

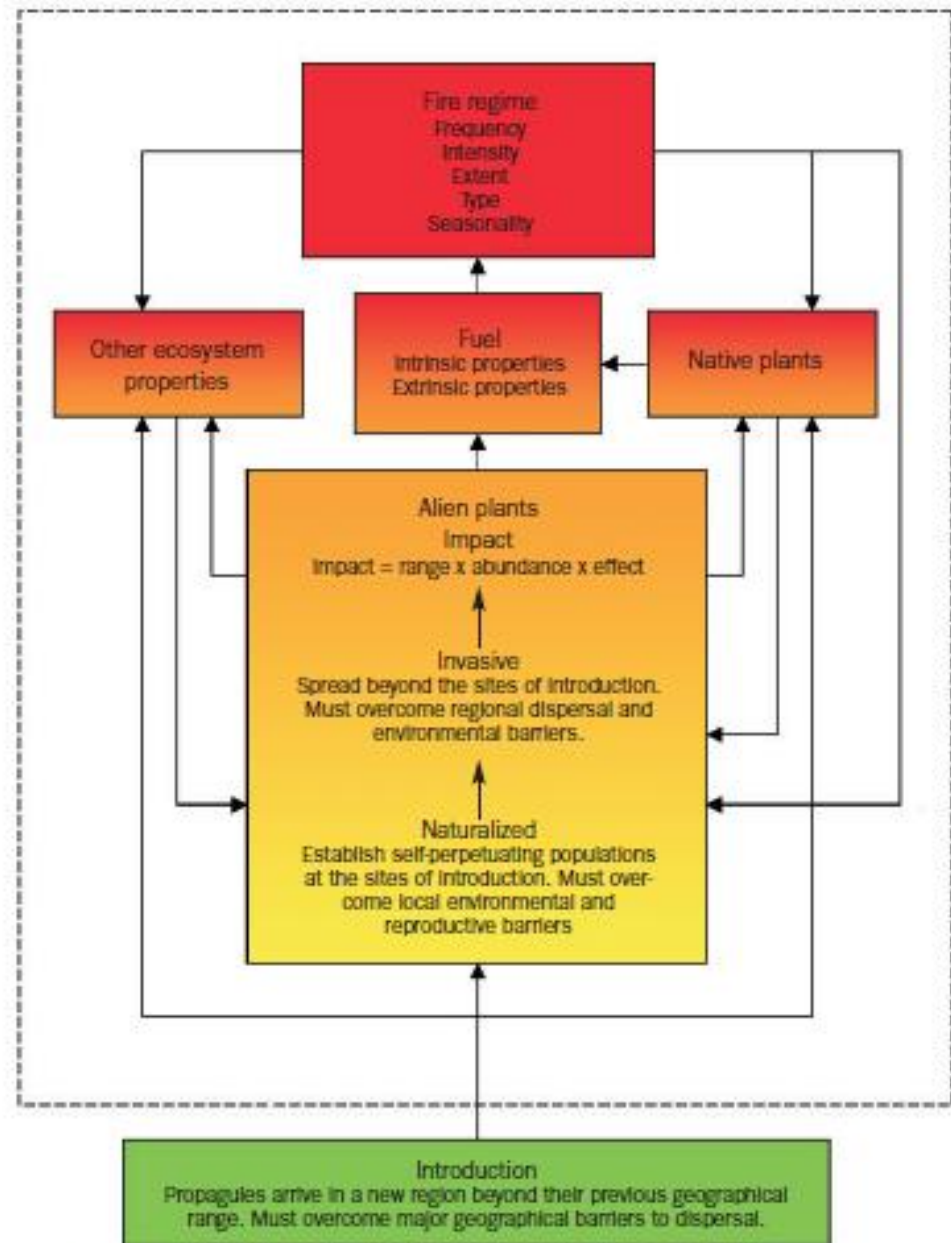
O Fogo e as Invasoras Lenhosas – Fire and woody plant invaders

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The problem

- Portugal is an invasion-prone country, given its mild climate and the introduction of many alien plant species
- Some of those species are fire-adapted

