



# IJRASET

International Journal For Research in  
Applied Science and Engineering Technology



---

# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

---

**Volume: 7      Issue: IX      Month of publication: September 2019**

**DOI: <http://doi.org/10.22214/ijraset.2019.9014>**

**[www.ijraset.com](http://www.ijraset.com)**

**Call:  08813907089**

**E-mail ID: [ijraset@gmail.com](mailto:ijraset@gmail.com)**

# Influence of Integrated Weed Management in Bt Cotton (*Gossypium hirsutum* L.) over Sole Method

K. S. Sreena<sup>1</sup>, G. S. Yadahalli<sup>2</sup>

<sup>1,2</sup>Department of Agronomy, University of Agricultural Sciences, College of Agriculture, Raichur – 584 104, India

**Abstract:** A field experiment was conducted during Kharif of 2018-19 at agricultural college farm UAS Raichur, Karnataka, to study the effect of integrated weed management in Bt cotton over sole method. The experiment was laid out in RCBD consists of 10 treatments with three replications. Among all the treatments Pendimethalin PE @ 1.0 kg ha<sup>-1</sup> fb Pyriithiobac Sodium PoE @ 75 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS was recorded significantly lower weed index at harvest (4.13 %), higher herbicide efficiency index at harvest (4.55 %), higher seed cotton yield (25.23 q ha<sup>-1</sup>) and zero crop phytotoxicity.

**Keywords:** Crop phytotoxicity, Herbicide efficiency index, Integrated weed management, Seed cotton yield and Weed index

## I. INTRODUCTION

India is a second largest cotton producing country in the world, plays an important role in the Indian economy involving about 60 million people in cotton cultivation, textile industries and trade. In India first GM crop to be introduced was Bt cotton in 2002 and has been widely used for crop improvement. Cotton supports the livelihood of 7.7 million farmers and India is the second largest exporter. As crop typically takes 140-180 days to complete its life cycle, throughout the growth cycle it is exposed to weeds and the competition therein. Weeds deplete the soil by removing 5-6 times N, 5-12 times P<sub>2</sub>O<sub>5</sub> and 2-5 times K than cotton crop thus reducing the yield by 54-85 %. Weed control in cotton has relied mostly on herbicides, consisting of various functional groups (active ingredients) that are capable of impeding the growth and development of weeds. Successful chemical weed control requires the uniform application of the correct quantity of herbicide (s) over the target area, and also precision operation and accurate calibrations of sprayers are therefore very important since rates that are too high may injure the crop and it may give better result than single method.

## II. MATERIAL AND METHODS

A field experiment was conducted during the Kharif 2018 in medium black cotton soil. The experiment having 10 treatments consists One hoeing at 15 DAS + Two hand weeding at 30 and 45 DAS, Three inter culturing through mechanical weeder at 20, 40 and 60 DAS, Pendimethalin PE @ 1.0 kg ha<sup>-1</sup> fb One HW at 45 DAS, Oxyflurofen PE @ 0.1 kg ha<sup>-1</sup> fb one HW at 45 DAS, Pendimethalin PE @ 1.0 kg ha<sup>-1</sup> fb Pyriithiobac Sodium POE @ 75 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS, Pendimethalin PE @ 1.0 kg ha<sup>-1</sup> fb Quizalofop ethyl PoE @ 50 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS, Oxyflurofen PE @ 0.1 kg ha<sup>-1</sup> fb Pyriithiobac Sodium PoE @ 75 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS, Oxyflurofen PE @ 0.1 kg ha<sup>-1</sup> fb Quizalofop ethyl PoE @ 50 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS, Weedy check, Weed free check. The cultivar used in the experiment was Jadoo BG-II is a hirsutum hybrid and sowing was done at August 16 on medium black soil having P<sup>H</sup><sub>7.6</sub>, organic carbon 3.55 g kg<sup>-1</sup>, Available nitrogen 254 kg ha<sup>-1</sup>, Available P<sub>2</sub>O<sub>5</sub> 34 kg ha<sup>-1</sup>, Available K<sub>2</sub>O 299 kg ha<sup>-1</sup> and having electrical conductivity 0.35 ds m<sup>-1</sup> and had applied NPK at the rate of 190:80:80. The PRE herbicides were applied on soil surface a day after sowing and POE herbicides sprayed on foliage of weeds between rows of cotton as per the treatment details. The herbicide was applied using knapsack sprayer and quantity of water used was 1000 liters per hectare.

