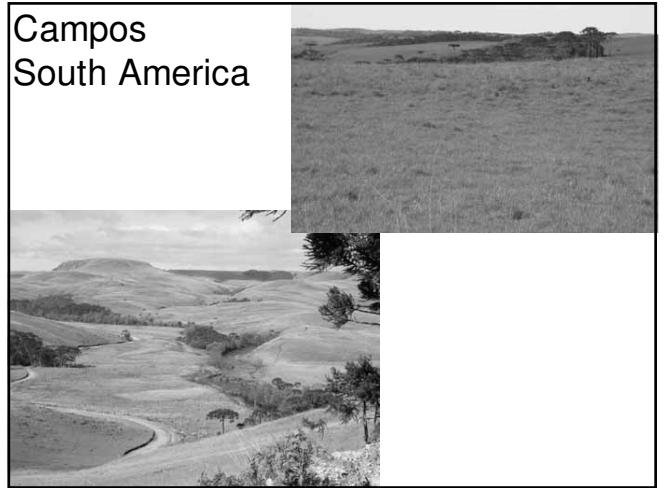


Tall-grass prairies
North America



Campos
South America



Tall-grass prairies
North America



Savanna trees can survive fire



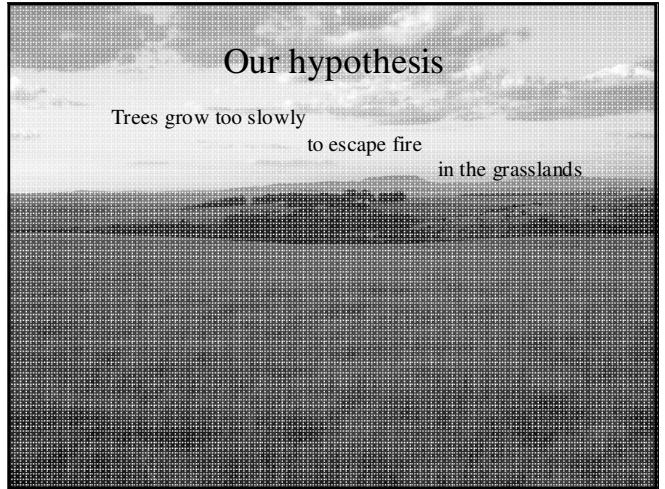
Other existing hypotheses...

1. **Human** derived and maintained by fire over the last 1000 years (Acocas, 1953)
2. **Shallow impervious layer / well-developed illuvial B-horizon** (Feely, 1987)
3. **Waterlogging-dessication** effect of shallow impermeable layer in the soil (Tinley, 1982).
4. Greater **grass competition**, due to higher nutrient availability. Higher water content of topsoils during growing season results in continuous mineralisation of soil organic matter and release of nutrients (Mills *et al.*, 2006)

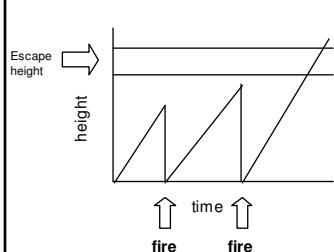
(See: O'Connor & Bredenkamp, 1997. Mills *et al.*, 2006)

Our hypothesis

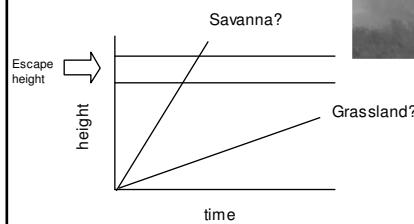
Trees grow too slowly
to escape fire
in the grasslands



Escaping the fire trap



Escaping the fire trap



Our hypothesis

Trees grow too slowly
to escape fire
in the grasslands

a lack of nutrients

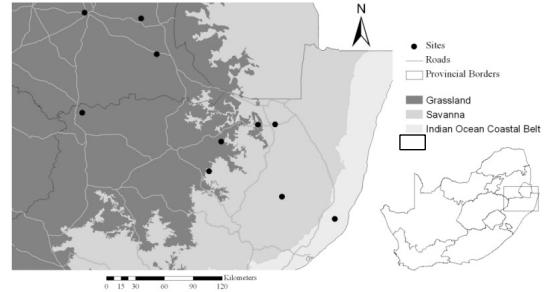
OR

cool temperatures

?

