Farm level adaptations to high energy prices
– Germany –

Simon Walther, *agri benchmark* Cash Crop

Beijing, Aug 18th 2009
Structure

1. German farm gate prices
2. Changes in crop rotations?
3. Case study: Adaptation of a top performing German farm
4. Conclusions
Structure

1. German farm gate prices
2. Changes in crop rotations?
3. Case study: Adaptation of a top performing German farm
4. Conclusions
German farm gate prices

Commodities, inputs
- World market prices adapted
- Sugar beets (Ethanol): 43 USD/t

Straw
- Straw can substitute oil for heating (small heat/power plants)
- Equivalent price (baled straw @ field): 177 USD/t

Organic fertilizers
- Estimates based on 2008 peak prices
- Meat and bone meal: 130 USD/t (was: 73)
- Dry chicken dung: 50 USD/t (was: 26)
Structure

1. German farm gate prices

2. Changes in crop rotations?

3. Case study: Adaptation of a top performing German farm

4. Conclusions
Changes in rotations?

Gross margins of different crops

Source: own calculations, based on LFL Bavaria 2009
Changes in rotations?

Source: own calculations, based on LFL Bavaria 2009
Structure

1. German farm gate prices
2. Changes in crop rotations?
3. Case study: Adaptation of a top performing German farm
4. Conclusions
Location of the farm

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

- < 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- > 35
Production system

**Location: “Central German Dryland”**
- Moderate-continental climate
- Avg. temperature: 9.2°C
- Precipitation: 470mm
- Very good soils

**Farm profile**
- 2000 ha
- Specialized cash crop farm
- Intensive production system
- Top farm → already highly optimized
  → low cost of production
  → clearly discern scenario effects
- Rotation: winter rapeseed (4.5 t/ha)
  winter wheat (9.7 t/ha)
  winter wheat (8.8 t/ha)
Production system

Tillage system: Intensive min-till

- Usually 2 cultivation passes between crops
- Up to 25 cm deep
Production system

Tillage system: Intensive “min-till”
⇒ Usually 2 cultivation passes between crops
⇒ Up to 25 cm deep

Plant protection and nutrition

Rapeseed: ⇒ 240 kg N in 3 doses
⇒ Organic fertilization
⇒ 4 pesticide applications

Wheat: ⇒ 165 kg N in 3 doses
⇒ 5 pesticide applications
Adaptation strategies

**Selling wheat straw**
- Makes use of the new high value
- 13 t/ha of straw per rotation
- More fertilization required (nutrient export)
- Humus balance?

**Mineral fertilizer substitution**
- Additional use of dry chicken dung
- 2.5 t/ha per rotation

**Strip tillage in rapeseed**
- Fuel and fertilizer savings
- Slightly higher capital cost
Monetary results

Source: own calculations

1: before scenario
2: after scenario, no adaptations
3: 2 + straw sale
4: 3 + more organic fertilizer
5: 4 + strip tillage in rapeseed
Structure

1. German farm gate prices
2. Changes in crop rotations?
3. Case study: Adaptation of a top performing German farm
4. Conclusions
Conclusions

Farm income effect of scenario?
- Farm profits increase substantially
- Incentive to intensify
  (but: German production already highly intensive)

Rotation changes?
- Gross margin relations do not change
- Sugar beets very competitive in certain regions
- Legumes as cover crops

Other adaptation?
- Sale of by-products for energetic use
- Other technological adaptations?
  - Smaller profit effect
  - Happen already, accelerated by scenario
Thank you for your interest

Simon Walther
- agri benchmark Cash Crop team -

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

phone +49-531-596-5108
mobile +49-179-3251811
e-mail simon.walther@vti.bund.de
internet www.agribenchmark.org www bw.vti.bund.de

Paper and further information: www.agribenchmark.org/191.html