BARK WOUND RESPONSES:RESULTS FROM BARK HARVESTING EXPERIMENTS (ZAMBIA, MALAWI & RSA)

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Introduction

- Traditional medicines are still the main source of health care for the African majority eg Over 60% of the Malawian population depends on herbal medicines
- Tree bark is an important component of herbal medicines; normally removed and mixed with other herbal extractives before administration
- Bark removal has a wide range of effects; coppicing to dying of trees.

Introduction cont.

- Responses of individual species were not adequately known to provide for sustainable management of species of different ecophysiology
- An experiment was carried out since July 2003 in Zambia (Miombo woodland), Malawi (Miombo woodland & Afromontane) and South Africa (Afromontane forest) to develop an understanding of species responses to bark removal

METHODOLOGY

- A number of target species for traditional bark harvesting were selected to represent a wide range of diameter class for each species- a vertical strip of 1 m long by10 to 15 cm wide (dependent on tree diameter) was removed.

METHODOLOGY(cont.)

METHODOLOGY cont.

- The bark removal was effected in two different seasons; dry season treatment (July -August) and rainy treatment (January-February)

Study sites and species

Species	Country
Brachystegia bussei	Malawi
Brachystegia spiciformis	Malawi, Zambia
Julbernardia globiflora	Malawi
Dalbergia nitidula	Zambia& Malawi
Pterocarpus angolensis	Malawi
Parinari curatellifolia	Zambia & Malawi
Pseuolachnostylis maprouneifolia	Zambia & Malawi
Prunus africana	Malawi & RSA
Rapanea melanophloeos	Malawi & RSA
Xymalos monospora	Malawi
Ocotea bullata	RSA
Ilex mitis	RSA
Cryptocarya myrtifolia	RSA
Zanthoxylum davyi	RSA

Species selection

- Done in consultation with traditional healers & herbarium;
- Based on observable trend on species' bark trade
- Such had to be health- crown and stem (field selection)
- 20-40 stems of each species were selected; half were for rainy and the other half for dry treatment

VARIABLES ASSESSED

- Edge growth
- Bark lift
- Sheet growth
- Bark movement
- Agony shoots count
- Fungi and insect activities
- Exudates

Results: Bark response

Recovery along wound edge

A combination of the two

On wood (sheet growth)

Bark response cont.

Many species exhibited negative response to bark removal

- Bark around wound lifted before edge growth
- Edge growth development under the lifted bark

Bark response cont.

- Most species exhibited edge development, which is indicative of the ability to recover from bark removal
- Others developed agony shoots either on wound or wound sides or at the base
- For some, the study period was to short to show a conclusive response pattern for management prescriptions
- The general response pattern is summarized in Table 3

Table 3: Patterns of recovery by bark growth on the wound or coppice of regrowth near base of the tree of different forest and woodland species

Species	Vegetation	Country	Bark recovery	Coppice regrowth
A. adianthifolia	Woodland	South Africa	Very good	No
Balanites maughamii	Woodland	South Africa		
B.bussei	Woodland	Malawi	Poor & slow	Poor
B.spiciformis	Woodland	Malawi, Zambia	Very poor & Slow (Mal) to good (Zambia)	No
C. myrtifolia	Forest	South Africa	poor	No
Curtis dentata	Forest	South Africa	Good	Good
D. nitidula	Woodland	Malawi Zambia	Good (Mal) Poor (Zambia)	No (Mal) good(Zam)

Table 3: Patterns of recovery by bark growth on the wound or coppice of regrowth near base of the tree of different forest and woodland species (Cont.)

Species	Vegetation	Country	Bark recovery	Coppice regrowth
Elaeodendron transvaalense	Woodland	South Africa	No	No
Ilex mitis	Forest	South Africa	Very good	Good
J. globiflora	Woodland	Malawi	No	No
J.paniculata	Woodland	Zambia	Good	No
O.bullata	Forest	South Africa	Very good	Good
P. curatellifolia	Woodland	Malawi, Zambia	Poor & slow (Mal) Good(Zam)	No(Zam) to good (Mal)

Table 3: Patterns of recovery by bark growth on the wound or coppice of regrowth near base of the tree of different forest and woodland species (Cont.)

Species	Vegetation	Country	Bark recovery	Coppice regrowth
P. africana	Forest	Malwi, South Africa	Very good	Poor to good
P.maprounefolia	Woodland	Malawi, Zambia	Good (Mal) to Very good (Zambia)	No (Mal), Yes (Zam)
Pterocarpus angolesis	Woodland	Malawi	Good	No
R. melanophloeos	Forest	Malawi,South Africa	No (RSA) Good	No to poor
R.chirindensis	Forest	South Africa	Good	Good
Warburgia salutaris	Forest	South Africa	Good	Good

Table 3: Patterns of recovery by bark growth on the wound or coppice of regrowth near base of the tree of different forest and woodland species (Cont.)

Species	Vegetation	Country	Bark recovery	Coppice regrowth
Xymalos monospora	Forest	Malawi	Poor	Good (but died later)
Zanthoxylum davyi	Forest	South Africa	Poor & slow	Poor
Bark recovery key:	**Very good:** edge and/or sheet growth good & fast to cover the wound relatively quickly	**Good:** Edge &/or sheet growth good but slow	**Poor & slow:** There is indication of edge &/or sheet growth but very slow	No: No recovery
Coppice regrowth key: **Good**: good coppice @ base of tree	**Poo**r: some coppice regrowth @ base but slow development	& may not survive	**No**: no coppice regrowth	

Insect and fungal attack and exudates

Fungal attack varied from species and from treatment to treatment

Insect attack also varied from species to species and treatment to treatment

Species groups based on response to bark removal

- Species which produce agony shoots at the base of the stem and also on wound sides but without sound edge or sheet growth eg *D.nitidula*
- Species with good wound recovery and good coppice regrowth eg *P. maprouneifolia* & *O. bullata*
- Species with good edge growth, poor shoot development and high intensity of insect and fungal attack eg *B. spiciformis* & *J. paniculata*
- Species that exhibit edge growth and sheet development without agony shoots.