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Propagation of Padauk
(*Pterocarpus macrocarpus* Kurz)

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ပိတောက်စိုက်ခင်းတည်ထောင်ခြင်း

စောစီဒူး
သစ်တောသုတေသနဌာန၊ရေဆင်း

စာတမ်းအကျဉ်းချုပ်

ပိတောက်စိုက်ခင်းတည်ထောင်သော နည်းစနစ်များကို တင်ပြထားခြင်းဖြစ်ပါသည်။ ပိတောက်စိုက်ခင်း တည်ထောင်ရာ၌ သစ်စေ့များသိုလှောင်ခြင်း၊ ပျိုးပင်များကို ထိန်းသိမ်းခြင်းနှင့် ပိတောက်စိုက်ခင်းများမှ ကိုင်းတက်ချိုင်ခြင်းကို မည်သည့်အချိန်တွင် ဆောင်ရွက်သင့်ကြောင်းနှင့် ဆောင်ရွက်ပုံ၊ ဆောင်ရွက်သော နည်းစနစ်ကို တင်ပြထားခြင်းဖြစ်ပါသည်။

Propagation of Padauk (P*terocarpus macrocarpus* Kurz.)

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Abstract

The Forest Department has launched a large scale of establishing Padauk (*Pterocarpus macrocarpus* Kurz) to provide information to Forest Department, research on methods of propagation of Padauk was conducted. Methods of seed storage, preservation of seedlings and methods of pruning are described in the paper.

Introduction

Padauk (*Pterocarpus macrocarpus* Kurz) in Burma grows in the drier parts of the country mostly in Upper Mixed Deciduous Forests. It ranges from 24 latitude in the Bhamo, Mogok and Katha Forest Divisions, southward to isolated patches in Tenasserim and Mon States. On the East, it is found in Sotherrn Shan States and Kayah State and ranges westwards as far as the Arkan and Pakkoku Forest Division. It grows abundantly in the Shwebo, Yemethin, Madalay, Meiktila, Yaw, Pakkoku, Prome and Thayet Forest Divisions.

Padauk is found in undulating hilly country at elevation up to 2500 (feet) and usually most abundant in the drier sites the ridge top and upper slopes. It occurs in rainfall areas of under 35 (inches) to over 100 (inches), but seems to thrive well with a rainfall of 50 to 60 (inches), with minimum and maximum temperature of 45° and 110° Ferenheit. It grows well on the more sandy soils especially in depression between tracts of semi-indaing forests.

Padauk is a member of the legume family and has a well developed root nodules even in young seedlings. (Saw C. Doo. F.R.I Leaflet No.8, February 1991). This symbiosis with Rhizobium bacteria which extract atmospheric nitrogen, adds to the nitrogen supply available to the plant. This may explain at least part the good growth of Padauk on the restricted sites. At Moswe (Yemethin Forest Division) seedlings planted in mid-June had attained an average height of 35 inches in four months even rainfall was much below the average.

Economic Importance

Padauk fetches a very high price on the foreign market, and large volume are being out throughout the forest areas where it occurs in quantity. Logs seldom exceed 6 (feet) in mid-girth, many are smaller. To replace the removed trees plantation becomes necessary. At Present, the Forest Department has launched extensive plantation establishment all over the area where Padauk grows.

Hence, Plantation technique including procurement and storage of seeds, technique of propagation , and management of Padauk plantation need intensive research in the country.

Objective

The objective of this research has directed to the technique of procurement and storage of seeds, technique of propagation and management of Padauk plantation.

Materials and Methods

1. Procurement and storage of seeds

Fruits of Padauk were collected every month beginning from the month of November to February. The seeds were manually extracted, from the fruit and the germination percent were tested.

Seeds were storage in one liter Erlenmyer flasks for three years consecutively, and the germination percent of seeds were conducted in the laboratory using petri dish and moist filter paper. During the period of storage occasional drying was carried out.

