

Perception of external challenges: How do German organic vegetable farmers deal with climate change, new fertilizer regulation (DüV) and Corona?

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Introduction

Agriculture under risk and uncertainty

- Continuously increasing changes in fundamental production conditions
- Three recent challenges of current importance identified:
 - Corona pandemic
 - Modified fertilizer regulation in Germany (2017 and 2020)
 - Climate change / changing weather conditions

Why (organic) vegetable production?

- High intensity of labour use (Eastern European seasonal workers)
- New fertilisation restrictions especially challenging: highly susceptible to nutrient deficiency, effects on yield and quality, often high residual N after harvest
- Particularly affected by extreme weather conditions (marketability of harvest)

Introduction

Aim of the study

- To analyse how organic vegetable farmers perceive different types of external challenges and how they deal with them, ...
- ...taking the Corona pandemic, the modified Fertilizer Ordinance (DüV) and changing weather conditions/climate change as examples

Research questions

- How do farm managers perceive these challenges?
- How do they see themselves affected?
- What coping strategies do they use to deal with the challenges?

Structure of the presentation

Introduction

- The three challenges briefly
- Why organic vegetable production?
- Aim of the study and research questions

Theoretical approach: Characterisation of the challenges

Empirical framework

Results

- Corona pandemic, new fertilizer regulation and weather/climate change

Discussion and conclusions

Characterisation scheme of the external challenges

Attributes

- Principal origin (natural/political/societal/...)
- Potential level of damage
- Probability of occurrence
- Expectability/predictability of occurrence
- Timeliness of the need for adaptation

Empirical framework: approach and data

Qualitative approach to cover as many aspects as possible

Data

- Interview data of 16 farmers from organic vegetable farms
- Interviews were audio-recorded and transcribed
- Selection of respondents via regional advisors and other experts

Data collection

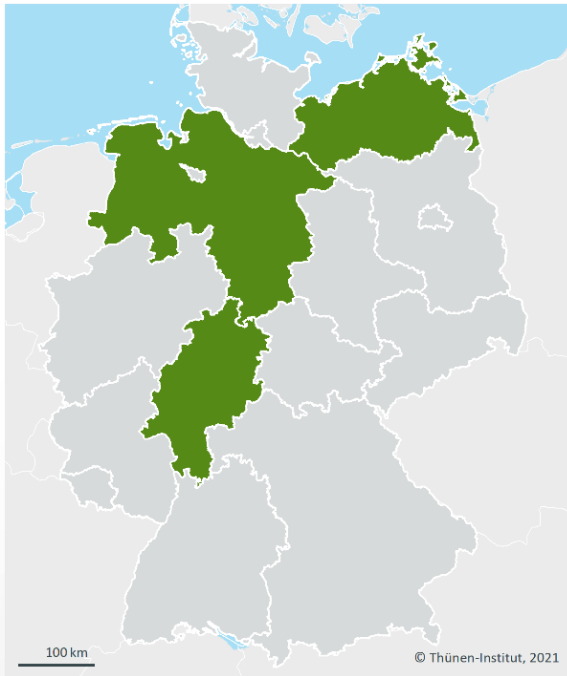
- Autumn 2020 (4) and January and February 2021 (12)
- Mostly (13) via video conference or telephone, some (3) in person

Data analysis

- Qualitative analysis of respondents' answers on direct questions

Empirical framework: study region and sample

Study region: three federal states in Germany



Estimated number of organic vegetable farms in the study region: ~ 300 (250-350)

Farm sizes: between several 100 square meters to about 250 ha organic vegetable area

Marketing: all types of marketing channels (CSA, direct marketing forms, natural food wholesalers, food retailers, intermediaries)

Production structure on farms: between several vegetable crop types on field scale to sometimes small farms with 40-50 different vegetable crops outdoors and several sets per crop

Source: Destatis, 2021; own data

Sample: 16 diverse farms between 2 and 240 ha vegetable area, all types of marketing channels and between 4 and more than 40 vegetable crop types

Results – Corona pandemic

Effects of the pandemic in 2020

Negative effects with respect to labour:

Lack of seasonal workers (1 farm)

Increased costs for labour organization and logistics for travel, accommodation, permits (7 farms)

