



ECONOMIC ANALYSIS OF DIFFERENT WEED CONTROL TREATMENTS IN FODDER MAIZE (*ZEAMAYS* L.)

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Abstract

Economical analysis plays very much important role for management of the weed in maize crop. Due to that farmer got information for saving money for weed control in fodder maize crop. For studied economics of the weed management in the fodder maize crop research had been conducted in the year 2019-20 on the farm of Agronomy in the Lovely Professional university, the field trial permitted “Effect of weed control practices on weeds, growth and seed yield of fodder maize (*Zea mays* L.)” was conducted. It was lay out three times in Randomized Block plan, with replicated nine weed control action. The action consisted of a single request of atrazine (1.0kg / ha), pendimethaline (1.0kg / ha) & 2,4-D (0.5kg / ha), atrazine (1.0kg / ha) followed by 2,4-D (0.5kg / ha), pendimethaline (1.0kg / ha) track by 2,4-D (0.5kg / ha) accompanied by manual prepare viz. incorporation. Atrazine (1.0kg / ha) + hand weaving (30 DAS), pendimethalin (1.0kg / ha) + hand weaving (30 DAS); compared with hand weeding and weed check. Pre-appearance request of atrazine 1.0 kg / ha + hand weed at 30 DAS and pendimethaline 1.0 kg / ha + hand weed at 30 DAS reduced considerably infestations and was most effective to paralyze development. Application of atrazine 1.0kg / ha + 2, 4-D (0.5kg / ha) with NMR (Rs 39079 / ha) and B: ratio C (2.42) was found to be more economically viable.

Key words: B:C ratio, gross monetary returns, fodder maize, herbicide, weed control, yield attributing characters.

Introduction

Weed management is considered an important factor in achieving higher efficiency. Because of increased cost and unavailability of manual labor in the necessary quantity timely for hand weeding, the role of herbicide is important; not only controlling weeds timely and efficiently, but also offering great scope to reduce weeds control costs regardless of the situation. The use of herbicide pre- and post-emergence application will make herbicide weed control more appropriate to farmers, which will not alter current agronomic practices but allow full weed control. The seasonal weed competition is causing significant losses in maize yields (Dalley *et al.*, 2006). Worldwide yield losses are projected to be around 37 percent in maize due to weeds (Oreke and Dehne, 2004). The prevailing weed flora was *Echinochloa crusgalli* L. and *Dactylon cynodon* L., *Cyperus rotundus* amongst the sedges and *Amaranthus viridis* L. among the monocot. *Digera arvensis* L., *Oleracea portulaca* L., *Alternanthera sessilis* L. and among the dicots *Trianthema* spp. (Arvadiya *et al.*, 2012). Weeds decrease crop yields by

competing for light, water, nutrients and carbon dioxide, interferes with processing and raises crop production costs (Oreke, 2005).

Materials and Methods

The field work “Effect of Weed Control Techniques on Weed Growth and Seed Yield from Fodder Maize (*Zea mays* L.)” took place on the college of Lovely expert throughout in 2019 *kharif* season. This chapter outlines the specifics of the objects, processes and strategies used throughout this analysis.

Experimental details

Experiment was conducted in the year June 2019. Total 9 treatments and 3 replication taken for the experiment so total number of the plots were 27 and size on the plot 5m × 3m. Randomized Block design use for the maize (*Zea mays* L.) for that Veer 006 selected. Total plot size was 460 m² Row to row spacing for this crop was 40 cm.

Details of treatments

9 treatment use for research as follows. T1: Atrazine

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Table 1: Details of treatments for weed control in maize crop.

Layout of experiment				
R1		R2		R3
T1		T3		T9
T2		T5		T4
T3		T7		T1
T4		T9		T3
T5		T2		T7
T6		T8		T5
T7		T4		T8
T8		T6		T2
T9	lm	T1	lm	T6

1.0kg/ha, T2: Pendimethalin 1.0kg/ha, T3: 2,4-D (Ethyl ester) 0.5kg/ha, T4: Atrazine 1.0kg/ha fb 2,4-D (Ethyl ester) 0.5kg/ha, T5: Pendimethalin 1.0kg/ha fb 2,4-D (Ethyl ester) 0.5kg/ha, T6: Atrazine 1.0kg/ha + Hand weeding (30 DAS), T7: Pendimethalin 1.0kg/ha + Hand weeding (30DAS) T8: Hand weeding, T9: Weedy check. Among them T1, T2, T6, T7 treatment apply for pre emergence, T3 for post and T4 and T5 for both pre and post emergence of the weed.

