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Comunicaciones

A note on the defoliation of leaves in cotton 'MCU 5'

Sumario. Las hojas del algodón MCU 5 bajo riego, situadas entre 0 a 30, 30 a 60, y más de 60 cm fueron defoliadas conforme el cultivo crecía en altura, en Coimbatore, India. Se encontró que la eliminación de las hojas monopodiales a 0 a 30 cm de altura, y la eliminación de las hojas tanto monopodiales como simpodiales a 30 a 60 cm de altura, dieron el máximo rendimiento en algodón en rama, lo que indica la posibilidad de que los materiales nutritivos sean transportados de una parte a otra de la planta.

The green leaves of plants have a very important role to play as the chief producers of food in plants. The kinetic energy of light is converted into potential energy and absorbed in the leaves. As a result of photosynthesis, simple chemical substances are converted into complex compounds like glucose and from that the plant prepares substances like starch, proteins and fats. These are stored in the leaf itself or carried t other parts of the plants such as the root or stem and to other storage organs.

Chaudhry and Shah (3) observed in maize that defoliation decreased grain yield. Sánchez and Dios (6) found in maize, removal of tassel and all leaves except one recorded lowest grain yield. In cotton, removal of leaves or growing points was found to increase the yield (7). Renny *et al.* (5) found that the bottom defoliation in cotton reduced boll rot loss and modified the micro-climate. It was observed by Brown (2) that the lowest leaves made no significant contribution to midzone bolls and hence their removal had no effect on bolls in the upper zone.

The present study was carried out in order to verity this statement and to find out the effect of defoliation of different leaves at different zones on boll number and yield of seed cotton.

A trial was laid out at the Cotton Breeding Station, Tamil Nadu Agricultural University, Coimbatore, India during 1976-77 on 'MCU 5' cotton, under irrigation. Coimbatore is situated at 11°N and 77°E at an altitude of 498 meters above mean sea level. The treatments included were (i) removal of sympodial leaves (T_1), (ii) removal of monopodial leaves (T_2) and (iii) removal of both sympodial and monopodial leaves (T_3). These treatments were further subordinated into defoliations at three levels viz. (a) 0 to 30 cm (H_1), (b) 30 to 60 cm (H_2) and (c) above 60 cm (H_3). The experiment was laid out in a randomised block desing replicated thrice. The cotton seeds were dibbled on 23.8.1976 in ridges made 75 cm apart with a spacing of 30 cm between seeds on one side of the ridge. The plots were given a uniform dose of 60 kg N, 30 kg P_2O_5 and 30 kg K_2O per hectare. Half the quantity of N and the entire quantity of P_2O_5 and K_2O were applied as basal dose and the rest of the nitrogen was top dressed on the 45th day. The cotton crop usually grows to a height of about 90 cm. As it grown and reaches the height of 30 cm, 60 cm and 90 cm and above the leaves in the regions of 0 to 30, 30 to 60 and above 60 cms were defoliated. The boll number per plant and the yield of seed cotton in kg per hectare were recorded and presented in the Table 1.

From the Table 1 it is evident that the removal of monopodial leaves has given a higher boll number (10.57) and highest yield of seed cotton (11.82 q/ha) indicating that the removal of monopodial leaves had contributed much in the efficient translocation of food materials whan compared to other defoliation, and is inferred that the monopodial leaves did not contribute to the yield to any appreciable extent. Allison and Watson (1) found that removal of part of the foliage of sorghum caused little loss of head

weight as other leaves increased their contribution considerably. In tomato, Khan and Sagar (4) concluded that although groups of leaves were mainly responsible for the supply of assimilate to individual trusses there was complete compensation by other functional leaves when some sources of assimilates were removed.

The removal of leaves in the 0 to 30 cm and 30 to 60 cm zones recorded the maximum boll number and seed cotton yield. The increased yield by removal of leaves in the lower zones can be attributed to the increased light intensity and ventillation in the lower zone as observed by Ranney *et al.* (5). The removal of top zone leaves resulted in a greates reduction of yields than with the defoliation of leaves in the other zones

It has been found that at 0 to 30 cm (H_1) level the removal of monopodial (T_2) and sympodial (T_1) leaves were equally efficient in increasing the boll number and yield of seed cotton. At the other two heights it was found that the removal of all the leaves gave more boll number and yield of seed cotton. The removal of monopodial leaves (T_2) at 0 to 30 cm (H_1) and the removal of all the leaves (T_3) at 3 0to 60 cm (H_2) level gave the maximum boll number of 12.26 and 12.73 respectively with a seed cotton yield of 13.23 Q/ha. This evidently shows that the removal of the leaves at these levels gave more ventillation and helps for the translocation of food materials from one part to another other part of the plant body which nullifies the hypotheses propounded by Brown (2) that the bolls derived most of their assimilates from the leaves in the same region of the plant. Further detailed experimentation is warranted on this aspect.

