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Preliminary Studies on the Air-Seasoning Behaviour of Leza (*Lagerstroemia Tomentosa)*

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Preminary Studies on the Air Seasoning Behaviour of Leza (Lagerstroemia tomentosa)

1. Objective

The basic purpose of this study is to increase the utility of the low value commercial timber species of Burma. The immediate aim is to measure the changes that take place in grate of lumber from selected low value species when mordern air drying methods are substituted for current mill procedures in Burma.

A secondary objective is to develop a procedural guide that will explain to mill owers and to the public how green lumber of selected species can be air dried for optimum savings.

2. Situation Evaluation

In Burma, although there are about 1200 timber species, only a few of these, such as Kyun, Pyinkado and Padauk are used extensively for building, furniture and other commercial purposes. Many timber species have no commercial value at all.

If more species were commercially acceptable, the nation would gain in several ways. For example, the export of teak and other Group I hardwoods could be increased if substitutes become readily available and building costs for the individual owner could be reduced if low value species were found to be acceptable.

The little used species have acquired a bad reputation with users, in large part because of their tendency to warp and occok, while being worked or after installation. If this instability could be reduced, the chances of commercial acceptance would improved careful air seasoning appears to provide this opportunity.

3. Background Review of Literature

The investigation of air-seasoning was started in Burma by the Utilization Circle of the Forest Department in 1925. A preliminary record of observations was made by Pemberton in “Burma Forest Bulletin No.16” Economic Series No.2, Part I of January 1927.

In 1940, Mr. N. Barbar, officer in-charge of seasoning section of the Timber Research Burma Timbers”. Burma Forest Bulletin No. 33-Economic Series No.8. It was a record of observations on the air seasoning of 50 different species of Burmese timber, tested during the year 1925 to 1936. In the paper the author recognized 3 groups of timber, namely, very refractory made rately refractory and non-refractory, according to warping, checking and splitting tendencies during the seasoning process.

Leza included in Group II-moderately refractory woods. The author suggested that-the protection afforded surrounding piles in the yard itself is adequate to prevent excessively rapid drying of these woods (Group II) so that they may be handled at any time of the years.

Only a few sample pieces were tested for each species. The results given can only be accepted as a general indicators in this test.

4. METHODOLOGY

4.1 MATERIAL

Leza (Lagerstroemia tomentosa) is common in moist deciduous forests from Tenasserim to Pegu Yoma and as far north as Mandalay. Pearson and Brown estimated the annual out-turn from Burma at over 1000 tons. They also demonstrate that it is stronger and harder in all resects than teak. But State Timber Corporation does not extract it or even if they do, they give it low value. It has a bad reputation with local users because of non-durability.

In this study, Leza logs were cut from selected trees in compartment 19 of Nagalaik reserve forest, Yemethin forest division. Thirty trees were cut in early December, 1979. Their breast height girths ranged from 4 ft. 1 inch to 7 ft. 4 inches. Majority of trees have prominent buttresses and that effects the recovery of sawn timber. 41 logs of 23.64 tons were cut out of the above 30 trees and these logs were transported to a private-own recutting mill near Taungnyo. The logs were cut into 4" x 2" x 18" pieces of lumber, during 5 days (22-1-80 to 26-1-80). Then all green lumber were transported to F.R.T. campers as soon as possible. These lumber were off-loaded into the timber seasoning shed on 28th January 1980.

4.2 Grading The Lumber

The author and two forest staffs graded each piece of lumber carefully, under the guidance of the deputy director of the forest products research division. In grading these lumber, “The Malayan Grading Rules for sewn Hardwood Timber” was followed. All defects such as split, surface check, spring, knot, ware were marked piece by piece and were recorded.

When two boards of the same grade were obtained, one board was elected randomly and placed in a stickered-pile in the drying shed and the other was thrown between poles, outside the shed. (see description of pilling method on page). This process was repeated until all boards had been placed on one or the other of the two piles.

4.3 Timber Seasoning Shed

4.3.1 Design And Description

The design of the shed is as shown in Fig. (1). The shed is 32 feet long, 24 feet wide with 9 feet high at the sides. 5" x 5" Pyinkado spuares which are used as posts were erected on the brick foundation. Bamboo shingle was used for roofing which was also under test for durability.