Fire and alien plants may be connected through a fire cycle



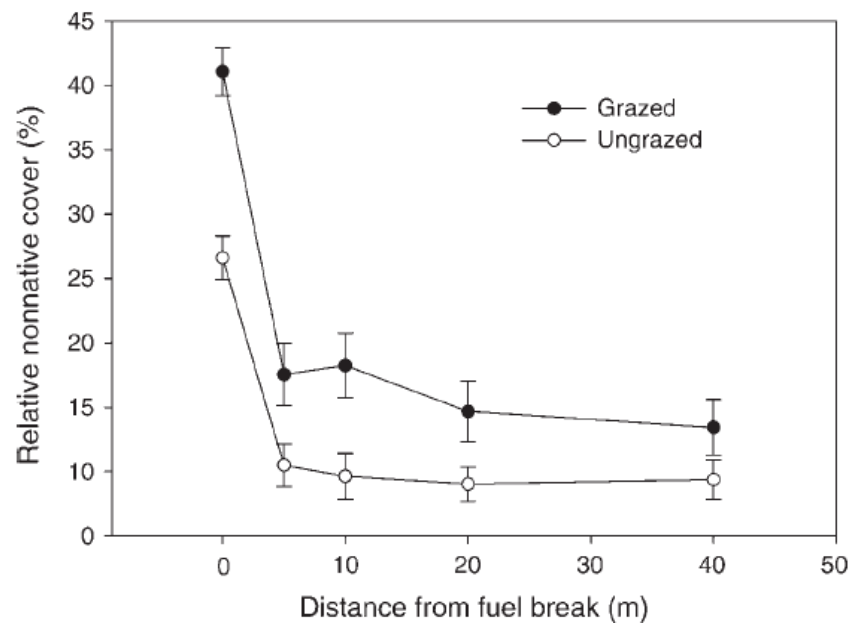
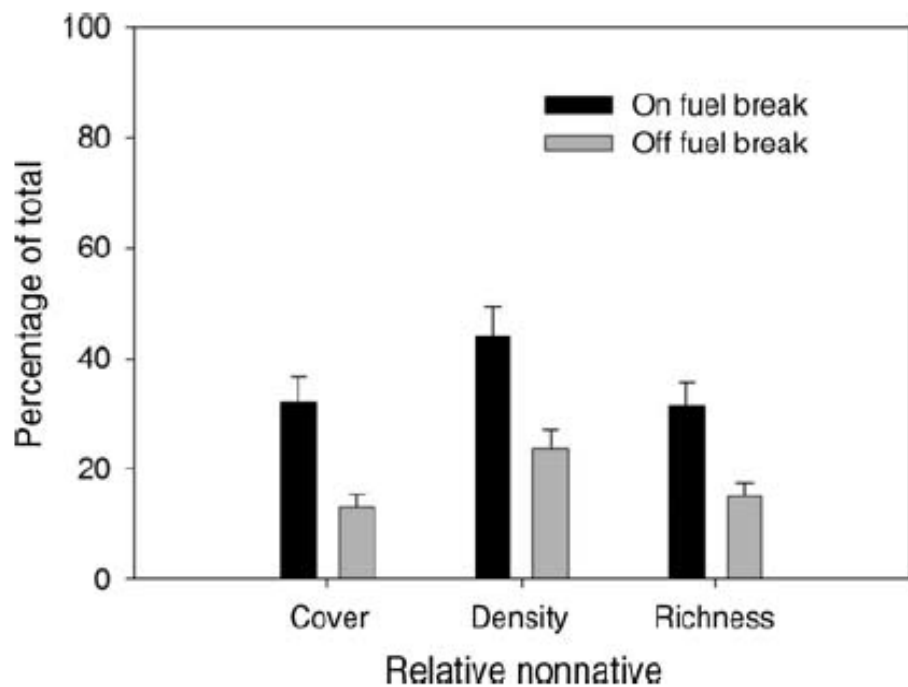
Brooks *et al.* 2004

Figure 2. The invasive plant–fire regime cycle. Green, phase 1; yellow, phase 2; orange, phase 3; red, phase 4.

- Most fuel management practices may potentially aggravate the problema of plant invasions
- Even fuel breaks for fire prevention can foster the establishment of invasive plants

In Califórnia (Merriam et al. 2006):

“We found that nonnative plant abundance was over 200% higher on fuel breaks than in adjacent wildland areas”



Merriam et al. 2006):

Alien plant species introduced to
Portugal that are well adapted to fire

- *Acacia dealbata*

- Australian origin
- As many other Fabaceae, it develops a soil seed bank
- The hard-coated seeds may be stored in the soil for decades
- Fire triggers seed germination
- It resprouts vigorously after fire
- Seed pods can be dispersed at considerable distances
- It has been expanding rapidly across the country



