Farming strategies for improving the sustainability of Mediterranean cropping systems

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CONTEXT & CHALLENGES
(Based on literature review)

Mediterranean area
- Mediterranean region is a highly vulnerable area, characterised by erratic rainy season and several environmental constraints.
- Climate change will severely shrink water resources in the near future (Falloon and Betts 2010), and agriculture production will be threatened by a rising competition for scarce resources and an increase of food demand (Quaranta et al. 2016).

Mediterranean agriculture
- The intensification of agricultural practices has led to soil and water degradation phenomena. The reliance on external inputs and non-renewable resources should be reduced, without drastically lowering crop yield (Lichtfouse et al., 2009).
- The challenge for Mediterranean agriculture is to find a trade-off between the increasing food demand and the conservation of non-renewable resources.
OBJECTIVE & HYPOTHESES

Objective(s) / Research question(s)

- Develop sustainable agricultural production to preserve soil and water compartments in a medium-term, with emphasis on low-input agro-ecosystems.
- Climate change adaptation and mitigation strategies will be assessed comparing alternative practices with more traditional ones, using field measured data and model-based approach.

Conceptual framework

Hypotheses

- Low-input systems could have synergic effect on vulnerable agricultural systems, by increasing soil water availability, improving nutrient use efficiency, and reducing GHG emissions.
- The beneficial effects of alternative strategies for farmers and consumers could be assessed by modelling scenario approach.
METHODOLOGY

Project work plan:

- Establishment of two-years field trials comparing representative Mediterranean agronomic systems designed by each partner of the project.
- Agronomic and environmental effect of alternative strategies in terms of: i) water and soil analyses; ii) crop nutrient and water use efficiency; iii) crop yield and quality.
- Testing, calibrating and validating crop/soil models for predicting the crop production, under different agronomic managements and scenarios, on medium-long term.
- Economic evaluation taking into account environmental (water-nutrients saving, carbon sequestration, etc.) and socio-economic relevance.

INVolVEMENT OF Stakeholders

- Farmers, Cooperatives, Technicians and Regional Agriculture and Environmental Department
EXPECTED RESULTS / IMPACT
(INNOVATION)

- The main project’s expected results will include the optimisation and the spreading of novel management strategies aimed to improve soil quality and to enhance resources use in sustainable managed agricultural system.
- Increase the knowledge of the influence of alternative strategies on plant/soil.
- Develop a collaborative multi-actor environment to support the intensive farm sector transition into sustainable agriculture.
PROPOSED PARTNERSHIP

Partner 1: CREA-RPS (Rome, Italy)

- CREA-RPS is a National Research Council with general scientific competence within the fields of agriculture, food, and forestry. CREA-RPS is involved in nitrogen nutrition and agricultural production; improvement of the qualitative characteristics of agricultural products; strategic importance of the soil for the environmental sustainability: soil-water functions, soil and environmental monitoring, GIS spatialization and plant-soil models.

Partner 2: Other Research Centres in Mediterranean Countries
Thank you for your attention!