Ploughing on the conventional plots (Balázs Madarász)

Conventional (contour-line and ploughing) tillage (Hungary)

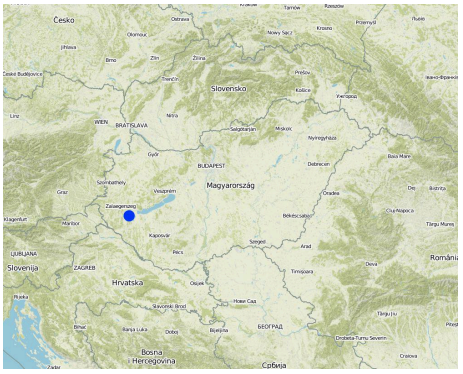
Hagyományos (szintvonalas és szántásos) müvelés (Hungarian)

DESCRIPTION

Conventional (contour-line and ploughing) tillage

The basis of the technology is the annual autumn ploughing. The ploughing and all other cultivation is carried out parallel to the contour lines. This way the erosion can be significantly decreased. The rotational cultivation aims at the reduction of the areal and fluvial erosion, at the repulsion of the weeds and at the attainment of the ideal state of the seedbed at the time of sowing. It is applicable anywhere bellow a certain slope angle. The only restriction is the excessively thin parcel structure.
Special education and investment are not required, it can be realised by the available instruments.

LOCATION



Location: Zala county, Zala hills, Zala, Zala county, Hungary

No. of Technology sites analysed:

Geo-reference of selected sites
- 17.0544, 46.678

Spread of the Technology: evenly spread over an area (0.1963 km^2)

In a permanently protected area?:

Date of implementation: more than 50 years ago (traditional)

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

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

Land use

Cropland
- Annual cropping: cereals - maize, cereals - wheat (winter)

Number of growing seasons per year: 1
Is crop rotation practiced? Yes

- [ ] 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

Water supply
- [x] rainfed
- [ ] mixed rainfed-irrigated
- [ ] full irrigation

Purpose related to land degradation
- [ ] prevent land degradation
- [x] 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, Wg: gully erosion/ gullying, Wm: mass movements/ landslides

physical soil deterioration - Pc: compaction

SLM group
- rotational systems (crop rotation, fallows, shifting cultivation)
- minimal soil disturbance

SLM measures

agronomic measures - A1: Vegetation/ soil cover, A3: Soil surface 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: **Hungarian Forint**
- Exchange rate (to USD): 1 USD = 195.8 Hungarian Forint
- Average wage cost of hired labour per day: 25.50

Most important factors affecting the costs

compacted soil surface> chiselling (loosening); steep slops>more fuel; nutrient supply>expensive inorganic fertilizers

Establishment activities

n.a.

Maintenance activities

1. ploughing (Timing/ frequency: autumn / annualy)

NATURAL ENVIRONMENT

Average annual rainfall
- [ ] < 250 mm
- [ ] 251-500 mm
- [x] 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
- [x] sub-humid
- [ ] semi-arid
- [ ] arid

Specifications on climate

Average annual rainfall in mm: 650.0

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

Landforms
- [ ] plateau/plains
- [ ] ridges
- [ ] mountain slopes
- [x] hill slopes
- [ ] footslopes
- [ ] valley floors

Altitude
- [ ] 0-100 m a.s.l.
- [x] 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)
- [x] moderately deep (51-80 cm)
- [x] deep (81-120 cm)
- [ ] very deep (> 120 cm)

Soil texture (topsoil)
- [ ] coarse/ light (sandy)
- [x] 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%)
- [x] 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

Is salinity a problem?
- [ ] Yes
- [ ] No

Occurrence of flooding
- [ ] Yes
- [ ] No

Species diversity
- [ ] 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
- [ ] 10-50% of all income
- [ ] > 50% of all income

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

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

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

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

Gender
- [ ] women
- [ ] 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
- [x] 50-100 ha
- [ ] 100-500 ha
- [ ] 500-1,000 ha
- [ ] 1,000-10,000 ha
- [ ] > 10,000 ha

Scale
- [ ] small-scale
- [ ] 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
- [ ] individual

Access to services and infrastructure

IMPACTS

Socio-economic impacts

Crop production	decreased	increased
farm income	decreased	increased

Socio-cultural impacts

SLM/ land degradation knowledge	reduced	improved

Ecological impacts

soil loss	increased	decreased
soil fertility	decreased	increased

Off-site impacts

downstream flooding (undesired)	increased	reduced
downstream siltation	increased	decreased
groundwater/ river pollution	increased	reduced

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

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ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology
- [x] single cases/ experimental
- [ ] 1-10%

Of all those who have adopted the Technology, how many have done so without receiving material incentives?
- [ ] 0-10%
- [ ] 11-50%

- [ ] 11-50%
- [ ] > 50%
- [ ] 51-90%
- [x] 91-100%

Number of households and/ or area covered
1 household

Has the Technology been modified recently to adapt to changing conditions?
- [ ] Yes
- [ ] No

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
- production increase
- no investment necessary
- decreased soil erosion

Strengths: compiler's or other key resource person's view
- decreased soil erosion
- production increase
- no investment necessary

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

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/en/wocat/technologies/view/technologies_1081/

Linked SLM data
Approaches: Conventional (contour-line and ploughing) tillage https://qcat.wocat.net/en/wocat/approaches/view/approaches_2650/

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