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# GROWING AND MANAGING ACACIA MEARNSII (BLACK WATTLE) IN KENYA

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Summary

The paper outlines the potential gains a small scale farmer in Kenya stands to achieve by investing in the Acacia mearnsii (black wattle) tree. A survey which included two case studies, was conducted in wattle growing areas.

The survey and the case studies revealed that investment in the growth and management of A. mearnsii for bark, post and pole production gives good returns. The magnitude of the return was increased by including maize into the management system. The level and intensity of management employed had an influence on the magnitude of the returns.

## 1.0. Introduction

Black wattle was introduced into Kenya in 1902 from its native land, Australia. Initially, it was grown along the railway line for the provision of fuelwood for steam engines. Later, with the evolution of the tannin extracting industries in Nairobi, Thika and Eldoret, the growing of black wattle tree spread to other areas, particularly Nyeri, Murang'a, Uasin Gishu, Nandi, Nyandarua and Kirinyaga districts.

By 1960s, small scale farmers had started growing the crop on their small holdings. The involvement by small scale farmers in the growing of the tree was enhanced through the sub-division of the formerly large scale farms.

Growing of black wattle has declined due to the low international tannin prices. However, one company and many

small scale farmers are still growing black wattle for the production of tannin, poles, posts and charcoal.

## 2.0. Establishment and Management

Black wattle is regenerated from seed and is usually grown as a plantation tree. Ripening pods are collected from fruiting trees and drying is completed in the sun. Dried and opened pods are flailed and shaken to release the seeds. These store well in sacks under cover at room temperature. There are about 70,000 seeds per kilogram. Pretreatment is needed before sowing or germination will be erratic. The usual method is treating with hot water. The ease with which plants develop from pre-treated seeds sown directly in the field removes any need for a nursery stage. Moreover, its seedlings do not adjust easily when transplanted.

Before sowing, the site chosen should be ploughed. Sowing is at close spacing in rows at 2.7m apart. Germination takes about a week. After germination, weeding is necessary at frequent intervals as the young trees require illumination. As they grow, thinning is done to increase spacing within rows, first to 0.3m and then during successive operations to 0.8m, 1.5m and finally 3.0m.

The tree is suitable for growing with agricultural food crops when young, before the canopy closes, and if espacement exceeding 2.7m is used between rows, the period of combination can be extended. A major advantage of such combinations is that normal tending of the food crop will take care of the tree seedlings.

## 3.0. Harvesting and Yields

Black wattle is felled between 5 - 10 years depending on the desired produce. It may be necessary to carry out a pre felling thinning or cleaning about 18 months before the end of the rotation. This is done to remove diseased and non-strippable trees to facilitate the main felling operations. In some cases, if market is available for small sized poles, felling can be done at lower ages than indicated.

Felling is done during warm wet season when bark is most easily stripped from the stem. At 10 years, as much as 350m3 of wood per hectare may be obtained in addition to some 10 tones dry weight of bark per hectare - assuming a **tree** density of 1000 per hectare ( Kaale, 1984). If grown as a green manure source, 20 tones (fresh weight), or more of foliage can be harvested per hectare per year ( Kaale, 1984).

The bark should be as fresh as possible during the delivery to the factory. Delays in delivery can result in oxidation and excessive red colouration of extract or formation of mould. These should be prevented in order to ensure good quality of tannin. Most farmers with small woodlots under black wattle or who are far from the factories usually prepare dried bark. This involves carefully drying the bark in well aerated strips to minimise formation of mould.

## 3.1. Other commercial uses of black wattle

Black wattle was originally grown primarily for tannin production. However, with the collapse of the tannin market as a result of the development of substitutes, the main products of black wattle became poles, posts and charcoal. Charcoal is currently the most profitable

product of black wattle followed by posts and poles.

