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APPLIED SCIENTIFIC RESEARCH CORPORATION OF THAILAND

COOPERATIVE RESEARCH PROGRAMME NO. 1

PRODUCTION, PROCESSING, AND UTILIZATION OF

KENAF AND ALLIED FIBRES

RESEARCH PROJECT NO. 1/4

EFFECT OF PLANT VARIETY, GROWING CONDITIONS, AND AGRONOMIC FACTORS

ON THE YIELD AND QUALITY OF KENAF FIBRE

REPORT NO. 5

EFFECT OF PLANTING AND HARVESTING TIMES ON THE YIELD OF KENAF

BY

PRAPANDH BOONKLINKAJORN

PRAWIT KRITTAYANAWACH

ASRCT, BANGKOK 1970

not for publication

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F O R E W O R D

Cooperative Research Programme No. 1 involves cooperation between ASRCT and many other agencies as set out on the cover of this report.

The present report involves cooperative work between ASRCT (Plant Sciences Group, ARI) and the Department of Agriculture (Non Sung Agricultural Experiment Station), Ministry of Agriculture. It is concerned with a study on the effects of planting and harvesting dates on the yield of Thai kenaf variety Non Sung 001 at the Non Sung Agricultural Experiment Station, Nakhon Ratchasima.

EFFECT OF PLANTING AND HARVESTING TIMES ON THE YIELD OF KENAF

By Prapandh Boonklinkajorn* and Prawit Krittayanawach*

SUMMARY

In an attempt to examine the influence of planting and harvesting times upon the yield of Thai kenaf variety Non Sung 001, an experiment was carried out at the Non Sung Agricultural Experiment Station. The study showed that the earliest planting (17 May) produced better yield and that planting time at 30-day intervals showed significant effects on the yield. Such effects did not occur by the influence of the cutting time manipulated after the onset of flowering.

INTRODUCTION

Kenaf grows best within latitudes 30°N and 30°S of equator (Seale 1954). It has been used as a substitute for jute and has been successfully grown in many countries, especially in Asia, as a commercial crop. Kenaf ranks third in value among agricultural export of Thailand. It is the most important cash crops in the north-east.

Early varieties of kenaf should be harvested at 100 to 125 days (Gangstad et al. 1951; Kasipar 1967), and in the case of late varieties, at 130 to 150 days after planting (Staub and Limfat 1953; Kasipar 1967). Moreover, Gangstad et al. (1951) reported that the best yields were obtained from early planting. The height of the plant, and particularly the diameter of the stem, reduced in the late planting. Similarly, Seale et al. (1954) found that most of the fibre quality was affected by dates of planting, although not to the same extent as fibre yield. In general, the quality declined when it was planted late. In Florida, Pate et al. (1954) indicated that the Salvadorial variety could be planted for fibre after 15 March and harvested in about 100 days. Growth in height in plantings made in late summer was much reduced and flowering began about 20 October. With the onset of fruiting, the extraction of fibre became increasingly difficult. Flowering is dependent on the length of day, when the varieties viridis and vulgaris are grown; it has

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been found that flowering does not occur until the daily light period is shortened to about 12½ hours, regardless of the time of planting (Kirby 1949).

In Mauritius, harvesting time is a critical and important factor in both qualitative and quantitative production of kenaf fibre (Staub and Limfat 1953) Har-Tzook (1965) emphasized that the effect of delay in the date of planting was remarkable and caused significant decrease in yield of fibre in all cases. Plant height, important for quality requirement of fibre, was also greatly affected by late planting. Kirby (1949) and several other workers agreed that yields of fibre from plants sown at different times vary roughly between 1½ and 5½ per cent. It is obvious, from the economic point of view, that planting should be made at the right time.

In Thailand, Kasipar (1967), Weeradecha (1959), and Department of Agriculture (1965) as cited by Boonklinkajorn et al. (1970) recommended that kenaf should be planted from the beginning of May to the first of June, and further pinpointed that the middle of May is the most suitable time for the operation. Contrarily, Boonklinkajorn et al. (1970) found at the Non Sung Agricultural Experiment Station that planting as early as 1 April produced higher yield. Further investigation attempting at the examination of the effect of harvesting date, starting from the onset of flowering, on the yield of kenaf is thus desirable. In the present study, three different planting dates have been used, since it is generalized that planting date causes a great reduction of the yield, and compensation or interaction may take place to a certain degree.

MATERIALS AND METHOD

An experiment employing a split-plot design with 8 replications was conducted at the Non Sung Agricultural Experiment Station in 1969. Thai kenaf variety Non Sung 001 was used. Three planting dates, 17 May, 2 June, and 17 June, were assigned to the main plot, and six harvesting dates, 30 October, 5,13,20,27 November, and 4 December as sub-plot. Each treatment combination had an area of 3.6 x 3.6 metres including the border rows which were discarded at the harvest. Kenaf seeds were drilled in rows 30 cm apart. The seedlings were thinned to 5 cm between

plants when they attained a height of about 20 cm. Weeding was done whenever considered necessary. Ammonium sulphate and double superphosphate were side-dressed at the rate of 4 kg N and 8 kg P_2O_5 per rai, respectively after thinning and weeding.

Data on plant height and fresh weight were recorded in the field, and yield of retted fibre was measured after the retting, which was done in an earth ditch.