Experimental set-up

Measured *Acacia* seedling growth in grassland & savanna soils & temperatures



Nutrient expt

10 different soils, one climate

2 *Acacia* species



Temperature expt

10 different climates

Same soil + fertilizer
(no nutrient limitation)

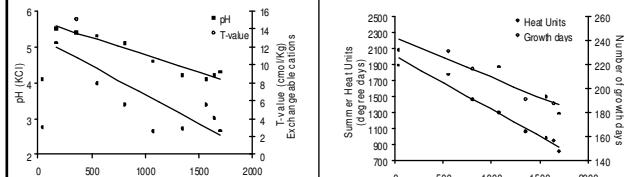
6 *Acacia* species

+ water
- animals
- grass



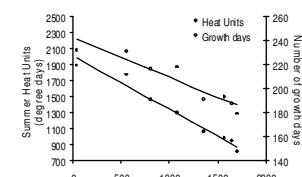
Nutrient expt

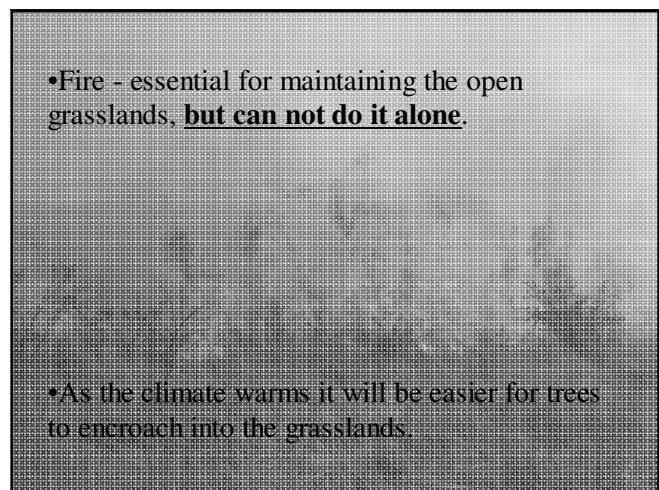
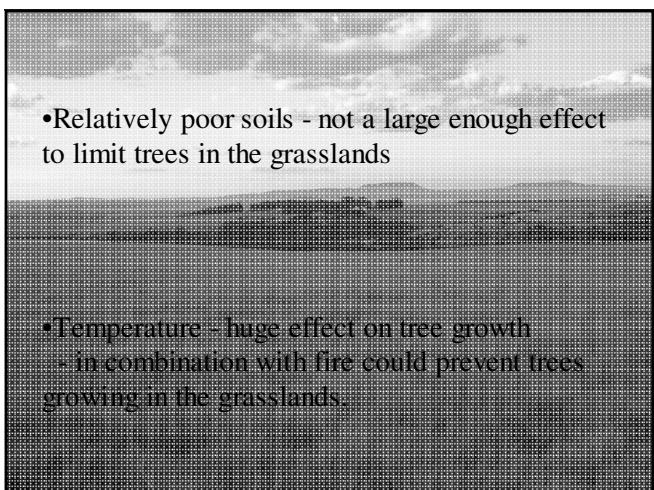
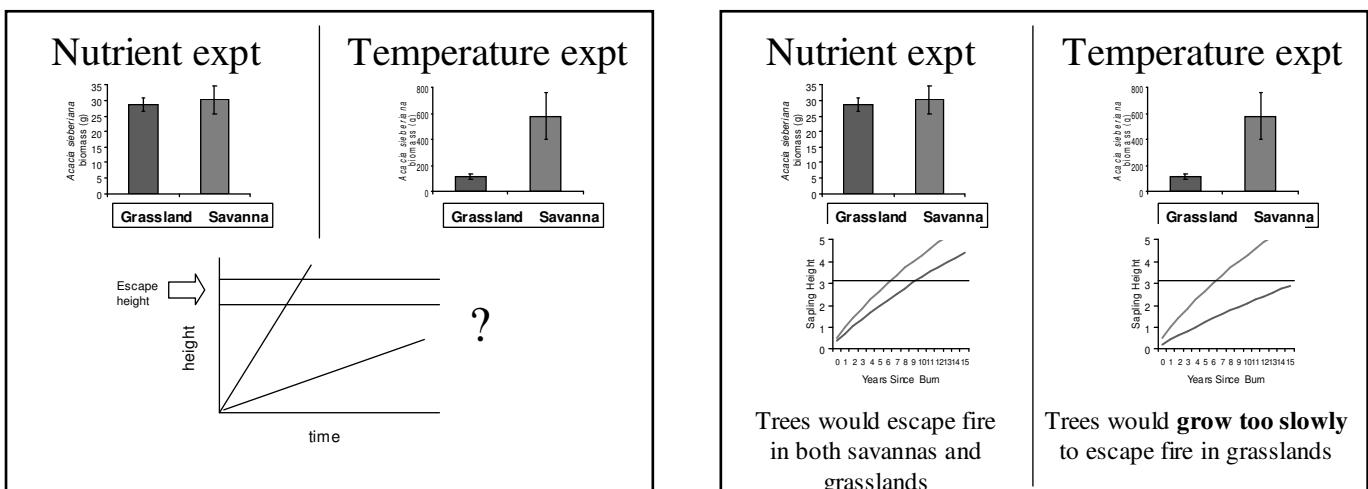
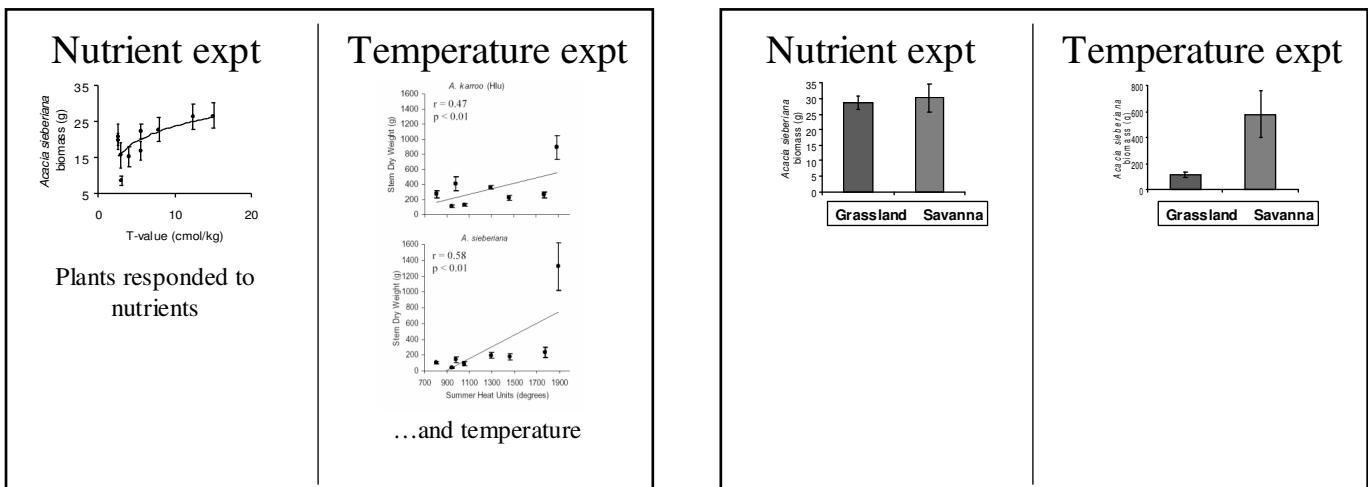
Higher altitude
= less nutrients



Temperature expt

Higher altitude
= cooler & shorter growing season





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