2. Cutting from seedlings

150-ten- months old seedlings selected for cuttings. Each seedlings was cut to length of 3-4 inches consisting of 2-3 buds in each cuttings. 6-7 cuttings were obtained from each seedling respectively. A total of 1000 cuttings were raised in the plastic bags consisted of

2 parts forest top soil, one part river sand and one part compost by volume. After 6 months the cuttings were transplanted in the field with s an average height of 1.5 feet. The survival and height were recorded after planting. Comparison was also made between cutting transplant.

Rito Gro (Indole Butyric Acid) was used in a test on the rooting of Padauk cuttings were treated with rooting powder. 45 other cuttings were not treated. The cuttings were then placed in the containers consisting of forest top soil and were kept under partial shade. A fine spray was used in misting-watering. Observation was made daily to observe shoot and root development of the cuttings.

Prunning

Branchy trees were selected and prunned in the month of April. The prunned surface was coated with creosote-tar and observation was made whether there was any decay development. Coppice was also tried to observe the development of new shoots.

Disease problem

There were several dieback of Padauk in the experiment plots. To identify the disease the trees were uprooted and all the plant parts were examined.

Results and discussions

Germination of Padauk seeds stored for one, two and three years, has no changes in viability, at least for three years. (Figure 9). Several test conducted in the laboratory demonstrated that Padauk seed germinated 2% after three days and 22% after 5 days. Padauk seed germinated for at least two weeks after which germination terminated. The cumulative germination percent was 73%-78% after 15 days. Cuttings Padauk from seedlings treated will IBA (Indole Butyric Acid) developed shoot 20 percent more than cutting without treatment. (Saw C .Doo, F.R.I Leaflet No.8, 1981).

The survival percent of cutting seedlings on the field was 80% while seedlings transplant was 84 %. The average height of planted cuttings after 3 years was 15' 5" where seedlings transplant was 17' 5". There was no significant different as regard to the height growth. The bole of the trees for both planting was also identical. When branchy Padauk were prunned and the prunned surface coated with creosote-tar, there was no decay in the wound. However, in some cases the small shoot developed in the vicinity of the area. It was also learned that after the purnned which was done after two years of planting new branch developed again in the upper portion of the tree. These branches were purnned again in the third year of planting. It was found out after the second prunned Padauk bole had a considerable clean bole for further development.

Die back of Padauk tree were uprooted and the plant parts were examined. Initially, the leaves become yellow with subsequent wilt of the trees, However, the tree still alive for sometimes, but the trees dried up gradually and died. No other symptom was observed in the anatomical structure of the plant. There were several wound on the tap root as a result of rodent bite. It may be concluded that rodent was the causal agent of Dieback.

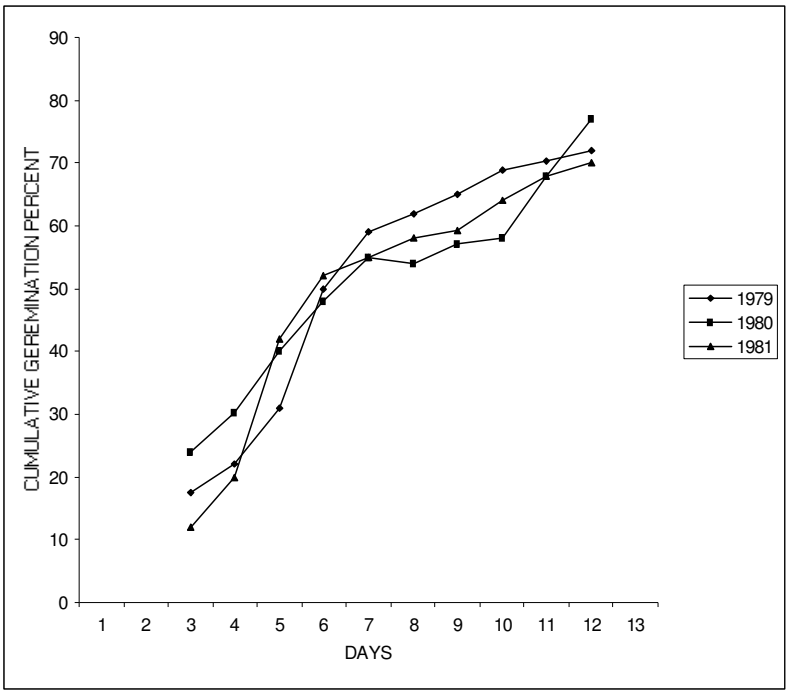

Fig (9) Germination Test of Padauk (*Pterocarpus mocrocarpus*)Seed in Laboratory .