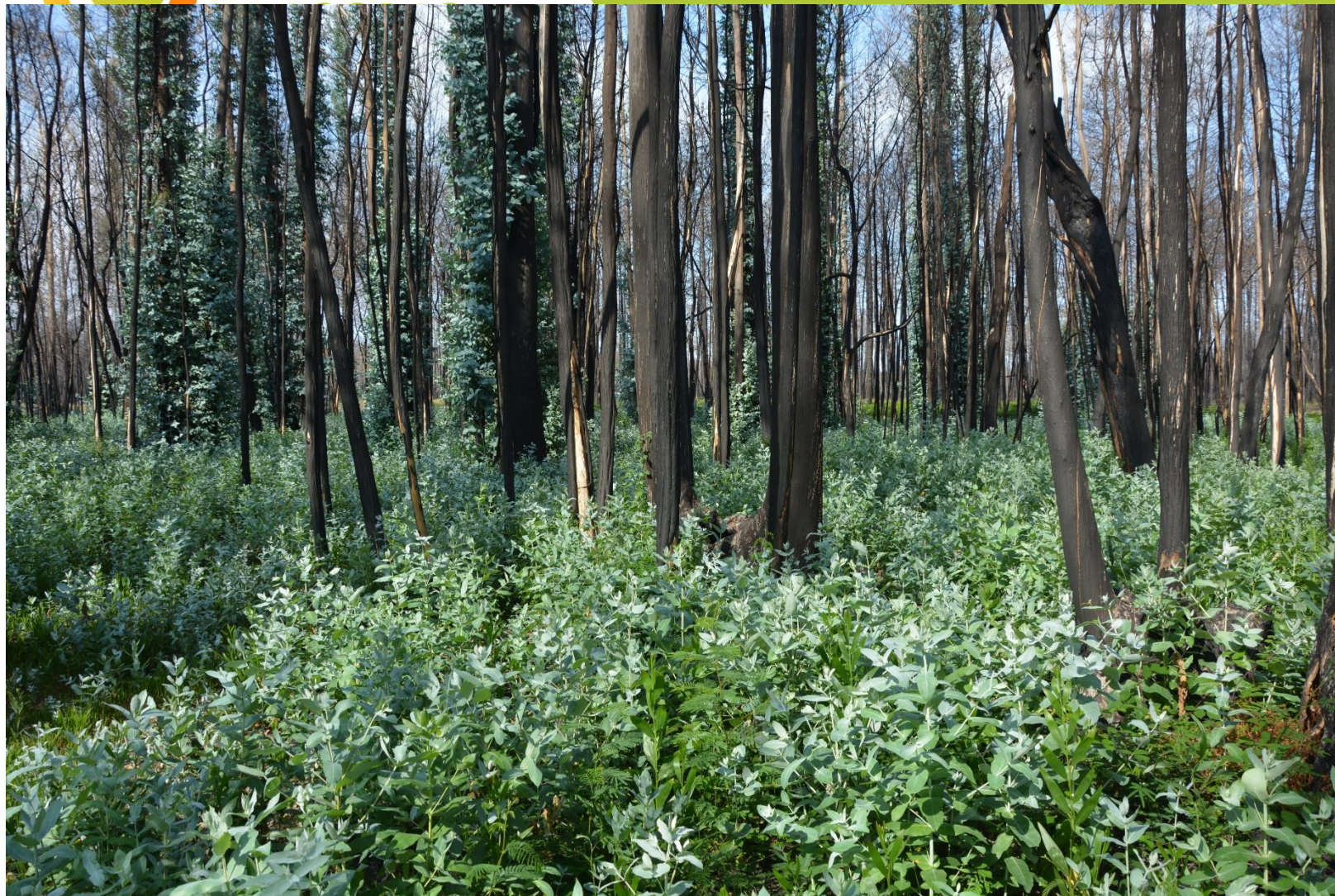


- *Hakea sericea*

- Another Australian species
- It is an obligate seeder
- It develops a canopy seed bank
- Woody fruits open after fire and disperse the seeds at considerable distances (>100 m), therefore expanding the invaded area

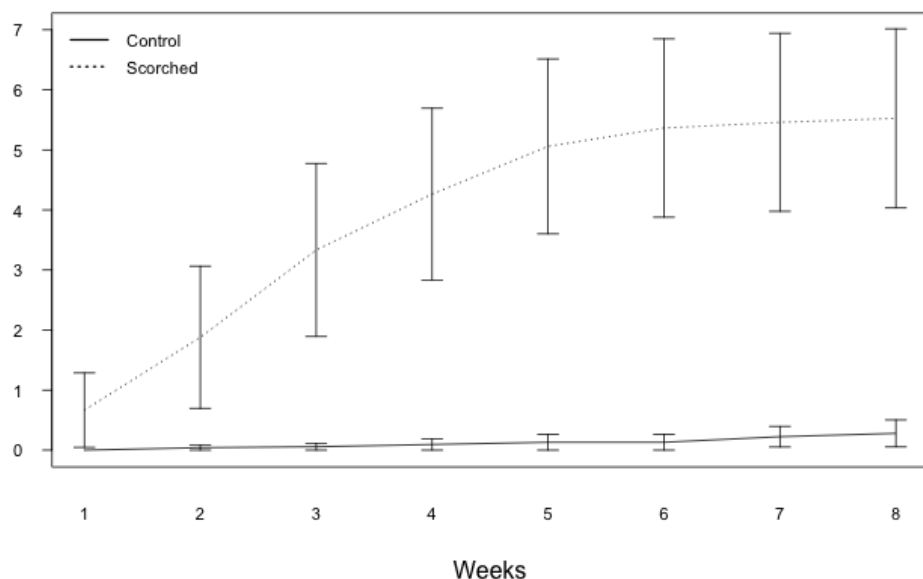


- *Eucalyptus globulus*
 - Also from Australia
 - Highly resistant to fire
 - Massive seed shed after fire from “old” trees
 - Not a problem if plantations are properly managed
 - A potential problem when trees are not harvested in short rotations



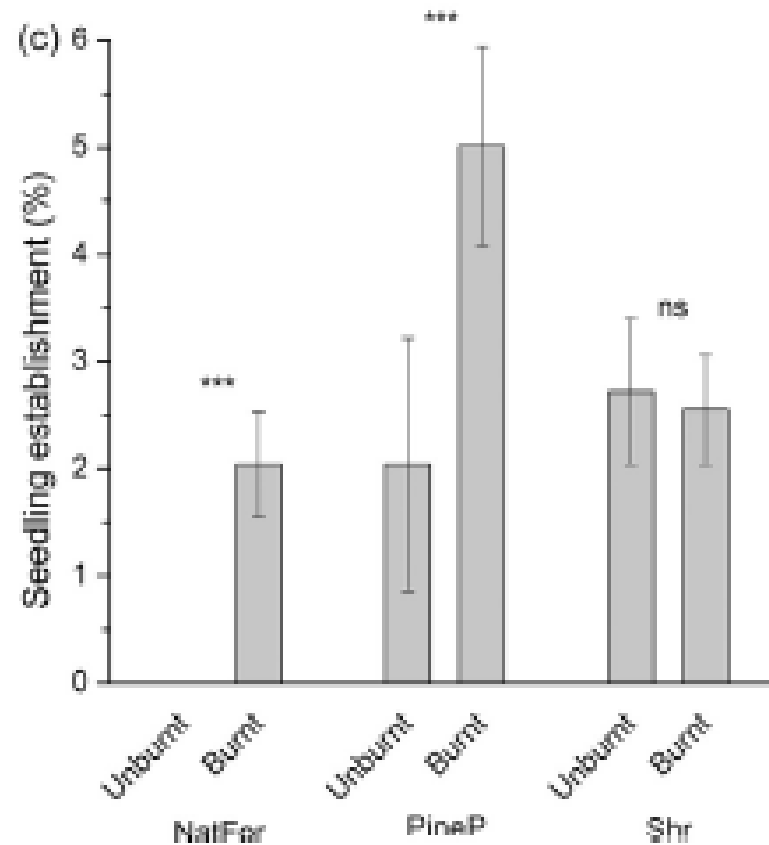






Santos et al. 2015

Calviño-Cancela et al. 2018





The Aliens and flames (Fogo e Invasoras) project

- The use of fire as a fuel management tool may aggravate the problem of plant invasions
- But proper management through an informed use of fire, may:
 - At least, minimize the risk of expanding the invasive plants, using an appropriate prescription;
 - If properly used, it may even contribute to locally eliminate the invasive plant species.

