

Research-based participatory approaches for adopting Conservation Agriculture in the Mediterranean Area



Deliverable 3.2

Set of technical improvements selected to be tested in open test-fields

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PRIMA
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Executive summary

One of the goals of WP3 is to define the main research needs for smallholder to test innovative solutions regarding several CA agricultural aspects under different conditions.

Based on the evidences reported in Deliverable 3.1, this Report (namely Deliverable 3.2 - Set of technical improvements selected to be tested in open test-fields) proposes some improvements to be tested in open test-fields according to farmers possibilities and CA fundamentals.

Possible improvements to be tested are organized according to the 4 key themes identified by WP3 as highly relevant to improve the CA management (weed control, seeding, crop fertilization and crop rotation).

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1. Materials and methods

The analysis of the focus groups conducted in the 8 CAMA partner Countries returned a quite homogeneous picture of farmers' needs in view of CA adoption (see Deliverable 3.1). This allows the identification of a unique set of technical improvements according to the 4 key themes identified by WP3 as highly relevant to improve the CA management (weed control and residue management, seeding, crop fertilization and crop rotation).

Theme 1: Weed control and residue management

It is crucial to upgrade strategies for weed control, to reduce/eliminate chemical herbicides in CA, and for management of crop residues to ensure good establishment of the next crop. Under CA, weeds should be controlled with alternative ways such as cover crops with highly competitive ability and/or with allelopathic properties. Green or dry crop residues that will be left on the field should contribute to weed control.

Theme 2: Seeding

Seeding a crop over crop residues, particularly when the latter are in high quantity, can be difficult and can lead to a failure of CA application. No till seeding, in particular, can be more difficult in case of clayey moist and compacted soils.

Theme 3: Crop Fertilization

CA-adapted N fertilization monitoring system, including fertilizers innovations when available (slow release, low N volatilization products, nitrification inhibitors) can be crucial for successful transition to CA.

Crop Rotation

Structuring and testing new crop rotations adapted to specific contexts and from economic, agronomic and environmental points of view is one of the main improvements to be developed to foster a successful transition to CA .

2. Set of technical improvements selected to be tested in open test-fields

Theme 1: Weed control and crop residues

- Strategies for the control of specific weeds such as *Veronica* and *Bromus*
- Testing new strategies for weed control without glyphosate
- Tools for mechanical control of cover crops
- Testing strategies for the effective coexistence of grazing and crop residues conservation
- Testing strategies for effective management of corn residues

Theme 2: Seeding

- Strategies for the cultivation of market-gardening crops according to CA principles
- Evaluation of the effects of different settings on direct sowing machines (e.g., sowing depth in different soil conditions)
- Definition of appropriate strategies to avoid soil compaction in CA systems
- Testing simple and cheap installation procedures of cover crops (open field distribution, overseeding etc)
- Testing best crop rotation for clayey soil structuring, also to avoid soil compaction.

Theme 3: Crop fertilization

- Testing methods for manure and slurry application in line with environmental rules in NT conditions
- Application of CA-adapted N fertilization monitoring systems

Theme 4: Crop rotation

- Strategies for anticipating installation of summer crops and cover crops in drought regions (e.g., intercropping, overseeding)
- Testing drought-tolerant varieties for summer crops and cover crops.