4.3.2 Capacity

The capacity of the shed is approximately 20 tons for 1" and 30 tons for 2" boards.

4.4 Procedure For Air-Seasoning

4.4.1 The Site

The test site is on level ground, well drained and free of all vegetation.

4.4.2 Foundation

The foundations are piled-bricks of 1 feet in height. Piers of bricks are easy to construct as shown in Fig( ) and are reusable at different locations. In this study, the piers were laid 2 feet apart in three lines. One 5" x 3" board was laid on each row of brick piers. 4" x 3" cross pieces were placed on these main girders. These cross pieces were 2 ft apart.

4.4.3 Sticker

Dressed pieces of toak lumber were used as stickers. Their sizes were 1½" x 1" in section and 5 feet in length.

4.4.4 Size of Pile

Width of the was 4 feet and height was feet. The length of the pile was 18 feet, since the maximum length of the testea lumber was 18 feet.

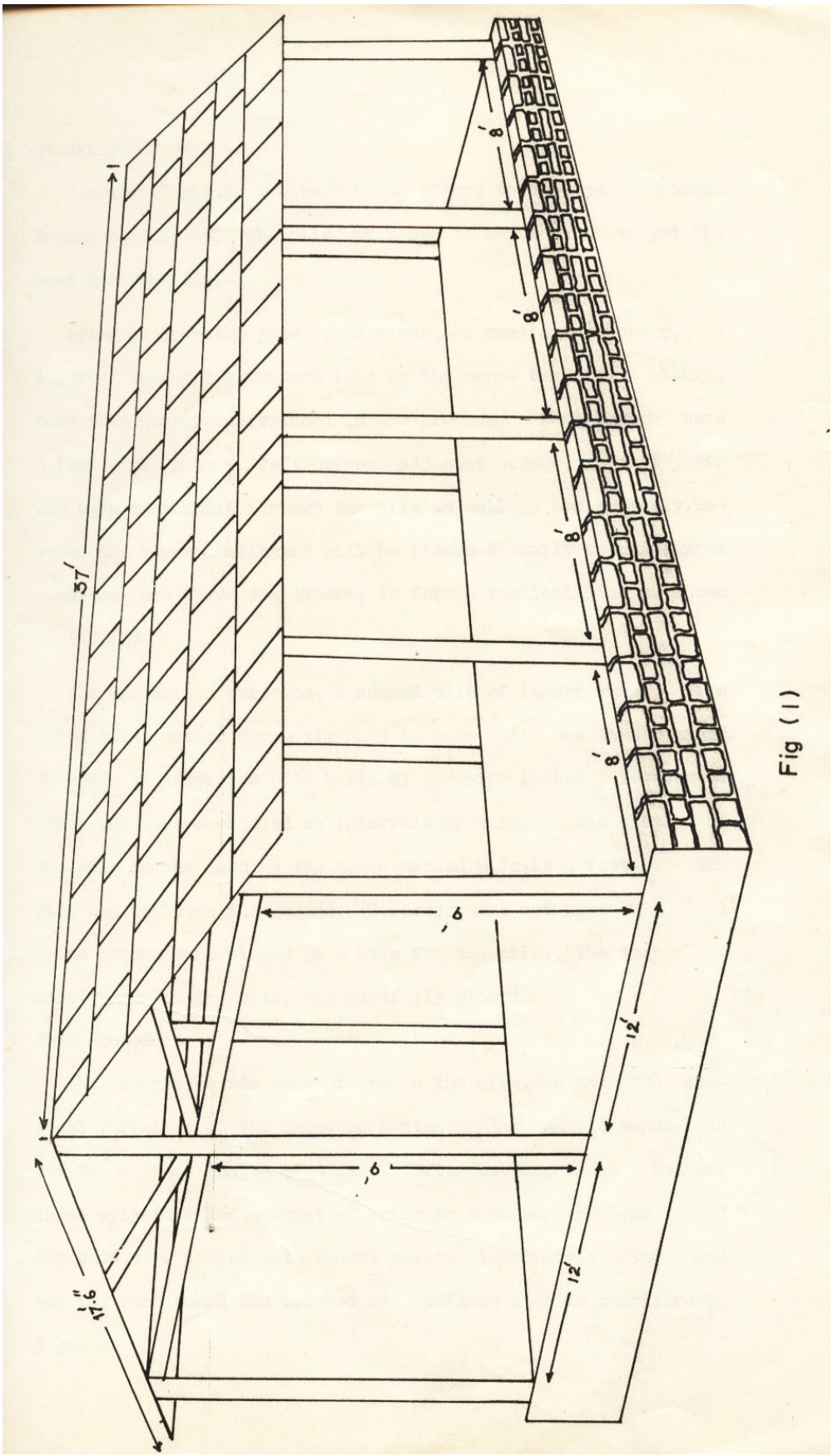

Fig (1)

4.4.5 Stacking Method

Horizontal piling was used in an effort to produce optimum drying conditions. The pile was faced to north-south to get the best air ventilation.

After placing the pile foundations, as mentioned above, a layer of graded lumber were laid on the cross bearers, taking care that non were displaced in the process. These layers were 4 feet wide, with ¾" left between adjacent pieces, so that air can pass vertically through the pile as well as horizontally. Between the layers, stickers will be placed directly over the cross bearers, one above the others, to form a vertical line as shown in Fig.(2).