Conclusion

In the establishment of Padauk plantation an intensive management is important. Weeding, cleaning and prunning must be done in time so as to have a well establishment plantation with clean bole for timber yield. Therefore the following suggestion may be of help to Plantation Assistants.

1. Padauk seed can be stored at least for three years provided. It is kept in a tight container. The seed should be dried occasionally during storage period.
2. Prunning of Padauk should be done in the second and third year after planting.
3. The leaf over stock of Padauk seedling10s after planting can be further maintained by producing cuttings. The cutting is best done in the month of October using 6 months old seedlings.
4. For protection of the plantation fire and rodent control scheme should be given priority.

Comparison of Height Growth of 3 Years Old Padauk Planted with small Tube Seedlings, Large Tube Seedlings, and Seedlings from Cuttings.

Table

Source	S.S	D.F	M.S	F.Ratic	Table.F
Treatment	144.94	2	72.47	9.06	3.07 (5%)
Block	10.78	2	5.39	0.666	4.79 (1%)
Treatment x Block	146. 9	4	36.73	4. 54	2.45 (5%)
Error	655.86	81	8.09		3.48 (1%)
Total	957.95	89			

Comparison of means

Treatment	Means	Combination	T. Statistic
T1	16.37	T1 x T2	3.98*
T2	17.57	T1 x T3	11.597**
T3	19.45	T2 x T3	3.55**

