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**Preliminary Study on Coppice Thinning Trial of
Bawzagaing (*Leucaena Leucocephala*)
After First Rotation**

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- | | |
|------------------|------------------|
| U Htay | Deputy ranger |
| U Soe Win | Deputy ranger |
| U Ko Ko Naing | Forester |
| U Win Nyunt | Forester |
| U Maung Maung Su | Forester |
| U Aung Soe Win | Forester |
| U Win Myint | Forester |
| U Tin Hla | Forest Guard |
| U Zaw | ရုံးလုလင် |
| U Moe | Labour |
| U Bo Gyi | Plantation guard |

ဘောစကိုင်းငုတ်တက်များအား ပင်ကျပ်နှုတ် ရှင်းလင်းခြင်း နည်းစနစ်စမ်းသပ်ချက်
ပဏာမ လေ့လာတွေ့ရှိချက်

ဦးခင်မောင်ဦး၊ B.Sc. (For.) (Rgn.), M.S. (SUNY)?
ဒုတိယညွှန်ကြားရေးမှူး (ကရင်ပြည်နယ်)၊
ဦးမြဝင်း၊ B.Sc. (For.) (Rgn.)၊ တောအုပ်ကြီး
ဦးမောင်မောင်ခင်/ B.Sc. (For.) (Rgn.) တောအုပ်ကြီး၊
ဦးချစ်လှိုင်ဝင်း? B.Sc. (For.) (Yezin) တောအုပ်ကြီး၊
သစ်တောသုတေသနဌာန၊ ရေဆင်း။

စာတမ်းအကျဉ်းချုပ်

ပထမသက်ပတ်၌ အပြောင်ရှင်းစနစ်ဖြင့် ခုတ်လှဲခဲ့သော ဘောစကိုင်း စိုက်ခင်းအား ဒုတိယ
သက်ပတ် တတိယနှစ်၌ ငုတ်တက်၊ ပင်ကျပ်နှုတ် ရှင်းလင်းခြင်း နည်းစနစ် (၆)မျိုး စမ်းသပ် ဆောင်ရွက်ရာ
အောက်ပါအတိုင်း ပဏာမ လေ့လာ တွေ့ရှိရပါသည်။ (၁) ပင်ကျပ်နှုတ် ရှင်းလင်းပေးသော ချန်ပင်များမှာ
မရှင်းလင်းသော ချန်ပင်များထက် ပျမ်းမျှ ရင်စို့အချင်း ကြီးထွားမှု ပိုများကြောင်း တွေ့ရပါသည်။
ရင်စို့အချင်း ကြီးထွားမှုသည် ချန်သောငုတ်တက် အရေအတွက် နည်းသည်နှင့်အမျှ ပို၍မြန်ကြောင်း တွေ့ရ
ပါသည်။ (၂) ငုတ်တက်တစ်ခု၌ ချန်သောငုတ်တက် အရေအတွက် များလာသည်နှင့်အမျှ ဒုတိယ
သက်ပတ်၏ (၃)နှစ်အရွယ်တွင် တစ်ဧက ပင်ထောင်ထုထည် များလာကြောင်း တွေ့ရပါသည်။

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Abstract

Six kinds of coppice thinning and cleaning trial were carried out at the third year of second rotation for *Leucaena leucocephala* plantation which was clear felled at first rotation. It is preliminarily observed as follows: (1)Mean diameter at breast height increment of thinned plots is higher than unthinned plots. Increment of D.b.h. increases when the number of coppice shoots left decreases. (2)Stand volume per acre at third year for second rotation increases when the number of coppice shoots at stump increases.

