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Life MIDMACC Adaptando la media montaña al cambio climático

Influence of agronomic practices in soil water content in mid-mountain vineyards

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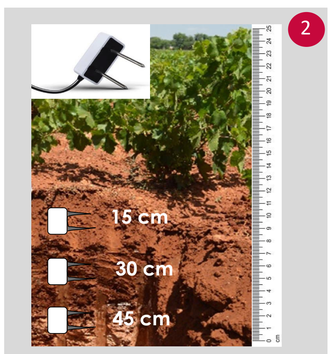
INTRODUCTION

In the context **of LIFE MIDMACC project,** several pilots have been installed in **vineyards** in **mid-mountain** areas of Catalonia and La Rioja to test **well-established agronomic practices** to **increase the adaptation of Mediterranean mid mountain vineyards to climate change**. The project intends to evaluate the influence of those practices on soil water availability and biodiversity and the effects on grapevine performance (yield and quality).

OBJECTIVE
The aim of this poster is to asses the effects of cover crop on soil water content.

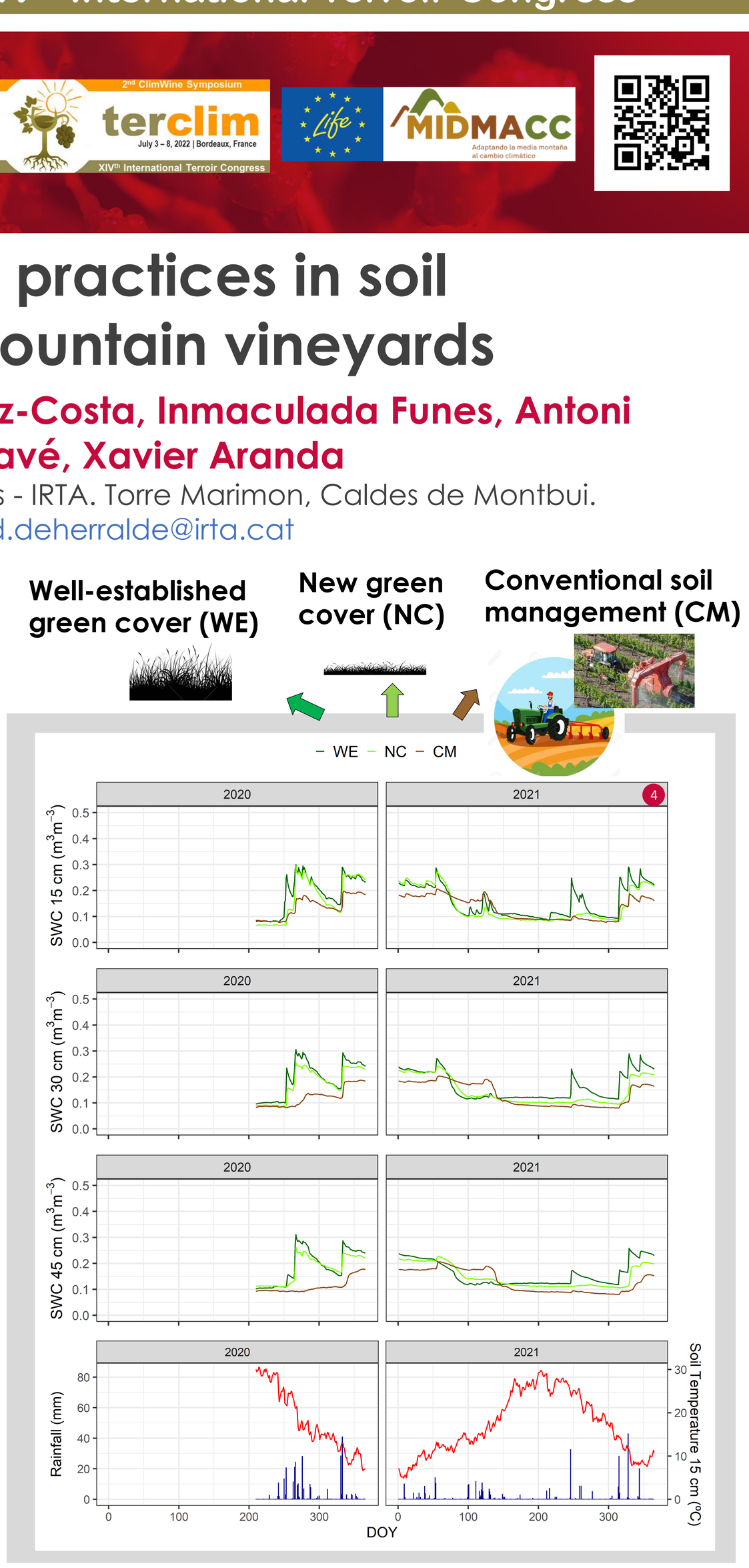
MATERIAL & METHODS

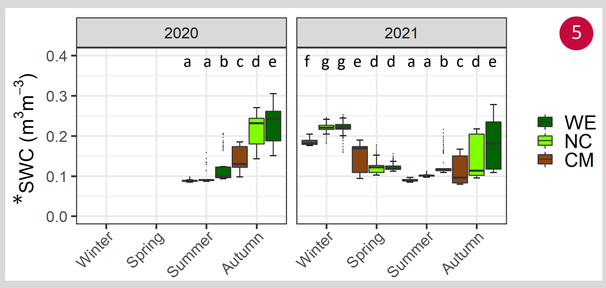
The vineyard, located in Espolla (1) (Alt Empordà, Spain), 90-100 m a.s.l., average annual precipitation of 750 mm, planted with old bush Carignan vines, grafted onto 110-R. Three soil managements were compared: Conventional soil management (**CM**), with tillage and herbicide application, a well stablished green cover (**WE**), for more than 5 years prior to the monitoring, combination of spontaneous and sown vegetation, and a new green cover (**NC**) established in 2019, just prior to the onset of the experiment. TEROS-10 soil moisture sensors were used to continuously monitor the soil volumetric water content (SWC) at three different depths (15, 30 and 45 cm) since August 2020(2). To determine erosion and infiltration rates rainfall simulations were carried out during 2020 and 2021, following Arnaez et al. 2007(3).



