Tobacco Research 39 (1) : 5-8, 2013

EFFECT OF CHEMICAL SUCKER CONTROL ON YIELD AND ECONOMICS OF FCV TOBACCO IN SOUTHERN LIGHT SOILS OF ANDHRA PRADESH

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(Received on 20th November, 2011)

A field experiment was conducted to evaluate the performance of new sucker control chemicals on cv. Hema for three seasons (2007-08 to 2009-10) at CTRI Research Station, Kandukur with 13 treatments in RBD design with three replications New chemicals prime + (Flumetralin) and stomp (Pendimethalin) were tried at 0.75, 1.00, 1.25 and 1.5% along with suckerout 4%, deconal 4% which are presently recommended sucker control chemical along with hand suckering, no suckering and no topping. Stomp or Prime+ @1.5% are found effective for sucker control under southeren light soil (SLS) conditions. Highest green leaf, bright leaf, cured leaf and grade index were observed with stomp 1.5% closely followed by prime+1.5% and hand suckering. Mean improvement in yields due to these treatments was 13.8% in cured leaf, 11.4% in grade index over no topping-control. Topping-without suckering treatment reduced the yields by 8.2% in cured leaf, 10.3% in bright leaf. Bulk trial with promising treatments showed that topping is beneficial and stomp at 1.5% gave maximum additional net returns per ha (Rs. 9305/-) followed hand suckering (Rs.7723) and suckerout 4% (Rs.7753). Similarly, the C:B ratio was maximum in stomp 1.5% (1:3.0), followed by Suckerout 4% (1:2.5) and hand suckering (1:2.1). This demonstrates beneficial effects of topping and the superiority of stomp 1.5% as sucker control agent in FCV tobacco which gave maximum returns under SLS conditions. The residual levels of stomp, as suckercide should be studied in details before recommending to the farming community, as the FCV tobacco is exported to other countries.

INTRODUCTION

All over the world farmers use to top tobacco because topped tobacco produce higher yield and better quality. Dinitro anilines, contact type with local systemic activity are reported to be promising on all types of tobacco. However in tobacco cultivation under Southern Light Soils (SLS) of Andhra Pradesh, topping is not practiced. SLS farmers are aware of the benefits of topping of tobacco. However they are not adopting the practice due to labour problems etc., Hence, there is an urgent need for evolving a suitable and economically viable sucker control chemicals . A few studies were done in case of *bidi*, *natu* and FCV tobacco to know the performance in comparison with existing recommended practices (Patel *et al., 1996;* Bhat *et al.*, 1994; Rao *et al.*, 1993; Janardhan *et al.*, 1994). There were no reports in SLS conditions of Andhra pradesh to work out efficient and economically viable chemical sucker control chemicals for use. Recommendation of an efficient and economically viable chemical will help the farmers to adopt topping and sucker control to improve yield and quality of FCV tobacco. To find out effective sucker control agent new chemicals at varying concentrations were tried along with recommended chemicals and practices.

MATERIALS AND METHODS

A field experiment was conducted for three seasons (2007-08 to 2009-10) at CTRI Research Station, Kandukur with 13 treatments in randomized block design with three replications using cv. Hema. New chemicals prime + (Flumetralin) and stomp (Pendimethalin) were tried at 0.75, 1.00, 1.25 and 1.5% concentration along with suckerout 4%, deconal 4%, hand suckering, no suckering and no topping control. The gross plot size was 5.2 m x 7.15 m and net plot size was 2.60 x 5.85 m.

Bulk trial was conducted during 2008-09 & 2009-10 with promising treatments to study the economics of sucker control. Prime+ was not considered in bulk study due to non availability of the imported chemical in sufficient quantity. Approximately 8 ml solution was applied to the top of plant just after topping, allowing the solution

to trickle down the stem. All suckers about 2 cm or longer on all plants were removed as they will not be controlled by chemicals. Topping was done at 20 to 22 leaves at button stage. The data on weight of suckers/plant, yield of green leaf, cured leaf, bright leaf and grade index as influenced by sucker control treatments was recorded and analysed statistically.

