Onland-Pflug von Hansueli Häberli (Hansueli Häberli)

Bodenschonende Landnutzung mit dem On-Land-Pflug (Switzerland)

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DESCRIPTION

Im Biolandbau ist der pfluglose Ackerbau noch immer schwierig. Um seinen Boden vor Verdichtung zu schützen und den Boden zu schonen, kann jedoch ein On-Land-Pflug eingesetzt werden, welcher im Vergleich zum konventionellen Pflug (20-25cm tief) nur 10-15cm tief pflügt.

Schon früh war dem Bauern eine bodenschonende Landnutzung wichtig. Seit den 1980er-Jahren werden die Felder deshalb ohne Herbizideinsatz bestellt. 2005 wurde der Betrieb schliesslich auf einen Biobetrieb umgestellt. Der pfluglose Ackerbau ist dabei noch schwierig. Trotzdem versucht der Bauer den Boden möglichst schonend zu bestellen. Das bedeutet, dass er seit 2002 den Boden nur noch oberflächig mit Scheibenegge, Federzahnegge oder zur Stoppelbereitung nach der Getreideernte mit dem Flügelschargrubber bearbeitet. Die Bearbeitungstiefe liegt dabei bei ca. 8 cm. Trotzdem kann er nicht ganz auf den Pflug verzichten. Der Umbruch der Kunstwiese erfolgt mit dem Onland-Pflug und auch zur Bekämpfung der Drahtwürmer wird dieser eingesetzt.

Purpose of the Technology: Mit dem Einsatz des Onland-Pflugs soll der Boden schonender bearbeitet werden, als mit dem konventionellen Pflug. Zudem wird dieser Onland-Pflug nur noch teilweise eingesetzt. Oft werden Felder auch gegrubbert oder Mulchsaat betrieben. Dies ermöglicht eine nachhaltige Bodenbearbeitung.

LOCATION

Location: Kirchlindach, Bern, Switzerland

No. of Technology sites analysed:

Geo-reference of selected sites
- n.a.

Spread of the Technology:

In a permanently protected area?:

Date of implementation: less than 10 years ago (recently)

Type of introduction
- ☐ through land users' innovation
- ☐ as part of a traditional system (> 50 years)
- ☐ during experiments/ research
- ☐ through projects/ external interventions
- ☑ Mund-zu-Mund im Dorf

CLASSIFICATION OF THE TECHNOLOGY

Main purpose
- ☐ improve production
- ☐ reduce, prevent, restore land degradation
- ☐ conserve ecosystem
- ☐ protect a watershed/ downstream areas – in combination with other Technologies
- ☐ preserve/ improve biodiversity
- ☐ reduce risk of disasters
- ☐ adapt to climate change/ extremes and its impacts
- ☐ mitigate climate change and its impacts
- ☐ create beneficial economic impact
- ☐ create beneficial social impact

Land use

Cropland
- Annual cropping: cereals - maize

Grazing land

Water supply
- ☐ rainfed
- ☐ mixed rainfed-irrigated
- ☐ full irrigation

Purpose related to land degradation
- ☑ prevent land degradation
- ☐ reduce land degradation
- ☐ restore/ rehabilitate severely degraded land
- ☐ adapt to land degradation
- ☐ not applicable

Degradation addressed

soil erosion by water - Wt: loss of topsoil/ surface erosion, Wo: offsite degradation effects

chemical soil deterioration - Cp: soil pollution

SLM group
- minimal soil disturbance

SLM measures


agronomic measures - A3: Soil surface treatment, A4: Subsurface treatment

TECHNICAL DRAWING

Technical specifications

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs
- Costs are calculated:
- Currency used for cost calculation: **n.a.**
- Exchange rate (to USD): 1 USD = n.a
- Average wage cost of hired labour per day: n.a

Most important factors affecting the costs
n.a.

Establishment activities
1. Maschine anschaffen: ausleihen, kaufen, Lohnarbeiter anstellen (Timing/ frequency: None)

Establishment inputs and costs

Specify input	Unit	Quantity	Costs per Unit (n.a.)	Total costs per input (n.a.)	% of costs borne by land users
Labour					
Maschine anschaffen: ausleihen, kaufen, Lohnarbeiter anstellen	ha	1.0	18000.0	18000.0	33.0
Total costs for establishment of the Technology				**18'000.0**	
Total costs for establishment of the Technology in USD				*18'000.0*	

Maintenance activities
1. Einsatz Onland-Pflug bei Wechsel von Kunstwiese zu Mais (Timing/ frequency: None)

NATURAL ENVIRONMENT

Average annual rainfall
- ☐ < 250 mm
- ☐ 251-500 mm
- ☐ 501-750 mm
- ☐ 751-1,000 mm
- ☑ 1,001-1,500 mm
- ☐ 1,501-2,000 mm
- ☐ 2,001-3,000 mm
- ☐ 3,001-4,000 mm
- ☐ > 4,000 mm

Agro-climatic zone
- ☐ humid
- ☑ sub-humid
- ☐ semi-arid
- ☐ arid

Specifications on climate
Thermal climate class: temperate

Slope
- ☐ flat (0-2%)
- ☑ gentle (3-5%)
- ☑ moderate (6-10%)
- ☐ rolling (11-15%)
- ☐ hilly (16-30%)
- ☐ steep (31-60%)
- ☐ very steep (>60%)

Landforms
- ☐ plateau/plains
- ☐ ridges
- ☐ mountain slopes
- ☑ hill slopes
- ☑ footslopes
- ☐ valley floors

Altitude
- ☐ 0-100 m a.s.l.
- ☐ 101-500 m a.s.l.
- ☑ 501-1,000 m a.s.l.
- ☐ 1,001-1,500 m a.s.l.
- ☐ 1,501-2,000 m a.s.l.
- ☐ 2,001-2,500 m a.s.l.
- ☐ 2,501-3,000 m a.s.l.
- ☐ 3,001-4,000 m a.s.l.
- ☐ > 4,000 m a.s.l.