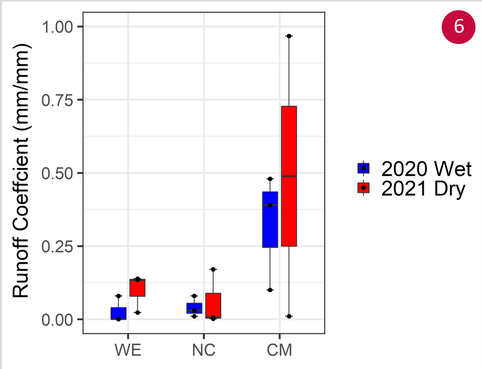
RESULTS AND DISCUSSION

NC presented an intermediate moisture level between WE and CM(4), responding similarly to CM in Autumn but quickly reaching similar SWC to WE, then following the same evolution till next spring, with CM presenting lower values along autumn and winter(5). Then, vegetation activation (vine and green cover) decreased SWC in all plots. Sensibility to spring rains is again intermediate for NC, which joins SWC evolution of CM by the end of spring till next autumn. During spring, CM had a higher SWC, but from May (DOY≈150) decreases the availability of water in the soil, presumably due to the release of the bound water caused by tillage and vine transpiration.





* Avg SWC 15 - 45 cm



The lowest Runoff Coefficients(6) correspond to WE and NC. Cover crops, in general, show best performance in terms of soil water availability than conventional tillage practices. The soil under conventional tillage practices is only filled with water when the autumn rains are cumulative of about 60-80mm.

CONCLUSIONS
Establishing green cover as an agronomic practice in mid-mountain vineyards could improve SWC availability, infiltration and reduced the runoff, avoiding water losses during dry periods and be an adaptation of Mediterranean viticulture to climate change.

References: J. Arnaez, T. Lasanta, P. Ruiz-Flaño, L. Ortigosa, Factors affecting runoff and erosion under simulated rainfall in Mediterranean vineyards. Soil and Tillage Research, Volume 93, Issue 2, 2007, Pages 324-334, ISSN 0167-1987. **Funding:** Financial support was provided by LIFE18 CCA/ES/001099.
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