For comparison purposes, a second pile of lumber was also piled using method currently used in some mills and timber users. This was an uncovered pile built by throwing lumber between 6 posts which were erected at intervals of 4 feet. The width of the pile is the same as the air-seasoned pile,ie 4 feet. The pile was built on the ground. Stickers were not used but 3 cross planks were placed as a base for pile. The lumber were thrown on the pile, not carefully placed.

4.5 Test Procedures

Six sample boards were placed in the pile, to know the seasonal variation of the moisture content. Each sample board was cut to an exact length of 4 feet. After cutting these boards, loose splinters and sawdust adhering to them were removed and two ends were coated with enamel paint. Immediately after and coating each board was weighed on a balance that is sensitive to 5 grams.

The initial moisture content of a sample board was determined from two small sections cut from each end of the sample board. The moisture content of these two sections were determined by over-drying method. Then, the overdry weight of the sample board is calculated based on the average moisture content of two sections and initial weight of the sample board. This calculated dry weight and the subsequent weights of the sample board obtained at intervals during the drying-called current weights-were used to compute the moisture content at those times.

After the sample boards were cut, end coated and weighed, they were placed in sample pockets as shown in Fig. (2). Three boards were placed on the left side of the pile and the others on the right side. Each sample board was weighed at every Wednesday (is weekly). and the current moisture content at every week was calculated.