Other negative effects:

Increased costs for marketing and adaptation of farmer shop (2 farms)

Delays in supply of inputs/plantlets (1 farm)

Positive effects:

Were able to attract local work force

Significantly higher demand and higher output prices for organic vegetables (10 farms)

Adaptation (plans) for 2021

Adapted organization of labour, accommodation, quarantine measures upon arrival, split into separated teams, hygiene routines established (9 farms)

Investment in additional sanitary facilities

Will increase production (2 farms)

Results – Changes in German fertilizer regulation

Effects of DüV 2017	Restrictions in nitrate sensitive areas	Expected effects of future regulations (DüV 2020)
<p>Had no effects on the farm (5 farms)</p> <p>Period for manure spreading in winter has changed (1 farm)</p> <p>Have to calculate fertilizer demand and take Nmin samples</p> <p><i>Regular statement: “Now we know how much fertilizer we could apply if we would want to”</i></p>	<p>Parts of the farm area are located in nitrate sensitive areas (5 farms)</p> <p>Early crops may be delayed due to obligation to grow winter cover crops (1 farm)</p> <p>Reducing N supply by 20 % might affect quality of the crops (1 farm)</p>	<p>No changes for own farm (5 farms)</p> <p>Problems with the application of manure, compost and mulch due to phosphorous contents (3 farms)</p> <p>Uncertainty about details of regulations and which would apply on the own farm</p> <p>Uncertainty about how to account for variable availability of nutrients from organic fertilizers when calculating N-balances</p>

Results – Changing weather/climate change

Weather and climate observations	Effects on vegetable production	Future and current adaptation measures
<u>Water:</u>		
Three years of unusual dry weather (12 farms)	Increased costs for irrigation (6 farms)	Investments in irrigation and water saving irrigation techniques (11 farms)
Frequency of extreme events (draught or rain) increased (4 farms)	Better control of growing conditions (2 farms) Easier mechanical weed control	Improve soil water retention (5 farms)
<u>Vegetation period:</u>		
Longer vegetation period, warm autumns	More sets are possible (3 farms)	Adjust crop portfolio and cultivation planning (4 farms)
Shifts in the seasons, short spring and early summer, very mild winters	New crops are possible (3 farms)	
<u>Extreme events:</u>		
Periods of extreme heat	Quality defects due to heat (2 farms)	Fleece or mulch covers for wind protection
Strong winds		
Lack of frost in winter		

Discussion

Connecting results on challenges with attributes of the characterisation scheme

Principal origin

- Corona: Perceived as “given”, societal/political origin (higher demand and costs)
- Fertilizer regulation: political decisions
- Climate change: natural events

Potential level of damage

- Corona: mostly low; positive effects due to very good market situation
- Fertilizer: mostly low, no changes in production system needed
- Climate change: very high, mainly due to water and high temperatures – damages in yield and quality (and hence marketability) expected

Discussion

Probability and predictability of occurrence

- Corona: was unexpected and sudden, now possible actions foreseeable
- Fertilizer regulation: both generally high, but high uncertainty whether or not affected by specific regulation (especially small farms)
- Climate change:
 - Probability: quite high – willingness to invest in (better) irrigation, new crops, work more on improving soil fertility/water retention capacity
 - Predictability: for water shortage/temp. high, for other specific effects low

Timeliness of the need for adaptation

- Corona: often immediately, preparations done for coming growing season
- Fertilizer regulation: short-term, uncertainty if affected hinders adaptation
- Climate change: short- to medium run, since they want to adapt soon

Conclusions

Characterisation scheme was helpful to analyse the three challenges

Perception and dealing with challenges

- Corona: not much damage, higher demand, some preparation done
- Fertilizer regulation: most only affected via documentation and sample requirements, no major changes in production system expected
- Climate change: major threat for vegetable production, also positive effects, investments in (better) irrigation techniques and increase of soil fertility

Resilience thinking

- Detailed, differentiated picture – negative impacts and opportunities
- Organic production was perceived as an asset to deal with the threats



Thank you very much for your attention!

In case of questions or suggestions, we would be pleased to receive an e-mail to barbara.heinrich@thuenen.de

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