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# Resilience and resistance of microbial communities against drought events, in a mature agroforestry system in Mediterranean area

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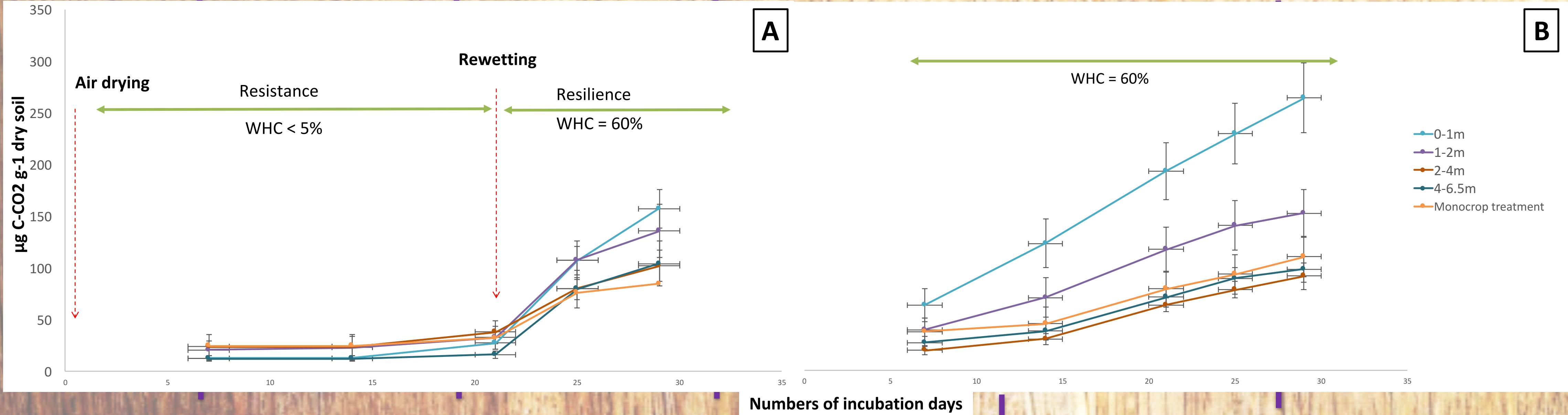
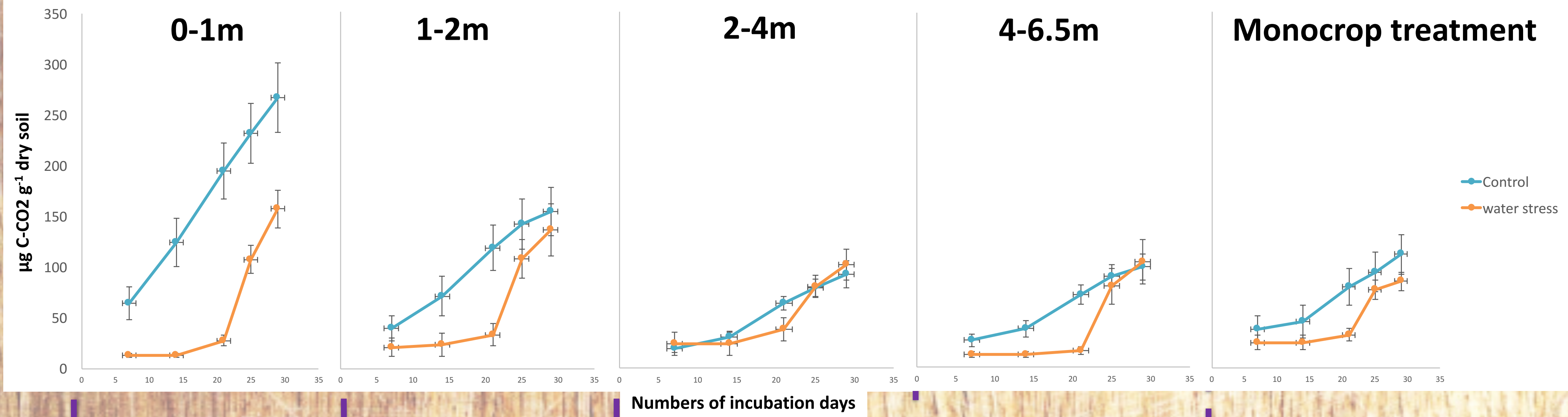
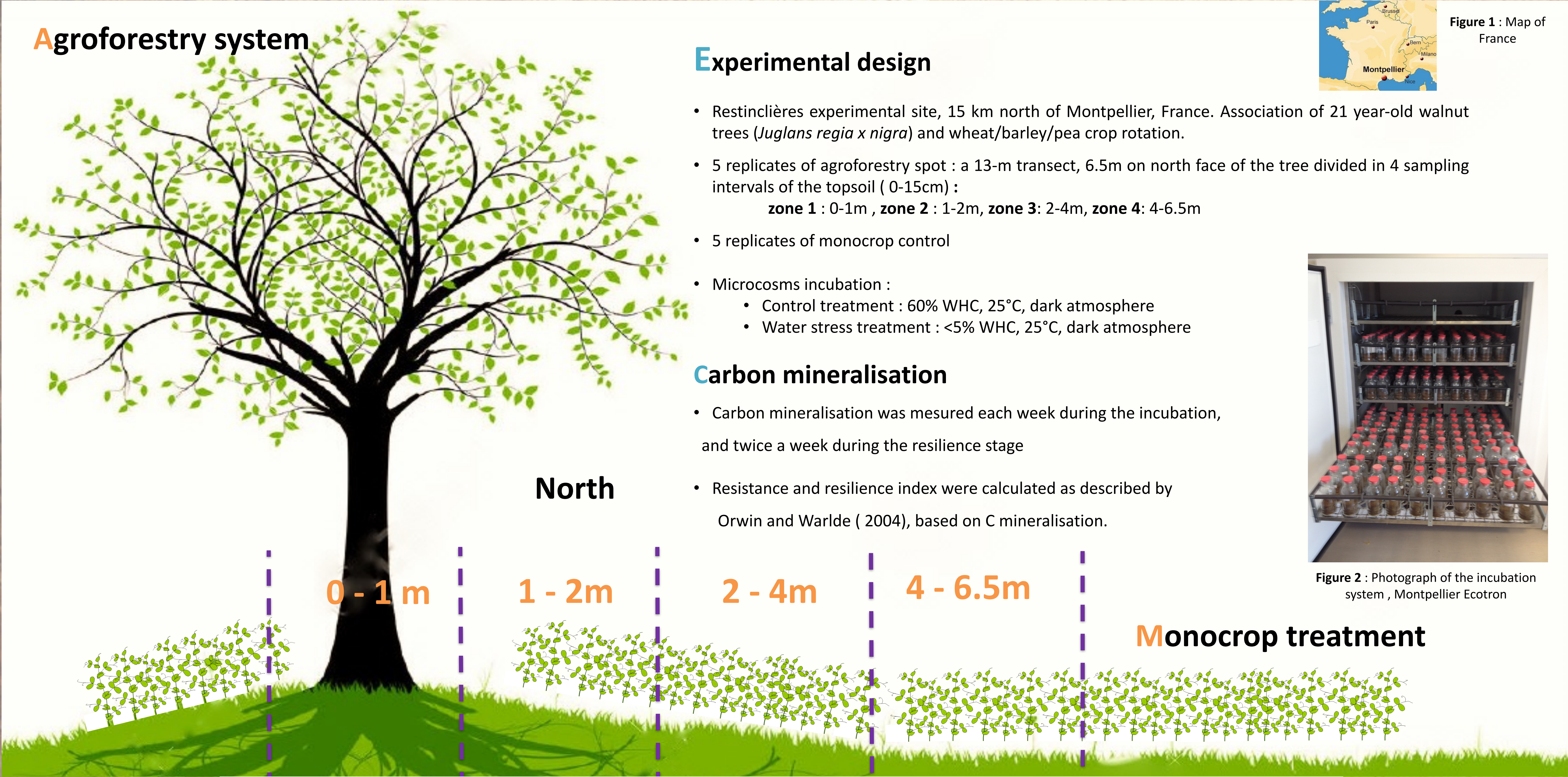
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- **A**groforestry systems are known to limit soil degradation, deeply store carbon and have positive impact on different indicators of soil quality.
- **W**hat is the impact of tree-crop associations on resistance and resilience of topsoil microbial communities?
- **O**ur aim is to evaluate the resistance and the resilience of the microbial communities of topsoil along a spatial gradient from the tree line to the center of the intercrop, and in the monocrop treatment.