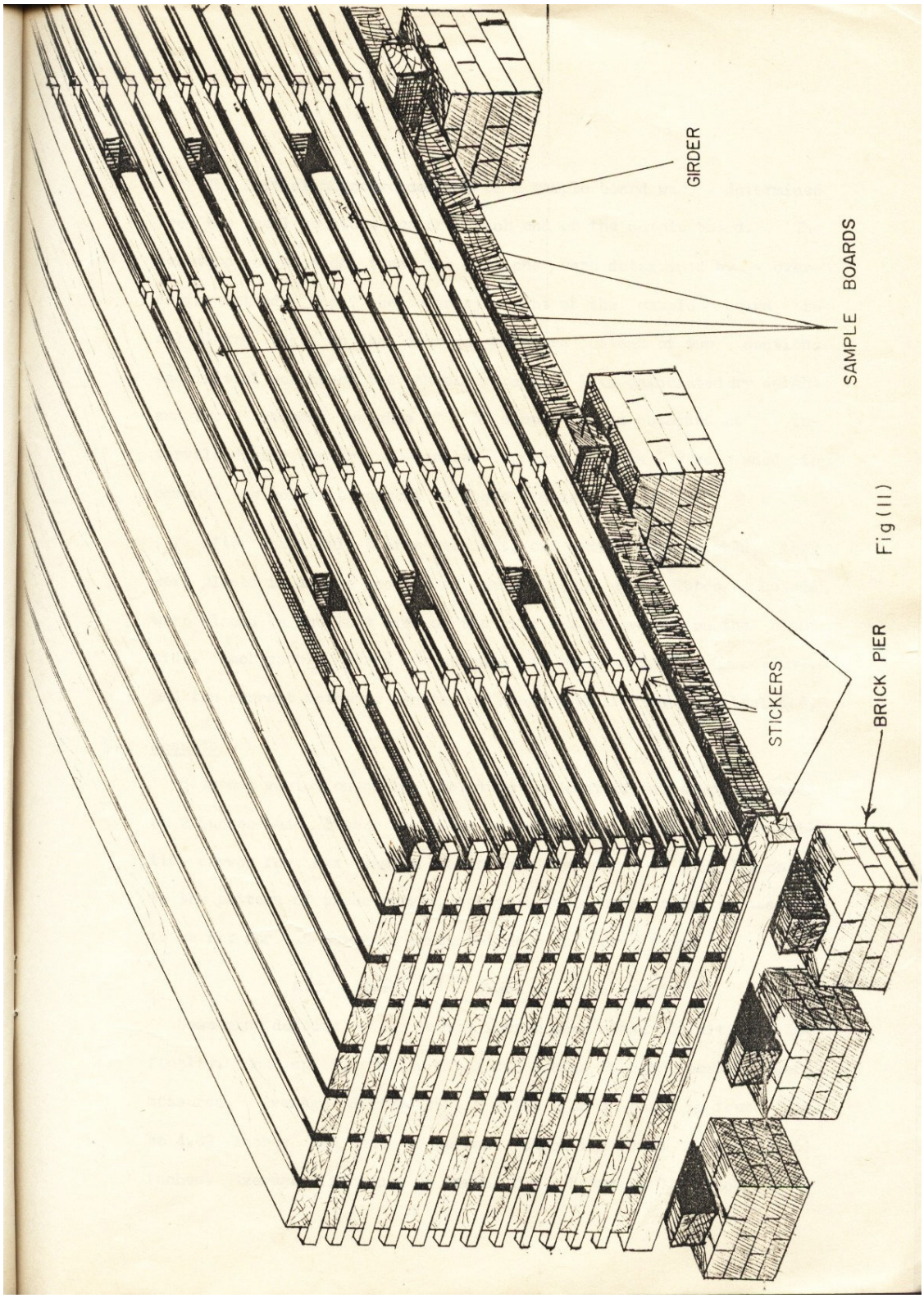

Fig (11)

5. Results

Seasonal variation of the moisture content of six sample boards of 2 inches Leza lumber are given in table (1). Moisture content-time curves for six sample boards are also shown in (Fig 3). Accord-to the pattern of these curves, negative exponential curve is assumed to be fit for the moisture content-time. The curve fits,

$$M.C. = 29e^{-0.02171t} \text{ where } t = \text{time weekly}$$

Seasoning defects of the tested lumber were measured initially and finally. End split, surface check and spring of every board were measured. Average difference in split for a board is found to be 4.89 inches and that of surface check is found to be 9.63 inches. Average difference in spring for a board is 0.19 inch.

5.1 Interpretation of the Graph

Samples put down begining of February, that is in the dry weather dried rapidly from 71% M.C. to 3.97% M.C. during three months.

5.2 Degrade Experience While Seasoning

Only slight surface checking, end splitting and warping. No signs of insect attack and free from discolouration or decay.

Variation of M.C. in seasoned timber –

Maximum in rains ……. 15.13%
Minimum in dry weather ……. 10.81%
Range of variation ……. 4.32%

