Are droughts and nutrient stress impacting the oak microbiome composition and increasing oaks susceptibility to Acute Oak Decline (AOD)?

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PRIFYSGOL BANGOR UNIVERSITY

kess 2 Ysgoloriaethau Sgiliau Economi Gwybodaeth Knowledge Economy Skills Scholarships

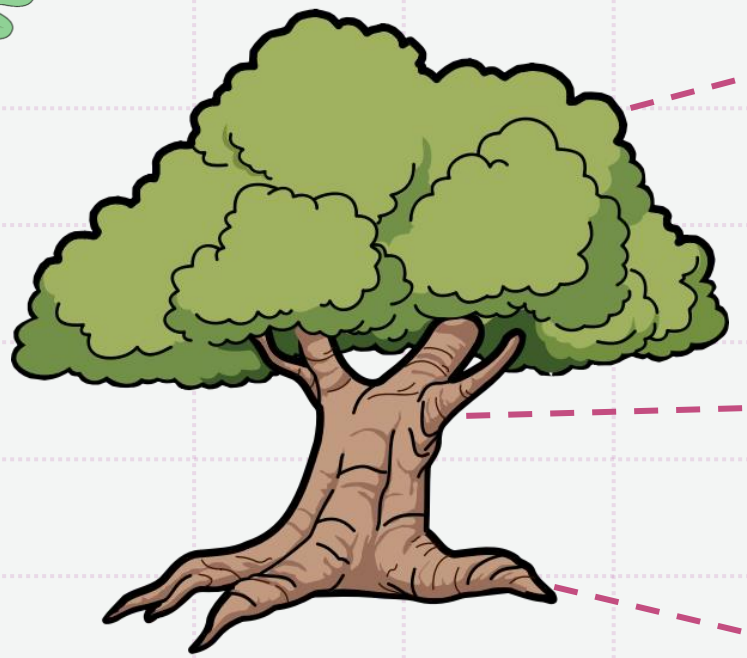
Cronfa Gymdeithasol Ewrop European Social Fund

WOODLAND HERITAGE for the future of British woods

BAC-STOP STOP BAD BACTERIA ON OAK

The tree microbiome

Microbiome – Microbes living on/in an environment and their activities



Inhibit pathogens

Stimulate Growth

Degrade organic matter

(Baldrian, 2017)

Acute Oak Decline and Microbiomes

Environmental Factors

Nutrient Stress

Drought

Biological Factors

Brenneria goodwinii

Gibbsiella quercinecans

Rahnella victoriana

Causes

Complex disease

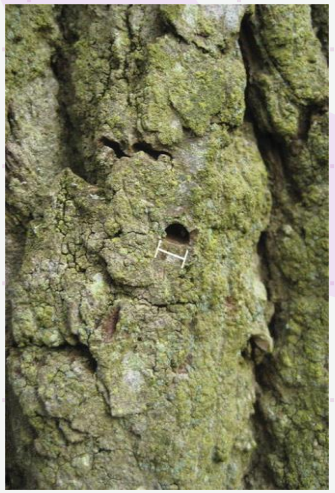
Combination of **biological** and **environmental** factors

Prerequisite?

Shift in the microbiome

Increased Susceptibility?

Symptoms



(Broberg et al., 2018; Denman et al., 2014; Denman and Webber, 2009)

Acute Oak Decline and Microbiomes

Main Objectives:

- To identify the core leaf, bark and root microbiome composition of *Q. petraea*