## III. RESULTS AND DISCUSSION

### A. Weed Index (%)

The data pertaining to weed index as influenced by different treatment is presented in Table 1 and the results revealed that Pendimethalin PE @ 1.0 kg ha<sup>-1</sup> fb Pyriithiobac Sodium POE @ 75 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS was significantly recorded lower weed index (4.13 %) after weed free check followed by all integrated weed management incorporated treatments and the higher weed index was noticed in weedy check (52.74 %). This might be due to the efficient weed management strategy introduced by integrated method which can control a major number of weeds associated with crop throughout its growing period. The same findings are also reported by Malarkodi (2017) and Mathukia *et al.* (2018).

### B. Herbicide Efficiency Index

The data in respect of herbicide efficiency index as influenced by different weed control treatments at harvest is presented in Table 1. Among the treatments Pendimethalin PE @ 1.0 kg ha<sup>-1</sup> fb Pyriithiobac Sodium PoE @ 75 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS was significantly recorded higher herbicide efficiency index (4.55) followed by Oxyfluorfen PE @ 0.1 kg ha<sup>-1</sup> fb Pyriithiobac Sodium POE @ 75 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS (3.66). Significantly lower, zero herbicide efficiency index were found in weed free check, weedy check, One hoeing at 15 DAS + Two hand weeding at 30 and 45 DAS and three inter culturing through mechanical weeder at 20, 40 and 60 DAS. It indicates the weed killing potential of pendimethalin fb Pyriithiobac sodium herbicides and its effectiveness in weed management over other herbicides. The same results are also noticed by Walia (2010) and kumar (2015).

### C. Crop Phytotoxicity

The data pertaining to crop phytotoxicity influenced by different weed management treatments are presented in Table 1. The data revealed that no herbicides had phytotoxic effect on crop plants as it was applied optimum dosage and couldn't find any negative impact. The results are in conformity with the findings reported by Malik *et al.* (2006) and Hiremath *et al.* (2013).

### D. Seed Cotton Yield (q ha<sup>-1</sup>)

The results revealed that Pendimethalin PE @ 1.0 kg ha<sup>-1</sup> fb Pyriithiobac Sodium POE @ 75 g ha<sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS was the best treatment depicted in Table 1, as its seed cotton yield was significantly higher than other treatments (26.79 q ha<sup>-1</sup>). The lower seed cotton yield (11.05 q ha<sup>-1</sup>) was noticed in weedy check. Integrated method can manage most of the weed species arise at different period and gave better control especially during critical period of weed competitions as it contain different methods chemically, mechanically and culturally. It was earlier found by Leela Rani (2016) and Patel *et al.* (2013).

## IV. CONCLUSION

It was presumed from the study that integrated method of weed management in cotton crop was the most effective for the control of weeds and resulted in significantly higher seed cotton yield as compared with the single method approach and the untreated check.