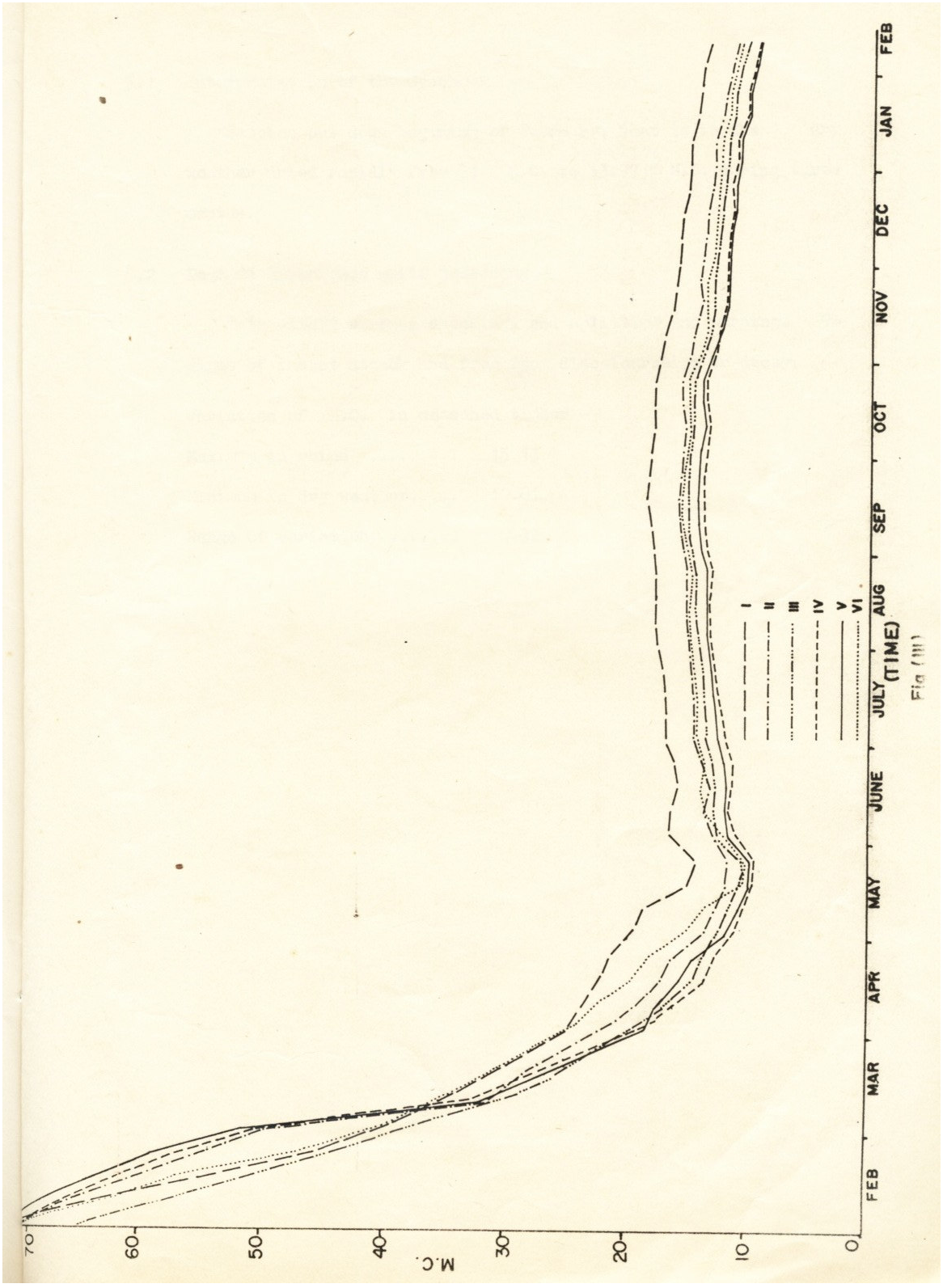
M.C.
70
60
50
40
30
20
10
0
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEP
OCT
NOV
DEC
JAN
FEB
(TIME)
I
II
III
IV
V
VI

Table – 1 Moisture Content of Leza Sample Boards

Date / Sample No.	Moisture Content Percent												
	1-2-80	6-2-80	13-2-80	20-2-80	27-2-80	5-3-80	12-3-80	19-3-80	26-3-80	4-4-80	11-4-80	18-4-80	25-4-80
I	73.50	64.41	55.32	46.23	40.51	35.89	32.20	28.51	24.80	23.58	22.37	21.44	20.51
II	71.50	66.11	60.72	55.34	49.86	33.08	29.46	25.84	22.22	19.22	17.25	16.06	14.88
III	65.80	58.81	51.82	44.83	38.95	31.22	27.30	23.39	19.48	17.03	14.57	13.87	12.18
IV	71.50	66.77	62.04	57.30	50.48	33.64	28.78	23.91	19.04	16.32	13.59	12.73	11.89
V	73.90	69.01	64.12	59.22	51.57	32.44	27.83	23.23	18.63	17.18	15.73	14.44	13.16
VI	71.50	63.69	57.58	47.47	40.53	36.15	32.03	28.72	24.57	22.59	19.58	18.12	16.68
Average M.C 71.28		64.80	58.60	51.73	45.32	33.74	29.60	25.60	21.46	19.32	17.18	16.11	15.05