Statistical analysis

The observations measured our estimated for all parameters with two factors and three replications were statistically analyzed by using OPSTAT software for two factor analysis.

Economic analysis of the treatment

The economic analysis of weed control treatments was calculated on the basis of per hectare area, which includes cultivation costs, gross monetary returns, net monetary returns and benefit cost ratio (profitability per investment rupee) under various treatments.

Cost of cultivation

The cultivation cost was determined to be a wise treatment based on the market price of various common and variable agro-inputs used. The values thus obtained shall be shown in table 2. Data revealed that weedy control

treatment had the lowest cultivation cost (Rs 26300 / ha) which increased in the range of Rs 26300 to 32875 / ha with post-emergence application of 2, 4-D 0.5kg / ha and hand weeding at 30 DAS, whereas under hand weeding was the highest twice (Rs 37555 / ha) where weeds were manually removed at 30 and 60 DAS.

Gross monetary returns

Depending on the existing market rate, the value of seed and stove yields was taken into account in determining the gross monetary returns (GMR) table 1, for specific treatment. The GMR was minimal in weedy checking (Rs 39264 / ha) which increased significantly in all weed control plots and was maximum in T8 (hand weeding twice, Rs 78554 / ha). Among herbicide treatments, atrazine (1.0kg / ha) + hand weeding, T6 (Rs 76391 / ha) obtained the highest GMR followed by pendimethaline (1.0kg / ha) + hand weeding (Rs 73973 / ha); then atrazine (1.0kg / ha) fb 2.4-D (0.5 kg / ha), pendimethalin (1.0kg / ha) fb 2.4-D 0.5 kg / ha (Rs 66417 and 65349 / ha). Alone application of various herbicides gave lesser GMR but superior over weedy control.

Net monetary returns

The net monetary returns (NMR) is calculated under each treatment by subtracting the cost of cultivation from GMR of the specific treatment. The wise values for treatment, thus obtained, are given in table 1. From the data it was evident that the NMR was minimal in weedy check (Rs 12965 / ha) which increased significantly in all the weed control plots. Among herbicide treatments atrazine + hand weeding, T6 (Rs 43578 / ha) obtained the highest NMR followed by pendimethalin (1.0kg / ha) + Rs 41090 / ha hand weeding than atrazine (1.0kg / ha) fb 2,4-D 0.5 kg / ha (Rs 39079 / ha) and pendimethalin (1.0 kg / ha) fb 2.4-D 0.5 kg / ha (Rs 37911 / ha) were more profitable than herbicides used on their own. Hand weeding twice achieved a net profit of Rs 40996 / ha which was lower than T6 (atrazine 1.0kg / ha + hand weeding at DAS 30).

Table 2: Economic analysis of different weed control treatments in fodder maize.

Treatment	Cost of cultivation (Rs/ha)	GMR(Rs/ha)	NMR(Rs/ha)	B:C Ratio
T1- Atrazine 1.0kg/ha	27190	61786	34599	2.27
T2- Pendimethalin 1.0kg/ha	27250	59550	32275	2.18
T3- 2,4-D EE 0.5kg/ha	26935	50620	23679	1.87
T4- Atrazine 1.0kg/ha fb 2,4-D EE 0.5kg/ha	27340	66420	39079	2.42
T5- Pendimethalin 1.0kg/ha fb 2,4-D EE 1.0kg/ha	27438	65350	37910	2.38
T6- Atrazine 1.0kg/ha + Hand Weeding (30 DAS)	32815	76390	43578	2.32
T7- Pendimethalin 1.0kg/ha + Hand Weeding (30DAS)	32875	73973	41090	2.24
T8- Hand weeding (30 & 60 DAS)	37555	78554	40996	2.09
T9- Weedy check	26300	39264	12956	1.49

GMR- gross monetary returns, NMR-net monetary returns

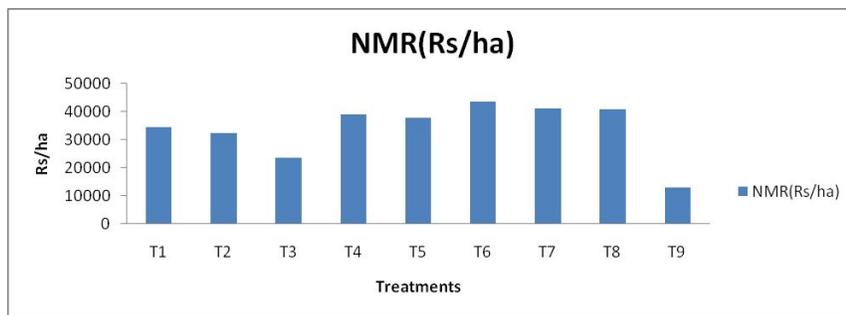


Fig. 1: Influence of weed control different treatments on NMR (Rs/ha) in fodder maize.