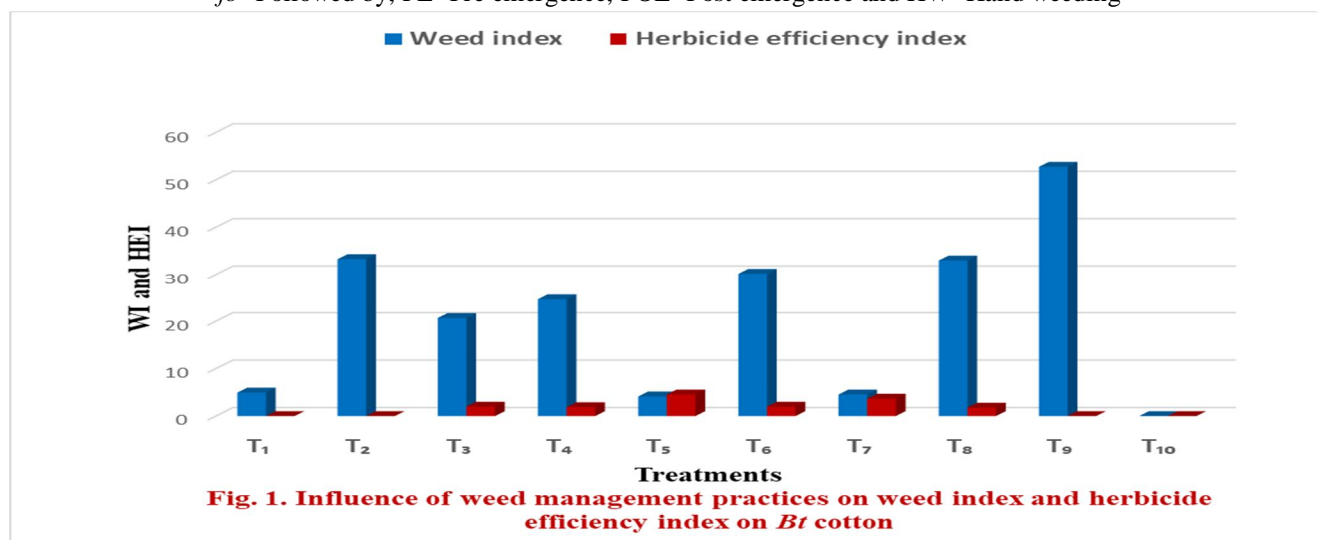
## REFERENCES

- [1] Hiremath, R., Yadahalli, G. S., Yadahalli, V. G., Chittapur, B. M., Koppalkar, B. G. and Vinodakumar, S. N., 2013, Evaluation of post emergent herbicides in Bt cotton (*Gossypium hirsutum* L.) under UKP command area of Karnataka, India. *Eco. Env. Cons.*, 20(1): 325-330.
- [2] Kumar, R., 2015, Integrated weed management in Bt cotton. Msc. (Agri.) Thesis, Mahatma Phule Krishi Vidyapeeth, Rahuri.
- [3] Leela Rani, P., Yakadri, M. and Ramprakash T., 2016, Effect of Integrated Weed Management Practices on Growth and Yield of Bt-Cotton in Telangana State, India. *Int. J. Curr. Microbiol. App. Sci.*, 5(2): 17-25.
- [4] Malarkodi, N., 2017, Integrated weed management effect on weeds and seed cotton yield, *Int. J. Env. Agric. Biotech.*, 2(2): 2456-1878.
- [5] Malik, N. A., Shaikh, M. A. and Saleem, A., 2006, Integrated weed management and its effect on the seed cotton yield in the cotton (*Gossypium hirsutum*) crop. *Pak J. Weed Sci. Res.* 12 (1 & 2): 111-117.
- [6] Mathukia, R. K., Sagarka, P. R., Mathukia, P. R. and Savaliya. N. V., 2018, Efficiency of some herbicides and manual weeding for weed control in irrigated Bt cotton, *Indian J. Agric. Res.*, 52 (3): 315-318.
- [7] Patel, B. D., Patel, R. B., Sheta, B. T., Patel, V. J., Patel, R. A. and Parmar, D. J., 2013, Influence of integrated weed management practices on weeds and yield of Bt cotton. *Research on Crops.* 15(2): 503-507.
- [8] Prabhu, G., Halepyati, A. S., Pujari, B. T. and Desai, B. K., 2012, Weed management in Bt cotton under irrigated condition. *Karnataka J. Agric. Sci.*, 25(2): 183-186.
- [9] Walia, U. S., 2010, Weed management. Kalyani publishers, New Delhi, pp. 373.

Table 1. Influence of different weed management practices on weed index (%), Herbicide efficiency index, Seed cotton yield (q ha<sup>-1</sup>) of *Bt* cotton at harvest and Phytotoxicity @ 60 DAS

Treatments	Weed index at harvest (%)	Herbicide efficiency index at harvest	Seed cotton yield (q ha <sup>-1</sup> )	Phytotoxicity @ 60 DAS
T1- One hoeing at 15 DAS + Two hand weeding at 30 and 45 DAS	4.95	0	26.64	0
T2-Three inter culturing through mechanical weeder at 20, 40 and 60 DAS	33.27	0	16.35	0
T3- Pendimethalin PE @ 1.0 kg ha <sup>-1</sup> fb One HW at 45 DAS	20.67	1.99	19.63	0
T4- Oxyflurofen PE @ 0.1 kg ha <sup>-1</sup> fb One HW at 45 DAS	24.64	1.87	18.82	0
T5- Pendimethalin PE @ 1.0 kg ha <sup>-1</sup> fb Pyriithiobac Sodium POE @ 75 g ha <sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS	4.13	4.55	26.79	0
T6- Pendimethalin PE @ 1.0 kg ha <sup>-1</sup> fb Quizalofop ethyl POE @ 50 g ha <sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS.	30.15	1.99	18.32	0
T7- Oxyflurofen PE @ 0.1 kg ha <sup>-1</sup> fb Pyriithiobac Sodium POE @ 75 g ha <sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS	4.55	3.66	26.65	0
T8- Oxyflurofen PE @ 0.1 kg ha <sup>-1</sup> fb Quizalofop ethyl POE @ 50 g ha <sup>-1</sup> at 45 DAS + one interculturing through mechanical weeder at 60 DAS	32.98	1.77	16.49	0
T9- Weedy check	52.74	0	11.05	0
T10- Weed free check	0	0	25.23	0
S.E.±	0.35	0.03	0.30	0
C.D. at 5 %	1.04	0.08	0.88	0

fb- Followed by, PE- Pre emergence, POE- Post emergence and HW- Hand weeding







10.22214/IJRASET



45.98



IMPACT FACTOR:  
7.129



IMPACT FACTOR:  
7.429



# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089  (24\*7 Support on Whatsapp)