RESULTS AND DISCUSSION

Topping and sucker control significantly improved the green leaf, bright leaf and grade index. The highest yield in all yield attributes were recorded in treatments stomp 1.5% closely followed by prime+1.5% and hand suckering (Table 1). Mean improvement in yields due to these treatments was 13.8% in cured leaf, 11.4% in grade index over no topping-control. stomp gave maximum improvement in leaf yield in *bidi* and FCV tobacco (Patel *et al.*, 1990; Jehan Bhakt *et al.*, 2007). Topping- without suckering treatment reduced the yields by 8.2% in cured leaf, 10.3% in bright leaf. This is due to increased production of suckers with topping and no suckering. Proper sucker control is necessary to reap the benefit of topping.

Prime+ (Flumetralin EC 15 %) which is a Dinitoaniline group and stomp (30% EC of Pendimethalin) are classified as contact type sucker control agents with local systemic activity. When applied to tobacco after topping, it stops cell division in the sucker buds which would start from the leaf axils, as a result, growth of sucker or side shoots is arrested. Long *et al.* (1990) reported that yield of tobacco was more when chemically topped with Flumetralin compared to hand topping. Following application of these suckericides prime+ or stomp at concentrations 1.5 or 1.25%, the developing sucker buds turned pale green and effectively stopped developing. The mean values

Table 1: Effect of sucker control chemicals on yields (kg/ha) of FCV tobacco (2008-10)

S. No.	Treatments	Green leaf	Cured leaf	Bright leaf	Bright leaf (%)	Grade index
1.	Prime + 0.75%	7568	1100	579	52.63	890
2.	Prime + 1.00%	8056	1190	632	53.10	978
3.	Prime + 1.25%	8593	1259	659	52.34	1020
4.	Prime + 1.5%	8831	1282	672	52.41	1040
5.	Stomp 0.75%	7476	1079	588	54.49	875
6.	Stomp 1.00%	8002	1176	619	52.63	957
7.	Stomp 1.25%	8414	1236	644	52.10	988
8.	Stomp 1.5%	8918	1293	687	53.13	1044
9.	Suckerout 4%	8199	1204	626	51.99	984
10.	Decanol 4%	8186	1198	627	52.33	981
11.	Hand suckering	8908	1278	662	51.96	1035
12.	No suckering	6961	1036	544	52.50	827
13.	No topping	7502	1129	607	54.05	933
	Mean	**8124**	**1188**	**627**	**52.69**	**965**
	SEm±	**274.5**	**42.8**	**30.0**		**32.3**
	CD (P=0.05)	**760.9**	**118.6**	**NS**		**89.5**
	CV (%)	**7.4**	**11.8**	**22.4**		**12.5**
	Seasons					
	2007-08	**7363**	**1109**	**603**	**54.37**	**943**
	2008-09	**8888**	**1277**	**703**	**55.05**	**1055**
	2009-10	**8122**	**1180**	**575**	**48.60**	**896**
	SEm±	**70.93**	**22.61**	**22.46**		**19.42**
	CD (P=0.05)	**245.47**	**78.26**	**77.72**		**67.20**
	CV (%)	**10.14**	**10.80**	**14.40**		**10.05**

of nicotine, reducing sugars, nicotine: reducing sugars ratio and chlorides in leaf were 3.31%, 13.05%, 3.94 and 0.70% respectively. Nicotine content tended to increase in response to topping (Table 2). Highest leaf nicotine was observed with plants sprayed with stomp-33 EC (Jehan Bhakt *et al.*, 2007).

