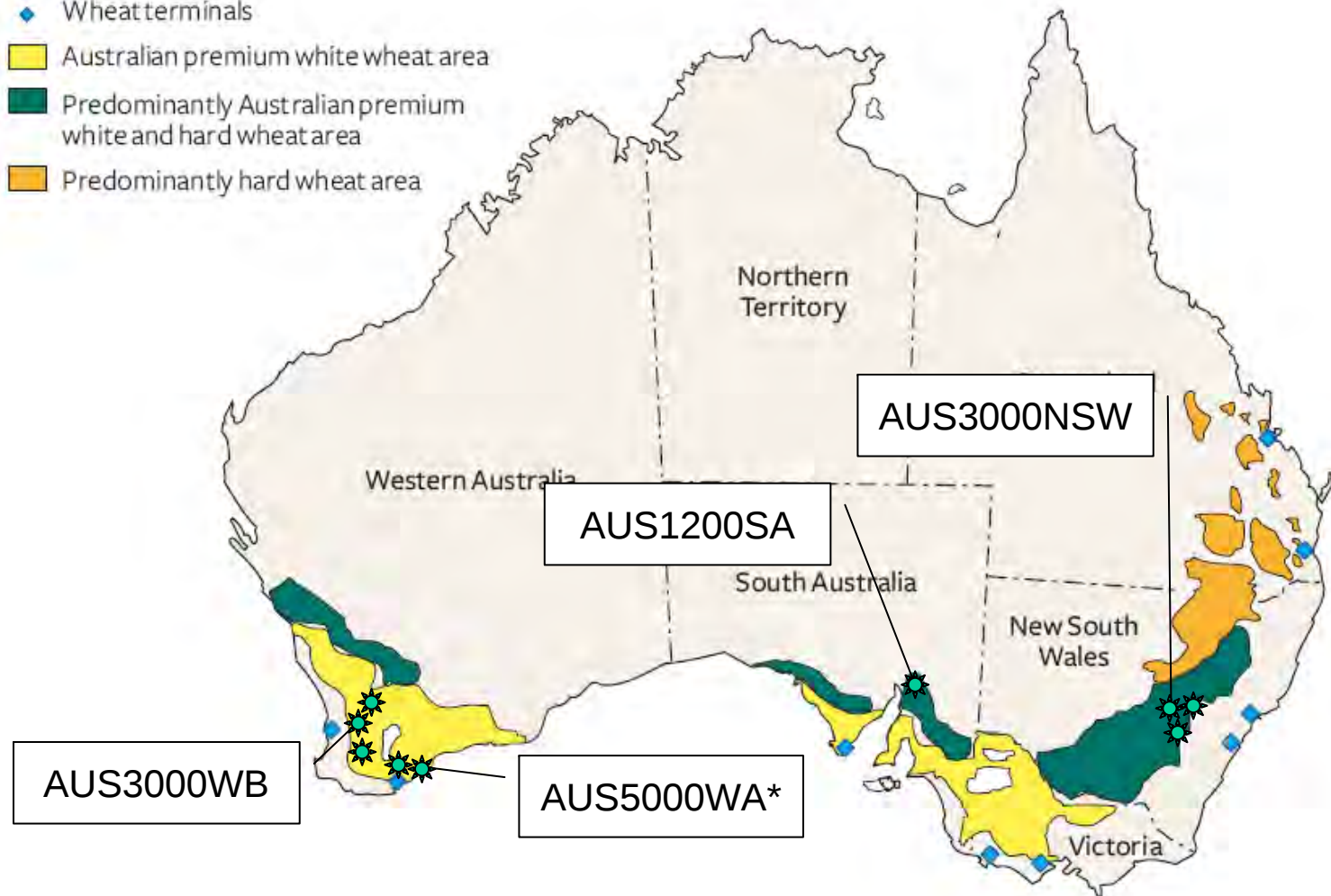
Yield level : 1,8 t/ha

Revenue: 570 USD/ha





- ◆ Wheat terminals
- Australian premium white wheat area
- Predominantly Australian premium white and hard wheat area
- Predominantly hard wheat area



NSW – “Traditional” wheat production 2007

- Mixed farm (50% crop + 50% sheep)
- 268 - 635 mm rainfall (last 3 years)
- Intensive Tillage (2x Cultivation)

