



SoilCare

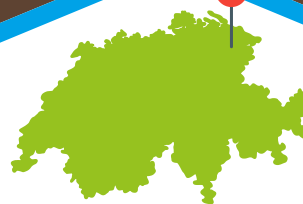
SOILCARE FOR PROFITABLE AND SUSTAINABLE CROP PRODUCTION IN EUROPE

Policy analysis:
PROMOTING SICs
ADOPTION IN
THURGHAU,
SWITZERLAND

SOIL HEALTH RELATED PROBLEMS ON SITE



Soil compaction Low soil organic carbon



SOIL-IMPROVING CROPPING SYSTEMS FOR INCREASING SOIL HEALTH IN THURGHAU, SWITZERLAND

The main soil threats in Switzerland include low organic carbon content and compaction. SICs tested at the study site to address these soil threats include:

1. **Compaction alleviation measures (Controlled traffic management on grass verges)**
2. **Integrated nutrient management (Under-foot fertilisation after CULTAN procedure)**
3. **Green manure in combination with minimum tillage (Green manuring and minimum tillage applied between crop rotations).**

The SICs above present important practices that might benefit soil health if widely taken up. The main aim of this study was to formulate policy alternatives and actions and to facilitate the adoption of SICs.

Research indicates that several factors shape the success or failure of policy instruments in Thurgau, Switzerland, and the uptake of SICs tested in the study site region. These factors include:

- **Lack of policies incentivising development or use of more efficient machinery**
- **Costs of SICs adoption**
- **Weak monitoring and enforcement**
- **Lack of knowledge and effective dissemination**
- **Insufficient/biased information available**
- **Market pressures favour short-term priorities over long-term investment in soil health**
- **Reluctance to change due to perceived peer pressure and closed farming community**
- **Self-perception as "food suppliers"**

Authors

Alicia McNeill, Melanie

Muro, Tugce Tugran, Zuzana Lukacova, Charlotte-Anne Chivers

Contributors

Alexandra Gavilano, Jérémie Loup, Abdallah Alaoui – Centre for Development and Environment, University of Bern

FACTORS AFFECTING THE UPTAKE OF GREEN VERGES FOR COMPACTION ALLEVIATION

Barriers to adoption

- Lack of knowledge transfer
- Effort/practicability
- Time taken before effects become visible
- GPS required, width of parcel, material quality
- D2 system does not fit (e.g., flower strips in favour of functional biodiversity)

Factors encouraging adoption

- More yield with less effort, including manuring input
- Improved soil activity (less compaction)
- Green strips always passable

FACTORS AFFECTING THE UPTAKE OF CULTAN FERTILISATION

Barriers to adoption

- Expensive, price must lower at every level
- Stony/compacted/dry soils
- Yeast concentration, working width, material quality, specialist required for the injection
- Dominance of the fertiliser industry
- Principles of Agricultural Crop Fertilisation in Switzerland
- Sulphur content

Factors encouraging adoption

- Long term pricing
- Increased humus content in soils
- Homogeneous and raw soils, flat roots, legumes
- Precise fertilisation, chrome steel
- Provides side business



@SoilCare_eu



The SoilCare project is funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No. 677407.



POLICY SHORTCOMINGS AND OPPORTUNITIES FOR FACILITATING THE UPTAKE OF SICS

The table below provides an overview of policies promoting the full range of SICS covered by the SoilCare project. Several policies contain provisions which allow the cantons to define measures to prevent soil erosion and deterioration of soil fertility, and which might include different SICS. Compliance with these measures is often linked to financial support paid out to farmers (under the Direct Payment Ordinance) and can also involve penalties if agricultural practices result in soil losses (under the Soil Damage Ordinance). Compaction alleviation measures, the use of cover crops, reduced tillage, and green manure, the SICS tested at the study site are regulated and incentivised to some extent: there are no dedicated policies regulating or incentivising controlled traffic management methods to reduce compaction other than through the pieces of legislation mentioned above. The use of crop rotation is promoted by the main national and cantonal agricultural policies. Green manure is not explicitly mentioned but the crop rotation requirements above can potentially lead to cover crops being used as green manure. In addition, the Direct Payment Ordinance stipulates that nutrient circuits should be closed as far as possible which might indirectly promote the use of green manure. Reduced tillage practices may be considered as soil protection measures under the same Ordinance and could therefore be eligible for financial support.

Red circles = SICS uptake promoted through existing mandatory, economic, or voluntary policy instruments in Thurgau, Switzerland. Blue circles = SICS uptake promoted as part of the wider SoilCare project.

