

Current Research into Mopane

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Mopane (*Colophospermum mopane*) is a common tree in Zimbabwe, especially in the lower and drier areas. It has great economic significance for many people, yet not much is known about its ecology. As a result of this, the Department of Forest Resources and Wildlife Management at the National University of Science and Technology (NUST) in Bulawayo has been carrying out a number of research projects into the ecology of the species.

This talk addressed the following questions:

- i) does mopane have seed banks?
- ii) do mopane seeds germinate under canopies of mother trees?
- iii) does mopane nurse seedlings?
- iv) what are the regeneration niches of mopane?
- v) what are the major causes of seedling mortality in mopane?
- vi) is seedling recruitment continual or episodic?

Germination trials of mopane seeds collected under fruiting trees after the rainy season showed that mopane does not have seed banks. Seeds that fail to germinate during the rainy season have a tendency to decay. Thus, seedling recruitment is reliant on annual seed production. Seed germination can exceed 70% under canopies. Although germination is good under canopies, no or very few seedlings are likely to survive through to sapling stage. Mopane seedlings are rarely found beneath mother trees. However, juveniles of other woody species (mainly bird-dispersed) may be found under canopies.

Seedling recruitment is mainly determined by the first rains of the season. Most areas where the species grows are characterized by erratic annual rainfall with extended periods of above and below average rainfall, causing recruiting to be episodic. Seedling mortality is high during the germination period and during the first year. Drought contributes about 80% to seedling mortality. In southern African savannas where mopane grows, both soil moisture and temperature fluctuate greatly during the early wet season. Because mopane seeds germinate on the surface or on litter (especially under canopies), the radicle must penetrate the soil soon after germination before the soil begins to dry out. Many seedlings fail at this stage, particularly on sites with compacted or capped soils. Mortality attributed to pathogens is higher under canopies than outside canopies.

Seedling monitoring experiments in a woodland environment reveal that survival is significantly higher in open bare ground sites than in grassed or under-canopy sites. *C. mopane* seedlings do not establish themselves in well-grassed areas probably because of grass shade and competition for moisture. In order to achieve successful recruitment, mopane seeds must reach sites that do not support high grass biomass. Open bare ground sites are the regeneration niches or 'safe sites' for mopane. The causes of high mopane seedling mortality under canopies require further investigation. Further studies should address the following issues: (a) what are the photosynthetic responses of *C. mopane* seedlings to different light levels?, and (b) what are the growth responses of *C. mopane* seedlings to litter leachates?