Assessing the effect of broad-leaved patches on forest health

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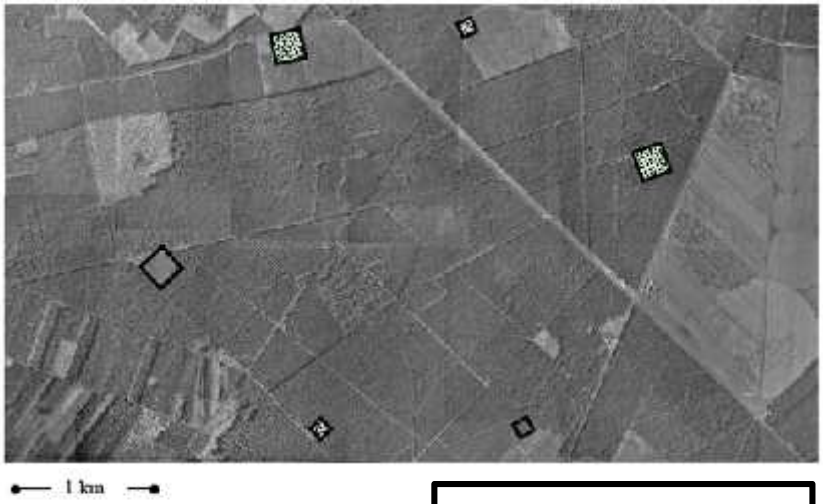
Hypothesis:

Patches of broadleaved forest provide natural enemies (parasitoids and predators) with suitable refuge habitats, thus enhancing the top down regulation of pest insects in nearby pine plantations.



Experiment:

8 mixed stands of 6 deciduous tree species (*Quercus robur, Q. pyrenaica, Q. rubra, Betula pendula, Prunus serotina, Robinia pseudacacia*) planted in 1996 within two *Pinus pinaster* plantation landscapes + 4 control stands on maritime pine.

Action:

Survey of pest damage (pine processionary moth, pine stem borer)
- Near pine vs. broadleaved plantations

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Protocol:

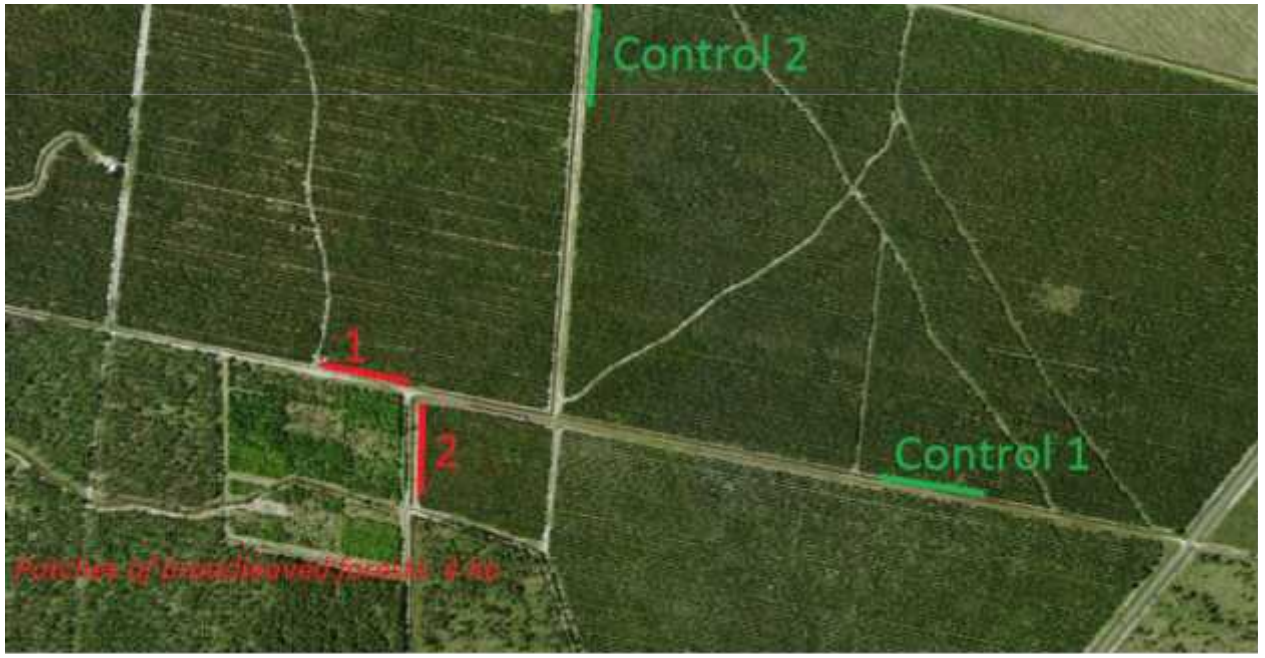
Counting pine processionary moth nests and pine stem borer attacks around 4 broadleaved patches (2 patches of 4 ha and 2 patches of 1 ha)

→ Data collection from two rows at the edge of pine plantation (of 100 meters length)

→ The same collection was made near pine forest patches (as a control)