Summary

A trial was laid out at the Cotton Breeding Station, Tamil Nadu Agricultural University, Coimbatore, India during 1976 - 1977 to find out the effect of defoliation of leaves on 'MCU 5' cotton under irrigation. The leaves found between 0 to 30, 30 to 60 and 60 cm and above were defoliated as the crop grows to its height. It was found that the removal of monopodial leaves at 0 to 30 cm height and removal of both the monopodial and sympodial leaves at 30 to 60 cm height gave the maximum seed cotton yield, indicating the possibility of the food materials translocated from one part to the other part of the plant body.

Table 1.—Effect of treatments on boll number and yield of seed cotton

Treatments	Boll number per plant				Seed cotton Yield Q/ha			
	0-30 cm (H_1)	30-60 cm (H_2)	above 60 cm (H_3)	Mean	0-30 cm (H_1)	30-60 cm (H_2)	(^{a}H) above 60 cm	Mean
T_1 Sympodial leaves removal	12.46	8.40	9.06	9.97	12.98	10.25	10.31	11.18
T_2 Monopodial leaves removal	12.26	10.10	9.36	10.57	13.23	11.46	10.78	11.82
T_3 Sympodial plus monopodial Leaves removal	7.73	12.73	9.83	10.10	8.73	13.23	11.21	11.06
Mean	10.82	10.41	9.42		11.65	11.65	10.76	
		S.E.	C.D (5%)			S.E.	C.D (5%)	
Between heights		0.12	0.25			0.11	0.23	
Between leaves		0.12	0.25			0.11	0.23	
Interactions		0.21	0.44			0.18	0.39	

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Periodic annual DBH increment in a subtropical moist forest dominated by Syzygium jambos (L) Alston.

Sumario. **Syzygium jambos,** a pesar de la presencia de árboles de mayor tamaño, y el hecho de que el bosque fue sometido a una entresaque para eliminarla, mantenía aproximadamente la misma proporción de tallos y área basal durante 32 años, principalmente como árboles intermedios y suprimidis. La especie produce una fruta comestible, regenera por rebrotes después de podarse, y crece en zonas de suelos pobres, características las cuales la hacen recomendable para programas agri-silviculturales.

Introduction

The Río Piedras Woodlot on the north coast of Puerto Rico is a secondary forest in the Subtropical Moist Life Zone (2). The woodlot is located on shallow tuffaceous soils (4) at about 40 m elevation, areas which generally accord to Beard's (1) classification for semi-evergreen seasonal forest. Mean annual rainfall exceeds 1900 mm with no monthly mean less than 70 mm. Mean temperature is about 25°C and varies little throughout the year.

A single 0,5 ha plot was established to record annual dbh increment (periodic annual increment, PAI) by species, and to observe growth of the coppicing tree *Syzygium jambos* (L.) Alston on low elevation, shallow soils.

Methods — In 1943, 96 stems $\geq$4.0 cm were measured (on a 0.05 ha plot). The stand had three stories, with *B. divaricata,* Z. martinicense and *S. mombin* in the canopy, species common on drier sites within the life zone. All stems were <35 cm dbh, and the basal area was 11.7 m²/ha.

An improvement cutting in 1953 removed 25 per cent of the stems and 33 per cent of the basal area. The cutting concentrated on *S. jambos, C. guianensis, C. arborea,* Melastomataceae, *D. morototoni, S. mombin,* and *M. splendens,* principally suppressed trees of small dimension. The woodlot was remeasured in 1975. Tukey's omega procedure, a multiple range test, was used to determine significant PAI difference by crown class.

Results and Discussion

Wadsworth (6) concluded that *S. jambos* seedling growth was slow but sprout growth was phenomenal, producing a dense stand within a few years. He cited a 6-year old coppice stand in Cidra, Puerto Rico, with 50,000 stems/ha and 42 m²/ha growing stock yielding an estimated 11 to 14 m³/ha/yr. Stumps were still vigorous after four cuttings. He concluded that *S. jambos* could provide small dimension wood products useful to a rural population as well as establish itself as a weed difficult to eradicate. He also observed that the species grew well on some of Puerto Rico's worst soils and produced shade so dense that subordinate vegetation could not develop, causing soil erosion on steep slopes.

During the 32 year observation of the Río Piedras Woodlot, the total number of stems decreased from 1920 to 1200/ha while the basal area increased from 11.7 to 14.9 m²/ha. Ãbout 90 per cent of the natural and man-caused stand mortality was in the 5 and 10 cm classes (Table 1).

S. jambos, a species that rarely exceeds 20 cm dbh, comprised about 25 per cent of the stems and 20 to 25 per cent of the basal area in 1943 and 1975. Much of both ingrowth and mortality was also attributed to this species.

The stand had 16 species in 1943 and 11 in 1975 (Table 1). Seven secondary species present in 1943 were absent by 1975; two climax species absent in 1943 comprised 25 per cent of the stems and 13 per cent of the basal area ingrowth by 1975.

In 1943, 55 per cent of the stand basal area was in the 10 cm dbh class; by 1975, 45 per cent in the