TABLE – 1 (Contd.) Moisture Content of Leza Sample Boards

Date / Sample No.	Moisture Content Percent												
	30-4-80	6-5-80	14-5-80	20-5-80	30-5-80	4-6-80	11-6-80	20-6-80	27-6-80	2-7-80	10-7-80	16-7-80	23-7-80
I	19.58	18.67	14.81	14.15	16.12	16.26	15.76	15.90	16.64	16.64	16.79	16.96	17.06
II	13.70	12.52	11.75	11.37	12.74	13.35	12.99	13.45	14.05	14.09	14.35	14.54	14.65
III	12.49	11.80	10.63	10.47	12.37	12.62	12.40	12.77	13.18	13.19	13.45	13.70	13.85
IV	11.05	10.21	9.68	9.32	10.73	11.31	11.02	11.02	11.78	11.96	12.32	12.52	12.79
V	11.88	10.60	9.79	9.53	11.57	11.76	11.45	11.81	12.29	12.41	12.60	12.77	12.89
VI	15.12	13.66	10.30	10.02	11.95	13.22	13.77	13.31	14.01	14.08	14.24	14.36	14.47
Average M.C 13.97		12.91	11.16	10.81	12.58	13.09	12.90	13.66	13.73	13.73	13.96	14.14	14.29

TABLE – 1 (Contd.) **Moisture Content of Leza Sample Boards**

Date / Sample No.	Moisture Content Percent												
	30-7-80	6-8-80	13-8-80	20-8-80	27-8-80	3-9-80	11-9-80	17-9-80	24-9-80	1-10-80	8-10-80	15-10-80	22-10-80
I	17.17	17.38	17.34	17.38	17.76	19.91	18.01	17.91	17.85	17.38	17.49	17.47	17.42
II	14.76	14.83	14.83	14.76	15.22	15.41	15.44	15.33	15.14	14.95	15.11	15.11	14.90
III	13.96	14.04	14.11	14.07	14.62	14.73	14.73	14.69	14.48	14.18	14.26	14.19	13.75
IV	12.91	12.91	12.91	12.79	13.14	13.38	13.49	13.45	13.09	12.91	13.14	13.05	12.72
V	12.95	13.13	13.13	13.13	13.72	13.83	13.81	13.80	13.61	13.13	13.37	13.37	12.83
VI	14.59	14.70	14.65	14.43	14.82	15.17	15.28	15.17	14.82	14.59	14.70	14.66	13.76
Average M.C 14.40		14.50	14.50	14.43	14.88	15.07	15.13	15.06	14.83	14.52	14.68	14.64	14.24

TABLE – 1 (Contd.) **Moisture Content of Leza Sample Boards**

Date / Sample No.	Moisture Content Percent													
	2-11-80	12-11-	19-11-	26-11-	3-12-80	10-12-	17-12-80	24-12-	31-12-	7-1-81	14-1-81	22-1-81	28-1-	4-2-81
I	16.94	16.52	15.96	15.72	15.34	15.24	15.10	14.74	14.56	14.56	13.85	13.76	13.19	12.83
II	14.49	14.08	13.67	13.78	13.33	13.09	13.04	12.66	12.43	12.43	11.53	11.42	10.96	10.40
III	13.34	12.93	12.52	12.56	12.25	12.03	11.87	11.56	11.36	11.34	10.74	10.78	10.15	9.74
IV	12.39	12.06	11.73	11.68	11.21	11.23	10.91	11.14	10.51	10.51	1.61	9.61	9.14	8.62
V	12.41	11.93	11.45	11.50	11.21	11.02	10.85	10.73	10.26	10.21	9.54	9.59	8.94	8.53
VI	13.38	13.06	13.08	13.15	12.62	12.39	12.32	12.04	11.97	11.95	11.14	11.04	10.58	10.07
Average M.C. 13.83		13.43	13.02	13.07	12.66	12.50	12.35	12.15	11.84	11.83	11.07	11.03	10.49	10.03

References

(1) Barbar H, (1940) – Air Drying Tests on Burma Timber.
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