

Fire-related soil temperature in the Top End

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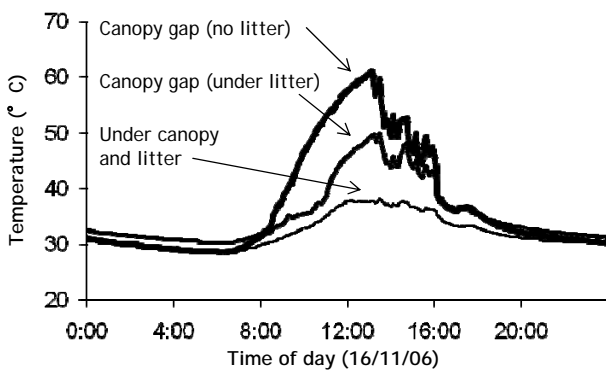
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Soil temperature is important because it determines the rate of seed germination

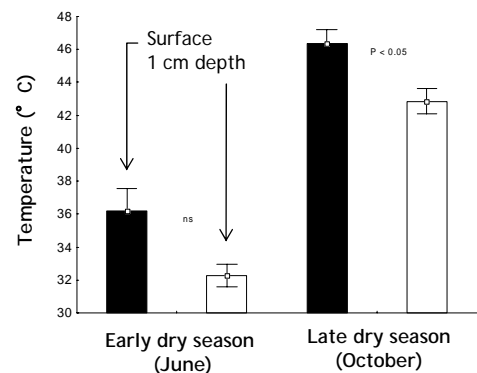
1. Diurnal change on surface (without fire)

- Up to 35° C difference between night and day
- Soil under leaf litter and tree canopy stays cooler



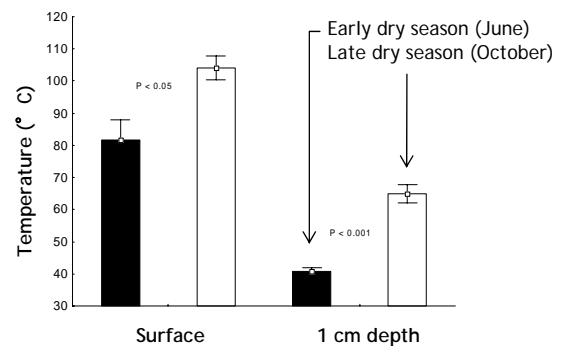
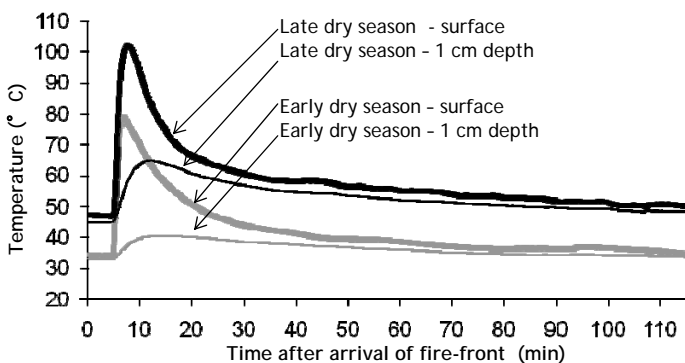
2. Depth and season (1.00 pm, without fire)

- Hotter on surface than at 1 cm below
- Hotter in late dry season than early dry season



3. During a fire

- Peaks rapidly and falls slowly
- Surface gets hotter than 1 cm below
- Fires hotter in late dry season than early dry season
- Soil temperature in early dry season fire similar to diurnal max



4. Implications

- Temperatures are never low enough to prohibit germination in the growing season (starts November)
- Seeds that bury themselves (hygroscopic awns), or fall in shady microclimates, are protected from high diurnal temperatures
- Seeds don't have a direct advantage of being heated by early dry season fire - they experience similar temperatures at time of germination
- Hotter fires in the late dry season should release more hardseeded legumes from dormancy (a given temperature extends deeper)