The effects of lopping *Colophospermum mopane* and *Combretum apiculatum* trees in order for livestock to access shoots and leaves on a semi-arid savanna site

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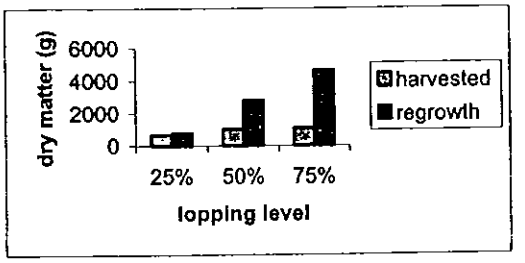
Introduction In most semi-arid communal areas, browse play a critical role as livestock feed in the dry season (Sibanda 1986 and Magadzire 2002). Grazing in these times is limited and in poor condition (Kelly and Walker 1976). Illius and O'Connor (2000) found dry season resources as the major factor affecting the long-term livestock numbers in the semi-arid regions. Trees produce leaves and shoots at the end of the dry season and may be a source of nutritious livestock feed (Lawton 1980). Lopping (cutting down tree branches) of browse trees when they come into leaf in order for livestock to access leaves and shoots is a common practice in semi-arid communal rangelands. However, very little is known about how it affects tree production.

Material and methods A completely randomised block design with four treatments was used on *Colophospermum mopane* and *Combretum apiculatum* trees on both clay and sandy soils. The treatments were zero, 25 per cent, 50 per cent and 75 per cent of branches removed from the trees. The treatments were replicated 13 times and were applied at the beginning of November 1998 and again on the same trees in November 1999 and 2000. Four shoots were marked on each tree and measured after treatments were applied. Shoot measurements were repeated at the end of the growing season in April 1999, 2000 and 2001 to estimate growth in response to the treatments and regrowth accumulated on each tree was quantified. Analyses of variance were performed on shoot growth and the amount of regrowth accumulated on each tree. Means were compared using least significant differences at the 5 per cent level.

Results Trees subjected to higher lopping severities provided more shoot material to feed to livestock than those that had less branches lopped (treatment effect $P<0.001$). The amount of material harvested on each tree increased as the years went by. The lowest harvest was in 1998 (120 grammes), the highest in 2000 (1664 grammes) and in 1999 the amount harvested was 256 grammes (year effect $P<0.05$). Regrowth increased with severity of lopping and all the treatments were significantly different from the other ($P<0.001$) (Figure 1). There was more regrowth on clay soils (2 718 grammes) than on sandy soils (1 384 grammes) ($P<0.001$). The highest regrowth material accumulated in 1999/00, the above average rainfall season and the least was in 1998/99 the drought year (year effect P=0.01). The mean shoot lengths for the zero, 25, 50 and 75 per cent lopped trees were 5, 6, 9 and 12 centimetres respectively (treatment effect $P<0.001$). The shoot lengths were 4, 7 and 13 centimetres for the 1998/99, 1999/00 and 2000/01 seasons respectively (year effect $P<0.001$). Soil type had no significant effect on shoot growth ($P>0.05$).

Figure 1 The amount of harvested shoot material and regrowth accumulated on each tree.



Conclusion
Removal of tree branches induced the growth of shoots and leaves. This practise ensures the conservation of rangeland resources and the environment as well as improving livestock productivity in the semi-arid regions.

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