Wheat:

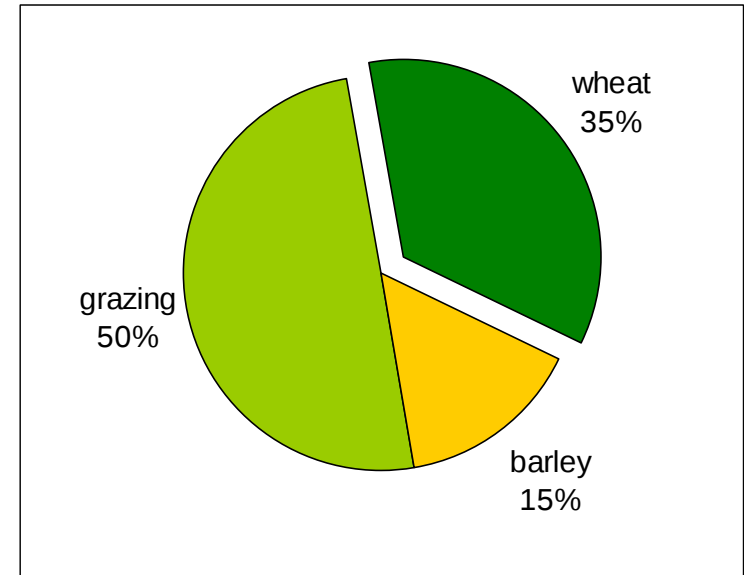
Seeding in May

N-Fertilizer: 5 kg N/ha

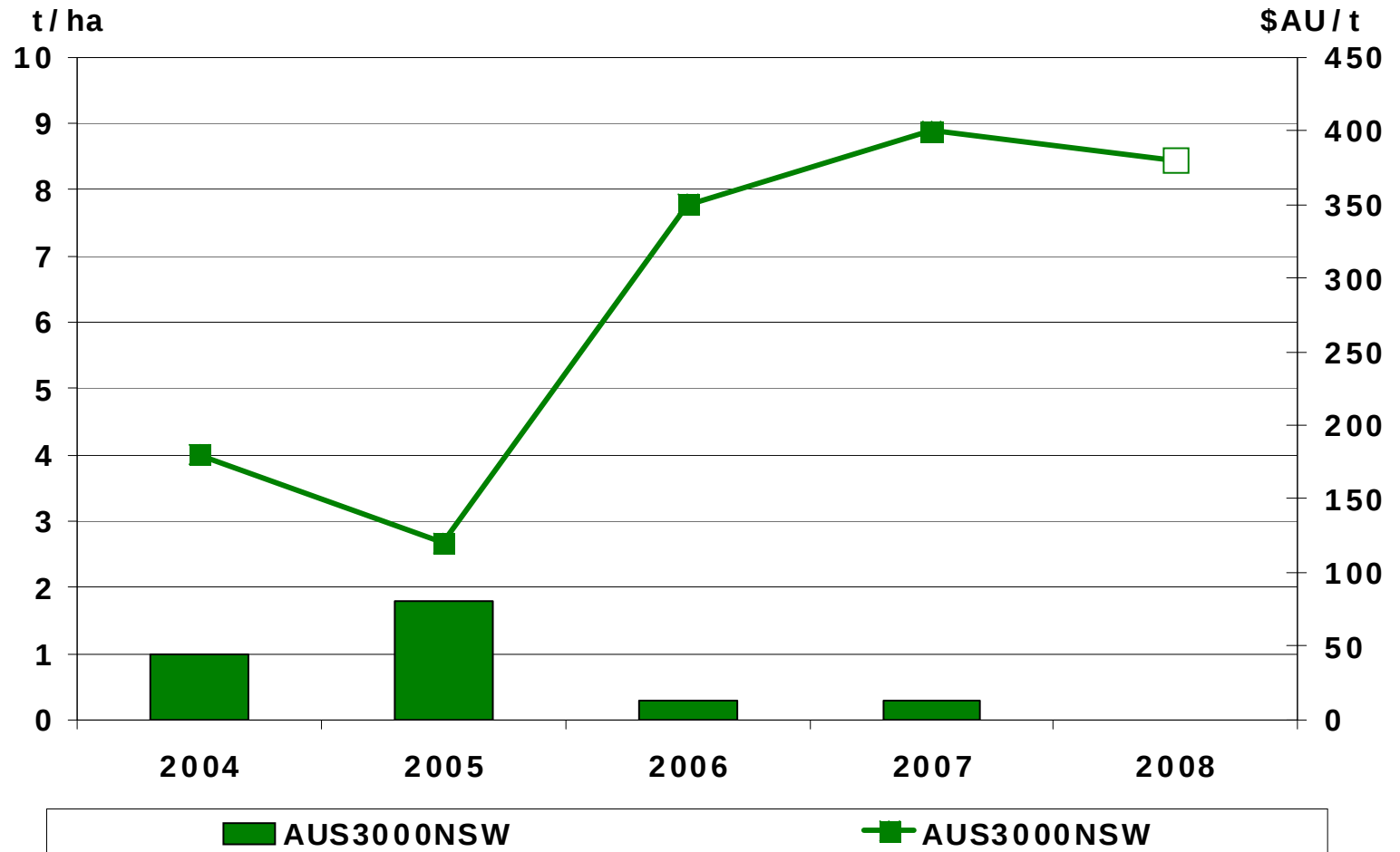
Plant protection: 2x herbicide, fungicide seed treatment

