(Giovanni Quaranta)

Cutting of Ferns in degraded pastures to use as litter and fodder (Italy)

DESCRIPTION

Cutting of wild ferns for fodder production and to mitigate pasture degradation.

Ferns are considered pioneer plants because Wherever there is fertile, acidic and well drained land Ferns (Pteridium sp.) preceed shrub species and the encroaching of forest species. Ferns that develop on pastures are fairly un-palatable to grazing livestock and completely disregarded by animals when the plant is fresh. The plant is thus usually mowed down to clear pastures and make way for more palatable species which would otherwise be suffocated by the presence of ferns. However, once cut down, dried and gathered, ferns can be used during the winter months (when the animals are in sheds or stables), both as a source of fibre and as bedding in deep litter housing systems (in place of the more common use of straw).

Purpose of the Technology: Improve pasture quality and gathering of fodder/ litter

Establishment / maintenance activities and inputs: End of summer/beginning of fall farmers use to cut ferns in the fields where they are diffused. Usually they use tractor whit a cutting equipment. As they get dry (it takes from 3 to 6 days according to air temperature and humidity) the ferns are collected and stored for winter use, either as fodder or litter housing.

Natural / human environment: The context of production is characterised by a medium level of mechanisation (only the most demanding operations are carried out using mechanical means), the production system is essentially mixed, a small part is destined for personal consumption whilst the bulk of production is destined for local markets. The property is predominantly privately owned but also includes some public land, especially in the case of pasture land. Most farms in the area are livestock farms whilst the agricultural component is destined exclusively for private consumption. The technique is mainly applied on higher latitude pasture land (because of the presence of acidic soils) which are not particularly stony.

LOCATION

Location: castelsaraceno, Basilicata, Italy

No. of Technology sites analysed:

Geo-reference of selected sites
- n.a.

Spread of the Technology: evenly spread over an area (approx. 0.1-1 km2)

In a permanently protected area?:

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

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

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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

Grazing land

- Semi-nomadic pastoralism
- Ranching

Animal type: goats, sheep, cows

Water supply

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

Purpose related to land degradation

- [ ] prevent land degradation
- [ ] reduce land degradation
- [x] restore/ rehabilitate severely degraded land
- [ ] adapt to land degradation
- [ ] not applicable

Degradation addressed

biological degradation - Bs: quality and species composition/ diversity decline

SLM group

- pastoralism and grazing land management
- fodder production and mitigation pasture degradation

SLM measures

vegetative measures - V2: Grasses and perennial herbaceous plants

management measures - M5: Control/ change of species composition

TECHNICAL DRAWING

Technical specifications

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated:
- Currency used for cost calculation: **euro**
- Exchange rate (to USD): 1 USD = 0.74 euro
- Average wage cost of hired labour per day: 81.08

Most important factors affecting the costs

The technique does not require specific investment given that the necessary equipment is usually already available on farm in the case of medium to large size livestock farms. The work is carried out in autumn when the machinery are not generally in use as haying operations are usually finished in the summer months. If the farm does not own suitable machinery it can be rented at a cost of €40 per hour.

Establishment activities

n.a.

Maintenance activities

1. Cutting and gathering of fern (Timing/ frequency: Once a year)

2. Cutting and gathering of ferns (Timing/ frequency: Once a year)

Maintenance inputs and costs

Specify input	Unit	Quantity	Costs per Unit (euro)	Total costs per input (euro)	% of costs borne by land users
Labour					
Cutting and gathering of fern	ha	1.0	162.16	162.16	100.0
Equipment					
Cutting and gathering of fern	ha	1.0	108.1	108.1	100.0
Total costs for maintenance of the Technology				**270.26**	
Total costs for maintenance of the Technology in USD				*365.22*	

NATURAL ENVIRONMENT

Average annual rainfall
- [ ] < 250 mm
- [ ] 251-500 mm
- [ ] 501-750 mm
- [ ] 751-1,000 mm
- [x] 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: 1519.0
68% in winter and 15% in summer
Thermal climate class: temperate

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

Landforms
- [ ] plateau/plains
- [ ] ridges
- [x] mountain slopes
- [x] 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.
- [x] 1,001-1,500 m a.s.l.
- [x] 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)
- [x] shallow (21-50 cm)
- [x] moderately deep (51-80 cm)
- [ ] deep (81-120 cm)
- [ ] very deep (> 120 cm)

Soil texture (topsoil)
- [ ] coarse/ light (sandy)
- [ ] medium (loamy, silty)
- [x] 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
- [x] 5-50 m
- [ ] > 50 m

Availability of surface water
- [ ] excess
- [ ] good
- [x] medium
- [ ] poor/ none

Water quality (untreated)
- [x] 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
- [ ] high
- [x] 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
- [ ] manual work
- [ ] animal traction
- [ ] mechanized/ motorized

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

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

Gender
- [x] women
- [ ] men

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

Area used per household
- [ ] < 0.5 ha

Scale
- [x] small-scale

Land ownership
- [ ] state

Land use rights
- [ ] open access (unorganized)

- [ ] 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

- [ ] medium-scale
- [ ] large-scale

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

- [x] communal (organized)
- [ ] leased
- [x] individual

Water use rights

- [ ] open access (unorganized)
- [ ] communal (organized)
- [ ] leased
- [ ] 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

Crop production	decreased	increased
fodder production	decreased	increased
fodder quality	decreased	increased
production area (new land under cultivation/ use)	decreased	increased

Socio-cultural impacts

Improved livelihoods and human well-being	decreased	increased

Ecological impacts

habitat diversity	decreased	increased

Off-site impacts

damage on neighbours' fields	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

In the short term the advantage is an increase in surface and quality of valuable pastures. for the grazing animals. In the long term the application of this technique is important to prevent shrub encroachment.

CLIMATE CHANGE

Gradual climate change

annual temperature increase	not well at all	very well

Climate-related extremes (disasters)

local rainstorm	not well at all	very well
local windstorm	not well at all	very well
drought	not well at all	very well
general (river) flood	not well at all	very well

Other climate-related consequences

reduced growing period	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%
- [x] 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

- ferns are used in winter as fodder which absorbs the cost of cutting and gathering ferns from pastures and also helps improve pasture quality.

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

- the cutting of ferns is a simple, low-cost operation which brings great benefits to livestock farms.

How can they be sustained / enhanced? Greater exchange of information amongst target farmers on the benefits of clearing pastures.

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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Date of documentation: Julie 18, 2014

Last update: April 18, 2019

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Full description in the WOCAT database
https://qcat.wocat.net/af/wocat/technologies/view/technologies_1214/

Linked SLM data
n.a.

Documentation was faciliated by

Institution

- University of Basilicata - Italy

Project

- Catastrophic shifts in drylands (EU-CASCADE)

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