But

- Currently we don't know how to set a prescription envisaging the achievement of such goals;
- The existing guides on prescribed burning for portuguese conditions:
 - Have the sole goal of managing fuels for fire hazard mitigation
 - Did not consider the risk of plant invasions

GUIA DE CAMPO PARA FOGO CONTROLADO EM MATOS



GUIA DE FOGO CONTROLADO EM EUCALIPTAL



**Piro
Pinus**

PRESCRIBED BURNING GUIDE FOR MARITIME PINE STANDS

Version 2.3, August 2011

Paulo Fernandes
Carlos Loureiro
Hermínio Botelho

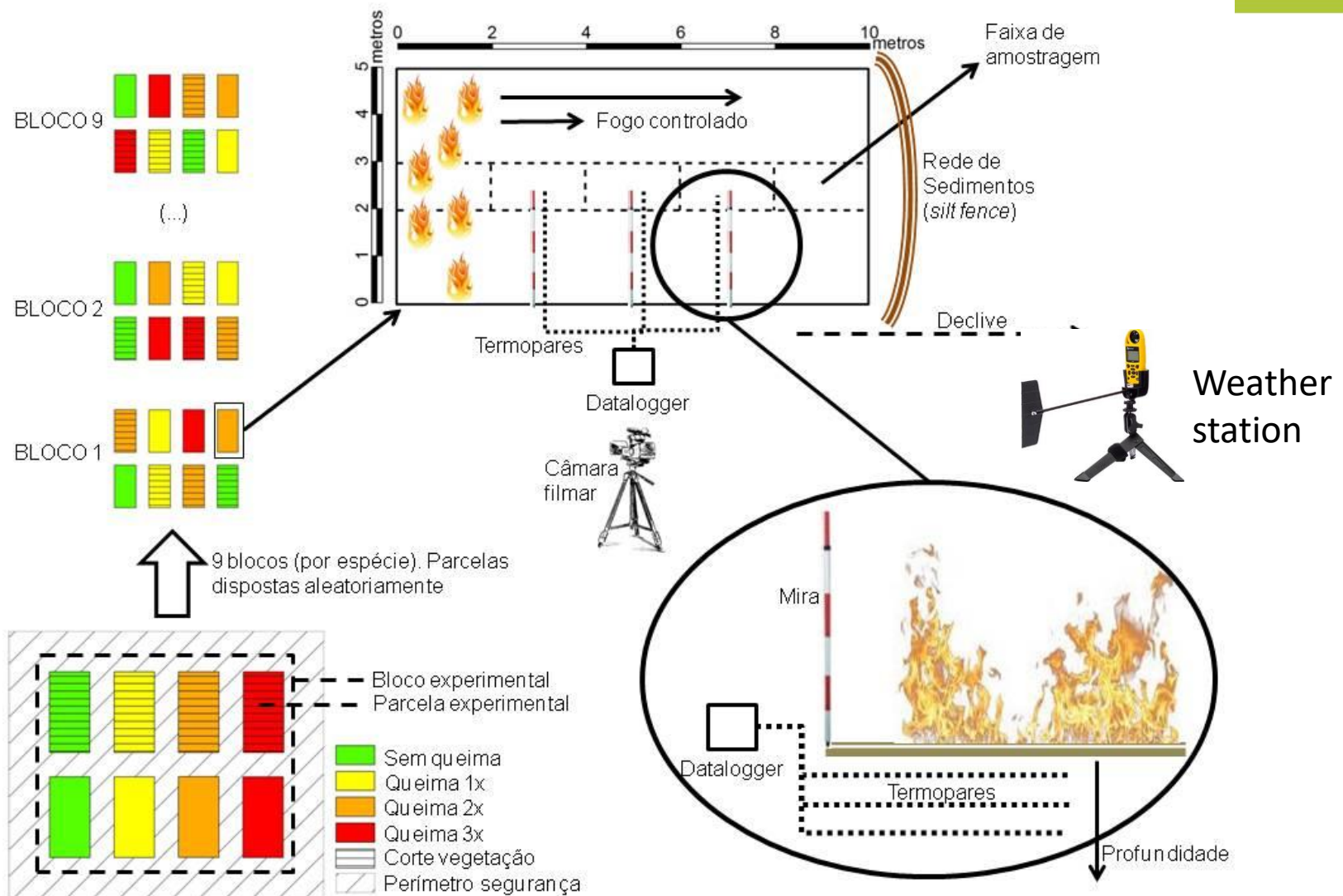


March 2016