Yield level : 0,3 t/ha

Revenue: 100 USD/ha



Yield and Prices (Wheat)



For typical farms we provide information about:

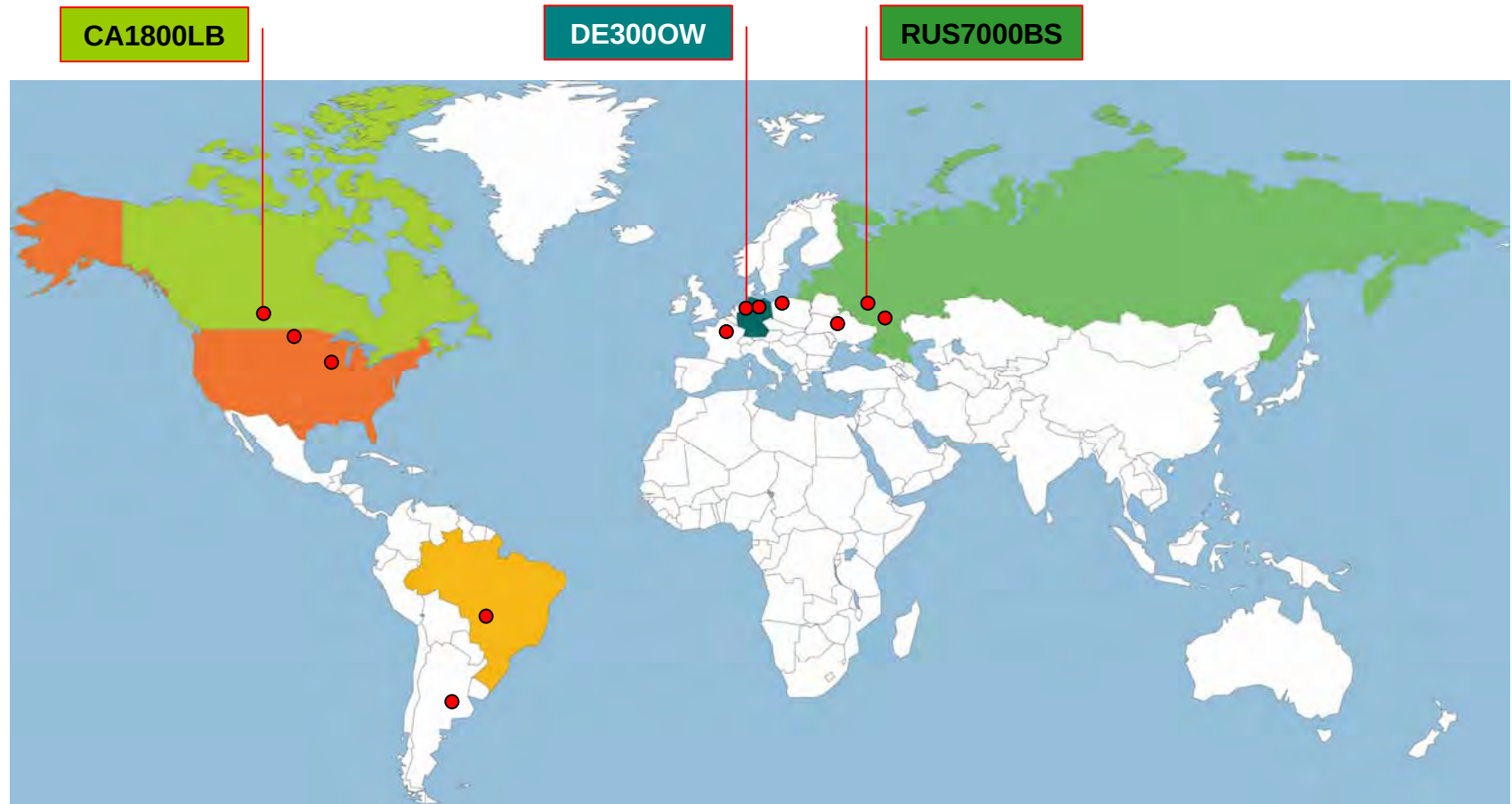
1) Framework conditions

e.g. Wheat production in Australia

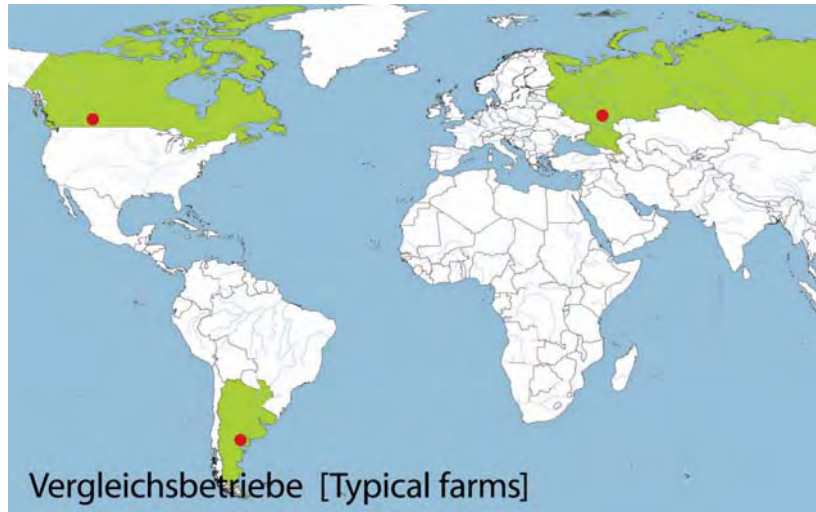
2) Production systems

e.g. Economics of Tillage Systems

Economics of Tillage Systems



Summer wheat – No-Tillage



- Tillage causes $\frac{1}{2}$ of the total operating cost

