

South Africa



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FACTS AND FIGURES

Definitions

Various exotic eucalypts (and their hybrid combinations), which are grown for commercial timber production, resprout from the cut-stump (cut-surface ca. 5-15 cm in height) following harvesting, predominantly from epicormic buds, and/or lignotubers. For commercial production, these coppice shoots are selectively thinned over time and managed as a coppice stand for pulp wood, mining timber or poles. In general, the coppice shoots are reduced to the original stocking in two operations: the first to 2 or 3 shoots when the dominant height is about 4 m, and the second to the original stocking when the dominant shoot height is about 8 m. Rotation-lengths vary according to site productivity and/or product and range from ca. 7 -15 yrs. Increasingly, rurally-based small growers are managing eucalypt coppice stems for multiple products (droppers, laths, poles and pulp wood), with a higher management intensity in terms of repeat visits to remove product, and over a much shorter rotation (ca. 1 - 7 yrs).

Legal Framework

As *Eucalyptus* stands regenerated via coppicing are generally managed for commercial timber production, the same legal framework that applies to all exotically grown tree species would apply. As such, there is no direct legislation that applies specifically to the management of coppice stands.

Rotation Period

The rotation period will depend on the eucalypt grown, desired end-product and site productivity. For laths/droppers the rotation period may be 3 years, extending to 7-15 yrs for pulpwood and poles. The general rule is to “plant - coppice - replant - coppice” due to improved genetics, species and/or hybrid combinations (the idea being to only coppice once before replanting).

Statistics

Of the total land area, ca. 1.1% (1.275 million ha) is planted to exotic plantation forests. The main tree species planted for commercial purposes include pines (51%), eucalypts (42%) and wattle (7%). A rough estimate of the area managed for coppice would be 25 - 33% of the area planted to eucalypts at any one time, but this figure will fluctuate from year to year.

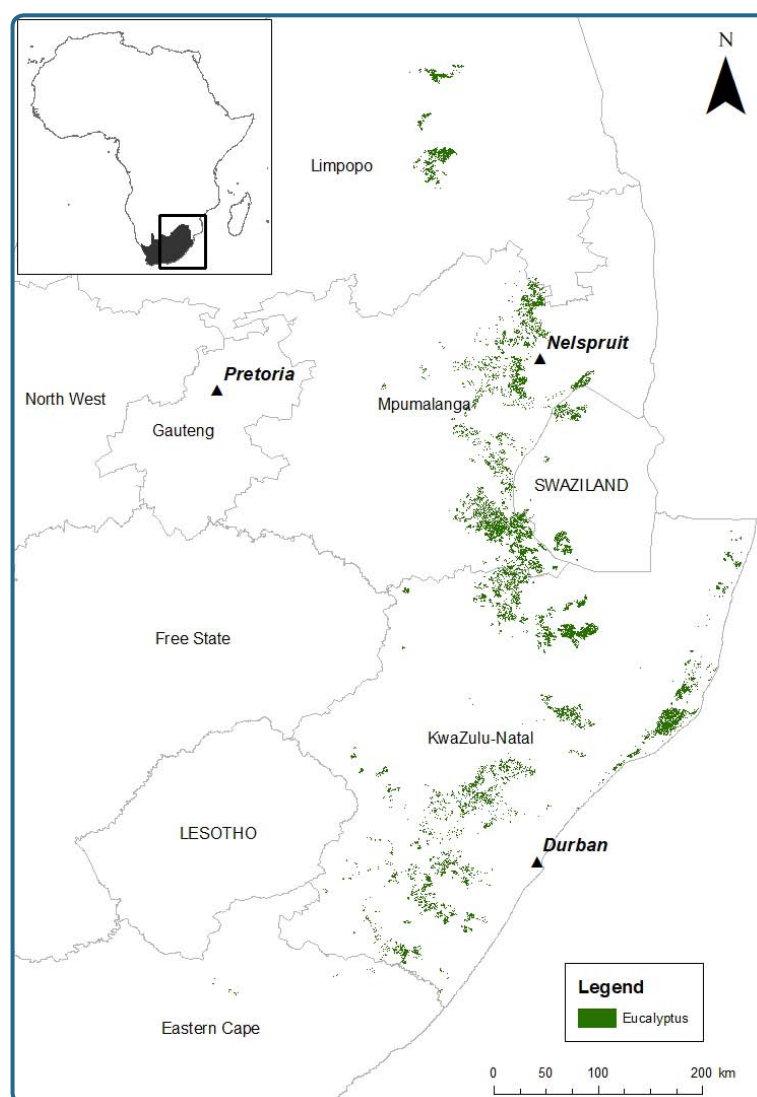
Most of the plantation forests are located within the summer rainfall region and along the eastern seaboard of South Africa (see Map section, following page).

