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Water & agriculture: adaptive strategies at farm level

What farm-level adaptation strategies exist or can be developed to deal with water scarcity?

The 19 experts of the EIP-AGRI Focus Group on Water and Agriculture collected and classified these strategies into three main categories:

- ▶ practices to increase water availability for crops and livestock,
- ▶ the efficient use of water (including irrigation efficiency), and
- ▶ farm resilience under water scarcity

They highlighted that many other factors than water affect productivity in both rainfed and irrigated commercial farms, and that these must be understood and dealt with. Based on their practical experience, the experts suggested 5 types of actions:

- ▶ Manage soil and residues to improve water availability: increasing soil organic matter, conservation agriculture, soil mulching, controlled traffic, sporadic subsoiling if necessary
- ▶ Choose improved well-adapted cultivars and introduce new drought-tolerant crops
- ▶ Use tools such as decision support systems to improve crop/farm management
- ▶ Use tools to improve irrigation scheduling: plant sensors, on line services for irrigation scheduling, regulated deficit irrigation, precision irrigation
- ▶ Manage water quality and salinity

To facilitate the adoption of best practices:

- ▶ Clearly identify economic and/or environmental benefits, in the short and long term
- ▶ Identify and solve any technical and operational problems through knowledge exchange among all concerned, such as farmers, equipment manufacturers, advisers, consumers and others
- ▶ Set up demonstration plots, preferably on real farms
- ▶ Provide clear user guides when promoting complex techniques

“Water scarcity and climate change are serious challenges for agriculture, worldwide. A wide range of multidisciplinary strategies need to be adopted, from breeding to soil and crop management, to secure the sustainability of EU yields and quality of production”.

- Brunella MORANDI (Italy), expert from the EIP-AGRI Focus Group on Water and Agriculture -

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Ideas for Operational Groups

- ▶ Adapt conservation agriculture to local conditions, emphasising permanent ground cover and proper tillage practice
- ▶ Develop improved crop rotation and crop diversification, including aromatic and medicinal plants
- ▶ Use spring-summer crops tolerant to low temperatures for earlier sowing
- ▶ Determine local benchmarks and use them as references for irrigation and crop performance
- ▶ Use soil/plant sensors for supplemental irrigation and/or regulated deficit irrigation and optimise irrigation to crop water balance
- ▶ Use precision irrigation aided by remote sensing
- ▶ Develop innovative solutions for using alternative water sources, maybe with poor water quality

Research needs from practice

- ▶ Develop on-farm research to evaluate strategies in terms of water conservation, and agronomic, economic and environmental impact
- ▶ Focus on long-term studies to show benefits of strategies aiming at increasing soil organic matter: conservation agriculture, mulching, cover crops, green manure, crop rotation
- ▶ Calibrate and evaluate decision support systems for local conditions; make them more user-friendly; and show clear benefits when using them
- ▶ Develop cost-effective, easy to use plant-based sensors to monitor the actual crop water in different crop species
- ▶ Validate and fine-tune regulated deficit irrigation protocols and precision irrigation approaches to a broader range of different species and agricultural systems
- ▶ Develop economically viable water recycling on-farm
- ▶ Evaluate vertical closed cycle systems that use little land and water

For more ideas for Operational Groups and research needs please see the Focus Group report

Other recommendations

On-farm strategies must be combined with efforts at a higher scale than the farm to be effective globally at conserving water and making an efficient use of it.

More information

Focus Group page	Inspirational ideas: <ul style="list-style-type: none">• Preserving soil organic matter and protecting water sources• ‘Mission possible’ to preserve wetlands in Spain• Dealing with water scarcity
Final report	
Brochure	

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