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1. Background

90 acres of *leucaena leucocephala* was planted for fuelled at Shweminwun Unclassed Forest near Shwedah village, Yemathin Township by the Forest Department of Myanmar in 1984 in cooperation with villagers, and clear felling was carried out at 30 acres after first rotation of 10 year i.e. 1993. The yield was 51.04 stacked tons per acre according to recorded data. Cost for establishment of 1 acre including tending operation was 885 Kyats for the period from 1984 to 1988; therefore, Total cost was (885 Ks x 30 acres = 26550 Ks). Fuelled produced from this plantation was distributed to local villagers free of charge. Nevertheless, it would earn 6075 Ks per acre if the firewood were sold in local price 150 ks/ a bullockcart. (Record from Forest Department, Yemathin Township)

After felling all trees at 1 to 2 feet above ground level, the stumps left were trimmed carefully in slopping surface with knife and saw to prevent water from settling and causing decay. Moreover, such area was completely protected from grazing and fire hence young coppice shoots are particularly subject to damage from browsing by cows, goats and sheep because browsing stumps would die and coppice system would not be able to be adopted after repeated browsing. (Record from Forest Department, Yemathin Township)

Minister of Forestry encouraged local forest officer to carry out a research program concerning coppice trial during his field in June 1994; consequently coppice thinning and cleaning trial was undertaken to compare the rate of growth and yield of thinned and unthinned crops by Forest Research Institute with Yemathin District Forest Department starting from August 1994.

2. Literature Review

(1) Emile Mer indicated that the removal of smaller shoots has a beneficial effect on the growth of left coppice shoots. The following are the chief results of coppice thinning trial which were carried out in coppice of hornbeam and lime in the state forest of Champenoux (Troup 1928)

(a) Dominant shoots of thinned clumps from all the smaller shoots as well as some of the main shoots had been removed showed decidedly superior growth in diameter, height, and volume production, as compared with similar dominant shoots in clumps from which the smaller shoots had not been removed; the money yield was also considerably higher in the former case than in the latter.

(b) In general the fewer the number of shoots on the stool the greater was the diameter and height increment produced per shoot.

(c) The strongest individual shoots produced the greatest increment.

(d) It is probable that there is, per clump, a definite number of shoots corresponding to a maximum production of volume and money; in the experiments in question the number was 4, though the actual number in different cases may be expected to vary with species and local conditions.

(e) The thinning of clumps, carried out judiciously and after experiment, would probably increase the yield of coppice considerably.

(2) The yield per acre has a strong tendency to increase with the decrease in spacing from 8'x8' to 4'x4' at four years old bawsagaing *leucaena leucocephala* plantation at Pynmana. Higher yield per acre can be benefited by using closer spacing in fuelwood production. (Mehn Ko Ko Gyi and Aung Khin 1984).

3. Materials and Methods

Experimental design adopted in the coppice thinning and cleaning trial was Randomised Complete Block Design and replicated in five blocks. The following six treatments are allotted randomly in each block.

1	Controlled (unthinned) containing 7 to 18 coppice shoots.
2	two coppice shoots left
3	three coppice shoots left
4	four coppice shoots left
5	five coppice shoots left
6	six coppice shoots left

There are 30 plots (6 treatments X 5 Blocks). Each plots containing 7 stumps at 7 rows. Lay out of experimental design is shown in Appendix II.

Coppice shoots to be left according to the experimental design are marked with plastic rope and shoots which must be removed were cut down with the participation of the rural people. The shoots which appeared at ground level were chosen to be left so as thus to enable to resist the strong wind. Moreover dominant vigorous shoots are chosen to be left and smaller coppice shoots were removed. New shoots which appear after the coppice thinning are cleaned periodically.

Total height and diameter at breast height of each left shoots are measured at initial year and following years. Furthermore, mean current annual increment in diameter at breast height is compared between each treatments and statistically analyzed.

Third year after coppice thinning and cleaning trial, stand volume per acre estimation is made. Utilizable length for fuelwood of main stems and mid diameter are measured volume of each main stems are calculated with Huber's formula and volume per acre was estimated for the fully stocked condition at 12'x12' spacing. Volume of lateral branches could not be measured hence they are at the out of the reach of labours.

