Economic impacts of quarantine measures against *Diabrotica* - results from selected farms in Germany
Content

1. Introduction
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Introduction

- Diabrotica is the most important pest organism for corn
- Lessons learned from other countries:
  - USA/Hungary:
    - yield depressions USA: 5-15 %, Hungary: 20-30 %
    - pesticide costs: 40-75 €/ha
- Classified as a quarantine organism in Europe

What are the economic impacts of eradication and containment measures for farms?
Considered measures

1. **Eradication measures in focus zone:**
   No corn for two years in the whole zone

2. **Eradication measures in security zone:**
   Corn just once within two years

3. **Containment measures:**
   Corn just once within three years
Selected farms

Emsland:
- 290 bulls
- 64 ha arable land
- Share of corn: 100 %

Borken I:
- 365 bulls 160 pigs
- 61 ha arable land
- Share of corn: 79 %

Borken II:
- 125 dairy cows / 130 bulls
- 59 ha arable land
- Share of corn: 68 %

Reisgau-Hochschwarzwald:
- Arable farm
- 87 ha arable land
- Share of corn: 74 %

Cuxhaven:
- 310 dairy cows / 320 bulls
- 140 ha arable land /150 ha pasture
- Share of corn: 79 %

Cloppenburg:
- Pig fattening (2.250)
- 69 ha arable land
- Share of corn: 68 %
Approach for the calculations

1. No plant protection costs against diabrotica
2. No yield decrease
3. Discuss adaptation options in the crop rotation with farmers
4. Calculate scenarios with SIM-farm-model
   - Profitability of crops
   - Adopted feed ratios
   - Increased costs for manure export
5. Profit base year vs. profit in years of eradication and containment measures
Assumptions

- Accounting data for input and output prices (2010)
- Standard values for costs of rye silage
- Yield rye silage: 25 t FM/ha
- Purchase price corn silage: 40 €/t FM
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Beef producer Emsland
(100% corn silage)

<table>
<thead>
<tr>
<th>Base</th>
<th>Focus zone</th>
<th>Security zone</th>
<th>Containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 ha corn</td>
<td>64 ha rye corn imp.</td>
<td>64 ha rye s. 15 ha corn imp.</td>
<td>field exchange 21 ha corn 46 ha rye s.</td>
</tr>
<tr>
<td>64 ha rye s. 15 ha corn imp.</td>
<td>2 years</td>
<td>field exchange 21 ha corn 46 ha rye s.</td>
<td>43 ha corn 21 ha rye s.</td>
</tr>
</tbody>
</table>

-39%  
-69%  
-49%  
-49%

-19%
Beef producer Borken
(79% corn silage)

<table>
<thead>
<tr>
<th>Base</th>
<th>2 years</th>
<th>first year</th>
<th>Containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 ha corn 8 ha wheat 5 ha barley</td>
<td>8 ha wheat 5 ha barley 48 ha rye 100% corn imp.</td>
<td>field exchange 30 ha corn 8 ha wheat 5 ha barley 18 ha rye s.</td>
<td>field exchange 43 ha corn 5 ha rye s. 8 ha wheat 5 ha barley</td>
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</tbody>
</table>
Dairy farm Borken
(68% corn silage)

<table>
<thead>
<tr>
<th>Profit €/a</th>
<th>Base</th>
<th>Focus zone</th>
<th>Security zone</th>
<th>Containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 ha corn</td>
<td>19 ha gras</td>
<td>19 ha gras</td>
<td>decreased heard</td>
<td>39 ha corn</td>
</tr>
<tr>
<td>19 ha gras</td>
<td>19 ha gras</td>
<td>19 ha gras</td>
<td>20 ha corn</td>
<td>20 ha gras</td>
</tr>
<tr>
<td>100% corn imp.</td>
<td>14 ha corn imp.</td>
<td>20 ha corn</td>
<td>19 ha gras</td>
<td>20 ha rye s.</td>
</tr>
<tr>
<td>-36%</td>
<td>-45%</td>
<td>-105%</td>
<td>-40%</td>
<td>-1%</td>
</tr>
<tr>
<td>2 years</td>
<td>2 years</td>
<td>first year</td>
<td>Security zone</td>
<td>Containment</td>
</tr>
<tr>
<td>first year</td>
<td>second year</td>
<td>40 ha rye</td>
<td>40 ha rye s.</td>
<td>20 ha rye s.</td>
</tr>
</tbody>
</table>