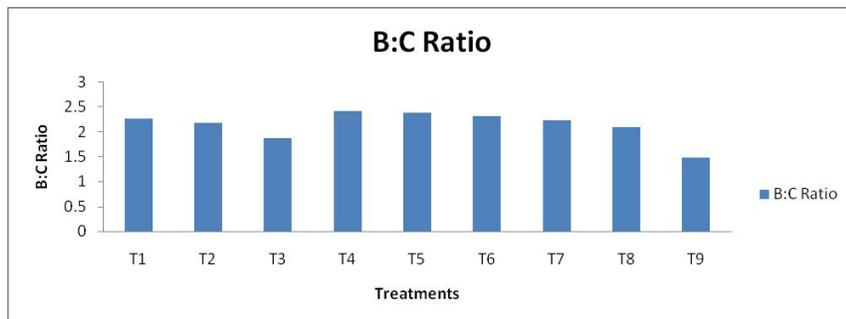


Fig. 2: Influence of weed control treatment on B:C ratio of fodder maize.

Benefit: cost ratio

It refers to net monetary benefit, with each investment rupee, under a specific care. Table 2 provide the gain cost ratio as influenced by the different treatments. From the data it is evident that B:C ratio was higher for T4: atrazine (1.0kg / ha) fb 2, 4-D (0.5 kg / ha) (2.42) followed closely by T5: pendimethalin (1.0kg / ha) fb 2, 4-D (0.5 kg / ha) (2.38) and atrazine 1.0kg / ha + hand weeding (30 DAS). Hand weeding twice had lower B:C ratio value (2.09) due to the maximum weed control costs.

Walia *et al.*, (2007) concluded that the combination of HW with pre-emergence application of atrazine 0.75 kg / ha, atrazine 0.50 kg / ha + pendimethalin 0.50 kg / ha, atrazine 0.50 kg / ha + alachlor 0.75 kg / ha and atrazine 0.5 kg + trifluralin 0.60 kg / ha resulted in significantly higher grain yield and less weed accumulation than the pre-emergence application of atrazine 1.0 kg / ha and all these trees.

According to Agniras *et al.*, (2010), the weed control methods atrazine 1.5 kg / ha and acetachlor 1.25 kg / ha are statistically similar to each other and significantly increased maize grain yield due to less crop weed competition provided by different weed species. Both 1.5 kg / ha atrazine and 1.25 kg / ha acetachlor increased maize grain yields to 75.2 and 71.7 percent, respectively, over unweeded land.

Tripathi *et al.*, (2005) concluded that weeding by two hands at 15 and 30 DAS provides successful weed control in corn. At 20 DAS, Atrazine alone could not provide effective weed control but improved effectiveness when combined with one hand weeding.

Conclusion

The following results may be taken from a single season's data:

1. B:C ratio was higher for T4: atrazine (1.0kg / ha) fb 2, 4-D (0.5 kg / ha) (2.42) followed closely by T5: pendimethalin (1.0kg / ha) fb 2, 4-D (0.5 kg / ha) (2.38) and atrazine 1.0kg / ha + hand weeding (30 DAS). Hand weeding twice had lower B:C ratio value (2.09) due to the maximum weed control costs.

2. Application of atrazine 1.0kg / ha + 2, 4-D (0.5kg / ha) with NMR (Rs 39079 / ha) and B:C ratio (2.42) was found to be more economically viable.

3. Pre-appearance request of atrazine 1.0 kg / ha + hand weed at 30 DAS and pendimethaline 1.0 kg / ha + hand weed at 30 DAS reduced considerably infestations and was most effective to paralyze development.

4. Management of the weed by hand weeding saving more money but it is suitable for less land holding farmers. For more land holding farmers T4: atrazine (1.0kg / ha) fb 2, 4-D (0.5 kg / ha) gave best result.

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