Technology is applied in
- ☐ convex situations
- ☐ concave situations
- ☐ not relevant

Soil depth
- ☐ very shallow (0-20 cm)
- ☐ shallow (21-50 cm)
- ☑ moderately deep (51-80 cm)
- ☑ deep (81-120 cm)
- ☐ very deep (> 120 cm)

Soil texture (topsoil)
- ☑ coarse/ light (sandy)
- ☑ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Soil texture (> 20 cm below surface)
- ☐ coarse/ light (sandy)
- ☐ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Topsoil organic matter content
- ☐ high (>3%)
- ☑ medium (1-3%)
- ☐ low (<1%)

Groundwater table
- ☐ on surface
- ☐ < 5 m
- ☑ 5-50 m
- ☐ > 50 m

Availability of surface water
- ☐ excess
- ☑ good
- ☐ medium
- ☐ poor/ none

Water quality (untreated)
- ☑ good drinking water
- ☐ poor drinking water (treatment required)
- ☐ for agricultural use only (irrigation)
- ☐ unusable

Water quality refers to:

Is salinity a problem?
- ☐ Ja
- ☐ Nee

Occurrence of flooding
- ☐ Ja
- ☐ Nee

Species diversity
- [x] high
- [ ] medium
- [ ] low

Habitat diversity
- [ ] high
- [ ] medium
- [ ] low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation
- [ ] subsistence (self-supply)
- [ ] mixed (subsistence/ commercial)
- [x] commercial/ market

Off-farm income
- [ ] less than 10% of all income
- [x] 10-50% of all income
- [ ] > 50% of all income

Relative level of wealth
- [ ] very poor
- [ ] poor
- [x] average
- [ ] rich
- [ ] very rich

Level of mechanization
- [x] manual work
- [ ] animal traction
- [x] mechanized/ motorized

Sedentary or nomadic
- [ ] Sedentary
- [ ] Semi-nomadic
- [ ] Nomadic

Individuals or groups
- [ ] individual/ household
- [x] groups/ community
- [ ] cooperative
- [ ] employee (company, government)

Gender
- [ ] women
- [x] men

Age
- [ ] children
- [ ] youth
- [ ] middle-aged
- [ ] elderly

Area used per household
- [ ] < 0.5 ha
- [ ] 0.5-1 ha
- [ ] 1-2 ha
- [ ] 2-5 ha
- [ ] 5-15 ha
- [x] 15-50 ha
- [ ] 50-100 ha
- [ ] 100-500 ha
- [ ] 500-1,000 ha
- [ ] 1,000-10,000 ha
- [ ] > 10,000 ha

Scale
- [ ] small-scale
- [x] medium-scale
- [ ] large-scale

Land ownership
- [ ] state
- [ ] company
- [ ] communal/ village
- [ ] group
- [ ] individual, not titled
- [x] individual, titled

Land use rights
- [ ] open access (unorganized)
- [ ] communal (organized)
- [ ] leased
- [x] individual

Water use rights
- [ ] open access (unorganized)
- [ ] communal (organized)
- [ ] leased
- [x] individual

Access to services and infrastructure

health	poor	good
education	poor	good
technical assistance	poor	good
employment (e.g. off-farm)	poor	good
markets	poor	good
energy	poor	good
roads and transport	poor	good
drinking water and sanitation	poor	good
financial services	poor	good

IMPACTS

Socio-economic impacts

Socio-cultural impacts

community institutions	weakened	strengthened
conflict mitigation	worsened	improved
Improved livelihoods and human well-being	decreased	increased

Ecological impacts

surface runoff	increased	decreased
soil crusting/ sealing	increased	reduced
soil compaction	increased	reduced
Soil structure	decreased	increased

Off-site impacts

buffering/ filtering capacity (by soil, vegetation, wetlands)	reduced	improved

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns	very negative	very positive
Long-term returns	very negative	very positive

Benefits compared with maintenance costs

Short-term returns	very negative	very positive
Long-term returns	very negative	very positive

CLIMATE CHANGE

Climate-related extremes (disasters)
local rainstorm

not well at all ✓ very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- single cases/ experimental
- 1-10%
- 11-50%
- > 50%

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- 0-10%
- ✓ 11-50%
- 51-90%
- 91-100%

Has the Technology been modified recently to adapt to changing conditions?

- Ja
- Nee

To which changing conditions?

- climatic change/ extremes
- changing markets
- labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- Der Onland-Pflug fördert auch die Betriebsstrategie des Bauern hinsichtlich Humus-Aufbau.

Strengths: compiler's or other key resource person's view

- Der Onland-Pflug führt zu einer geringerer Bearbeitungstiefe von maximal 15cm. Damit wird die Bodenstruktur geschont und Verdichtung vermieden.

  How can they be sustained / enhanced? Onland-Pflug kann verschieden eingestellt werden. Dabei soll eine möglichst geringe Tiefe beibehalten werden. Dies erfordert technisches Wissen.

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome

- Der Anbau von Hackfrüchten ist eine Herausforderung, da er eine gewisse Tiefe benötigt. Die Agrarpolitik sollte auf Bearbeitungstiefen und Erosionsbekämpfung noch mehr Einfluss nehmen. Direktzahlungen sollten mit dem Schutz des Bodens enger zusammenhängen.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's viewhow to overcome

REFERENCES

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Full description in the WOCAT database
https://qcat.wocat.net/af/wocat/technologies/view/technologies_1283/

Linked SLM data
n.a.

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