

Drought legacy effects on post-fire vegetation dynamics in a Mediterranean shrubland of Central Spain

A. Parra, M.B. Hinojosa, I. Torres & J.M. Moreno

Departamento de Ciencias Ambientales

Universidad de Castilla-La Mancha, Toledo, Spain

antonio.parra@uclm.es

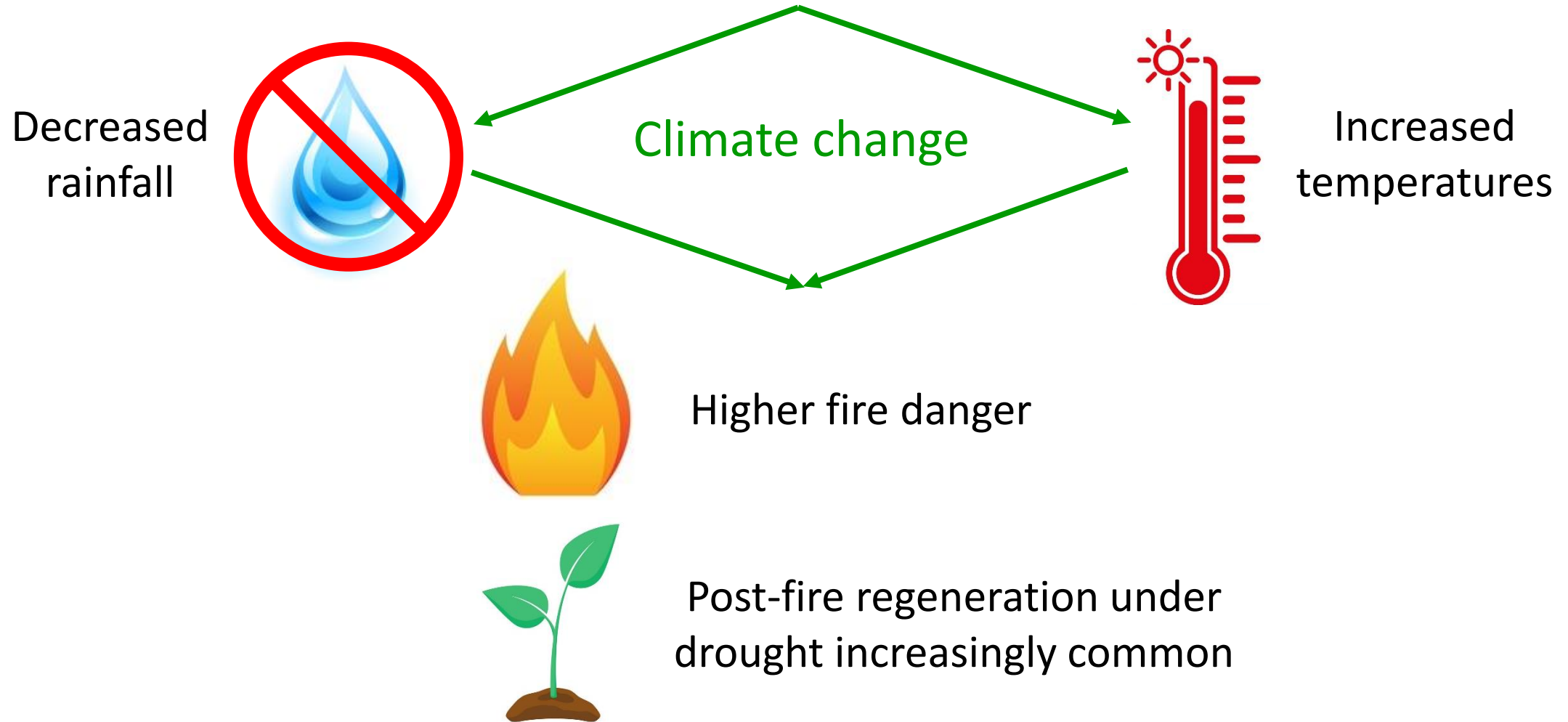


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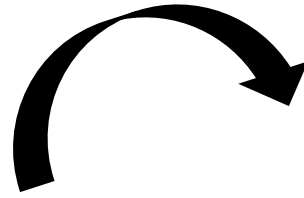
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Mediterranean ecosystems



How anticipate the vulnerability of vegetation to climate change?