* Significant at 5% level = 2.92
** Significant at 1% level = 6.965

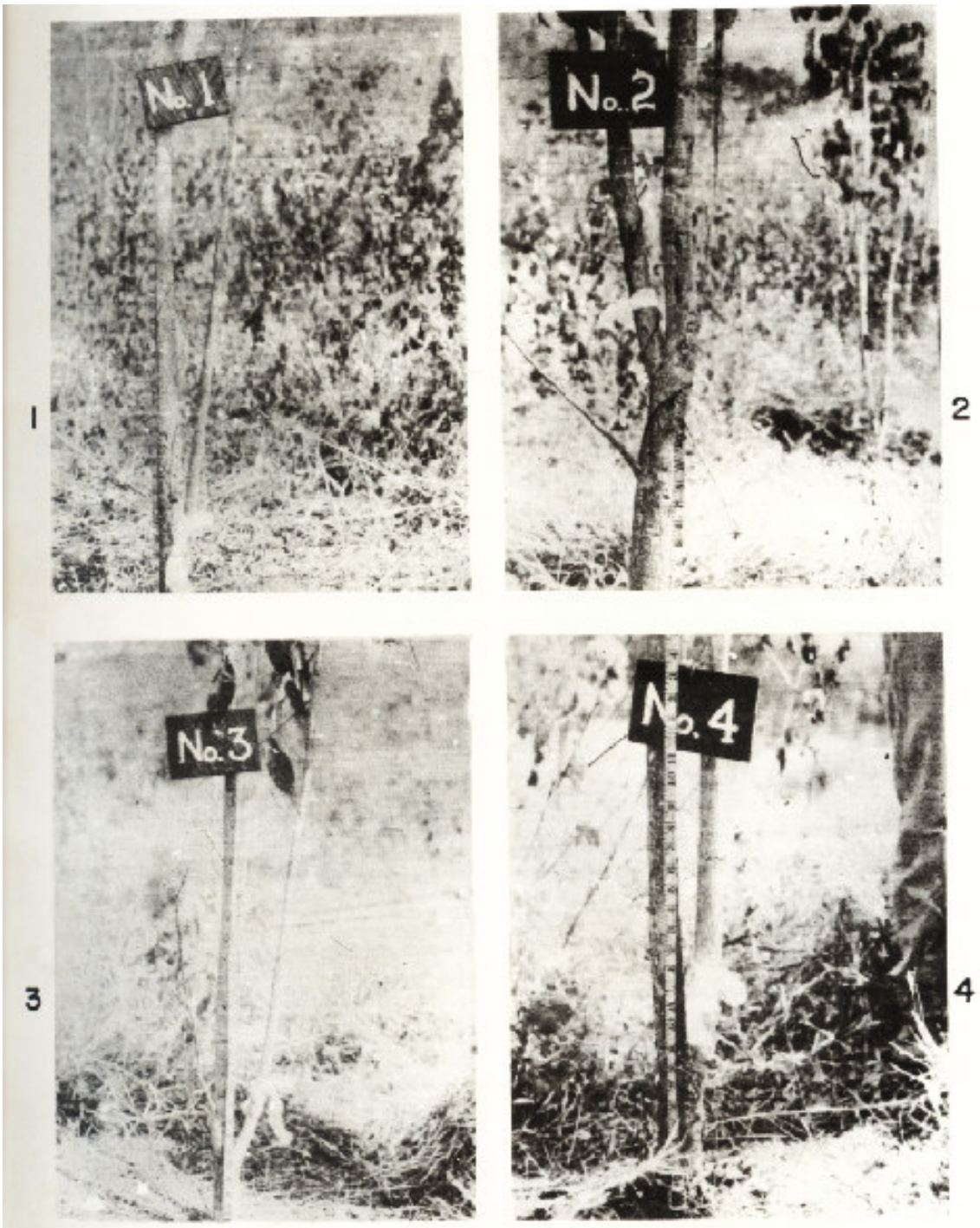

FIGURE . 1, 2, 3, 4 DIFFERENT TYPES OF BRANCHING.

THE RIBBONS INDICATE THE LOCATION OF PRUNNING.