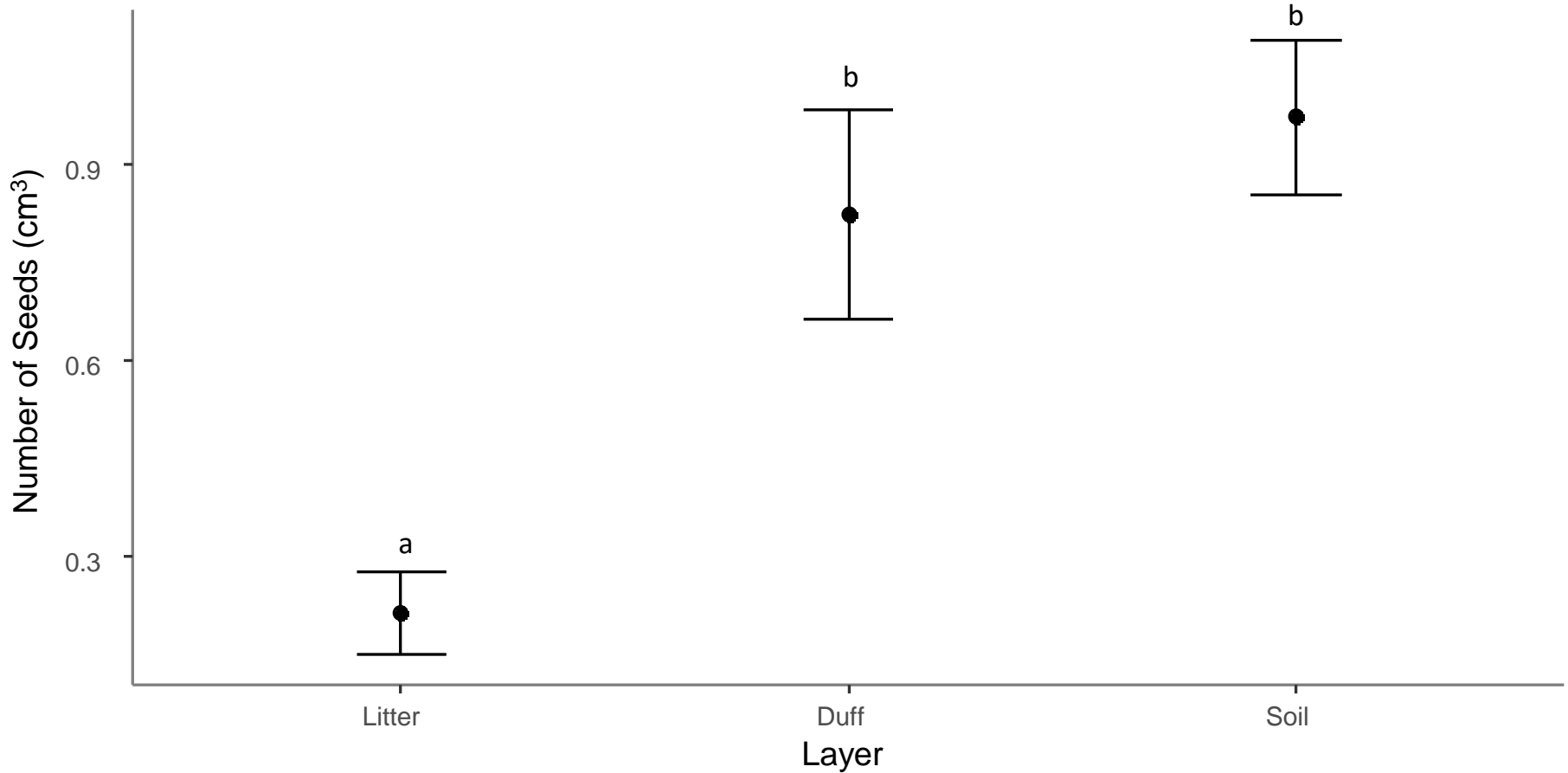




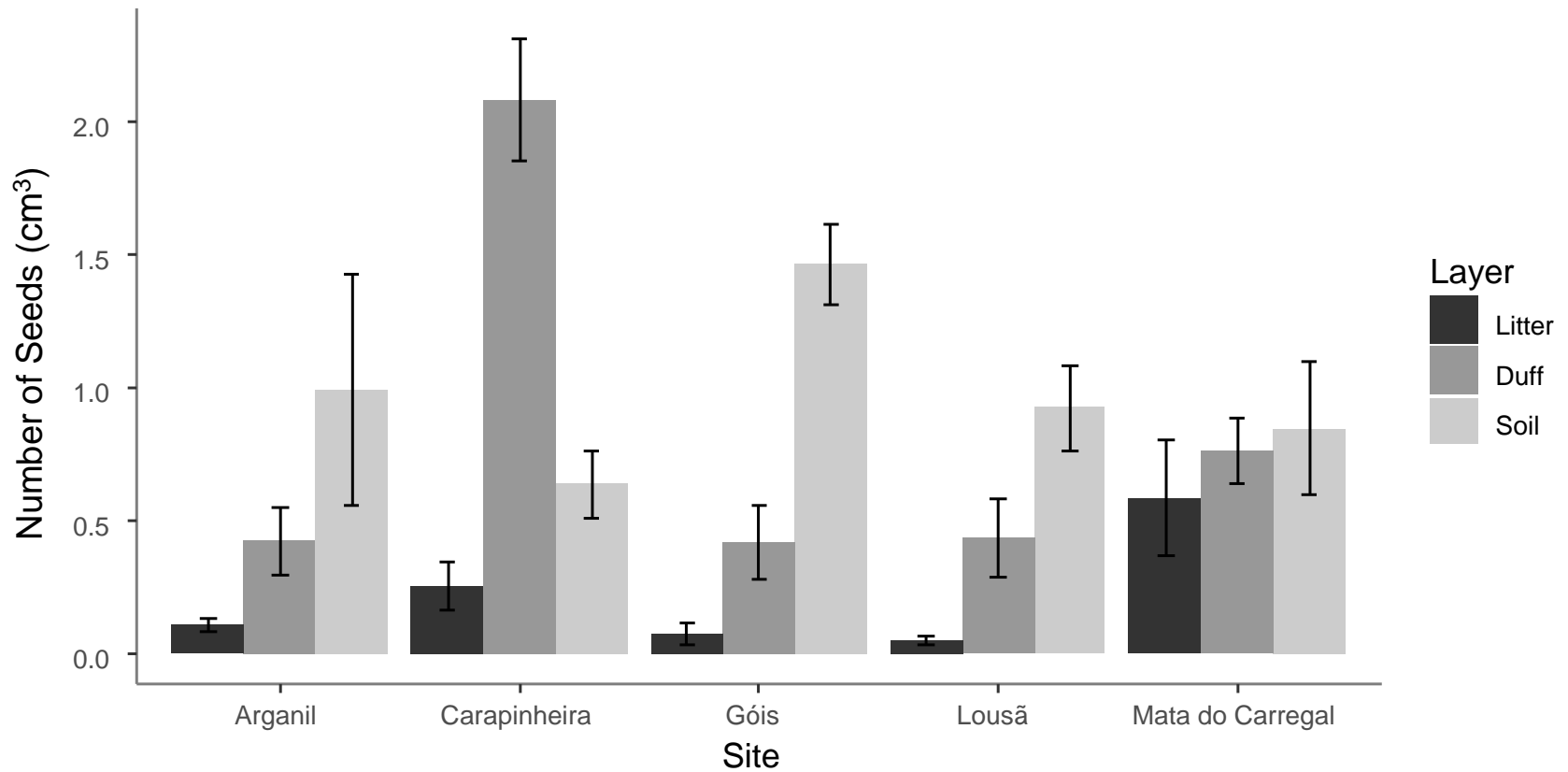
Experimental design – initial version

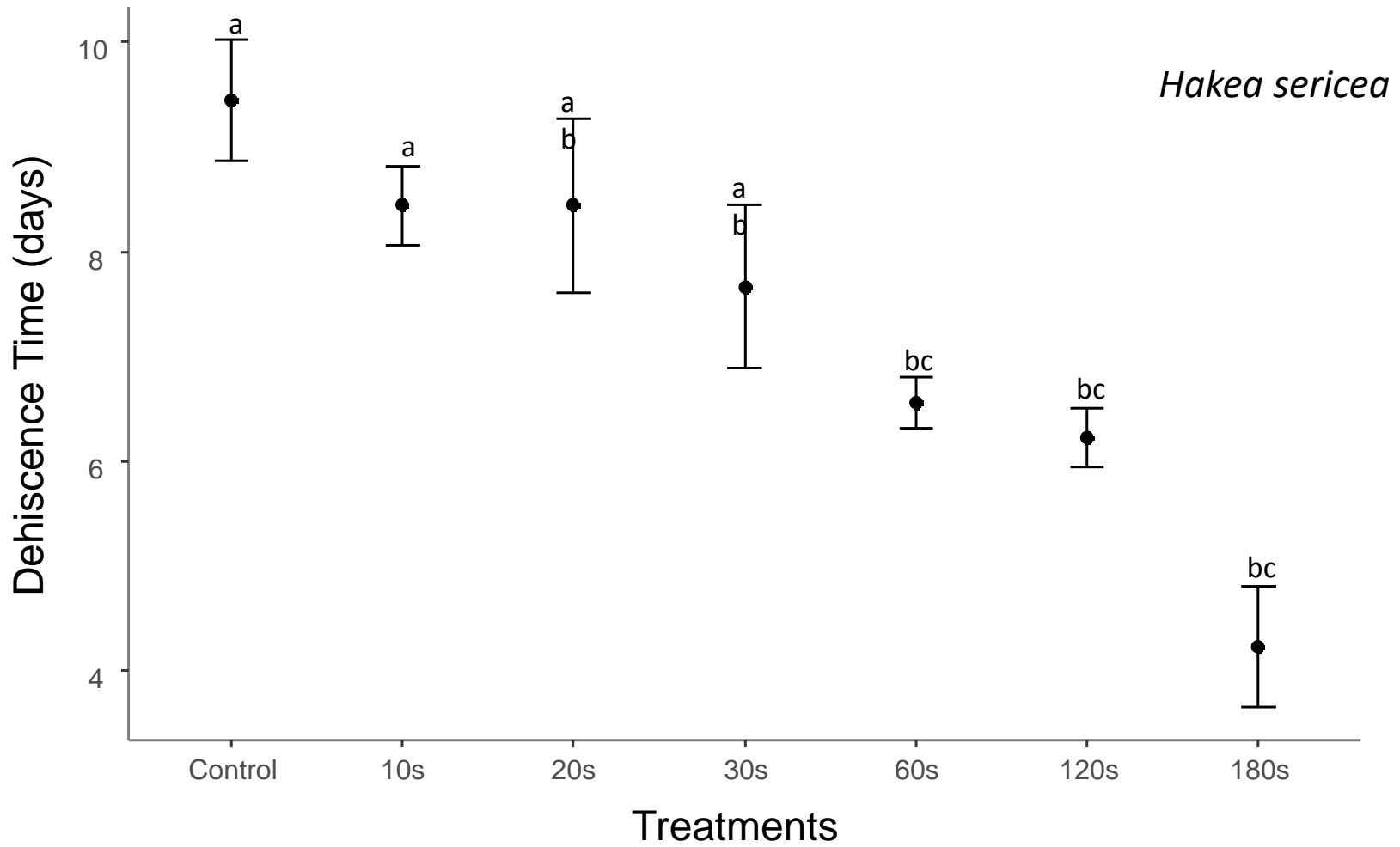


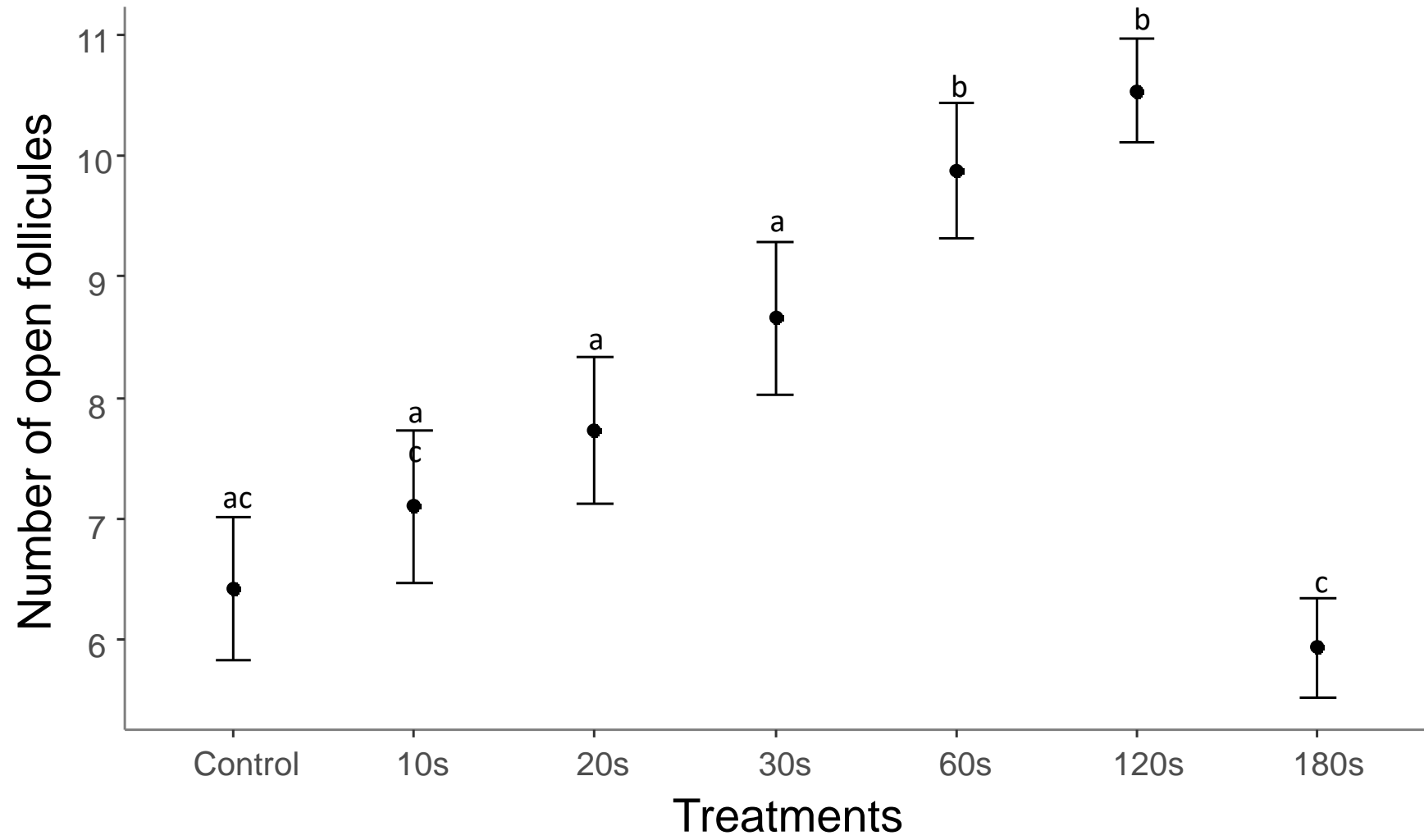