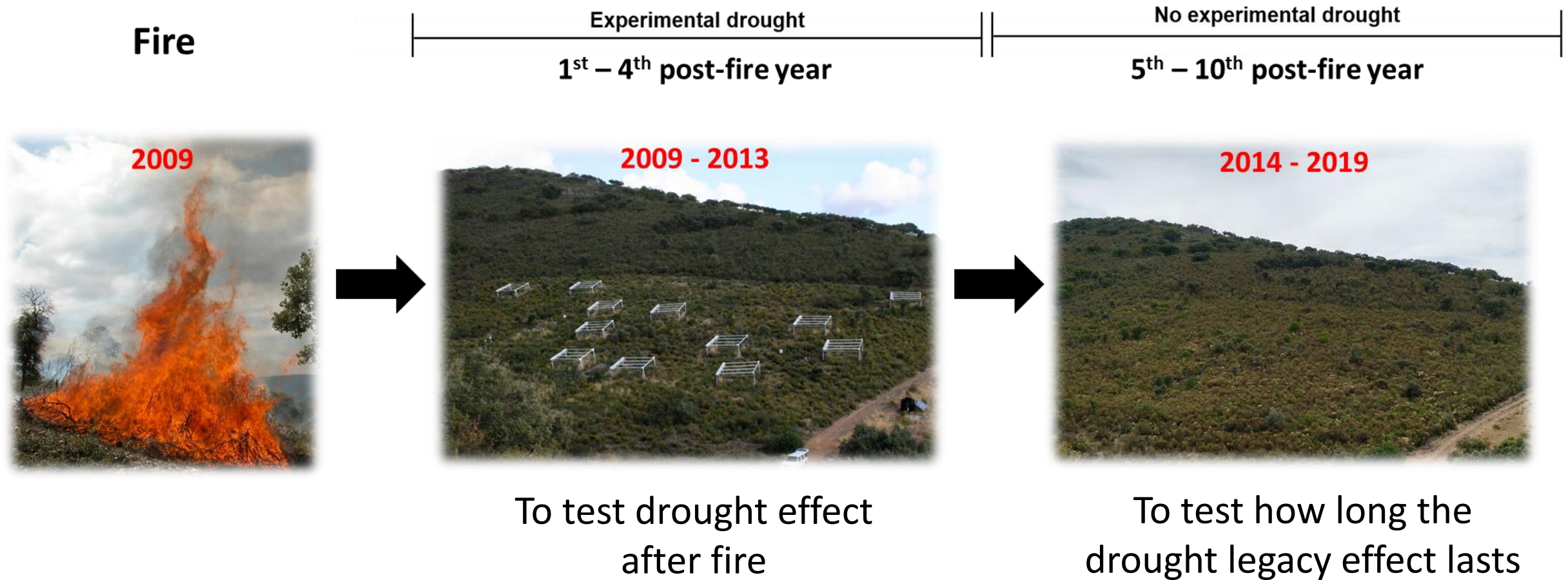
- **Drought manipulative experiment:** Mediterranean shrubland of central Spain.



Treatment	Annual rainfall	Drought length
Environmental control (EC)	Natural rainfall	Natural drought
Historical control (HC)	600 mm	2 months (Jul - Aug)
Moderate drought (MD)	450 mm	5 months (May - Oct)
Severe drought (SD)	325 mm	7 months (Apr - Nov)

