Seedling recruitment success linked to season of fire in a Mediterranean-climate woodland

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Biography:
Russell is a PhD candidate studying the impacts of varying fire regimes on plant population demographics in Banksia woodland, a biodiverse Mediterranean-climate vegetation type on southwestern Australia's Swan Coastal Plain.

Postfire seedling recruitment is vital for the persistence of many plant species in fire-prone ecosystems. The season of fire is known to have an impact on recruitment success in Mediterranean-climate ecosystems with research showing that recruitment is best after dry-season fires. Altered fire seasonality due to changing climate conditions and human activities is, therefore, a cause for concern for species persistence. In the research presented here, I quantified the impact of planting seeds at monthly intervals during autumn-spring on seedling emergence and survival as well as seed survival over summer for those failing to germinate in the first winter-spring. For the Banksia woodland species studied, recruitment was best from autumn-mid winter plantings (May-July). Seeds that were planted in late winter-spring (August-October) failed to emerge in the same year and many died over the ensuing summer, leaving few propagules to emerge the next year. I also discovered that seedlings emerging later in winter showed lower survival over the first summer, presumably because they had a shorter establishment period. This research suggests a negative impact of fire in late winter-spring with seeds either germinating but quickly dying or having to survive over summer to the following winter. Therefore, burning in winter-spring in strongly seasonal environments may present tradeoffs in the persistence of obligate seeders and resprouters. Information on fire patchiness and intensity according to season could help identify pathways of persistence for obligate seeders under certain burning regimes. Integrating ecological knowledge into fire management can assist in avoiding unwanted impacts on biodiversity.

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