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Effect of Sequential Herbicide Application on Banana and Weeds

A. R. Shaikh and O. G. Lokhande
AICRP on Weed Control
Marathwada Agricultural University, Parbhani-431 402 (M. S.), India

Banana is an important cash crop of Maharashtra state grown in irrigated tract of the state where assured irrigation facilities are available. As the crop is of long duration and grown only under irrigated situation faces serious problem of perennial and annual weeds and yield is adversely affected. Farmers adopt presently physical method of weed control, which is costly due to increased labour wages. Similarly, perennial weeds viz., *Cynodon dactylon* and *Cyperus rotundus* are not effectively controlled by manual weeding. Hence, present investigation was undertaken to find out effective and economic method of weed control involving sequential herbicide application.

Experiment was conducted during 1999-2000 and 2000-01 at Marathwada Agricultural University, Parbhani. The experimental soil was medium deep black (Vertisols), slightly alkaline in nature, low in N, medium in P_2O_5 and high in potash content. The banana variety Ardhapuri was planted at 1.5 x 1.5 m spacing in 2nd week of July during 1999 and 3rd week of August during 2000. The recommended dose of NPK was applied. Irrigation was given by flow method whenever required. The experiment was conducted in randomized block design with three replications. There were eight treatments consisting of three pre-emergence herbicides i. e. diuron at 1 kg a. i. ha^{-1}, atrazine at 1.0 kg a. i. ha^{-1} and oxyfluorfen at 0.15 kg a. i. ha^{-1} supplemented with post-emergence followed by application of glyphosate at 1.64 kg a. i. ha^{-1} at 9 and 12 weeks after planting. These treatments were compared with weedy check and hand weeding at 3, 6, 9, 12 and 15 weeks after planting. Weed dry weight was recorded at 16th week after planting.

The experimental field was infested with 38%

Table 1. Effect of treatments on weeds and crop (Mean of two seasons)

Treatment	Dose (kg ha^{-1})	Application stage	Fruit yield (t ha^{-1})	WCE	Cost of treatment (Rs ha^{-1})	Return due to treatment (Rs ha^{-1})
Weedy	-	-	523	-	-	-
Weedings–4	-	3, 6, 9, 12	756	79	4389	58211
Diuron fb	1.0	Pre-em.	703	75	3700	53600
Glyphosate	1.64	9				
Diuron fb	1.0	Pre-em.	822	85	5600	86811
Glyphosate fb	1.64	9				
Glyphosate	1.64	12				
Atrazine fb	1.0	Pre-em.	722	72	3600	60478
Glyphosate	1.64	1.64				
Atrazine fb	1.0	Pre-em.	768	88	5500	69322
Glyphosate fb	1.64	9				
Glyphosate	1.64	12				
Oxyfluorfen fb	0.15	Pre-em.	738	76	3578	61240
Glyphosate	1.64	9				
Oxyfluorfen fb	0.15	Pre-em.	854	89	5478	96194
Glyphosate fb	1.64	9				
Glyphosate	1.64	12				
LSD (P=0.05)	-	-	81.9		-	-

grassy weeds and 62% broad-leaved. The dominant weeds were : *Cynodon dactylon , Cyperus rotundus, Dinebra rettraflexa, Acalypha indica, Digera arvensis, Euphorbia* sp. and *Chrozophora rottleri.* The weed control treatment significantly reduced the dry weed weight over weedy check. Oxyfluorfen at 0.15 kg a. i. ha^{-1}, atrazine at 1.0 kg a. i. ha^{-1} or diuron at 1.0 kg a. i. ha^{-1} supplemented with two post-emergence glyphosate at 1.64 kg a. i. ha^{-1} application at 9 and 12 week after planting were found equally effective in reducing weed dry weight and significantly superior over rest of the treatments with higher weed control efficiency (Table 1).

Uncontrolled weeds caused an average yield loss of 39%. During the year 1999-2000, all the weed control treatments were found significantly superior in increasing the fruit yield of banana over weedy check. The highest yield was recorded in pre-emergence application of oxyfluorfen at 0.15 kg a. i. ha^{-1} supplemented with two sprays of glyphosate at 9 and 12 weeks after planting which was at par with diuron 1.0 kg a. i. ha^{-1} or atrazine 1.0 kg a. i. ha^{-1} supplemented with two post-emergence applications of glyphosate at 1.64 kg a. i. ha^{-1} and significantly superior over rest of the treatments. The increase in yield was a result of effective weed control by these treatments. The pooled mean values indicated that all the weed control treatments were equally good and superior over weedy check. The highest net monetary return was recorded due to pre-emergence oxyfluorfen at 0.15 kg a. i. ha^{-1} fb glyphosate at 1.64 kg a. i. ha^{-1} at 9 and 12 weeks after planting. The next best treatment was diuron 1.0 kg a. i. ha^{-1} fb glyphosate at 1.64 kg a. i. ha^{-1} at 9 and 12 weeks after planting.