Bulk trial was laid out during 2008-09 and 2009-10 to work out the economics of topping and sucker control with the promising treatment stomp 1.5%, suckerout 4% and hand suckering and mean of two seasons data presented in Table 3. Results of additional yield due to topping and sucker control was 152 kg/ha in hand suckering, 145 kg/ha in stomp 1.5% and 128 kg/ha in sucker out 4%. The improvement in yield on an average was 12.0% in cured leaf (Table 3).

Additional cost due to topping and sucker control treatment was less in stomp 1.5% (Rs. 4580/ha) compared to suckerout 4% (Rs. 4812/

Table 2: Chemical quality of leaf as influenced by sucker control treatments (pooled data 2007-08 to 2009-10)

S. No	Treatments	Nicotine (%)	R. sugar (%)	Nicotine: R. sugar	Chlorides (%)
1	Prime+ 0.75%	3.19	13.96	4.38	0.50
2	Prime+ 1.00%	3.99	12.88	3.22	0.88
3	Prime+ 1.25%	3.80	14.44	3.80	0.74
4	Prime+ 1.5%	3.52	12.00	3.41	0.86
5	Stomp 0.75%	2.66	13.94	5.24	0.54
6	Stomp 1.00%	3.34	13.61	4.07	0.86
7	Stomp 1.25%	3.14	11.56	3.68	0.62
8	Stomp 1.5%	3.16	14.96	4.3	0.87
9	Suckerout 4%	3.41	11.97	3.51	0.88
10	Decanol 4%	2.64	12.03	4.56	0.48
11	Hand suckering	3.51	11.62	3.31	0.68
12	No suckering	3.26	14.02	4.30	0.72
13	No topping	2.54	12.74	5.02	0.52
	2007-08	3.33	16.33	4.90	0.43
	2009-10	3.30	9.77	2.96	0.98
	G. mean	3.31	13.05	3.94	0.70

Table 3: Economics of topping and sucker control under SLS conditions (Bulk trial, mean of seasons)

Treatment	Cured leaf yield (kg/ha)	Additional yield (kg/ha)	Additional gross returns (Rs/ha)	Additional cost of production (Rs/ha)	Additional net returns (Rs/ha)	C:B ratio
1. Stomp 1.5%	1308	145	13835	4580	9305	1:3.02
2. Suckerout 4%	1291	128	12165	4812	7353	1:2.52
3. Hand Suckering	1318	152	14555	6832	7723	1:2.13
4. No topping	1164					

N.B: 1. Stomp 1.5% 2.5 l. (@ Rs.410/-per l) + 20 Women
2. Suckerout 4% 6.25 l. (@ Rs.245/- per l) + 20 Women
3. Hand suckering 50 women days per ha @ Rs. 112.50/- day
4. Average price of tobacco Rs. 95.5/kg

ha) and hand suckering (Rs. 6832/ha). At the average price of Rs. 95.50/kg of cured leaf, the additional net returns due to these treatments were maximum in stomp 1.5% (Rs.9305/ha) followed by hand suckering (Rs. 7723/ha) and suckerout 4% (Rs.7353/ha). Similarly, the C:B ratio was maximum in treatment stomp 1.5% (1:3.0) followed by suckerout 4% (1:2.5) and hand suckering (1:2.1) (Table 3). This demonstrates beneficial effects of topping and the superiority of stomp 1.5% as sucker control agent in FCV tobacco which gave maximum returns avoiding problems of labour under SLS conditions. It can be concluded that prime+ (15% EC of Flumetralin) at 1.5% or stomp (30% EC Pendimethalin) at 1.5% concentration were found superior and were on a par with hand suckering under SLS conditions. Stomp @ 1.5% was found more economical than hand suckering due to saving of labour in bulk trial. The results will help in improving the quality and productivity levels of SLS tobacco. The residual levels of stomp as suckercide should be studied in details before recommending to the farming community.

ACKNOWLEDGEMENTS

Authors gratefully acknowledge the facilities extended by Director, Central Tobacco Research Institute, Rajahmundry, A.P to conduct this study.

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