Journal of Crop and Weed 6(2)59-62: (2010)

Identification of critical stages of weed competition and effect of weed competition in banana variety Palayankodan

P. PRAMEELA

College of Horticulture, Vellanikkara,
Kerala Agricultural University, Thrissur, Kerala

ABSTRACT

An experiment was conducted to study the effect of weed competition and to identify the most critical stage of weed competition in banana. The treatments consisted of different weeding schedules as well as an unweeded control. It was found that early vegetative phase of growth of banana especially up to 3rd/6th month after transplanting and bunch development stage are the critical stages of banana at which yield is affected. Cost benefit ratio indicated that frequent weeding, withholding weeding during the first three MAP as well as during 6 to 9 MAP is less economical compared to other treatments.

Key Words: Banana, critical stages, weed competition

Among the various factors limiting growth and yield of banana, weed competition is one of the most important one. Frequent weeding is carried out by farmers to control weeds especially during the initial phases of crop growth. Weeding during the vegetative phase (1 to 6 months after planting) is very important and weed control during this period enhances fertilizer use efficiency and yield (Chadha 1999). Hemeng *et al.* (1994) reported a significantly higher number of leaves, maximum pseudo stem girth and bunch weight following weeding at 4-week intervals. Keeping the crop generally free of weeds throughout the crop period resulted in 47% increase in yield over un weeded plot and in a cost/benefit ratio of 0.05 *(Badgujaret al.,)* Similar results have been reported by other workers with respect to the influence of different weeding frequencies on growth and yield of the cultivar 'Basrai. The scarcity and high cost of labour are problems faced by the farmers which in turn are affecting the net returns from banana cultivation. The present study was undertaken to identify the most critical period of weed competition.

MATERIALS AND METHODS

The study was conducted at the Banana Research Station, Kannara, Thrissur of Kerala Agricultural University during the period May 2005 to March 2006. The experiment was laid out in RBD with three replications.

The treatment details are as follows:

T_1 - No weeding
T_2 – Weed free – frequent weeding
T_3 – Traditional weeding practice (Weeding three to four times according to severity of weed infestation)
T_4 – No weeding till 3rd month and then weed free
T_5 – No weeding till 6th month and then weed free
T_6 – Weeding till 3rd month, no weeding 3-6 months, then weed free
T_7- Weed free till 6th month, no weeding6-7 month, then weed free
T_8- Weeding till 9th month and no weeding thereafter

RESULTS AND DISCUSSION

Growth parameters recorded at different stages of growth showed that weed competition influenced the vegetative growth of plants (Table.1). Significant difference between treatments could be observed from four months after planting (MAP). The data showed that plants were taller when plots were kept weeded at least up to 6 MAP At flowering, the treatments which were weed free (T_2,T_3,T_7 and T_8) recorded comparable heights indicating that weed competition during initial stages of growth of banana affected vegetative growth of plants.

Though significant difference in girth of plant could be observed only at 4th and 6th MAP, the highest values were observed in treatments which were weed free throughout (T_2, T_3) or up to 6 MAP (T_7) and 9 MAP (T_8).

There was not much variation in number of leaves produced. However , as in the case of height and girth a reduction in values could be observed due to weed competition. At four MAP, all the treatments in which weeding was not carried out (T_1, T_5 & T_4), recorded lower leaf number compared to others.

Flowering got significantly delayed due to weed competition (Table 2). The days to flowering varied from 274 days to 320 days in different treatments. The duration was maximum in un weeded plots (T_1) and plots which were kept un weeded up to 6 months after planting (T_5), which were statistically on par. All other treatments except T_4 (no weeding till 3 MAP) also were at par, indicating the weed competition during early stages of growth (upto 6 months) delayed flowerings of banana

E mail:prameelaagron66@yahoo.com

Days to harvest showed almost a similar trend as that of days to flowering (Table 2).The range in values was from 368 to 404 days. Competition from weeds delayed flowering and this in turn affected the days to maturity also. Frequent weeding, traditional weeding and weeding up to $6^{th}/9^{th}$ month after planting recorded lower values which were statistically at par. Significant variation between treatments could be observed in bunch weights. The highest yield of 15.6 kg/ plant was recorded in traditional weeding (T_3) which was comparable to that of frequent weeding (T_2) and weed free till 9^{th} month (T_8) (Table 3) The lowest yield of 9.75 kg/plant which was significantly inferior to all weeding schedules. No weeding during the initial three months as well as no weeding during the bunch formation stage also recorded lower yields which were on par. Hence it can be inferred that early vegetative phase of growth of banana especially up to $3^{rd}/6^{th}$ MAP and bunch development stage are the critical stages of banana at which yield is affected

Out of the different yield parameters studied, only the number of hands per bunch showed statistically significant variation between treatments, Where T_1 (control) and T_5 recorded lower values compared to others. Number of fingers per bunch, length of bunch, fruit weight, length and girth of the fruit, as well as pulp peel ratio did not differ significantly. Durgadevi and Sathiamoorthy (1996), studied the influence of weed infestation in banana and found 18% increase in bunch weight when the crop was weeded until the 9th month, left without weeding until the 12th month and then kept weed-free. They reported a yield loss of 54.7% when the crop was not weeded. Cost of cultivation ranged from 1,58,400Rs/ha for T1 to1,99,900 Rs/ha for T_2 (Table 2). The gross return per hectare was highest for T_3, closely followed by T_2 and T_8. The B:C ratio was the highest for treatment T_3 (1.29) which was comparable to T_6 and T_8 . Hence, it can be inferred that frequent weeding, with holding weeding during the first three MAP as well as during first six MAP and no weeding during bunch development stage is less economical in banana cultivation.