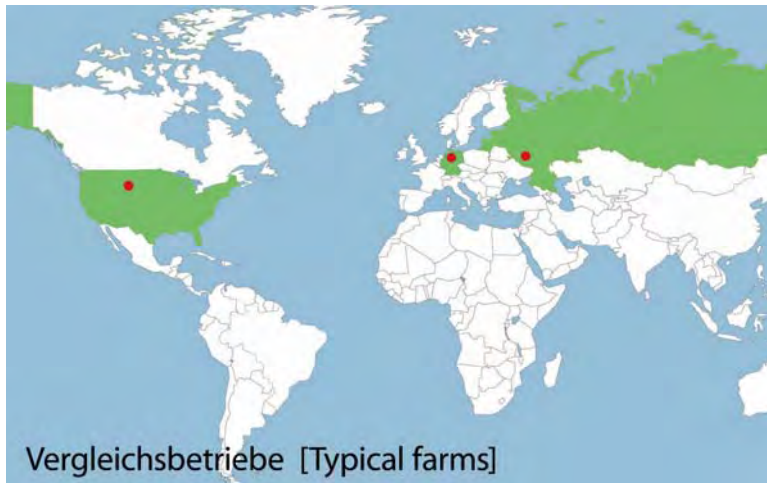


- Depreciation and repairs are most important to cost structure

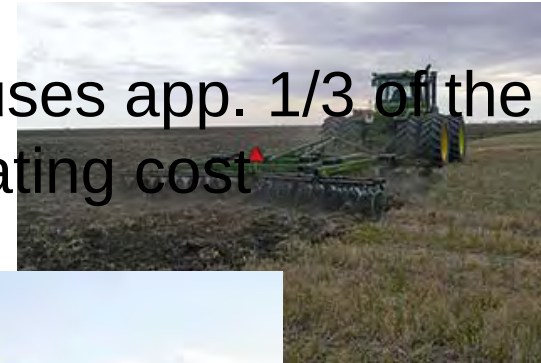


- Tillage cost: 26 €/ha

Winter wheat – Conservation tillage



- Tillage causes app. 1/3 of the total operating cost



- 70 % of the total machinery cost for depreciation and repairs

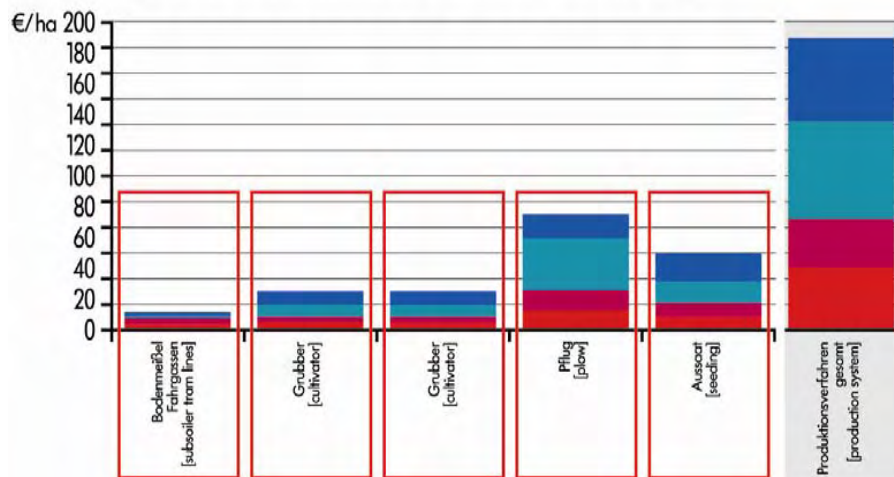


- Tillage cost: **49 €/ha**