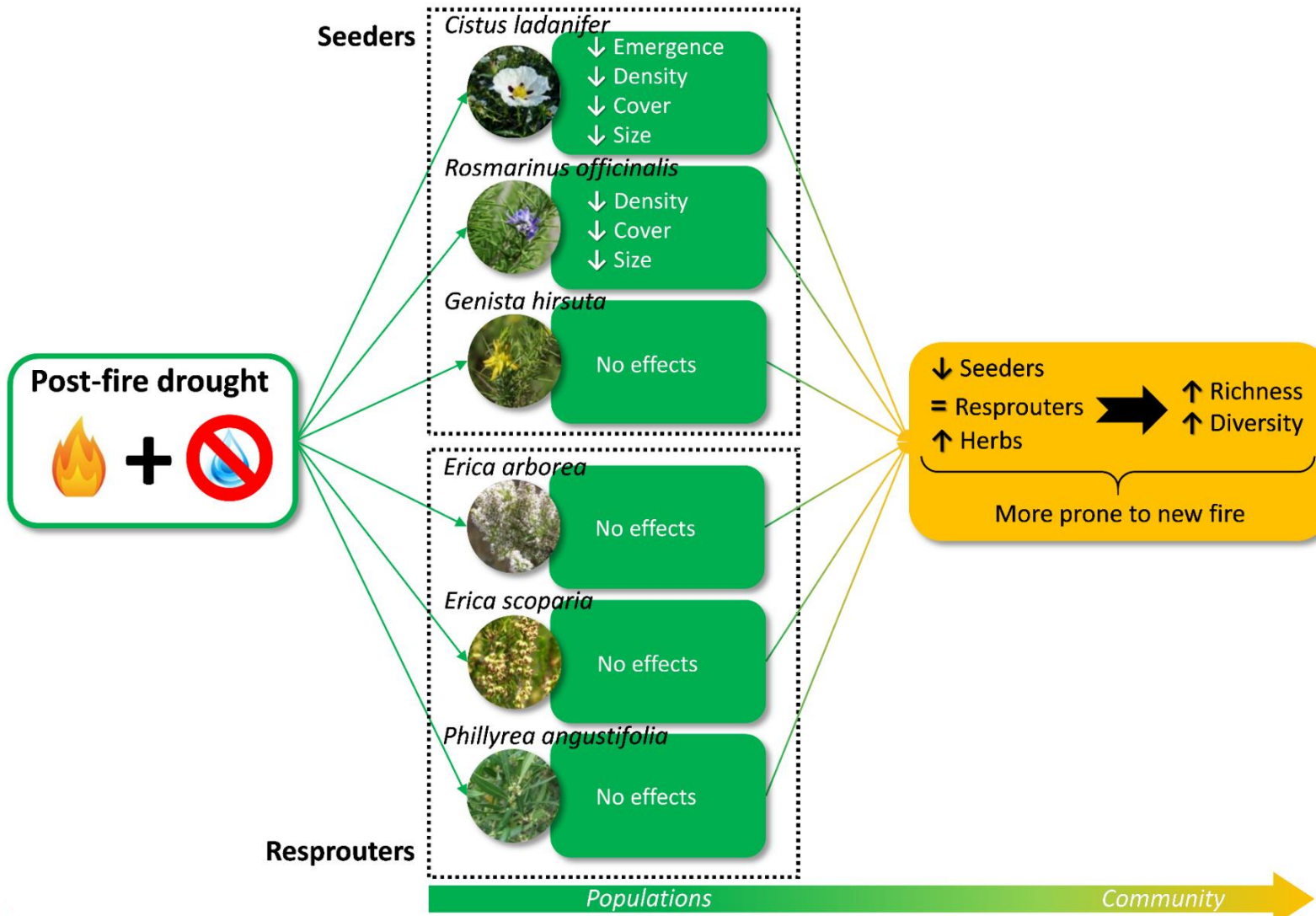
MATERIALS & METHODS

- Experimental burning + monitoring post-fire plant community response.



See [Parra et al. 2012 \(Int. J. Biometeorol.\)](#) for further details about materials and methods.

What are the effects of the post-fire drought on plant community?

