

## FLOWERING OF TEAK

by

SA-ARD BOONKIRD

*School of Forestry, Kasetsart University  
Bangkok, Thailand*

### SUMMARY

Flowering of teak is being studied in Thailand. This investigation will provide some knowledge about forest genetics which will be very useful in forestry, especially in silviculture and in the field of reforestation or afforestation.

### OBSERVATIONS OF FLOWERING HABIT IN TEAK

Most trees, especially those in the temperate zone have main or leading shoots that grow higher and higher. Eventhough the leading shoots have flowered in the past only the side branches which are about two or more years old usually produce flowers. Flowering may occur on the main shoot when the tree is fully grown or over-mature. Teak differs from other trees in this respect since it flowers quite early and usually flowers on the main shoot only, though it may occassionally flower on the side branches. Teak generally flowers in the fifth or sixth year but in some places it may flower as early as two years of age. General observations indicate that the main shoot which has been flowered will partly die-back, and some lateral buds at the base of the inflorescence grow up into two or more shoots. These shoots may develop into big branches of equal size that competing with each other and causing the trees to become forked. These observations lead to the current investigation of the causes of branching.

For the benefit of silviculture, afforestation or reforestation in the future we should know:—

(1) Whether it is true that flowering causes branching in teak? It has been reported that the remainders of the inflorescences in teak are dead stakes, and two or more of the opposite buds give shoots competing to become the leading shoot, and often with equal success

(Gram and Syrach Larsen, 1958). Teak flowering causes die-back of the leader (in some case as much as 6 ft.) and if two or more competing leaders develop, at the very least a bad dog-leg is formed in the bole (K.J. White, 1962) (Fig. 2). These are all observations which scientists have made of teak trees. We should investigate these characteristics of teak in northern Thailand because they will play an important role in the reforestation or afforestation programs of teak in this country in the future.

(2) Is early flowering inherited?

In the same article mentioned above, Dr. Gram and Dr. Syrach C. Larsen make the following comment on their observations in Thailand, “--- however, leave no doubt that flowering time also depends considerably on genetically determined variation”. This comment was based on an observation which one botanist and one forest geneticist made of some evenaged teaks in a plantation of which some trees had flowers several years and others not at all although all growing close together. Thus, they believed that early flowering is caused by heredity. This observation has led to further investigation.

#### LOCALITY OF INVESTIGATION

In the early stages of the investigation we did not have enough funds to conduct a broad scale country-wide study of teak. Therefore we started in the small plantations in the Ngao District, Lampang Province.

#### METHODS OF INVESTIGATION

Several teak trees in one plantation and with the same or nearly the same height and girth were selected the trees were divided into two groups, one consisting of flowered trees and the other of non-flowered trees. Then, for all trees:

(1) Study of the growth characteristics of the inflorescences the buds at the base of the inflorescence, and the branching of the trees which have flowered compared to those which have not.

(2) Study the die-back of the main shoot of the flowering trees.

- (3) Comparison of all these characteristics by taking pictures of each teak tree every year or month if possible.
- (4) Study of the inherent flowering characteristics.

#### INVESTIGATION WHICH HAS BEEN DONE

In 1961 ten trees were selected from a 1953-teak plantation and another ten from a 1954-teak plantation. Half of the trees in each plantation flowered and the other half did not. The trees were marked with Arabic letters E.F. (Early flowering studies) and numbered 1-20. Odd numbers were assigned to the trees which have no flowers and even numbers to the flowered trees. The photos are taken on the same trees every year. The most suitable time to take pictures of branching is in the dry season when all the branches can be seen clearly and there is more light. The study of the inherent flowering characteristics of teak has taken place in the "Teak Tree-Show" (Boonkird, 1964).

#### THE RESULTS

We found without doubt that the inflorescences of teak will die-back to a certain length (K.J. White, 1962) as shown in Fig. 1. Steps in the growth of the lateral buds which have taken the place of the dead main shoot are illustrated in Fig. 3. Big branches have not formed during these three years of study, but we can see some changes in the size and length of those branches on the flowered trees (Fig. 4). Non-flowered teaks are still continuing their height growth without any sign of die-back. Growth in girth and height are recorded in Table I. Girth growth is not quite uniform but height growth appears to decrease as frequency of flowering increases. (Table II).

#### CONCLUSION

From four years of study we cannot draw exact conclusions, but we can say that flowering will cause more or less branching, and it distinctively causes slow height growth. Flowering in teak appears to be inherited (Boonkird, 1964). We need more time and data for these investigations.