Intensive silvicultural regimes are practised to maximise volume production, with mean annual increments ranging from 15 to 60 m³ ha⁻¹ annum⁻¹, dependent on site quality. Although eucalypts are planted at various inter- and intra-row distances, the target density at felling age is 1,300-1,600 sph.

Typology

<p>Short rotation coppice</p>	<p><u>SRC using the “coppice selection system”</u> Selected shoots (linked to product) are cut when needed, giving rise to uneven-aged stands. This system is used mostly by rurally-based growers on smaller areas (< 5 ha) planted to eucalypts. Mainly for the production of firewood, laths, droppers, poles and some pulpwood, with multiple cuts carried out within 1 – 7 year cycles.</p> <p><u>SRC using “singling”</u> All shoots in a stand are felled, with the resultant regrowth “singled” to leave 1-2 stems per stump. Occurs in commercial plantations, mainly for the production of pulpwood and poles over 7 – 15 year rotations.</p>
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MAP



Areas within the summer rainfall regions of South Africa within which various eucalypts and/or their hybrid combinations are planted (ca. 605 000 ha). Of this area, 25 - 33% of the eucalypts will be managed for coppice once felled, but this figure will fluctuate from year to year. Map source: Institute for Commercial Forestry Research, Pietermaritzburg, South Africa.

DESCRIPTION

Within South Africa, the forestry sector contributes 1.2% to the Gross Domestic Product of the country. Of the total land area, about 1.1% (1.275 million ha) is planted as exotic plantation forests, with less than 0.9% occupied by indigenous forests. The main tree species planted for commercial purposes include pines (51%), eucalypts (42%) and wattle (7%), which supply timber products (sawlogs, veneer, pulpwood, mining timber, poles, matchwood, charcoal and firewood) to both the local and export markets.

Most of the plantation forests are located along the eastern seaboard of South Africa, where various eucalypts and/or their hybrid combinations are matched to the site conditions (Figure 1). *Eucalyptus nitens*, *E. macarthurii* and *E. smithii* are planted in the cooler temperate regions, *E. grandis*, *E. dunnii* and *E. grandis* x *E. nitens* in the warmer temperate regions and *E. grandis* x *E. urophylla* in the sub-tropical regions. These eucalypts are grown over short rotations (typically 7 to 15 years), predominantly for pulpwood production, and to a lesser extent mining timber. Intensive silvicultural regimes are practised to maximise production volume, with mean annual increments ranging from 15 to 60 m³ ha⁻¹ annum⁻¹, dependent on site quality.



Figure 1. A coppiced stand of six-year-old *Eucalyptus grandis* x *E. camaldulensis* clones in the sub-tropical region of Zululand, South Africa.

Although eucalypts are planted at various inter- and intra-row distances, the target density at felling age is 1,300 to 1,600 stems per hectare.

One of the notable attributes of eucalypt species is their ability to survive and produce new growth following adverse environmental conditions, and this is largely a function of their bud systems being able to coppice. This survival mechanism is exploited in commercial plantations for re-establishment following felling, where the coppice shoots are selectively thinned over time and managed as a coppice stand for the production of pulpwood.

Previous research on coppice management in South Africa focused primarily on optimising the number of stems remaining on the stump and on the effects of frequency and timing of reduction (or thinning) of the shoots on timber volume and properties. This produced robust recommendations that are still used today, and state that coppice should be reduced in two operations: first to two or three stems per stump when the dominant shoot height is 3-4 m, and later to the original stocking when the dominant shoot height is 7-8 m.