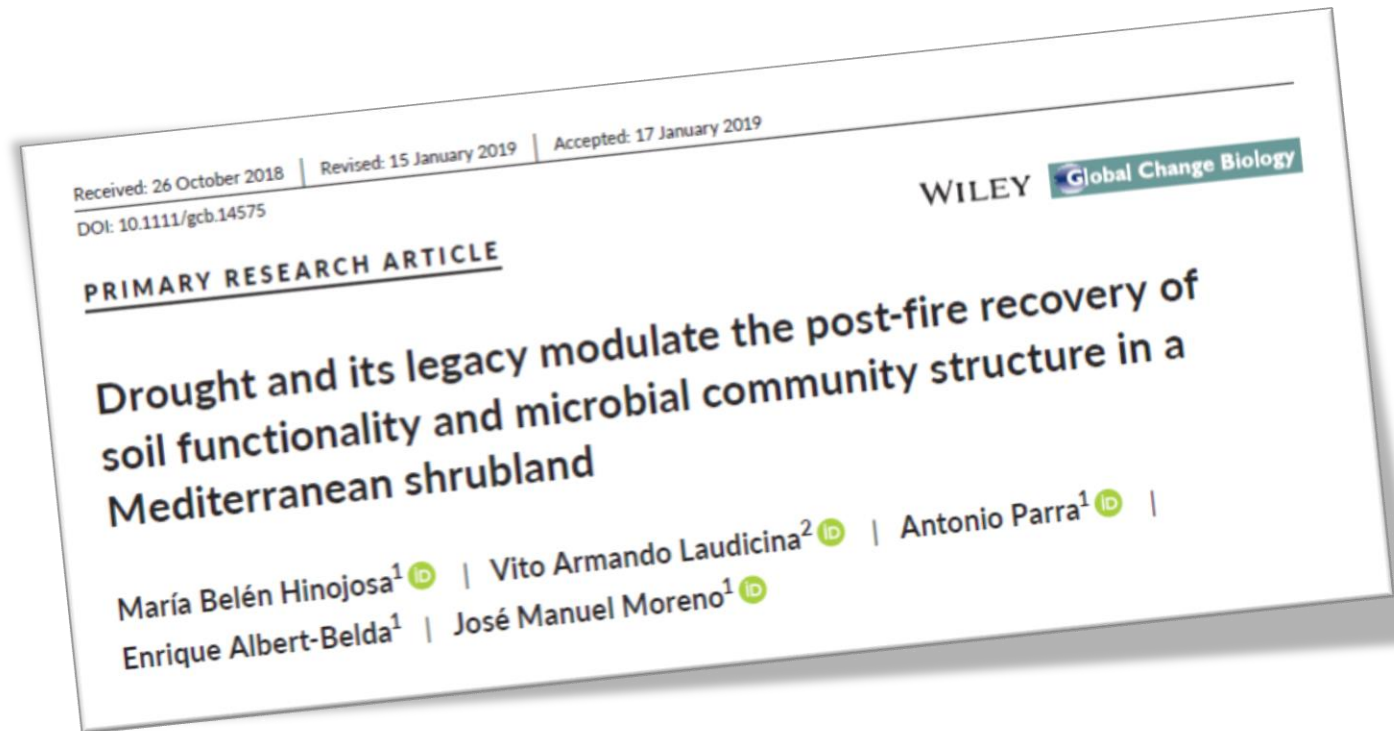


- Reduction of seeder species populations.
- No effect on resprouters.
- Community 'herbalization': herbs occupy gaps left by seeders.

For further details see:

[Parra & Moreno 2017 \(New Phytologist\)](#)
[Parra & Moreno 2018 \(Sci. Total Environ.\)](#)

What happens after the drought?



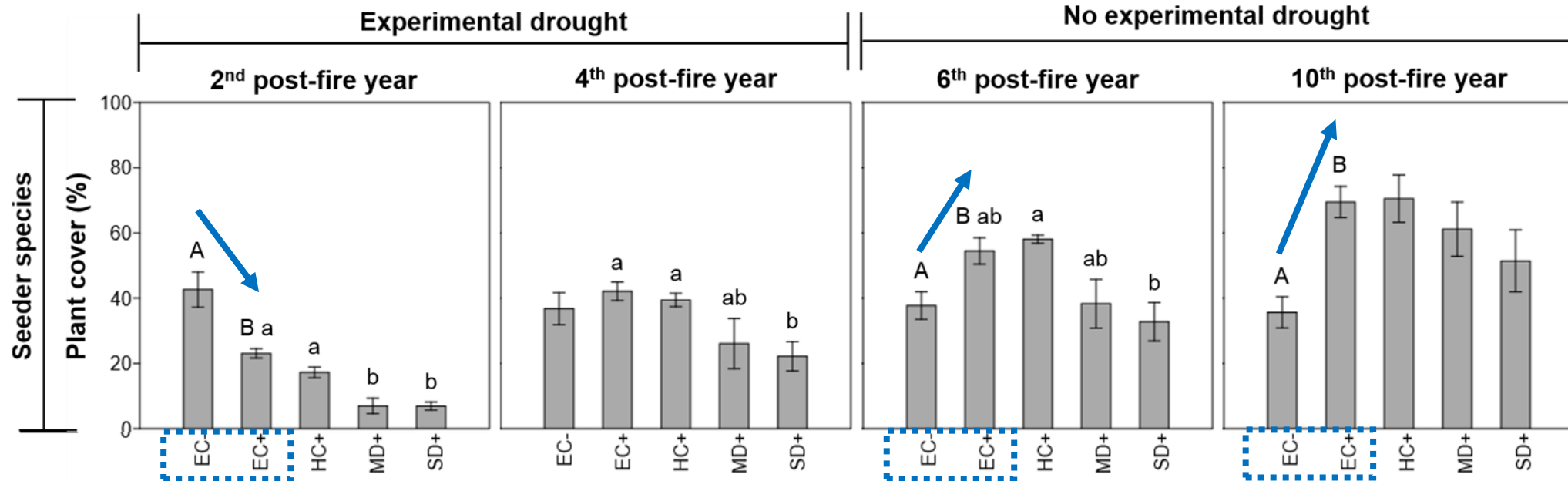
- Legacy effects of drought persist on the functionality and community of soil during, at least, 2 years after ending treatments.