TABLE I  
**Growth of Flowering Teak**  
 (From a 9- and 10- year old teak plantation)

E.F. No.	Girth (cm.)				Height (m.)			
	1961	1962	1963	1964	1961	1962	1963	1964
1	33.0	39.0	39.0	43.0	--	*14.90	15.55	*16.98
2	33.0	39.0	39.0	41.0	*--	*14.00	14.10	*15.97
3	32.0	43.5	45.5	54.0	--	*15.50	15.85	*17.80
4	38.0	48.0	48.0	51.0	*--	*14.25	*14.75	*17.40
5	43.0	55.0	57.0	63.0	--	*14.70	*15.40	*16.67
6	39.0	48.0	49.0	54.0	*--	*14.55	15.45	*16.57
7	44.0	57.5	59.0	64.0	--	*14.68	16.80	*17.87
8	46.0	59.0	59.0	65.0	*--	*15.58	*16.35	*17.49
9	36.0	48.0	49.5	52.0	--	16.15	17.30	18.71
10	41.0	49.5	49.5	53.0	*--	*15.35	*15.40	*16.73
11	36.0	42.2	42.0	49.0	10.27	10.75	12.35	12.93
12	38.0	45.0	45.0	50.0	*10.72	*11.00	*11.00	*12.10
13	32.0	36.5	36.5	41.0	9.97	11.50	11.85	13.52
14	46.0	53.0	54.0	60.0	*10.67	*10.85	10.85	*13.12
15	37.0	43.0	43.0	47.0	10.82	11.75	12.50	14.26
16	33.0	39.0	38.0	41.0	*10.65	*10.65	16.65	*13.33
17	45.0	50.0	51.0	57.0	12.11	*13.45	13.75	*15.50
18	45.0	51.0	48.5	52.0	*11.80	*11.85	11.85	*13.44
19	37.0	45.0	45.0	54.0	10.98	12.50	13.50	15.22
20	42.0	48.0	48.0	53.0	*10.24	10.50	*11.35	*12.02

\* Flowering.

TABLE II  
Average girth and height growth of teak from 1961-1964

Number of trees	Frequency of flowering	Average girth growth	Average height growth	Note
		cm./yr.	m./yr.	
5	None	3.25	0.87	E.F. 19 has no flowers on the terminal from the start of the investigation but it has lateral flower in 1964.
4	Twice	3.94	0.84	
7	Trice	3.82	0.62	
4	Four times	3.50	0.60	

## REFERENCES

- BOONKIRD, SA-ARD (1964). The first teak tree-show in Thailand. *Nat. Hist. Bull. Siam Soc.* Vol. 20.
- GRAM, K., and SYRACH LARSEN, C. (1958). The flowering of teak (*Tectona grandis*) in aspects of tree breeding. *Nat. Hist. Bull. Siam Soc.*, Vol. 19.
- WHITE, D.J. (1962). Tree breeding with teak (*Tectona grandis*). *Australian Forestry*, Vol. XXVI, No. 2 1962.



Fig. 1. Showing die-back of the main shoot and growth of secondary branches taken place.

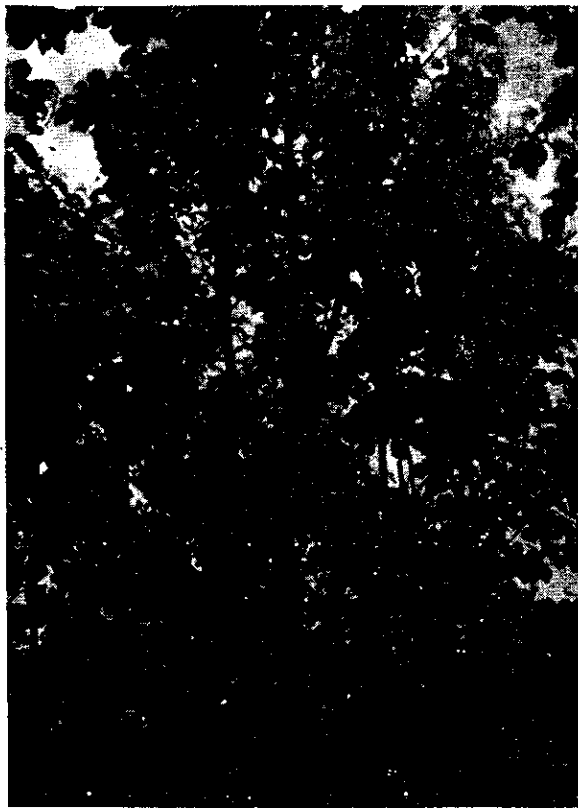


Fig. 2. Dog-legged teak which is undesirable tree in the plantation.



A



B

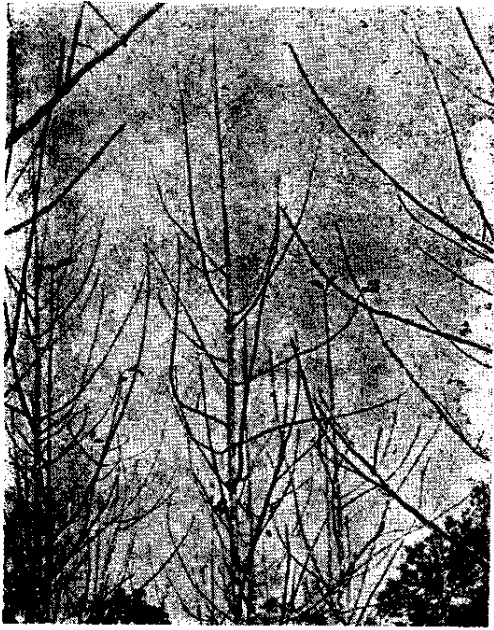


C



D

Fig. 3. Showing the progress of growth of the same tree for a period of time in which the buds at the base of the inflorescence are growing in place of the old dead shoot.



1961



1962



1963

Fig. 4. Branching of the same flowered teak tree.





Fig. 5. Non-flowered teak tree which is rather extraordinary for the ten-year old teak.