Evaluation of selected methods to control invasive species along transportation linear infrastructures: a preliminary approach

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General framework

Context: Roads and railways are **linear infrastructures**, massively widespread throughout the territory, with negative effects on biodiversity. These transport routes are a **privileged channel for invasive flora species introduction and spread**. As such, it is necessary to establish **management actions for invasive species control** around these infrastructures and understand the impacts of each method. The LIFE LINES project (LIFE14 NAT/PT/001081) aims **to mitigate negative effects of linear infrastructures** and **improve the local biodiversity**, in many ways, including through the **invasive exotic flora management**.

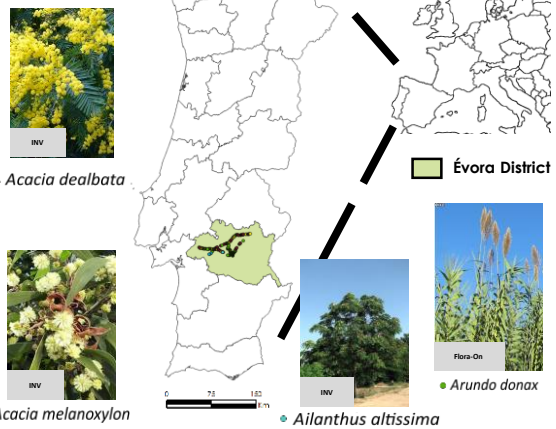
Aim: To evaluate the **effectiveness of control methods of invasive species**, and their impacts on the surrounding native species community, in two roads (EN4 and EN114) and one disabled railway (Évora ecotrail) in southern Portugal (Évora district).

Target species:

- *Ailanthus altissima* (Mill.) Swingle
- *Acacia dealbata* Link.
- *Acacia melanoxylon* R.Br
- *Arundo donax* L.

Tasks:

1. **Invasive target species mapping** in EN4, EN114, and Évora ecotrail (2017)
2. **Selection of intervention plots**
3. **Selection** and **application of control methods** individually or jointly (2017-2019)
4. **Promotion of native flora** (2018-2019)
5. **Monitoring** through flora transects **in spring and autumn** (before, during and after the control methods application – 2017-2019)



Ailanthus altissima and *Acacia* species - Methods

Adults

Cut + Herbicide

Drill + Herbicide injection

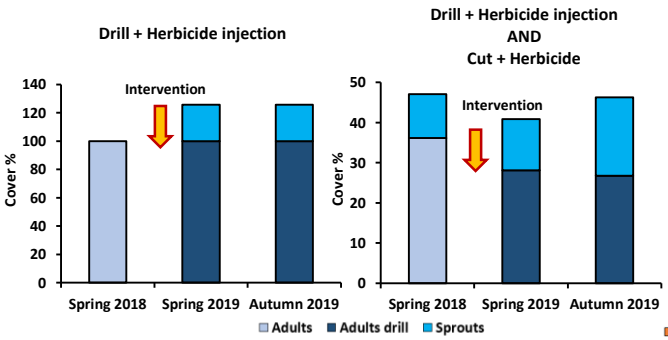
Adults, Young adults and Big sprouts → ***Acacia* species only**

Ring-barking or Peeling

Selective cut

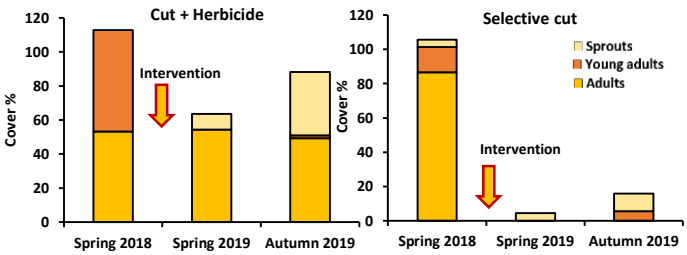
Ailanthus altissima - Results

- **Trees didn't react** yet to the **drill method**
- The **sprouts cover increases** when the **cut method** is also applied



Acacia species - Results

- For both the **cut methods** was observed an **immediate decrease in Acacia adults' cover** followed by a progressive **increase of the sprouts**, due to a reduction of the alelopathic effect
- The **sprout growth** was **more intense** with the **selective cut method**

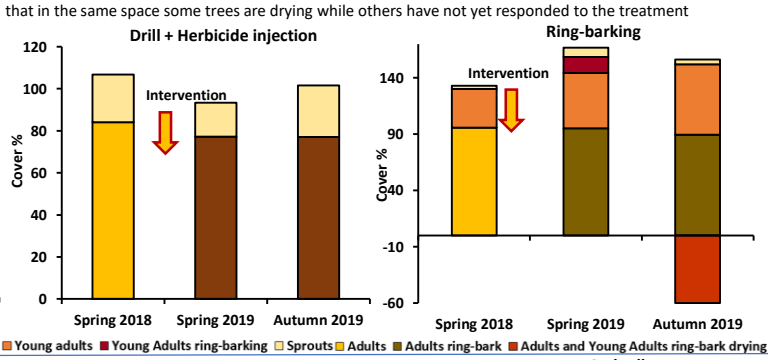


A. melanoxylon
Cut + Herbicide

Spring 2019

Autumn 2019

- Until the moment, the **drilled adults didn't show** a significant **reaction to the treatment**
- Some of the **ring-barking trees start to dry** after a few months
- With the **drill and ring-barking methods** the **cover of sprouts didn't increase**
- The adults cover in Spring 2019 and Autumn 2019 is similar due to an overlap of the treetops, which make that in the same space some trees are drying while others have not yet responded to the treatment

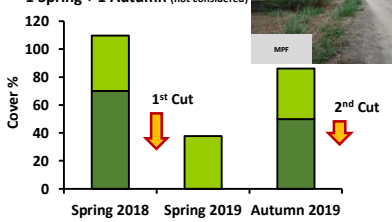


Arundo donax – Methods and Results

Large Arundo donax *Small Arundo donax*

Consecutive cuts:

1 Spring + 1 Autumn (not considered)



Rhizome removal + Hand pull

- **Consecutive cuts:** *Arundo donax* **cover diminished**, but in less than one year, **the** *Arundo donax* **cover is already the same**
- **Rhizome removal + Hand pull:** *Arundo donax* **cover significantly decreases** and the ***Arundo donax* recovery** is **slower than with the consecutive cuts' method**

Autumn 2018 → Spring 2019

Taking Home ideas

***Ailanthus altissima* and *Acacia* species**

Drill or ring-barking methods:

- Diminishing of invasive flora cover is slower than with the cut method, but the **sprouts emerge slowly**
- **Ring-barking method** seems to **take effect faster** than the **drill method**

Arundo donax

Rhizome removal:

- It is an **efficient method with better results than the cut method**
- **Decreased the *Arundo donax* cover** and the **sprouts reappear slower**
- **Favors the emergence of native herbs**

A. dealbata
Ring-barking

Spring 2019

Autumn 2019

Regardless of the invasive species or the control method, it is necessary to maintain a continued monitoring and an active control of sprouts

Coordinating Beneficiary | Associated Beneficiaries

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