|                                                                         | Distance            |  | 0-1m                | 1-2m                 | 2-4m                | 4-6.5m               | Monocrop treatment  |
|-------------------------------------------------------------------------|---------------------|--|---------------------|----------------------|---------------------|----------------------|---------------------|
|                                                                         | Day                 |  |                     |                      |                     |                      |                     |
| Rate day <sup>-1</sup><br>μg C-CO <sub>2</sub> g <sup>-1</sup> dry soil | Day 21 : Resistance |  | 1.315 <sup>a</sup>  | 1.579 <sup>a</sup>   | 1.823 <sup>a</sup>  | 0.780 <sup>a</sup>   | 1.543 <sup>a</sup>  |
|                                                                         | Day 29 : Resilience |  | 18.556 <sup>a</sup> | 14.670 <sup>ab</sup> | 9.125 <sup>b</sup>  | 12.579 <sup>ab</sup> | 7.503 <sup>ab</sup> |
| Index                                                                   | Day 21 : Resistance |  | 0.0758 <sup>a</sup> | 0.147 <sup>a</sup>   | 0.373 <sup>a</sup>  | 0.122 <sup>a</sup>   | 0.357 <sup>a</sup>  |
|                                                                         | Day 29 : Resilience |  | 0.216 <sup>ab</sup> | 0.607 <sup>a</sup>   | 0.219 <sup>ab</sup> | 0.477 <sup>ab</sup>  | -0.064 <sup>b</sup> |

**Table 1 :**

Daily rate of C mineralisation at the end of the stress (Resistance) and 7 days after rewetting (Resilience) and indices of resistance and resilience based on cumulated C mineralisation. Data are mean, n=5, letters indicate significant differences (P<0.05)

- Stronger cumulated C mineralisation occurring close to the tree, decreasing with increasing distance from tree.
- Our data show difference in microbial resilience along the spatial gradient, but not difference in resistance.
- Microbial communities seem to be more sensitive to water stress and rewetting close to the tree than in the monocrop treatment.