Residual seed banks, and soil seed bank longevity in a fire-prone shrubland in SW WA

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Biography:
Ben has recently moved from Kings Park, where he was Director of Science, to establish a Fire Science Program within the WA Department of Biodiversity Conservation and Attractions' Biodiversity and Conservation Science service.

Soil seedbanks are a key component of the life cycle of many Australian plant species. They enable a range of important ecological strategies supporting persistence and resilience of populations, and buffering against short term selective pressures, and disturbance-cued recruitment strategies. They are also hard to study. If all seeds in a species' seedbank committed to germination after a single disturbance, then the entire population is exposed to significant risk if an event such as drought, herbivory or a second disturbance were to occur before seedlings establish and plants become mature. A residual seedbank strategy requires a proportion of the seedbank to respond to germination cues, with the remainder remaining dormant but alive, and able to be cued by a subsequent event. In this study, we prevented seed inputs into an array of intact soils for several years and used cold smoke application to stimulate germination in replicated plots one to six years after inputs ceased, to assess seedbank persistence. We also annually smoked a subset of plots to assess the residual seedbank. The

study occurred in species rich Mediterranean kwongan shrubland north of Perth in Western Australia. Community-level seedbank survival was high for three years but dropped rapidly thereafter. About 25% of germinable seeds did not respond to smoke stimulation in the first treatment, but did in subsequent events, although most did not respond immediately, only germinating after several years of treatment.

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