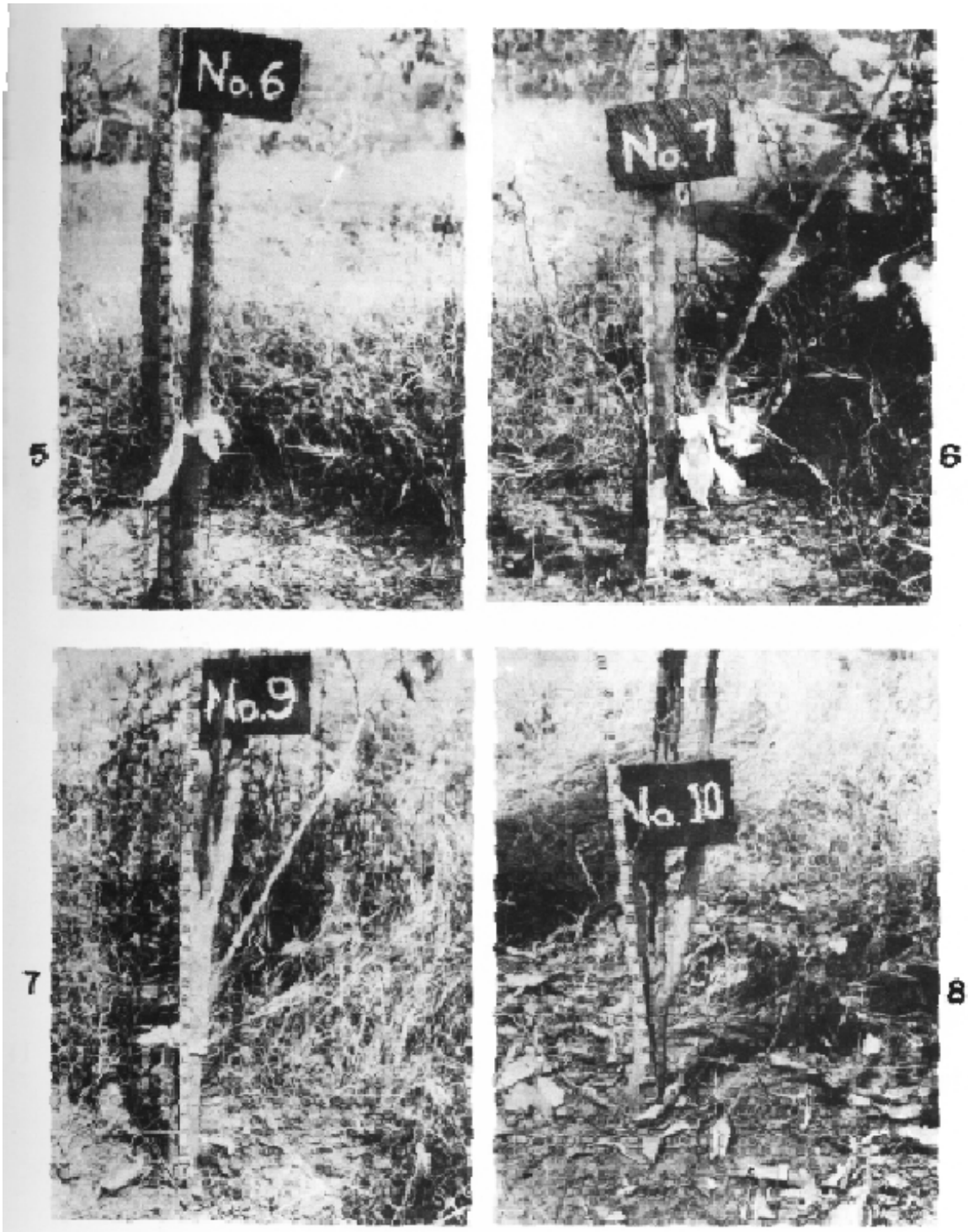

FIGURE . 5, 6 . 7, 8 DIFFERENT TYPES OF BRANCHING.

THE RIBBONS INDICATE THE LOCATION OF PRUNNING.

Figure 9,10,11,12 Different Types of Branching

The Ribbons Indicate the Location of Prunning.

Figure 13,14,15,16 Different Types of Branching

The Ribbons Indicate the Location of Prunning.

