



Swales for water retention in a semi-arid region in Portugal

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Finca Equilibrium is located in a semi-arid region with sandy soils and average annual precipitation of 709 mm (average 1960-1990). In recent years, during extreme drought events with 300 mm of annual precipitation, there have been occasions of heavy rainfall lasting only a few hours (for instance, 30 mm on 1 or 3 hours). On this property two temporary water lines merge together and, during intense or prolonged precipitation events, fill up and runoff through the valley or the flattened riverbed which results from the old and costly mechanized soil mobilizations.

Nowadays, the main investment is water management to cool down the microclimate and increase vegetation productivity. In 2018 an experimental alley cropping agroforestry system was started, with diverse tree species, shrubs and drip irrigation.

To enlarge the flooded area and the amount of water infiltration a ditch and pond system was installed, inspired by the "Key-line system". A rotary excavator was used with a 4500 € budget and 70 labour hours. The top of the ditches and ponds is on the contour lines which enables to slow, spread, catch and infiltrate an average of 20000m³ of water along a 1 km distance. Water depth varies between 0.5 and 1.5 m.

Allowing for the slow rise of the water table the irrigation costs from the well hole are expected to lessen and the opening of the shallow well, closed years ago, may be justified.

References and links:

<https://www.youtube.com/playlist?list=PL9WAF9lckk6a8blxkMMhwVKvqP1GKi3Mv>



Figure 1 Swales for water retention, according to keyline system.
Credits: Linea Clave

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