A global initiative to combat desertification

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17 JUNE WORLD DAY TO COMBAT DESERTIFICATION
ENHANCING SOILS ANYWHERE ENHANCES LIFE EVERYWHERE

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Info-brief 2

Sustainable Land Management enhances our living soils

The DESIRE Project shows how this can be achieved

We rely on land based ecosystems to provide important benefits for human livelihoods such as: our food, fodder for animals, construction materials, climate regulation and clean water. To achieve this provision sustainably, it is important to promote a balance between activities such as agricultural production, and respect for nature and the environment. The EU's legal framework for Rural development 2007-2013 emphasises the need for better integration of agricultural and environmental policies.

The *DESIRE Project* (www.desire-his.eu) is extending this approach to a number of regions around the world, with a range of land uses affected by desertification. An important benefit of sustainable land use is the maintenance or improvement of biodiversity. New initiatives such as the EU's Biodiversity Information System for Europe will help improve the integration of coherent land use policies and synergies around the world.

Land degradation in dryland areas dramatically affects the biological diversity of landbased ecosystems. This is because of the effects on plant organic matter, plant roots, and organisms in the soil: like termites, moles and earthworms, fungi and bacteria. This living system below the ground determines the biological diversity of land above the ground, and ultimately land productivity and other benefits that land provides.

The synergies between soil biodiversity and sustainable land management mean that any action that conserves water and improves soil quality will also enhance soil habitats. The *DESIRE Project* is developing strategies to remediate land degradation in dryland areas. The following examples demonstrate how these strategies maintain or enhance soil biodiversity.

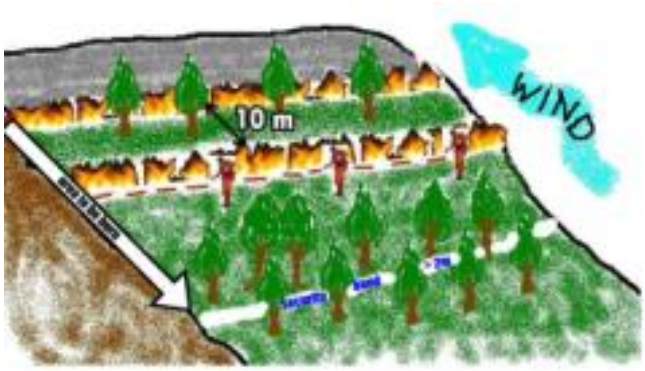
Regular resting of rangeland allows vegetation and soils to recover from grazing

In **Médenine, Tunisia** areas of rangeland left without grazing for 3-5 years improve the plant cover and diversity for the next period of grazing. This helps to avoid land degradation from over-grazing. An increase of infiltration, soil organic matter and runoff control are secondary benefits.

Resting rangeland in Béni Khédache,-El Athmane, Tunisia

Overgrazing can result in desertification in Tunisia

Prescribed fire minimises the extent of plant and soil destruction



Plan for prescribed fire implementation, that leaves vegetation belts intact and avoids widespread soil erosion. ESAC 2009 ©

In the **Goís region of Portugal** controlled fires are used to control the bulk and extent of forest or scrubland biomass fuel, with the aim of enhancing grazing areas and limiting the spread of the inevitable wildfires. Prescribed fire helps to maintain habitat diversity and to reduce invasion by alien species. In contrast to wildfires, prescribed fire is expected to reduce soil erosion and to improve physical and chemical soil properties.

The prescribed fire technique has been applied in the Goís area by the National Forest Authority, supported by various local stakeholder groups.

Minimum tillage avoids leaving the soil surface bare and reduces susceptibility to erosion and moisture loss

In the Secano Interior, Chile, crops are grown with minimum disturbance of the soil through tillage. In the *DESIRE Project* experiment, it was applied to oats-wheat rotations to improve the topsoil structure, to reduce soil erosion and to increase the infiltration capacity and organic matter content of the soil. This practice may also increase the diversity of macro- and micro- flora and fauna in and on the soil. First results showed reduced soil compaction, increased water retention and crop water extraction at later growth stages of the crops.

Minimum tillage in Secano Interior, Chile

Optimum chances for enhanced sustain-ability and biodiversity, and avoidance of land degradation, can be achieved by good management, as in the example below.

Prescribed fire in Goís, Portugal

Well-managed olive orchards and grazing in Crete

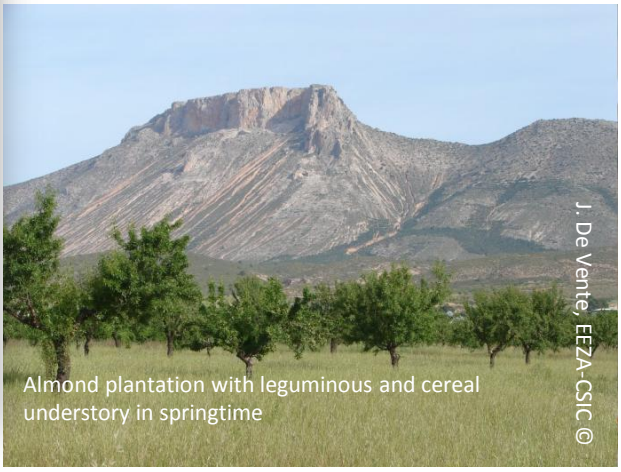
Mulching, reduced tillage and crop residues can be used to restore degraded land

Mulching and crop residues are used in maize cultures in the **Cointzio area in Mexico** in an attempt to restore this heavily overgrazed land. The technique aims to increase soil fertility, increase soil water infiltration capacity and enhance soil biological activity.

Runoff and sediment collector on a plot with emerging corn

The ecosystem approach to agriculture maintains a sustainable balance

Under ecological agriculture, soil organic matter and soil biological activity increase, with positive effects on soil structure, soil fertility and infiltration capacity. In the DESIRE experiment, the use of green manure and reduced tillage was compared to traditional almond production in the **Guadalentín region of Spain**. Beneath the almond trees, green manure provides nutrients and protects the soil from erosion in winter, when no ploughing is performed. The highest harvest was observed in the field with green manure.



Almond plantation with leguminous and cereal understory in springtime

Compiled by Simone Verzandvoort and Nichola Geeson, June 2010

For more information see:

• The DESIRE Harmonised Information System: www.desire-his.eu and DESIRE website: www.desire-project.eu

References and further reading

• Global Biodiversity Outlook GBO-3
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• Message of Luc Gnacadja, Executive Secretary, UN Convention to Combat Desertification on the occasion of the International Day on Biological Diversity 22 May 2010
• http://en.wikipedia.org/wiki/No-till_farming
• WOCAT database on Technologies (accessed June 2010): POR02, TUN11, SPA05, CHL01
•The Biodiversity System for Europe http://biodiversity.europa.eu/

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SIXTH FRAMEWORK PROGRAMME

DESIRE
A global initiative to combat desertification

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