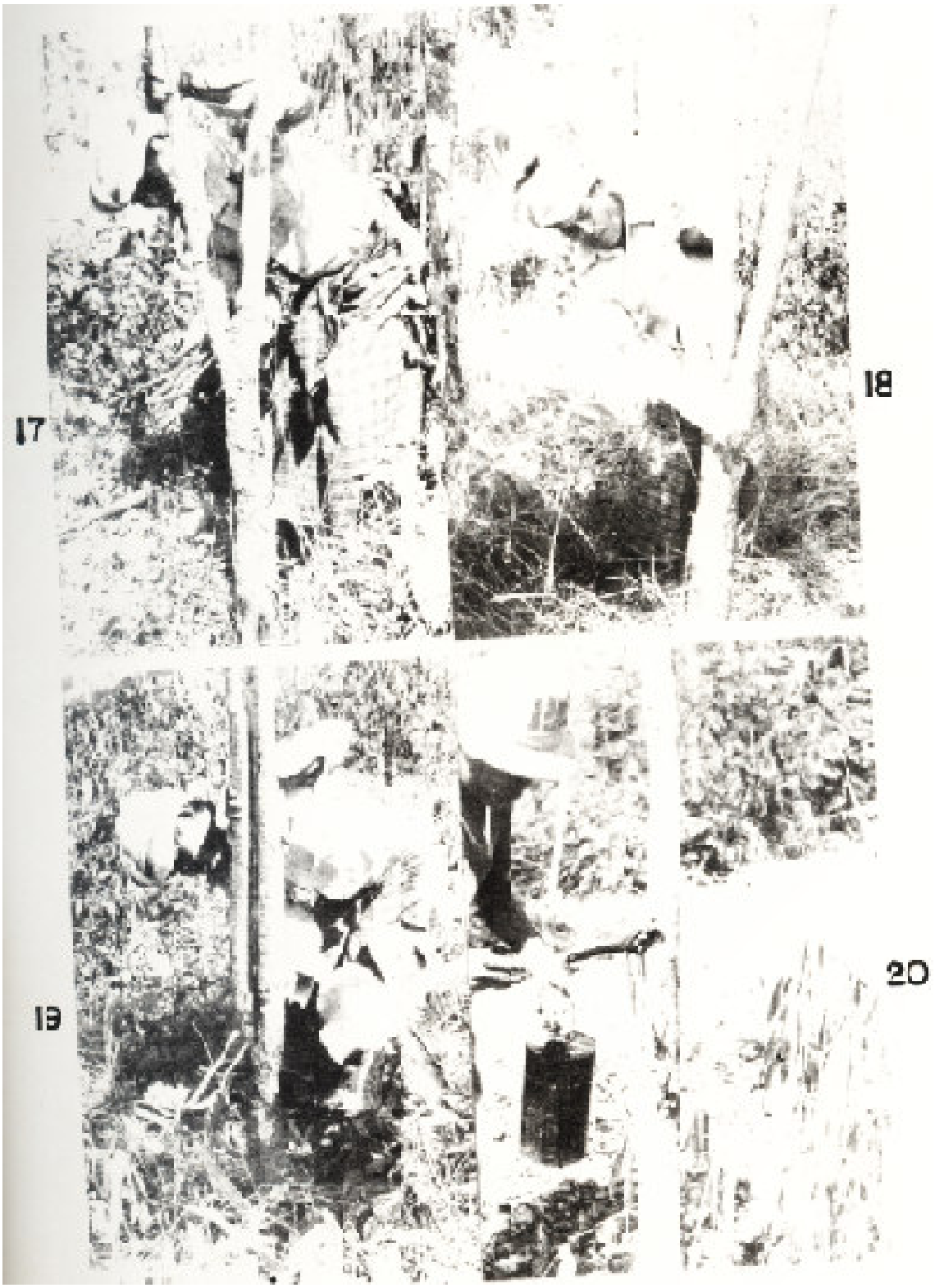

Figure 17,18,19 The Method of Prunnig
Figure 20 The Application of Creosode – Tar After Prunning

References
(*Pterocarpus* Species)

1. Bryee, J.M (1967). The Commercial Timbers of Tanzania, Forest Division, Ministry of Agriculture and Cooperatives. United Republic of Tanzania, pp. 95-96.
2. Burgess, P.F. (1966). Timber of Sabah, Forest Department, Sabah, Malaysia, 343-347.
3. Clavenia, J.R. (1952). Notes on Nara (Pterocarpus Species). The Philippines Journal of Forestry, 7 (1/4): 31-40.
4. Doo, C. (1981). Treatment response of planted Padauk, F.R.I Leaflet No.8, Forest Department, Burma.
5. Farmer, R.H. (1972). Handbook of Heardwoods. 2nd. ed. Building Research Establishment. Princess Risborough Laboratory. Her Majesty's Stationary Office, London. pp. 138-139, 162-164.
6. Purkill, I.H. (1935). Dictionary of the Economic Products of the Malay Peninsular, Vol.2, Crown Agents for the Colonies, London, pp. 1929-1832.
7. Jay, B.A. (1972). Timbers of West Africa. Timber Research and Development Association. Hughenden Valley High Wycombe., England.
8. Keey, R.W.J.C.F.A. Onche, and D.P. Standfield. (1964). Nigerian Trees, Vol.2. Federal Department of Forest Research, Ibaden, Nigeria. pp. 145-151.
9. Nyan Htun, (1980). Nursery Practice of Padauk. F.R.I Leaflet No. 1, Forest Department, Burma.
10. Papua New Guinea, Department of Forest (1973). New Horizons Forestry in Papua New Guinea. Jacaranda Press. Brisbane, Australia.
11. Rojo, J.P. (1972). Pterocarpus. Revised for the world. Phanerogamarum Monographic Tomus V. Verlag Von J. Cramer. J.M.B.H, 6901, Leutershausan, Federal republic of Germany.
12. Singh, R.S. (1972). Symposium on man - made Forest in India.
13. Streets, R.J. (1962). Exotic Trees in the British Commonwealth. Clarandon Press, Oxford, pp. 655-657.
14. Troup, R.S. (1929). Burma Padauk.
15. Troup, R.S. (1921). Silviculture of Indian Trees.