Pine processionary moth (*Thaumetopoea pityocampa*) nest

Pine stem borer (*Dyroctria sylvestrella)* attack



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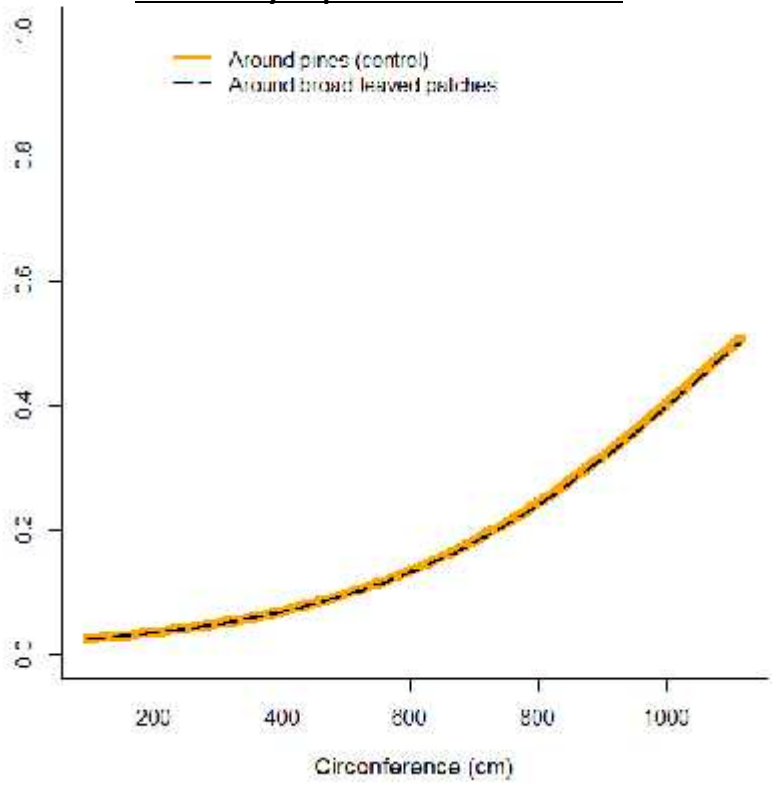
Results:

Pine stem borer	Total	Around broad-leaved	Around pines
Mean percentage of infestation (±SE)	**0.15 (0.01)**	**0.15(0.02)**	**0.15(0.01)**

- No effect of proximity to broad-leaved patches (p=0.93)
- Confirmed effect of pine size (p<0.0001)

Probability of pine stem borer attack



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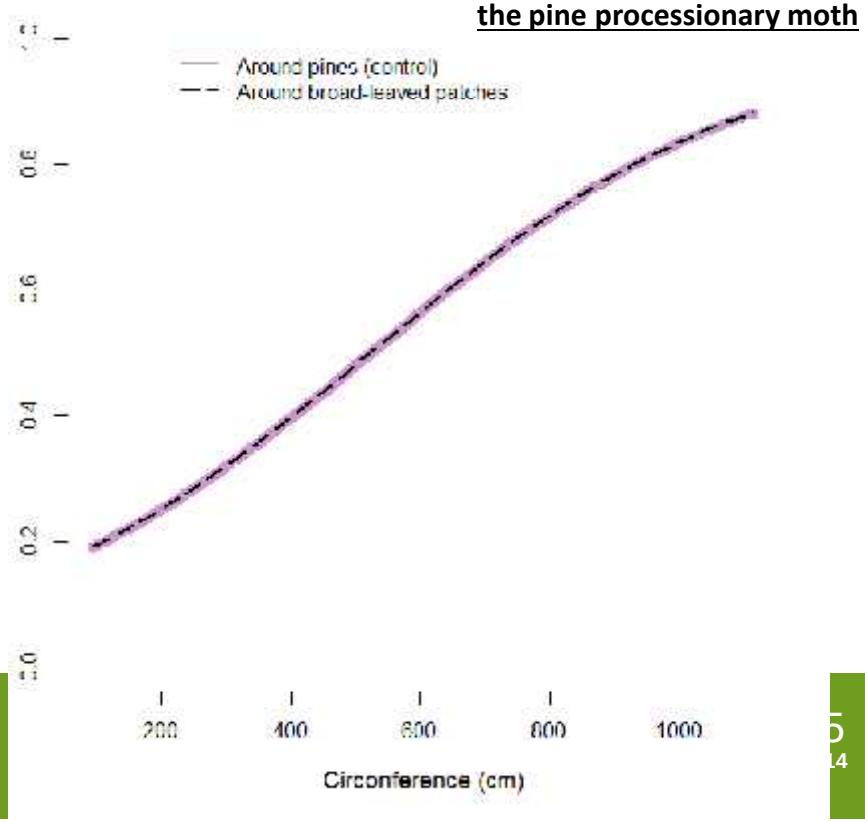
Results:

Pine processionary moth	Total	Around broad-leaved	Around pines
Mean percentage of infestation (±SE)	0.52 (0.01)	0.56 (0.02)	0.49 (0.02)

- No effect of proximity to broad-leaved patches (p=0.99)
- Confirmed effect of pine size (p<0.0001)

Probability of infestation by the pine processionary moth



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Conclusion :

No effects of broad-leaved patches on PPM infestation and pine stem borer attacks on close maritime pine stands

→ Hypothesis of increasing parasitoids and predators through broad-leaved patches implantation to control pests attacks is clearly not confirmed

→ Broad-leaved patches are of interest for increasing biodiversity, but others means have to be developed for forest pest management

- the effect of broad-leaved hedgerows on pest management could be tested.