-20.000
0
20.000
40.000
60.000
80.000
100.000

-20.000
0
20.000
40.000
60.000
80.000
100.000

-36%
-45%
-40%
-105%
-40%
-1%
Dairy farm Cuxhaven (79% corn silage)

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<thead>
<tr>
<th>Base</th>
<th>Focus zone</th>
<th>Security zone</th>
<th>Containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 ha corn</td>
<td>128 ha rye</td>
<td>128 ha rye s.</td>
<td>30 ha corn</td>
</tr>
<tr>
<td>18 ha rye</td>
<td>12 ha barley</td>
<td>12 ha barley</td>
<td>110 ha rye s.</td>
</tr>
<tr>
<td>12 ha barley</td>
<td>128 ha rye s.</td>
<td>12 ha barley</td>
<td>48 ha rye s.</td>
</tr>
<tr>
<td>100% corn</td>
<td>12 ha barley</td>
<td>128 ha rye s.</td>
<td></td>
</tr>
<tr>
<td>imp.</td>
<td></td>
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<td>48 ha rye s.</td>
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<td>100% corn</td>
<td>12 ha barley</td>
<td>128 ha rye s.</td>
<td></td>
</tr>
<tr>
<td>imp.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

- Base: 0% profit
- Focus zone: -9% profit
- Security zone: -28% profit
- Containment: -20% profit
- Base: 0% profit
Pig producer Cloppenburg
(68% corn)

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Profit €/a</th>
<th>Change %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>60,000</td>
<td>-28%</td>
</tr>
<tr>
<td>Focus zone</td>
<td>40,000</td>
<td>-35%</td>
</tr>
<tr>
<td>Security zone</td>
<td>40,000</td>
<td>-15%</td>
</tr>
<tr>
<td>Containment</td>
<td>40,000</td>
<td>-1%</td>
</tr>
</tbody>
</table>

- 47 ha corn (gr.)
- 22 ha rye
- 69 ha rye
- 47 ha rye
- 22 ha barley
- 46 ha corn (gr.)
- 23 ha rye
Cash crop farm Breisgau-Hochschwarzwald (74% corn)

<table>
<thead>
<tr>
<th>Base</th>
<th>Containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 ha corn (gr.)</td>
<td>58 corn (gr.)</td>
</tr>
<tr>
<td>23 ha wheat</td>
<td>29 ha wheat</td>
</tr>
</tbody>
</table>

profit €/ha

-5%
Conclusions

1. High variation in costs, main drivers are:
   – dependency on corn for feeding
   – share of corn in the rotation
   – possibility for field exchange
2. Highest losses for specialized beef producers which already grow corn in monoculture
3. Also high losses for specialized dairy farms
4. Reduced losses with field exchanges, esp. with horticulture farms
5. Minor effects on cash crop farms
Thank you for your attention!
Biogas and piglet producer Stade
(72% corn silage)

<table>
<thead>
<tr>
<th></th>
<th>Base</th>
<th>2 years</th>
<th>first year</th>
<th>Containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>180 ha corn</td>
<td>11 ha wheat</td>
<td>68 ha wheat</td>
<td>210 ha rye silage</td>
<td>166 ha corn</td>
</tr>
<tr>
<td>60 ha rye (pigs)</td>
<td>78 ha rye</td>
<td>41 ha sugar beets</td>
<td>180 ha rye s.</td>
<td>52 ha rye (pigs)</td>
</tr>
<tr>
<td></td>
<td>€300,000</td>
<td>€270,000</td>
<td>€220,000</td>
<td>€250,000</td>
</tr>
<tr>
<td></td>
<td>-13%</td>
<td>-10%</td>
<td>-22%</td>
<td>-5%</td>
</tr>
</tbody>
</table>

- Base: 2 years
- Focus zone: 1 year
- Security zone: 1 year
- Containment: 2 years

Profit €/a