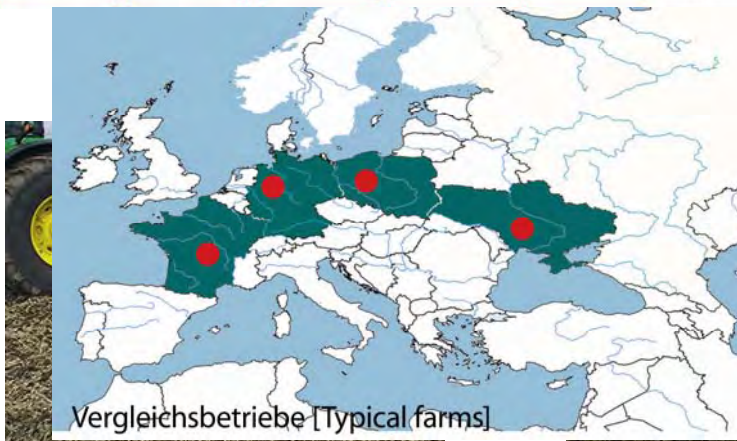


Wheat after Wheat – Intensive Tillage

Bodenbearbeitung/Aussaat – Winterweizen nach Winterweizen
[Tillage/Seed – Winter wheat after winter wheat]



- Tillage and Seeding causes $\frac{3}{4}$ of the total farm operating cost (excl. harvest)
- Only a 30% share for depreciation and repairs



- Dominating role of fuel cost & labor
- Total tillage cost: **185 €/ha**

For typical farms we provide information about:

1) Framework conditions

e.g. Wheat production in Australia

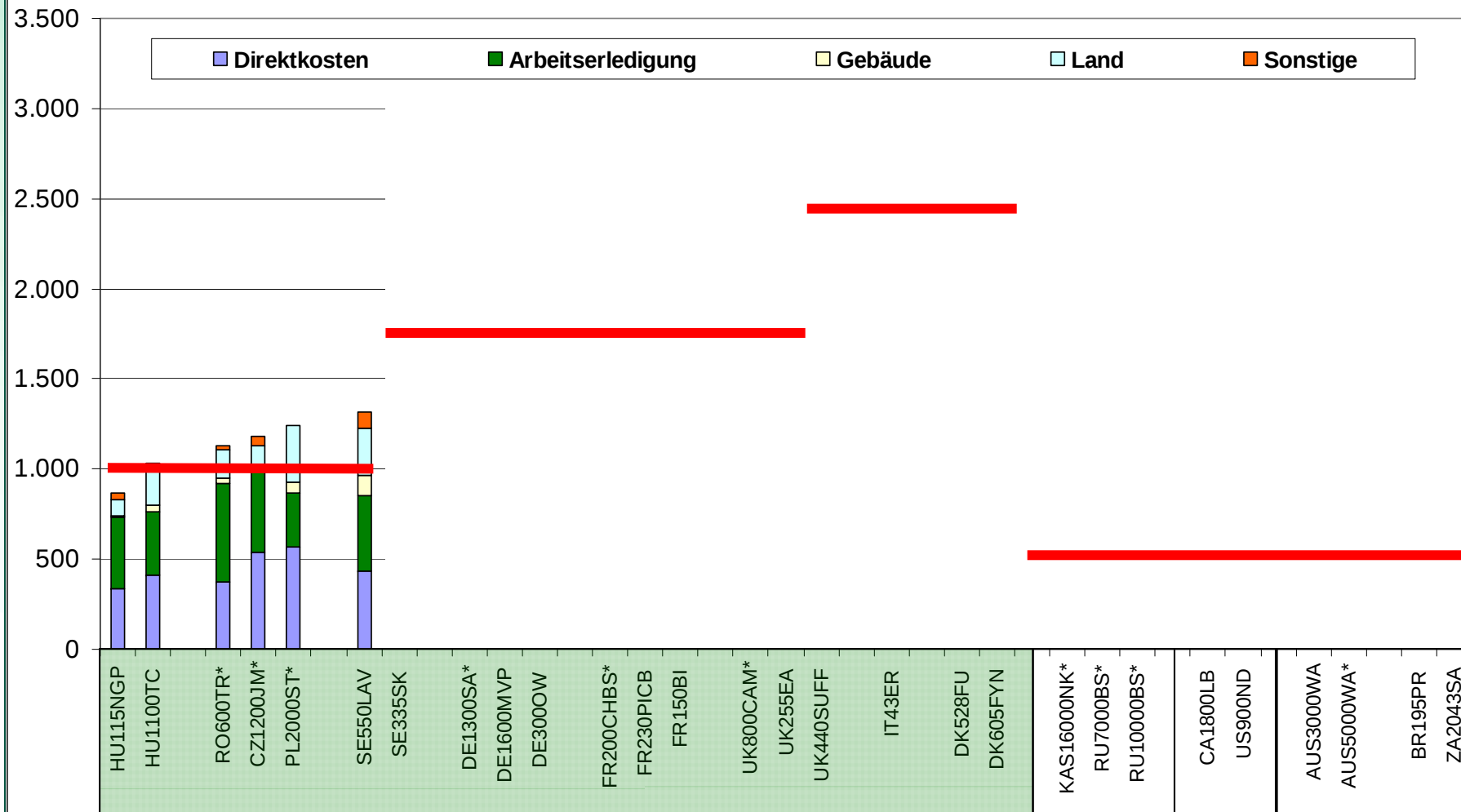
2) Production systems

e.g. Economics of Tillage Systems

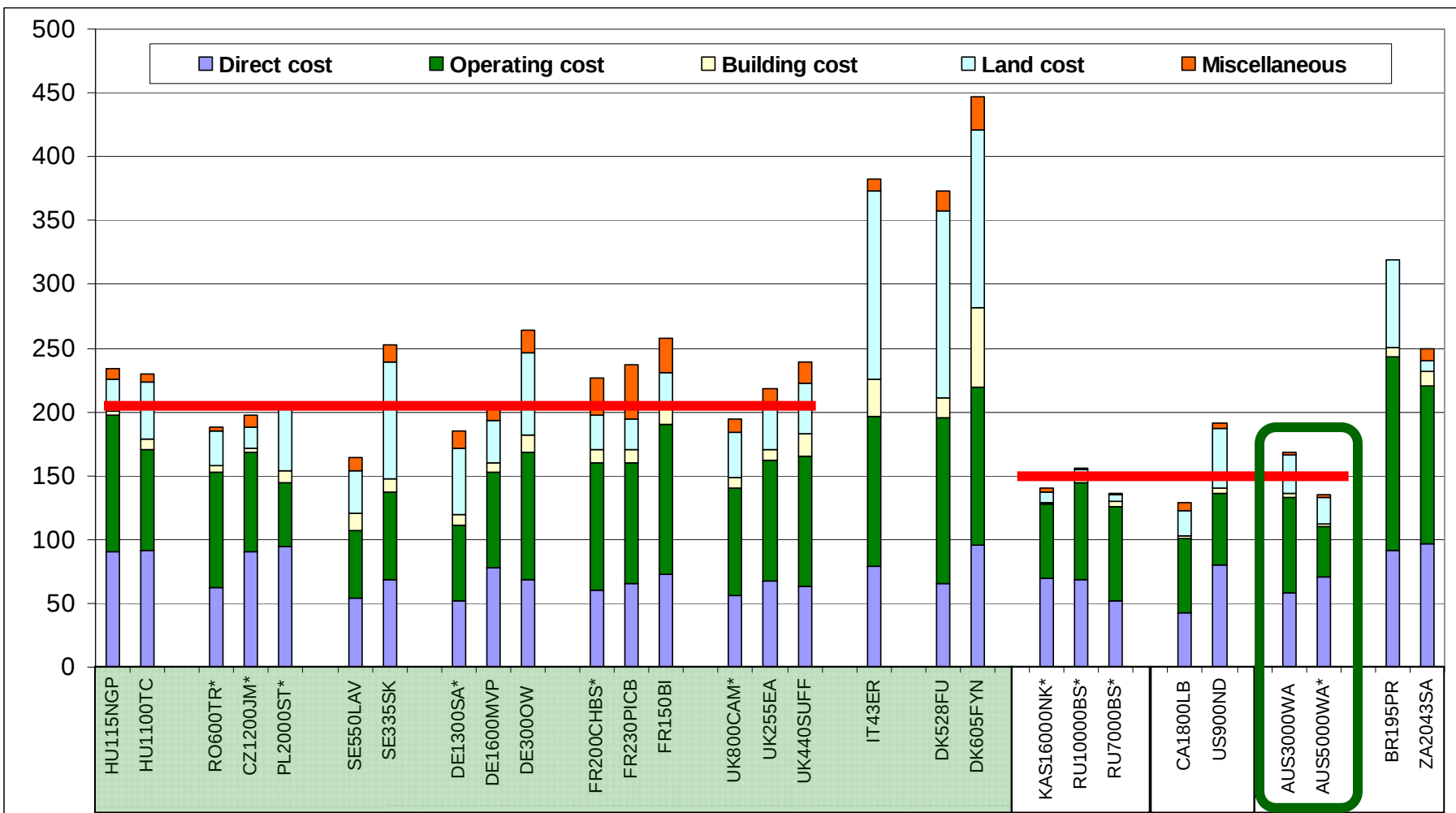
3) Cost of Production

e.g. Wheat per ha / Wheat per t

Cost of production • 2007 • USD/ha



Cost of production • 2007 • USD/t



Summary

- *agri benchmark*: global comparison of production systems, framework conditions and competitiveness
- Typical farms and hands-on experience from panels are the backbone of economic analyses
 - Cost and revenues can be broken down to **prices** and **quantities**. This allows identification of **causalities** for differences
 - Effects of **rotations** and **production systems** can be analyzed.

Outlook

- Continuous improvement of tools, methods and output:
 - TYPICROP is well established within network
 - The what-if perspective becomes more relevant: Launch of new RESULT tool
- Integration of more countries and regions to broaden the view on global agriculture
- Intensify partnerships to members along the supply chain and agribusiness sector with tailor made analyses and feedback to agri benchmark research activities

Thanks a lot for your attention



Klaus Nehring

- *agri benchmark* Cash Crop Team -

Institute of Farm Economics
Johann Heinrich von Thünen-Institute
Bundesallee 50, 38116 Braunschweig

phone	+49-531-596-5125
mobile	+49-170-2082935
e-mail	klaus.nehring@vti.bund.de
internet	www.agribenchmark.org
	www.bw.vti.bund.de