

Sustainable Soil Management: Its perception and the need for policy Intervention in the European context

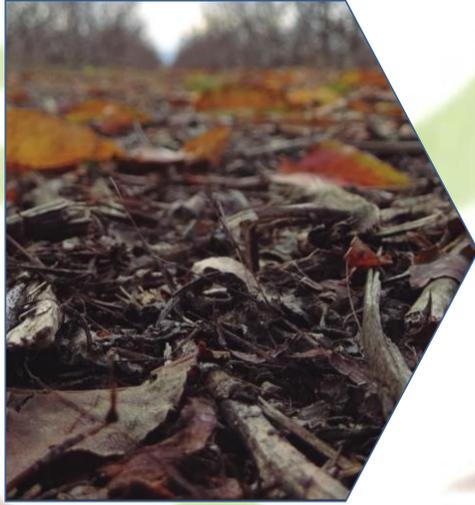
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Soil threats	Soil functions	Soil based ecosystem services
erosion	habitat (roots, soil organisms)	1. Food, feed, fibre and biofuel production
SOM decline	nutrient capture and cycling	6. Biodiversity conservation
contamination	decomposition (incl. degradation of pollutants)	3. Erosion control
sealing	soil structure maintenance	5. Pest and disease control
compaction	biological population regulation	2. Water quality and supply (incl. pollutant attenuation and degradation)
biodiversity loss	water cycling (infiltration, retention, percolation)	4. Climate regulation
salinization	SOM dynamics (humus formation, C sequestration)	
landslides/floods		

Sustainable Soil Management must be able to address soil threats, guarantee soil functions and deliver ecosystem services

Sustainable soil management must contribute to and maintain the key functions that are expected a good-quality soil to fulfil. These functions are of physical (structure), hydrological, chemical and biological nature. Only a well-functioning soil resists (to a certain point) or is resilient to the major soil threats as identified by the EU Soil Thematic Strategy. It is also pre-condition for a soil to deliver the manifold Ecosystem Services as many of them are basically soil-mediated. Thus, the mitigation of soil threats and the delivery of Ecosystem Services are closely interlinked with soil functions.




Natural "good" soil conditions ↔ Principles of Sustainable Productive Soil Management "Conservation Agriculture (CA)"

Soils in natural, undisturbed ecosystems are considered as a reference for good soil conditions under a given agroecological setting. Therefore, Sustainable Soil Management means to maintain or contribute to achieve such 'good' soil conditions. However, this is only attainable if agricultural soil management succeeds to mimic natural soil conditions and to respect as much as possible three basic principles that we can find in most natural environments. These are: a) Minimum mechanical soil disturbance to allow maintain soil structure; b) Permanent organic soil cover to protect the soil from the impact of rain and wind and to avoid soil water evaporation and c) Plant and crop diversity or rotations to reduce pest and disease pressure and to allow for an optimized and efficient use of inputs..

How EU addresses Sustainable Soil Management

Compulsory measures linked to Direct Payment schemes:

- ☞ **Cross-compliance** (Good Agricultural and Environmental Condition – **GAECs**)*
 - ☞ GAEC 4: Minimum soil cover
 - ☞ GAEC 5: Minimum land management reflecting site specific conditions to limit soil erosion
 - ☞ GAEC 6: Maintenance of soil organic matter level through appropriate practices
- ☞ **"Greening" Measures***
 - ☞ Crop diversification on arable land
 - ☞ Having ecological focus areas (EFA) on arable land (5%)
 - ☞ Maintenance of the existing permanent grassland

* However: Flexibility for Member States to tailor GAECs; GAECs not applicable to all arable land; No monitoring of SOM levels; Greening does not require crop rotations; EFA only 5% (many other measures eligible)

Voluntary measures decided by Member States or Regions:

- ☞ **Rural Development Program**
 - ☞ Agri-Environmental Measure Schemes** - Compensation for cost incurred and income forgone
 - ** These schemes may include payments for the practice of Conservation Agriculture principles

Conclusions and proposals for policy intervention in Europe

- ☞ Soil quality/health and consequently Sustainable Soil Management are on top of the political agenda;
- ☞ The principles of Conservation Agriculture (CA) have proven to work in most agro-ecological regions and to succeed in providing high productivities while reducing costs and enhance environmental performance of farming;
- ☞ Despite the existing knowledge on how to manage soils sustainably, the traditional, tillage-based mind-set still prevails in many regions;
- ☞ In Europe, agriculture is strongly oriented by the Common Agricultural Policy (CAP) and farmers' decision-making is heavily driven by supports through Direct Payments (Pillar 1 of CAP) and/or the Rural Development Programs (Pillar 2 of CAP);
- ☞ A clear policy and institutional support is therefore needed to promote the adoption of CA and to mainstream its principles both in annual and perennial cropping systems;
- ☞ The most promising approach in terms of policy intervention would be the recognition of CA as equivalent to the present greening measures, which would provide incentives to farmers and extend the benefits of the Ecological Focus Area of only 5% of the farmland to a much greater percentage of the annual and perennial cropland;
- ☞ Especially in Europe, Conservation Agriculture is associated with an increased use of herbicides, above all glyphosate. This negative and wrong perception, especially with regard to the total input of agrochemicals represents certainly the most important hindrance for a broad acceptance of CA as a sustainable farming approach.
- ☞ Science-driven evidence is needed to proof that CA is capable to reduce external inputs in the medium and long term, and that any perceived drawbacks are more than offset by the overall performance of CA.

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