Preliminary results



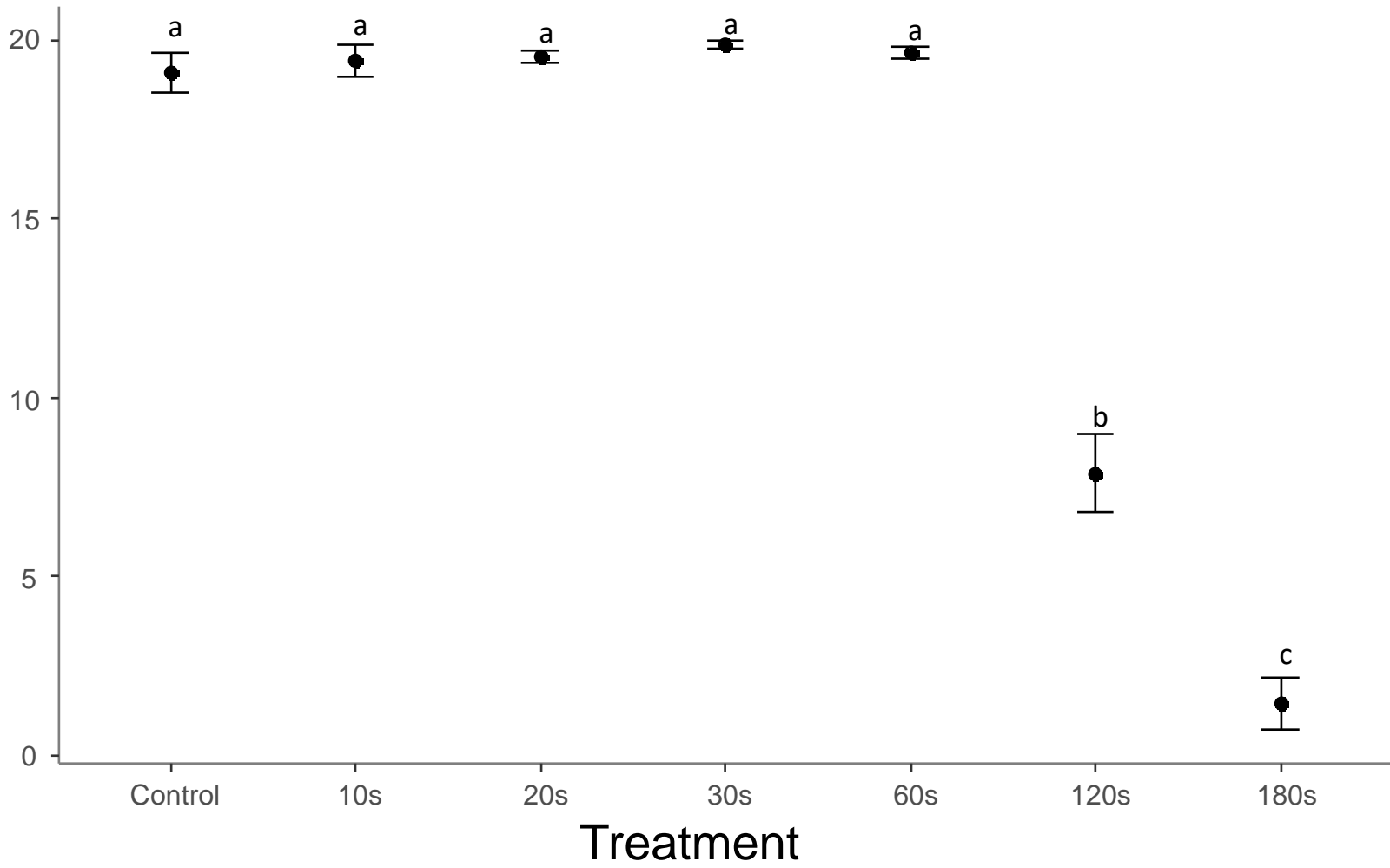
Acacia dealbata

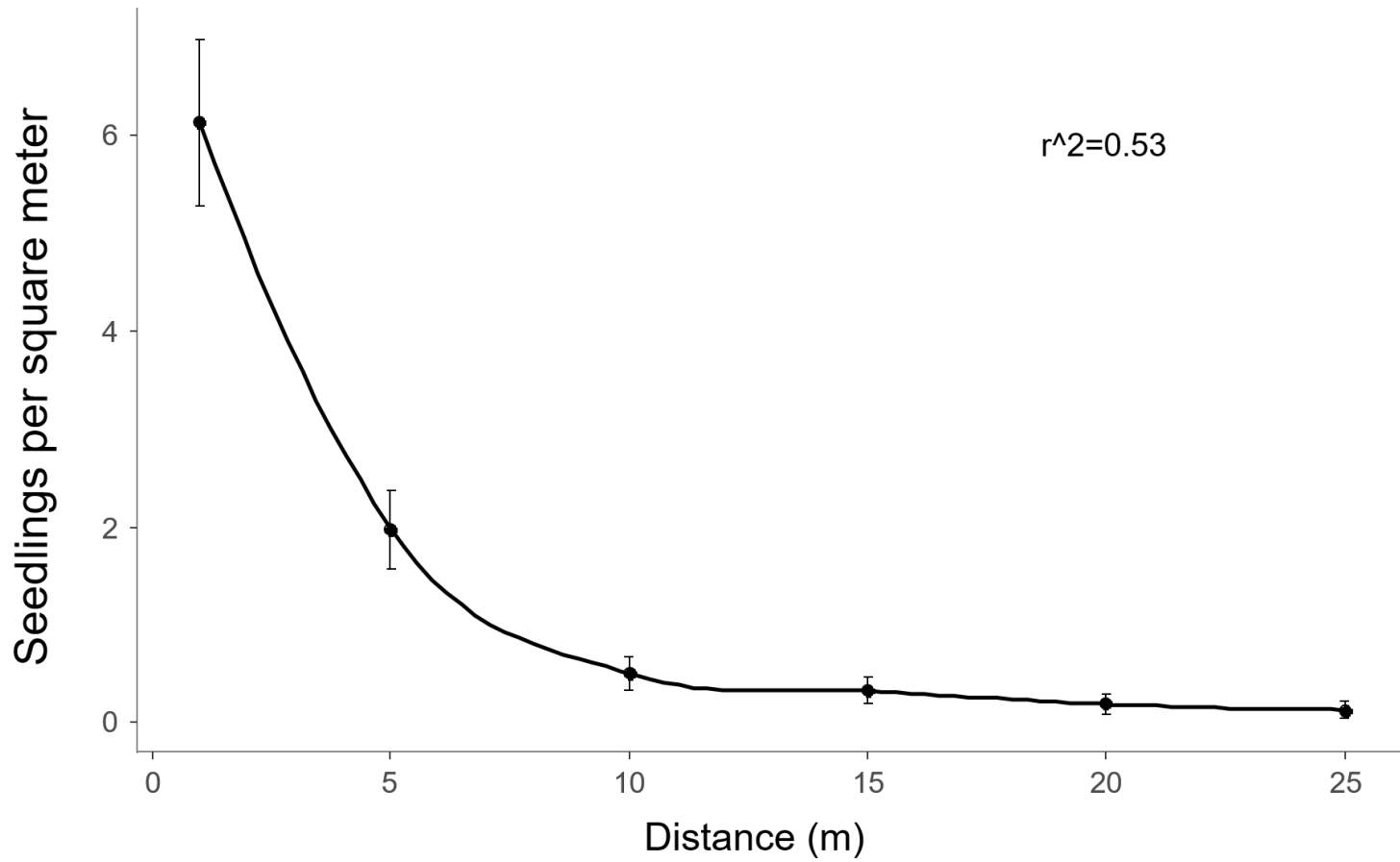






Number of Viable Seeds







Obrigado – Thank you