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INNOVATIVE AND SUSTAINABLE MEASURES OF
KEEPING WATER IN THE AGRICULTURAL LANDSCAPE



The greater increase in drought conditions in the 21st century, especially in Southern Europe, will raise competition between different water users, such as agriculture, industry, tourism, and households.

Droughts are expected to have negative effects on agriculture and livestock farming in the upcoming years.

Rising temperatures will increase evapotranspiration and crop water requirements, which in many cases can only be satisfied by practicing irrigation. It is therefore of utmost importance for landowners to maintain certain skills and knowledge to effectively manage water resources under climate change conditions.

Key Facts about Water

Although only 7-8 % of the total agricultural area in Europe is irrigated, about 40-45 % of total water use in Europe is allocated to crop irrigation annually.

Southern Europe uses about 95 % of the total volume of irrigation water at the European level.

In many cases, water is abstracted off-stream and conveyed over long distances, through open channels, ditches, or pipes, in order to provide water for irrigation. During

this transportation, a portion of the water is lost via evaporation or leakages in the conveyance systems, resulting in a reduction in irrigation efficiency, of between 50 and 70 %.

Main Impacts of Droughts on Agriculture

Droughts affect the vitality of crops and increase the need for additional irrigation.

Under drought conditions, no intermediate crops are used, usually because of the fear that drought will cause the subsequent failure of the main crops.

When rain is most needed but not available, a lack of water for crops or livestock leads to poor production.

Impacts of Droughts on the Land

Increased evapotranspiration during drought leads to a decrease in surface and soil moisture. This, in turn, leads to the need for more frequent irrigation of crops with larger amounts of water.

Soil fertility is reduced.

Soil salinization phenomena are observed to limit the ability to cultivate certain salt-sensitive crops.

The heavy rainfall accompanying drought events results in leaching and soil erosion, as well as the removal of fertile land.

Water Management in the Landscape

Innovative water management practices and strategies are a prerequisite for agriculture to remain sustainable and serve the needs of a growing global population.

Examples of Innovative Water Management

Drip irrigation systems deliver water directly to plant roots, reducing the evaporation that occurs with sprinkler irrigation systems.

Irrigation scheduling. Smart water management is not only about how water is delivered but also when, how often, and how much.

Crops resistant to drought. Growing crops that are appropriate to the region's climate is another way in which farmers achieve higher yields per drop.

Dry farming relies on soil moisture to produce crops during the dry season, avoiding artificial irrigation.

Rotational grazing is a process in which animals are moved between pastures to promote their regeneration.

Compost, or decomposed organic matter used as fertilizer, has been found to improve soil structure and increase its water-holding capacity.

Cover crops reduce weeds, increase soil fertility and organic matter and help prevent erosion and compaction.

Conservation tillage uses specialized plows or other implements that partially till the soil but leave at least 30% crop residue on the surface.

Organic agriculture has higher yields than conventional fields in years of drought be-

cause organic methods help conserve soil moisture. Healthy soil that is rich in organic matter and microbial life serves as a sponge that provides moisture to plants. Organic fields can enrich groundwater supplies by up to 20 %.

How to Support Farmers

Farmers face challenges due to climate change which also implies an increased risk of yield losses due to drought or extreme events, such as storms, heavy rainfall, hail and floods.

It is necessary to increase the technical knowledge and professionalism of farmers to make farms and cooperatives more competitive.

Succession processes should facilitate the renewal of generations. Moreover, it will be necessary to raise the professional profile through more training, the development of new skills, and the possibility of providing advice on technical, bureaucratic, and financial aspects.

More "motivating" programs should be adopted and implemented to improve irrigation systems. In addition, the adopted measures should promote "greening" in terms of rewarding farmers who comply with good environmental practices in relation to pastures, crop rotations, and areas of ecological interest.