For further details see:

[*Hinojosa et al. 2019 \(Glob. Change Biol.\)*](#)

**But... is there also a drought legacy effect at plant community level??
... how long can that effect last??**

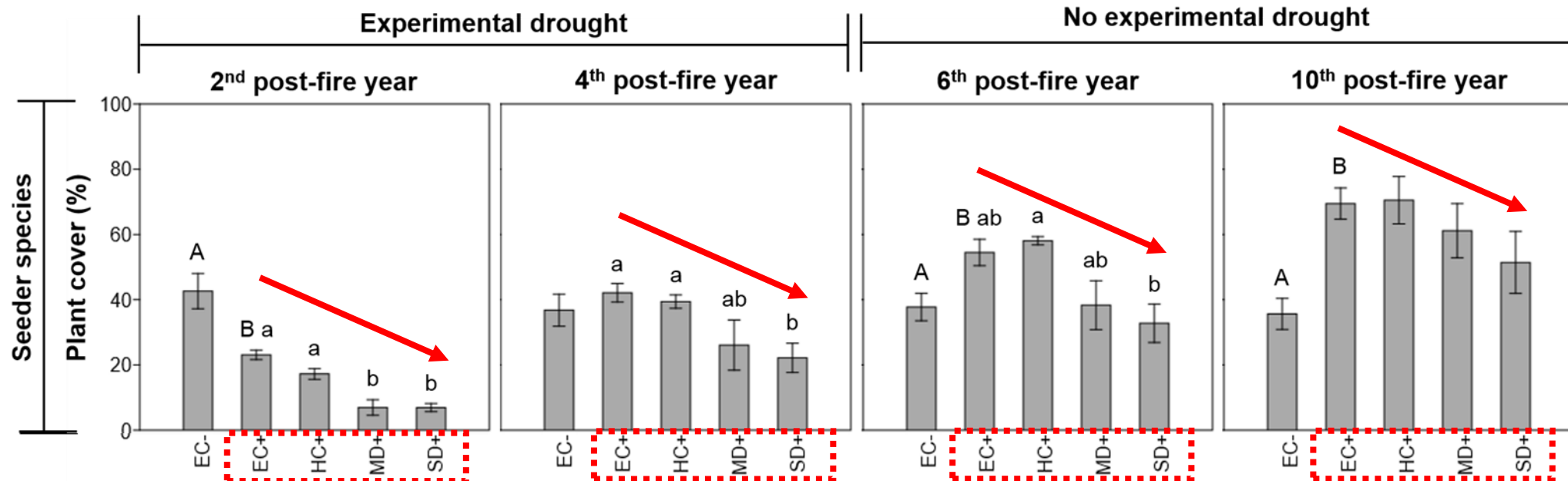
Is there a drought legacy effect on plant community?



Plant cover (%) recorded in all woody seeders (mean \pm s.e.) for the environmental control unburned (EC-), environmental control burned (EC+), historical control burned (HC+), moderate drought burned (MD+) and severe drought burned (SD+) during and after treatments application. Uppercase and lowercase letters represent statistically homogeneous subsets from ANOVA Tukey test assessing fire effect (EC-/EC+) and post-fire drought effect (EC+/HC+/MD+/SD+), respectively. The absence of letters implies that there were no significant differences among treatments ($P > 0.05$).

- The fire had a negative effect on seeders in the short term, but was beneficial to their populations in the long term.

How long does the drought legacy effect last?



Plant cover (%) recorded in all woody seeders (mean \pm s.e.) for the environmental control unburned (EC-), environmental control burned (EC+), historical control burned (HC+), moderate drought burned (MD+) and severe drought burned (SD+) treatment during and after treatments application. Uppercase and lowercase letters represent statistically homogeneous subsets from ANOVA Tukey test assessing fire effect (EC-/EC+) and post-fire drought effect (EC+/HC+/MD+/SD+), respectively. The absence of letters implies that there were no significant differences among treatments ($P > 0.05$).

- Drought reduced the seeder populations during the first years after the fire.
- The legacy effect of the drought was significant 2 years after its end and still visible even 6 years later (10th post-fire year).

- What happens during the first few years after fire is extremely important for vegetation recovery and long-term community configuration.
- The effects of a long drought can persist over various years, and likely over a whole fire cycle.

!!Thanks for your attention!!

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antonio.parra@uclm.es



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