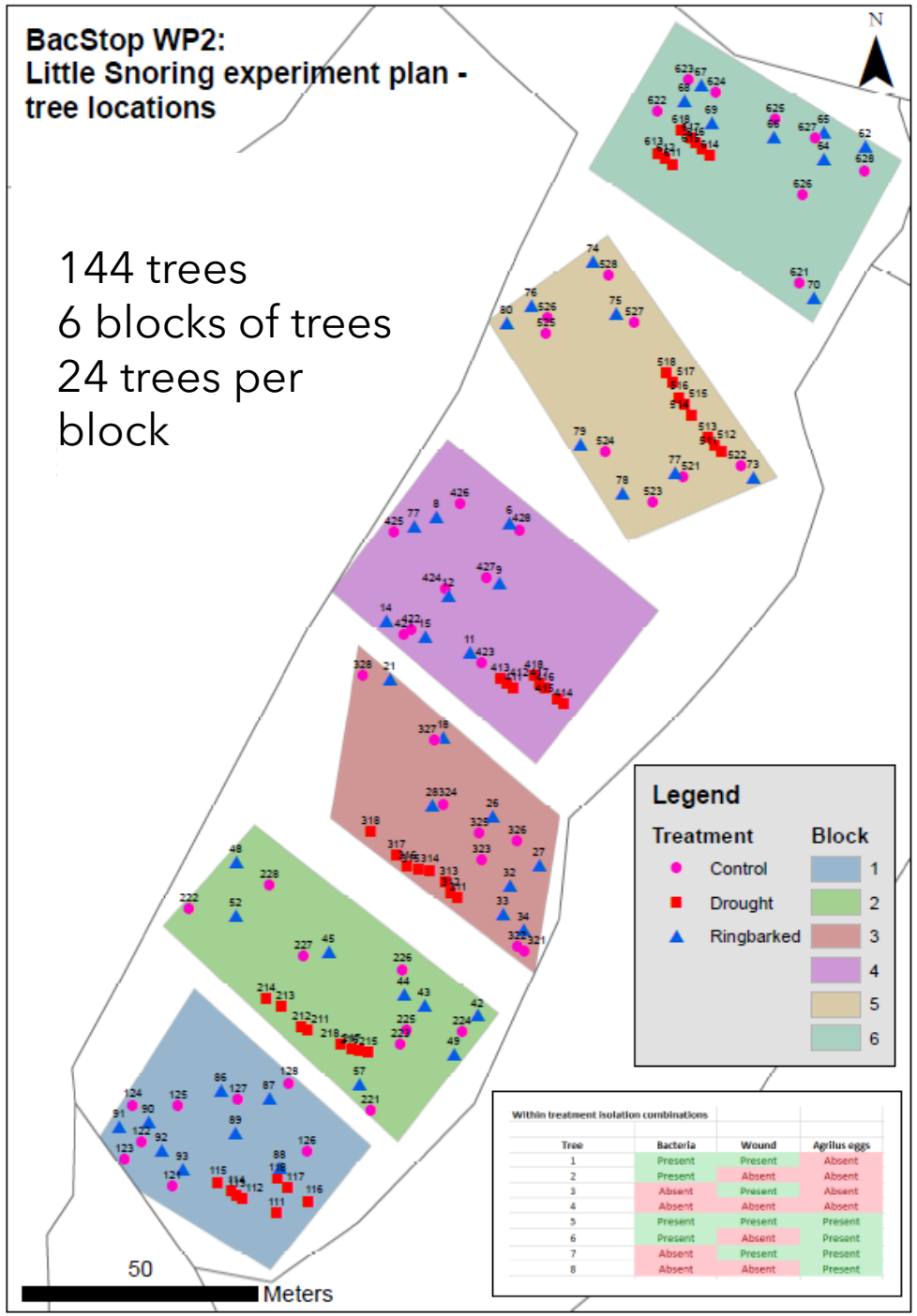
- To measure the impact of drought and nutrient stress on the oak microbiome composition

- To assess whether drought and nutrient stress increases the vulnerability of oaks to AOD

- To develop suitable field sampling and lab protocols for large scale tree microbiome studies

Experimental Setup

144 trees
6 blocks of trees
24 trees per block

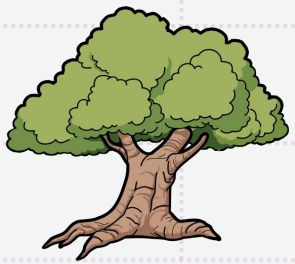


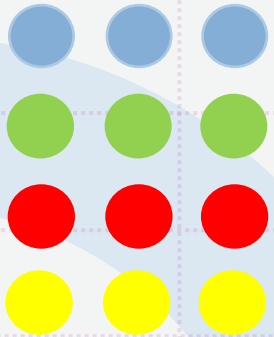
Project Workflow

Collected **1440 samples**

Developed novel lab techniques

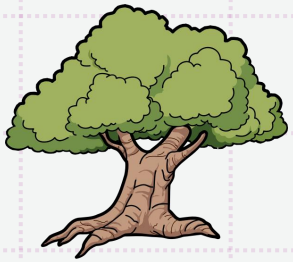
Sampling ~Oct 2020

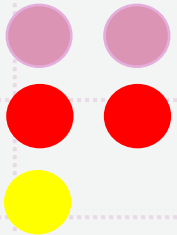




Drought shelters ~May 2021

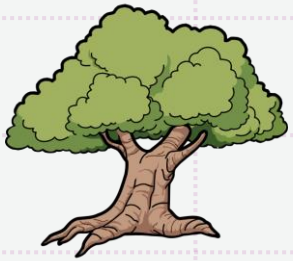
Sampling ~Aug 2021

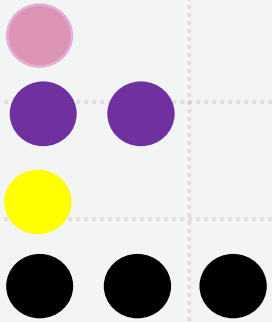




Inoculation ~Aug 2021

Sampling ~Oct 2021





Lab Work Current

Assess Disease Severity Future

Thanks for listening!

References

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