One major drawback to the production of black wattle posts and poles is that they are very susceptible to decay and attack by termites. This however depends on the age and the part of the stem used. Old and mature stems are relatively more **resistant to decay and attack by termites than young immature stems.**

## 4.0. Marketing and Extension

During the survey, it was noted that three categories of buyers exist in the black wattle growing areas;

Local agents who are traders and/or farmers, mobile commercial contractors, and, both the East African Tannin and Extract Company ( Eldoret) and the Kenya Tannin Extract (Thika), who buy the bark

directly from the farmers, agents and commercial contractors. The farmers sell **bark in small quantities to the agents** who accumulate it until it is enough to fill a lorry of seven tones and then sell **to the factories. The agents can also** buy charcoal and poles from the farmers.

The commercial contractors apart from buying the bark, poles and posts from farmers, also enter into contracts with the farmers for cutting, processing and selling black wattle woodlots. They also buy immature woodlot for future harvesting.

Farmers with exceptionally large woodlots can sell bark directly to the factories. At the time of the survey (1988), the price paid by the factories for one tone of dry bark was between Kshs.700 and 870, while wet bark fetched between Kshs.530 and 650 at factory gate depending on quality. Wattle poles were

being bought at a price of Kshs.380 per tone as compared to eucalypti poles which fetched Kshs.270 per tone. The price difference is to encourage farmers to grow more **black** wattle than eucalypts.

The East African Tannin and Extract Company (EATEC) based at Eldoret has taken the lead in encouraging small scale farmers to grow black wattle for commercial purpose. The strategy being employed by EATEC is to develop extension network capable of transferring the technology of growing the tree. Through this approach, they expect to reach a sustainable supply of improved quality of wattle bark. The factory management will also be able to forecast the future supply trends of bark. For this purpose, EATEC provides free seed to interested farmers as part of its policy of making the crop popular with the small scale farmers. To encourage distant farmers, a transport compensation formula is used

to ease transportation costs. This implies that farmers from distant areas, e.g. **Kericho,** Nakuru and Trans Nzoia are charged low transportation costs as compared to those from Nandi and Uasin Gishu. This has increased the economic delivery radius.

The other large processing factory is the Kenya Tannin Extract (KETE) which started its operation in 1934. The company runs an extension service which covers all districts in Central Province. To maximise the collection of wattle bark and at the same time extend the technology of growing and managing the wattle tree, the company has appointed local agents in all the districts. The number of agents differ from district to district depending on the intensity of bark production. These agents work closely in collaboration with the extension officers who are few in number but are mobile through the use of motor

cycles. One of KETE's incentives is free transportation of bark from the buying centres to the factory.

## 5.0 Returns from growing Black Wattle

During the survey, two case studies were done using one small scale farm of one hectare in which wattle bark alone was grown and a large farm (one hectare was used) being managed by one company, on which wattle and maize were grown. The farms were located in Nandi and Uasin Gishu districts respectively. Due to their location and style of management the results from the case studies are not comparable but are used here only to show what can be expected from growing black wattle on its own or mixed with maize in the first year. In economic analysis of agricultural ( including forestry) projects, some crops may take more than one year before returns are forthcoming.

In such cases, for the sake of uniformity, it is necessary to discount all the future incomes to the present. Choosing a discount rate poses a unique problem to analysts.

Gittinger (1982) has recommended 12% for agricultural projects in the developing countries. In doing so, he has assumed that the opportunity cost of capital in such countries lies somewhere between 8 and 15%. 12% discount rate has been found suitable since the interest rate offered by banks in the country ranges between 8% and 16%. We **have used 12% discount rate in the two case studies in analysing the cost and** revenue data from the case studies-The results of the analysis are shown on Tables 1 and 2.