However, some of the stumps are lacking in the required number of coppice shoots due to unavoidable circumstance. For example, one coppice shoot instead of two shoots, at two-shoot trialplot because one shoot was felled by strong wind. Such kind of stumps are rejected in calculating the volume per acre for each treatments. In this way, the stumps which included less than 7,6,5,4,3 and 2 coppice shoots from unthinned (controlled), 6 shoots left trial plots, 5 shoots left trial plots, 4 shoots left trial plots, 3 shoots left trial plots and 2 shoots left trial plots respectively were rejected in calculating the volume per acre for each treatments.

Standing volume per acre at third year for unthinned treatment and thinned treatments are compared and statistically analyzed. Statistics data, tables and graphs are presented in appendix III(a).

4. Results

(1) According to the comparison of mean current annual increment in diameter at breast height for all coppice shoots and largest coppice shoots it is preliminary found that the fewer the number of coppice shoots on the stump the greater the mean current annual increment in diameter at breast height. Tables and figures are shown at appendix III (a) and III (b).

(2) According to the stand volume estimation at three year after coppice thinning and cleaning trial, it is observed that the volume per acre increase with proportional to the increase in the number of coppice shoots at a stump. Tables and figures are shown at appendix IV.

5. Conclusion and Discussion

(1) Coppice thinning can be done so as to increase the rate of growth in diameter if the purpose of the plantation is to supply the pole, post and agricultural equipments. Suitability for furniture with this wood should be tested so as to make a decision whether coppice thinning and cleaning require or not at second rotation.

(2) If the purpose of the plantation is only for supply the fuelwood, smaller coppice shoots could be used because plantation may not be thinned. If it may be thinned, down to 7 to 18 coppice shoots for one stump at shorter rotation should be left although it should be observed when the unthinned plots will slow down in growth rate.

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3. Bertram Husch. January, 1963. Forest mensuration and statistics.
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Appendix I



- (1) Coppic thinning and cleaning trial at e.p of *Leucaena leucocephala*, Yemathin Township. Unthinned (controlled) plot can be seen at background.



- (2) Unthinned trial plot (7 to 18 coppic shoots contain at a stump).



(3) Trial plot of two coppic shoots left.



(4) Three coppic shoots left trial plot.



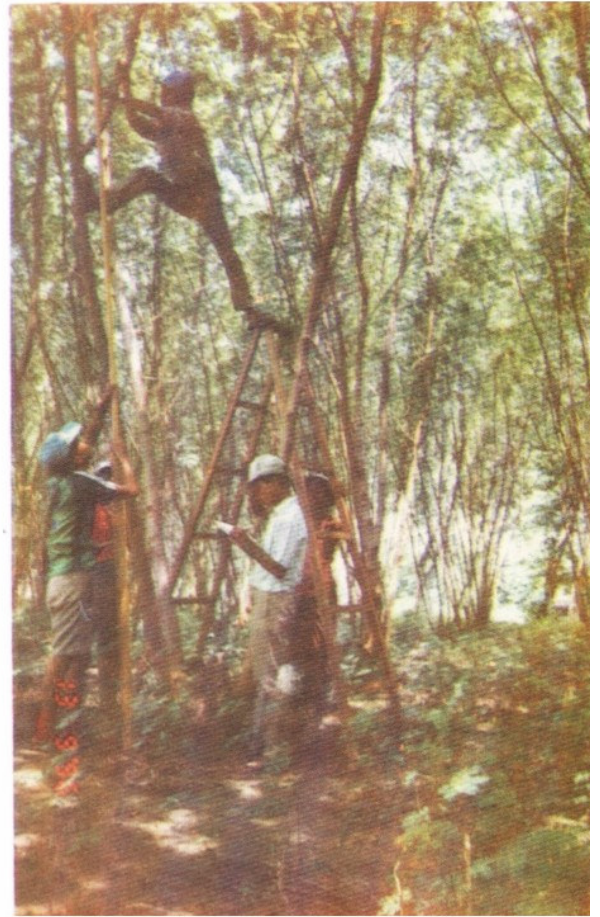
(5) Four coppic shoots left trial plot.



(6) Five coppic shoots left trial plot.



(7) Six coppic shoots left trial plot.



(8) Utilizable Height and Mid diameter are measured precisely as shown in the picture.