ORGANIC OAK

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COMPETE 2020
REACT-EU

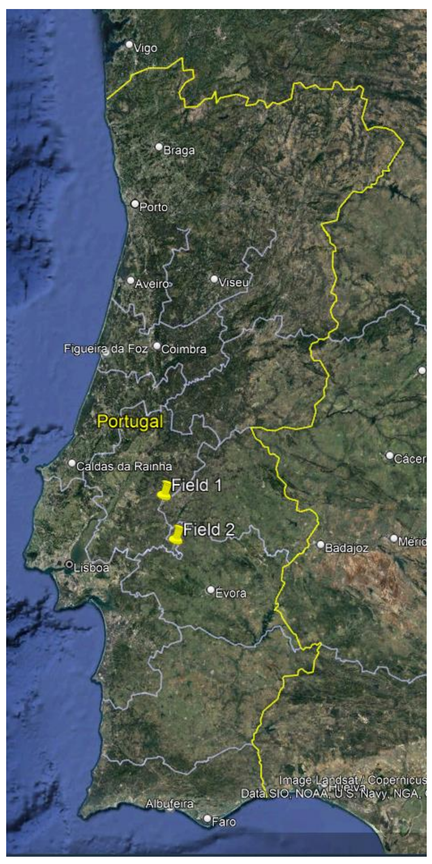
BACKGROUND

- The Mediterranean region is a climate change hotspot.
- Mediterranean cork oak woodlands are unique ecosystems, geographically limited to the western Mediterranean Basin.
- These man-made woodlands harbor high biodiversity and high socio-economic value, mostly due to cork production.
- These ecosystems are losing vitality, due to higher temperatures and increased drought occurrence, and poor management practices.

MAIN OBJECTIVE:

Explore best practices to improve soil fertility and reduce ecosystem susceptibility to desertification

FIELD PILOT STUDIES



Field 1: < 20-year-old stand. Not yet debarked

DESIGN
- 3 randomized blocks
- 3 treatments/block
- 4 trees/ treatment

TREATMENTS
- Control
- Biodiverse sown pasture
- Organic matter addition

MEASUREMENTS
- Tree growth (height, DBH)
- Tree phenology
- Leaf nutrient content
- Soil sampling (chemical, physical, microbiol analysis)
- Soil seed bank
- Plant species composition
- Aerial imagery (NDVI, NDRE)

Field 2: Recently planted stand

DESIGN
- 3 randomized blocks
- 4 treatments/block
- 6 trees/ treatment

TREATMENTS
- Control
- 3 levels of organic matter (10; 20 and 30 t/ha)

MEASUREMENTS
- Tree growth (height, DBH)
- Soil sampling (chemical, physical, microbiol analysis
- Plant species composition

GREENHOUSE STUDIES – pot experiments

- Assess seed germination and seedling survival when subjected to different organic matter levels and soil water content.

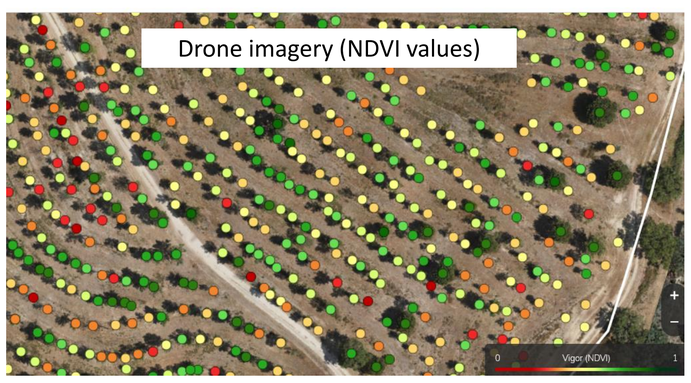
TRIAL 1
- 3 levels of organic matter (0; 177g; 353g/plant)
- 3 levels of soil water content (50% of field capacity (FC); 30% FC; wilting point)
- 6 replicates/treatment

TRIAL 2
- 3 levels of organic matter (0; 177g; 353g/plant)
- 4 levels of soil water content (40% FC, 30% FC, 15% FC, and 5% FC)
- 6 replicates/treatment

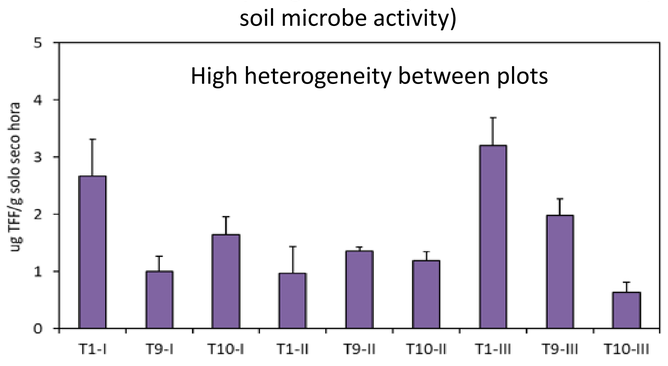
MEASUREMENTS
- Seed germination/survival
- Tree growth
- Above and below ground biomass
- Specific leaf area
- Leaf Chlorophyll content

STATE OF PLAY

- ✓ Field pre-treatment data has been collected, including aerial imagery analysis.
- ✓ Pot Trial 1 is finished and data is being analyzed.
- ✓ Pot Trial 2 is ongoing.



Pre-treatment **Dehydrogenase** (organic matter oxidation | soil microbe activity)



PRELIMINARY RESULTS

FROM POT TRIAL 1:

- Earlier seed emergence in treatments with organic matter addition;
- In treatments with low water availability (wilting point), the addition of organic matter increased seedling survival;
- High soil water content and addition of organic matter had a negative effect on seedling development. Probably due to high C/N of organic substrate used (N limitation).