Financial Returns to a Small Scale Farmer from one Hectare of Black Wattle

| Operation (Items) | Year | Costs (Kshs) | Discounted 12% | Revenue (Kshs) | Discounted 12% |
|---|---|---|---|---|---|
| Ploughing (once) | 0 | 600 | 600 | - | - |
| Harrowing (once) | 0 | 300 | 300 | - | - |
| Seeds 16Kg | 0 | 80 | 80 | - | - |
| Sowing | 0 | 240 | 240 | - | - |
| Weeding | 1 | 240 | 214 | - | - |
| 1st thinning | 1 | 60 | 54 | 800 | 714 |
| 2nd thinning | 2 | 150 | 120 | 1,250 | 996 |
| 3rd thinning | 3 | 150 | 107 | 3,000 | 2,136 |
| Clear fell -ing 12 tons bark | 7 | 1,200 | 542 | 14,400 | 6,509 |
| Charcoal | 0 | 2,530 | 1,144 | 24,000 | 10,848 |
| Totals | - | 5,550 | 3,401 | 43,450 | 21,203 |
| Profit | - | - | - | - | 17,802 |

Source: Survey done in Nandi District

Financial Returns to a Large Scale Farmer from one Hectare of Black Wattle grown with Maize

| Operation (Items) | Year | Costs (Kshs) | Discounted 12% | Revenue (Kshs) | Discounted 12% |
|---|---|---|---|---|---|
| Ploughing (once) | 0 | 600 | 600 | - | - |
| Harrowing (once) | 0 | 300 | 300 | - | - |
| Wattle seeds 16Kg | 0 | 80 | 80 | - | - |
| Fertilizer | 0 | 370 | 370 | - | - |
| Sowing | 0 | 250 | 250 | - | - |
| Weeding | 1 | 270 | 241 | - | - |
| 1st thinning | 1 | 370 | 330 | 800 | 714 |
| 2nd thinning | 2 | 220 | 175 | 1,250 | 990 |
| 3rd thinning | 3 | 220 | 157 | 3,000 | 2,136 |
| Harvesting of maize | 7 | 1,200 | 542 | 9,000 | 4,068 |
| Sale of maize cobs | 1 | 300 | 268 | 5,500 | 4,912 |
| Harvesting clear fell -ing bark | 7 | 1,200 | 542 | 9,000 | 4,068 |
| Poles | - | - | - | 18,000 | 8,136 |
| Totals | - | 5,100 | 4,158 | 51,050 | 33,012 |
| Profit | - | - | - | - | 28,853 |

Source: Survey done in Uasin Gishu District

## 5.1 Case studies results

From tables 1 and 2, the returns to the small scale farmer growing wattle trees were Kshs. 17, 802.00 net profit while for the large scale farmer, growing wattle trees mixed with maize received Kshs. 28,853.00 net profit.

### 5.1.1 Discussion of Results

The results are not comparable as:-

(a) the locations were different

(b) the management styles and intensities were different.

However, it is clear from the results that growing of wattle trees can give good returns. Production can be enhanced through intercropping of maize and wattle trees. For the small scale farmer,

charcoal gave a good return after seven years while for the large scale farmer, maize and cobs gave a good return after a shorter investment period.

## 6.0 Conclusions

Three apparent conclusions from this survey are that:

- growing of Acacia mearnsii coupled with good management can give good returns on investment.
- Acacia mearnsii when grown together with maize, under good management gives even better returns on investment.
- where the market for poles and posts is readily available these products would fetch better prices, thus *increasing* the returns. In the absence of this, poles and posts should be sold as charcoal after conversion since it gives better returns in the same investment period.

## 7.0 Future Prospects and Recommendation

According to O'Keefe et al (1984) charcoal production from areas being cleared for farms which are currently the main source of the commodity is expected to fall drastically by the year 2000. Charcoal supply is already becoming a critical issue especially in urban areas. Due to this high demand and low supply situation, charcoal prices are expected to continue to raise. From 1987 to 1989, the prices have gone up from Kshs. 60 to over Kshs. 120 per sack of 40 kg in the open market. According to Schuh '(1988), small farm woodlots of Acacia mearnsii and eucalypts, provide surplus income over and above the value of domestically consumed poles of fuelwood. For rural families, this represents their only significant source of surplus from farm income. This could be a reality in many small scale farms in Kenya if tree

growing is accelerated by intensifying extension services and by restructuring the market for poles, posts and charcoal.

## 8.0 References

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