

## WEED MANAGEMENT IN BANANA cv. NENDRAN WITH COWPEA AS AN INTERCROP

**B**anana, one of the most important fruit cum subsidiary food crops of the tropics, is being grown in a wide range of agroclimatic conditions in Kerala. Of the multitudes of cultivars which are being cultivated in the State, Nendran is the most popular commercial one. Usually Nendran is grown as an irrigated crop with heavy manures and fertilizers, which poses weed problems during the crop growth, especially during the early stages. The main effects of weed competition on banana plants are reported to be the delay in flowering and reduction in yield (COPR, 1977). This investigation was carried out at the Banana Research Station, Kannara, Trichur during 1987-88 with an objective to standardise an effective and economic weed control method in banana cv. Nendran.

The experiment was conducted in RBD with eleven treatments replicated thrice. Planting of banana was done in October, 1987. Herbicides namely diuron (1.25 kg and 2.50 kg a.i./ha as pre-emergence application at planting), paraquat (0.8 kg and 1.2 kg/ha two months after planting or three sprays of 0.4 kg/ha at monthly interval starting from two months after planting), glyphosate (0.8 kg/ha two months after planting), 2,4-D + dalapon (1.0 + 4.0 kg/ha tank-mix) two months after planting and paraquat + diuron (0.8 + 1.25 kg/ha tank-mix) two months after planting were compared with raising cowpea cv. Kanakamani in the interspace (two crops) and hand weeding (four times) and an unweeded control. The plots were 6 m x 4 m in size with six banana plants planted at a spacing of 2 m x 2

m. In the cowpea raised plots, seeds were broadcast-sown @ 40 kg/ha. All cultural practices except weed control operations were followed as per KAU (1986). The observations on the weed flora of the plots, dry weight of weeds at 2, 4, 5 and 7 months after planting and vegetative and yield characters of banana were recorded following standard procedures.

The important weeds observed in the experimental area were:

a) Grasses: *Ageratum conyzoides* Linn., *Cynodon dactylon* (L.) Pers. and *Eragrostis tenella* L.

b) Sedges: *Cyperus rotundus* L. and *Cyperus ma* L.

c) Dicots: *Borreria* sp., *Commelina benghalensis* Linn., *Crotalaria* sp., *Emilia sonchifolia* (L.) DC., *Euphorbia hirta* L., *Ischaemum rangacharianum* Fischer, *Ludwigia parviflora* Roxb., *Mimosa pudica* Linn., *Mollugo disticha* Ser., *Phyllanthus niruri* Linn., *Sida acuta* Burm., *Synedrella nodiflora* Gaerth., *Vernonia cineria* Less. and *Vicoa indica* (L.) DC.

Of these, *Cynodon dactylon* and *Cyperus rotundus* were the most important weeds during all the stages of sampling which constituted about 40% and 35% of the total weeds respectively. The data on weed growth at different stages of crop growth (Table 1) showed that at all the stages of sampling i.e., 2, 4, 5 and 7 months after planting, there existed significant variation among the treatments. During all the stages, the plots intercropped with cowpea recorded the minimum weed growth

Table 1. Weed dry matter production ( $\text{g/m}^2$ ) at different stages of crop growth, as influenced by the treatments

Treatment	Months after planting			
	Two	Four	Five	Seven
Diuron 1.25 kg a.i./ha	82	1083	411	542
Diuron 2.50 kg a.i./ha	160	933	624	435
Paraquat 0.4 kg a.i./ha	239	261	256	346
Paraquat 0.8 kg a.i./ha	198	571	880	667
Paraquat 1.2 kg a.i./ha	174	688	720	839
Glyphosate 0.8 kg a.i./ha	211	443	651	1173
2 4-D 1.0 kg/ha + dalapon 4.0 kg a.i./ha	184	581	833	862
Paraquat 0.8 kg a.i./ha + diuron 1.25 kg a.i./ha	189	651	800	747
Cowpea	44	237	85	187
Hand weeding	61	559	171	196
Unweeded control	203	1571	997	1387
CD (0.05)	64**	634*	225**	616*

\* Significant at 5% level

\*\* Significant at 1% level

(i.e., 44, 237, 88 and 187  $\text{g/m}^2$  dry matter at 2, 4, 5 and 7 months after planting, respectively) which was on par with hand weeding. Chacko and Reddy (1981) also noted similar suppression of weed growth by intercropping cowpea in banana. In most of the treatments weed growth was slightly reduced during the fifth month after planting (March) mainly because of the drying of the annual weeds due to the onset of the summer season. Pre-emergence application of diuron was found to be effective up to two months after application. At two month stage, it was on par with hand weeding and intercropping with cowpea. However, at subsequent stages its effect declined, probably due to the degradation of the chemical,

resulting in insufficient quantity of the herbicide in soil for effective control of weeds. Repeated application of paraquat could control the weeds effectively and the treatment was on par with hand weeding. However, single application of this herbicide at double or triple doses could not give prolonged weed control. Bhuria and Leela (1973) also reported that the effect of paraquat lasted only up to 4-6 months. Glyphosate alone, paraquat either as single application or in combination with diuron and combination of 2,4-D and daiapon were not effective in controlling weeds in banana garden.

The data presented in Table 2 revealed that there is no significant

Table 2. Vegetative characters (at flowering), crop duration, yield and bunch characters of banana as influenced by weed control treatments

Treatment	Height (cm)	Girth at collar (cm)	Days to flower	Total crop duration (days)	Bunch weight (kg)	Number of hands	Number of fingers
Diuron 1.25 kg a.i./ha	284	58	245	328	6.73	4.53	46.20
Diuron 2.50 kg a.i./ha	284	62	250	327	7.42	5.33	47.63
Paraquat 0.4 kg a.i./ha	276	60	259	339	7.30	4.93	48.83
Paraquat 0.8 kg a.i./ha	284	59	258	342	4.70	4.80	42.20
Paraquat 1.2 kg a.i./ha	277	60	252	338	7.47	5.00	47.93
Glyphosate 0.8 kg a.i./ha	275	58	264	348	5.08	5.10	49.40
2,4-D 1.0 kg/ha + dalapon 4.0 kg a.i./ha	283	58	262	346	7.33	5.00	46.90
Paraquat 0.8 kg a.i./ha + diuron 1,25 kg a.i./ha	277	55	253	339	7.43	4.93	48.60
Cowpea	287	63	259	340	7.63	5.00	48.60
Hand weeding	287	63	259	340	7.63	5.00	48.60
Unweeded control	283	59	256	341	7.30	5.27	48.17
CD (0.05)	NS	2.83"	NS	NS	NS	NS	NS

\*\* Significant at 1% level

NS = Not significant

difference among treatments with respect to yield and vegetative characters except the collar girth. The maximum collar girth (63 cm) was recorded by the treatments where cowpea was intercropped or hand weeding was given, diuron 2.5 kg a.i./ha, paraquat 0.4 kg a.i./ha in three equal splits and paraquat 1.2 kg a.i./ha which were all on par. Since no significant difference among treatments could be observed with respect to yield and yield contribution characters as in the earlier trials elsewhere (Bhuria and Leela, 1973 and Das and Misra, 1977) it may be

presumed that the weed growth in this trial was not sufficient to give strong competition to the main crop.

Considering the lesser cost involved, the benefit of addition of organic manure and fixing atmospheric nitrogen in the soil in addition to weed smothering, raising cowpea (sowing at the time of planting banana and incorporating with the soil after 45 days followed by a second crop) in the interspace of banana seems to be the most effective and economic method of weed control in banana garden.

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