NATIONAL POLICIES	CROP ROTATION	GREEN MANURES, COVER CROPS, CATCH CROPS	INTEGRATED NUTRIENT MANAGEMENT	EFFICIENT IRRIGATION	CONTROLLED DRAINAGE	REDUCED/NO TILLAGE	INTEGRATED PEST MANAGEMENT	SMART WEED CONTROL	SMART RESIDUE MANAGEMENT	CONTROLLED TRAFFICKING	INTEGRATED LANDSCAPE MANAGEMENT
Federal Act on the Protection of the Environment	●	●	●	●	●	●	●	●	●	●	●
Ordinance on Protection of Waterbodies			●		●		●	●			
Soil Damage Ordinance	●	●	●	●	●	●	●	●	●	●	●
Federal Act on Agriculture	●	●	●	●	●	●	●	●	●	●	●
Direct Payment Ordinance	●	●	●	●	●	●	●	●	●	●	●
Federal Chemicals Act							●	●			
Chemical Risk Reduction Ordinance			●				●	●			
Ordinance on Plant Protectants							●	●			
Fertiliser Ordinance			●								



Red circles = SICS uptake promoted through existing mandatory, economic, or voluntary policy instruments in Thurgau, Switzerland. Blue circles = SICS uptake promoted as part of the wider SoilCare project.

REGIONAL POLICIES	CROP ROTATION	GREEN MANURES, COVER CROPS, CATCH CROPS	INTEGRATED NUTRIENT MANAGEMENT	EFFICIENT IRRIGATION	CONTROLLED DRAINAGE	REDUCED/NO TILLAGE	INTEGRATED PEST MANAGEMENT	SMART WEED CONTROL	SMART RESIDUE MANAGEMENT	CONTROLLED TRAFFICKING	INTEGRATED LANDSCAPE MANAGEMENT
Act on Agriculture	●	●	●			●	●		●	●	
Ordinance on Structural Improvements in Agriculture					●						●

POLICY RECOMMENDATIONS

Based on the results of this study, the following policy recommendations can be made:

CONSIDER INTRODUCING WEIGHT LIMITATIONS FOR AGRICULTURAL MACHINERY INTO LEGISLATION



ESTABLISH BETTER MONITORING AND ENFORCEMENT MECHANISMS

Consider introducing weight limitations for agricultural machinery into legislation: for road vehicles, legislation establishes limitations on maximum weight. This is lacking for agricultural machines and should be integrated in existing agricultural legislation or a new, dedicated technical standard. In addition, farm advisory services need to include information on lighter vehicles farmers may use in the services they offer.

Establish better monitoring and enforcement mechanisms: while it was found that there are several policies already in place that – directly and indirectly - regulate and incentivise different SICS, stakeholders report that outcomes on soil health are limited due to weak implementation and enforcement mechanisms. It is clear mechanisms for checking compliance with existing regulations need to be strengthened and expanded. Performance indicators and measurements need to be clearly specified and monitored.





FACILITATE THE EXTRACTION OF AMMONIA FROM SEWAGE TREATMENT PLANTS

The cost of applying the CULTAN procedure could be reduced if ammonia extracted from sewage treatment plants could be made available to farmers. This might require the investment in research on different methods for ammonia recovery by public institutions, a dissemination of findings and technologies and a subsequent adaptation of current guidelines on “Principles of Agricultural Crop Fertilisation in Switzerland” (PRIF).

REWARD ENVIRONMENTAL BENEFITS GENERATED BY SICS AND TALK ABOUT IT



Market forces need to be counterweight with subsidies rewarding the environmental benefits generated through the SICS to make their uptake more appealing to farmers. It will be equally important to continue to educate consumers about the advantages and disadvantages of conventional farming practices vs. sustainable practices to ensure increased demand for sustainably produced products and encourage the retail sector to make these more widely available to all sections of society. An innovation award could be an effective instrument to create awareness for sustainable producers and production methods amongst consumers and farmers alike.

MAKE SOIL HEALTH A STRONGER COMPONENT OF VOCATIONAL TRAINING AND EDUCATION



PROVIDE BALANCED INFORMATION AND ESTABLISH OPPORTUNITIES FOR PEER-TO-PEER LEARNING

Make soil health a stronger component of vocational training and continued education of farmers: the move from conventional practices to SICS and sustainable agricultural practices requires a shift in attitudes as well as knowledge. Soil, as the main medium on which food and feed are grown, should feature highly on the curriculum for farmer training, be it basic vocational or continued adult learning. Farmers also need to be shown how to observe and measure soil changes – using simple methods and instruments - to make the benefits of SICS adoption visible in the short-term (where possible).

Provide balanced information and establish opportunities for peer-to-peer learning: personal conviction of farmers to adapt to new practices is a powerful tool in the face of multi-layered challenges. Education plays a very important role in that regard. Therefore, unbiased knowledge and information must be made accessible to farmers. This information should not favour any particular interest. Some of the practices benefitting soil will require farmers to learn about these techniques, their application to different conditions as well as their benefits to change their misconceptions about these methods. Since farmers tend to place a lot of trust in their peers, establishing a network of lighthouse farms demonstrating how to use and adapt different SICS in the region would effectively support farmers in learning and sharing experiences about these practices.