REFERENCES

Badgujar,C.D. Dusane, S.M. and Deshmukh, S.S. InfoMusa **12**: 12-13

Chadha K.L. 1999. An overview on banana production in India. National seminar on Banana Production, Post -harvest Tech. and Export 15-16th Oct, 1999. APEDA, Delhi.

Durgadevi, D and Sathiamoorthy, S. 1996. Influence of weeding treatment on yield of Banana. Conference on Challenges for Banana Production and Utilization in 21st century. 24-25 Sept. 1996, Trichy, India.

Hemeng O.B., Tulie,K.A., Yeboah, D.K. and Ferries,R.S.B.. 1994. Effect of weeding frequency on growth and yield of plantain. *Mus A*frica **5**:4-5

Table 1. Growth attributes of banana as influenced by different weeding schedules

Treatment	Plant height (cm) (MAP)							Pseudostem girth(cm) (MAP)							Number of leaves per plant (MAP)						
	2	3	4	5	6	7	8	2	3	4	5	6	7	8	2	3	4	5	6	7	8
T_1	59.83	86.57	120.30	138.40	168.90	221.20	255.4	19.58	27.0	35.40	41.17	50.40	59.17	64.27	5.23	8.23	7.00	8.10	9.33	11.40	12.40
T_2	72.93	97.97	138.07	159.93	196.13	237.33	268.6	22.36	29.37	41.73	45.97	55.63	60.20	67.00	5.77	9.20	8.03	8.83	9.60	11.57	13.50
T_3	64.60	88.90	138.93	157.07	204.17	246.33	281.1	21.20	29.53	40.77	43.23	55.27	62.97	67.90	5.85	9.00	7.80	9.17	10.03	11.20	13.77
T_4	57.23	81.83	119.77	139.50	272.47	229.20	267.4	17.80	25.67	34.90	41.33	59.07	61.33	68.70	5.33	8.20	7.40	8.93	9.80	11.57	13.00
T_5	57.27	83.47	114.73	138.57	168.07	213.43	247.0	18.80	25.77	33.70	39.67	50.0	58.27	64.23	4.77	7.87	6.90	8.07	9.23	11.00	13.30
T_6	63.27	88.23	120.17	142.83	181.93	230.63	264.9	21.03	28.07	36.23	42.20	52.10	59.27	65.63	5.63	8.60	7.53	8.40	9.27	10.93	12.83
T_7	66.13	94.17	133.03	148.43	186.40	237.87	272.9	21.72	29.37	38.90	45.10	53.40	60.80	66.07	5.57	8.80	7.90	8.83	9.83	11.30	12.83
T_8	64.07	100.03	138.63	161.27	195.83	253.43	289.8	20.93	30.57	40.90	45.33	55.27	62.43	68.04	6.53	9.90	7.60	8.73	9.67	11.67	13.13
LSD (0.05)	NS	NS	12.75	17.63	24.11	20.66	22.13	NS	NS	3.57	NS	4.31	NS	NS	NS	NS	0.52	0.73	NS	NS	NS

MAP- Months After Planting

Table 2. . Influence of weeding schedule on days to flowering harvesting, gross return and B: C ratio of banana

Treatments	Days to flowering	Days to harvest	Yield (t/ha)	Gross returns (Rs./ha)	Cost of cultivation (Rs./ha)	B:C ratio
T_1	319.57	404.37	21.45	207856	158400	0.94
T_2	279.03	375.87	33.98	236896	199900	1.18
T_3	289.20	374.60	34.32	238920	185400	1.29
T_4	296.0	377.60	29.70	207900	178650	1.16
T_5	307.4	399.27	28.82	201740	171900	1.17
T_6	292.4	387.27	31.94	223608	178650	1.25
T_7	289.26	386.73	30.13	213752	185400	1.15
T_8	274.40	368.20	33.18	232100	192150	1.21
LSD (0.05)	**20.64**	**17.67**	-	-	-	**0.10**

Table 3. Influence of weeding schedule on yield and yield parameters of banana.

Treatments	Yield (kg/plant)	No. of hands/ bunch	No. of fingers/ bunch	Length of bunch (cm)	Fruit weight (g)	Fruit girth (cm)	TSS (degree brix)	Pulp: peel ratio
T_1	9.75	9.73	210.53	63.20	68.16	10.67	21.26	2.77
T_2	15.45	11.73	179.83	60.73	61.81	10.53	22.69	2.99
T_3	15.60	10.17	187.37	66.13	68.92	10.57	20.69	3.29
T_4	13.50	10.37	183.57	60.57	60.19	10.07	20.66	3.19
T_5	13.10	9.70	202.27	63.80	62.84	10.42	21.02	2.99
T_6	14.52	10.57	194.37	63.90	61.90	10.49	20.68	2.96
T_7	13.69	10.27	190.03	64.67	60.92	10.60	20.59	3.01
T_8	15.08	10.10	184.67	67.50	70.49	10.90	20.38	3.15
LSD (0.05)	**1.26**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**