RESULTS

(i) Effect of planting date

The analysis of variance shows highly significant difference between the planting date treatments on the fresh weight, fibre weight, and plant height. Table 1 demonstrates that planting on 17 May produced the same yield of fresh weight and fibre weight as well as plant height as those of the 2 June planting, but significantly higher than those of the 17 June planting. Based on such yield components, the 2 June planting in its turn was not statistically better than the 17 June planting.

TABLE 1
MEAN FRESH WEIGHT, FIBRE WEIGHT, AND HEIGHT OF KENAF AS INFLUENCED BY PLANTING DATE

Yield component	Planting date		
	17 May	2 June	17 June
Fresh weight (tonnes/rai)	8.50 a	6.14 ab	5.58 b
Fibre weight (kg/rai)	450.22 a	294.08 ab	248.52 b
Height (cm)	199.15 a	169.59 ab	163.02 b

Note: Data were analyzed with the Duncan's new multiple range test. Values having a letter in common do not differ significantly at 5% level (Steel and Torrie 1960).

(ii) Effect of harvesting date

As shown in Table 2 the plant height was affected by harvesting dates, but the fresh weight and fibre weight, on the other hand, did not show any influence of the harvesting date.

TABLE 2
MEANS OF YIELD COMPONENTS AS INFLUENCED BY HARVESTING DATE

Harvesting date	Average fresh weight[1] (tonnes/rai)	Average fibre weight[1] (kg/rai)	Average height[2] (cm)
30 October	6.76	315.83	178.13 bc
5 November	6.74	331.51	177.24 bc
13 November	6.44	304.86	168.14 cd
20 November	7.43	339.80	197.75 a
27 November	6.70	320.27	184.42 ab
4 December	6.39	333.36	157.86 d

[1] No significant difference.

[2] Values of different letters mean significant difference by Duncan's new multiple range test at 5% level (Steel and Torrie 1960).

(iii) Interaction between planting and harvesting dates

Only the interactions between planting date and harvesting date upon the yields of fresh weight and fibre weight showed statistical difference (Tables 3 and 4). Harvesting on 20 November gave the best yield for the 17 May and 2 June plantings. The 17 June planting did not show any statistical difference on the fresh weight, as did on the fibre weight.

TABLE 3
MEAN OF FRESH WEIGHT OF KENAF AS INFLUENCED BY PLANTING TIME AND HARVESTING TIME

Harvesting date	Fresh weight (tonnes)			Total fresh weight	Mean of fresh weight
	Planting date				
	17 May	2 June	17 June	(tonnes)	(tonnes/rai)
30 October	8.50 b	6.35 de	5.43 e	20.28	6.76
5 November	8.32 b	6.19 e	5.17 e	19.68	6.74
13 November	7.63 bcd	5.50 e	6.19 e	19.32	6.44
20 November	10.34 a	6.59 cde	5.35 e	22.28	7.43
27 November	8.40 b	6.05 e	5.64 e	20.09	6.70
4 December	7.81 bc	6.16 e	5.19 e	19.16	6.39
Total	51.00	36.84	32.97	120.81	40.46
Average	8.50	6.14	5.58	20.22	6.74

Note: Values of the same letter mean non-significant difference by Duncan's new multiple range test at 5% level (Steel and Torrie 1960).

TABLE 4
MEAN OF FIBRE WEIGHT AS INFLUENCED
BY PLANTING TIME AND HARVESTING TIME

Harvesting date	Fibre weight (kg)			Total fibre weight	Mean of fibre weight
	Planting date				
	17 May	2 June	17 June	(kg)	(kg/rai)
30 October	373.47 cd	313.92 def	260.11 efgh	947.50	315.83
5 November	442.91 abc	289.48 efgh	262.15 efgh	994.54	331.51
13 November	397.61 bc	249.43 fgh	267.53 efgh	914.57	304.86
20 November	503.95 a	291.40 efgh	224.05 h	1019.40	339.80
27 November	405.08 bc	319.64 de	236.08 gh	960.80	320.27
4 December	458.28 ab	300.59 efg	241.22 gh	1000.09	333.36
Total	2581.30	1764.46	1491.14	5836.90	1945.63
Average	430.22	294.08	248.52	972.82	324.27

Note: Values of the same alphabet mean non-significant difference by Duncan's new multiple range test at 5% level (Steel and Torrie 1960).

DISCUSSION

This is another experiment showing that early planting produced better yield. Plant height, which is important for quality requirement of fibre, is greatly affected by the delay of planting. To obtain the highest yield, Kasipar (1967) suggested that kenaf should be planted as early as possible at the beginning of the rainy season. However, planting as early as 1 April was found by Boonklinkajorn et al. (1970) to produce the highest yield. Such an early planting is being practiced in certain kenaf growing areas such as in Changwat Chaiyaphum. Harvesting dates from 30 October to 4 December showed no statistical difference on the fresh and fibre yields. This demonstrated that after the onset of blooming, quantitative yields could not be increased by later cuttings. It is clearly seen and therefore concluded that no compensation of quantitative yield occurs to the late planting plots by the delay of harvesting.

ACKNOWLEDGEMENTS

Thanks and appreciations are due to Mr. Amnuay Kasipar of the Non Sung Agricultural Experiment Station, Department of Agriculture for making his staff members, facilities and field equipment available for the present study; to Dr. Siribongse Boon-Long and Dr. Narong Chomchalow, ARI, for their patient interest and suggestions in the study and preparation of the manuscript.

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