Decisions as to whether to coppice or replant

Dependent on a number of factors, felled eucalypt stands may be coppiced once (seldom more than twice) before being replanted. Although stand regeneration through coppicing is more cost-effective than replanting, decisions as to coppice or replant specific stands takes into consideration a number of different factors, some of which include determining:

- whether the planted eucalypt has the ability to coppice (there is a range in terms of different eucalypts and their coppicing ability),
- whether the correct species is growing on the site (for example is the species the best in

terms of potential yield, genetic improvement, disease resistance, drought tolerance, frost tolerance, snow tolerance etc.),

- whether trees were planted at the correct spacing (matching stand density to site productivity),
- or if rotation-end stocking of the originally planted stand is adequate.

Challenges

Current challenges in terms of coppice management centre mainly around issues associated with (1) increased mechanisation of forest operations, (2) the incidence of pests and disease, and (3) a change in land ownership.

1. Until recently, South Africa made extensive use of manual labour for both silvicultural and harvesting (motor-manual) operations. Planting densities (especially between tree spatial arrangements), thinning (reduction) operations, and the remaining number of stems per hectare (based on manual operations), will need to be optimised for mechanisation. This will ensure that the currently higher harvesting costs associated with felling coppiced stands is optimised.

2. The impact of recently introduced pests and disease into South Africa has meant that many

of the susceptible eucalypts have been replaced with more resistant, alternative eucalypts and/or hybrid combinations. The coppicing potential and subsequent silvicultural management of these eucalypts will need to be tested.

3. Changes in the South African land reform policies has meant that ca. 50% of commercially afforested land is under “land claim”. This will result in a change in ownership of existing areas under plantations from larger corporate companies to that of small-scale timber growers. In contrast to commercial companies, where maximising rotation-end product at lowest input cost is important, rurally based, small-scale timber growers require constant product throughout the rotation, either for personal use and/or cash-flow (for example droppers and poles for fencing, laths and poles for building, or as a source of firewood). Although the average size of each of these planted areas is small (ca. 1.5 ha), collectively the large number of growers provides an important source of timber to the commercial companies. Best management practices will need to be tested that support the needs of these small-scale growers, whilst still securing timber for South Africa’s pulp-wood needs.

References

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FORESTRY REGULATIONS

As eucalypt stands regenerated via coppicing are generally managed for commercial timber production, the same legal framework that applies to all exotically grown tree species in South Africa would apply. Thus, there is no coppice-specific legislation that applies to the manner in which coppice stands are managed. Within South Africa, the protection of natural forests and the sustainable development of commercial timber is governed by a legal framework that covers a range of sector activities. This policy and legal framework is extensive and includes structures and policies that range from International Conventions to Government Acts that give effect to these, and the Regulations passed in terms of the Acts that enable their implementation. In general, these policies and supporting guidelines (in terms of criterion, indicators and measures) ensure sustainable forestry management in terms of:

- the protection of biodiversity within forest management units,
- the management of impacts such as erosion and alien invasive plant species,
- the management of outputs that reduce environmental quality such as waste,

- fair and appropriate labour practice,
- ensuring the health & safety of labour,
- the protection of heritage resources,
- the regulation of land tenure & rights

Although the two most relevant acts governing forest practices in South Africa are the National Forests Act (Act No. 84 of 1998) and the National Water Act (Act No. 36 of 1998), sections relating to forestry are also contained within other National Governmental Departments (for example Environmental Affairs, Labour, Rural Development and Land Reform, etc.).

References

Three websites that link directly to the Acts and Legislation regarding forests within South Africa:

<http://www.daff.gov.za/daffweb3/Branches/Forestry-Natural-Resources-Management/Forestry-Regulation-Oversight/Sustainable-Forestry/Principles-Criteria-Indicators> [Accessed 30 July 2017]

http://www.nda.agric.za/docs/media/Revision%205_Sept%202015_Draft%20Final.pdf [Accessed 30 July 2017]

<http://www.forestry.co.za/government/> [Accessed 30 July 2017]

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