



Short Communication

APPLICATION OF THIO-UREA AT LAND PREPARATION TO EVALUATE THE YIELD OF SEED POTATO CROP

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ABSTRACT

The objective of the study was to evaluate the effect of thio-urea used at land preparation (3, 5, 7 and 10 kg/ha) on yield of potato variety Atlantic. Experiment was randomized block design with three replications for each concentration. The observations of the study was number of stem per plant, number of tuber per plant and total yield, the haulm was killed at 75 days after planting and the data for number of tuber/plant and total yield were taken at 25 days after haulm killing at harvesting. The maximum number of tuber per plant was reported in 10kg/ha (6 ± 0.87) concentration of thio-urea, followed by 7 kg/ha (6 ± 0.55), 5 kg/ha (6 ± 0.02), 3 kg/ha (5 ± 0.33) and control (4 ± 0.67), the increase in thio-urea concentration shows increase in number of tuber per plant also. The highest yield (MT/ha) were reported in 10 kg/ha (17.1 ± 1.50) concentration followed by 7 kg/ha (16.2 ± 1.40), Control (13.5 ± 1.90), 5 kg/ha (13.2 ± 0.35) and 3 kg/ha (10.5 ± 0.85) concentration. The present study indicates that 10 kg/ha thio-urea at land preparation is found suitable in comparison to control in aspect of yield of potato.

KEY WORDS: Thio-urea, land preparation and potato.

INTRODUCTION

As a crop of high biological value for its protein and a substantial amount of vitamins, minerals and trace elements, potato is undoubtedly a very important crop in the country (Gebre and Sathanarayana, 2001). Potato has the fourth rank among foods in terms of importance after wheat, rice and corn in the world (Germchi, *et al.*, 2011). Higher yield and proper tuber size in terms of seed potato and ware potato is a very important aspect to full fill the requirement of seed potato producers/ farmers and for all the population of the country, because of increasing consumption of potato day by day. With this aim the present study was done to evaluate the effect of Thio-urea treatment at land preparation on potato yield. Dormancy of potato tuber is defined as the physiological state in which autonomous sprout will not occur, even when the tuber is placed under ideal conditions for sprout growth (Rehman *et al.*, 2001). Among the chemicals applied for breaking down the potato nodes dormancy, thio-urea, a catalyze inhibitor which tiggers potato tubers germination and healing tubers injuries especially when it is applied in an appropriate concentration (Mani *et al.*, 2013). Also many studies reported that thio-urea treatment is not only more efficient to break dormancy but it increases also sprouts number, comparing to other chemicals like IAA and GA3 (Germchi *et al.*, 2010). In addition, earlier workers also reported that thio-urea has great influence on yield and quality of potato tubers (Panah *et al.*, 2007), but the impact of thio-urea on plant growth and on quality of potato

tubers is not well established. According to Rahman *et al.*, 2003; Panah *et al.*, 2007; Mani *et al.*, 2011, treating tubers with thio-urea is efficient to break dormancy, but its impact on yield is not well established. Thus the present experiment was conducted to determine the effect of thio-urea on yield of potato variety Atlantic.

MATERIALS & METHODS

Potato tubers of variety Atlantic (35 –45 mm size) was taken as planting material. The effect of thio-urea chemical was examined at land preparation. In land preparation thio-urea was broadcasted (3, 5, 7 and 10 kg/ha concentration, indicated as T1, T2, T3 and T4 respectively) followed by control (T5-without thio-urea) done with broadcasting method. Experiment was randomized block design with three replications for each concentration. Each concentration having 180 tubers in three replications, the observations of the study was number of stem per plant, number of tuber per plant and total yield, the haulm was killed at 75 days after planting and the data for number of tuber/plant and total yield were taken at 25 days after haulm killing at harvesting. Tubers were planted in field at the spacing of 68.6 cm x 20 cm. The amount of fertilizers were used as 420 kg/Ha Urea, 350 Kg/Ha SSP, 250 Kg/Ha DAP, 300 Kg/Ha MOP and 30 Kg/Ha Zinc in whole cropping period. During the experiment period, each day show minimum of 5.9 °C and maximum of 24.6 °C air temperature. The soil temperature was minimum of 10.3 °C and maximum of 22.3 °C.

RESULTS & DISCUSSION

Effect of thio-urea at land preparation on number of tuber per plant and total yield.

The number of tuber per plant was observed at 25 days after haulm killing at harvesting (Table-1), the maximum number of tuber per plant were reported in T4 (6 ± 0.87) followed by T3 (6 ± 0.55), T2 (6 ± 0.02), T1 (5 ± 0.33) and T5 (4 ± 0.67) concentrations, this result is supported by Mani *et al.*, 2013, who observed that using thio-urea the number of tuber per plant and dry matter of potato plants increased significantly. The yield was observed at 25 days after haulm killing at harvesting (Table-1), the highest yield was reported in T4 (17.1 ± 1.50) followed by T3 (16.2 ± 1.40), T5 (13.5 ± 1.90), T2 (13.2 ± 0.35) and T1

(10.5 ± 0.85) concentrations. Present study shown that thio-urea concentration shows positive influence on number of tuber and total yield in comparing to control, similarly Bajji *et al.*, 2007, have also reported significant effect on tuber yield. The present study is also supported by Swaminathan, 1980, in which the research outcomes indicates that the Potato is a shallow- rooted plant and so only a small volume of soil is enclosed by its root system. Soil application of thio-urea promoted larger bulk and deeper penetration of the plant's roots, and consequently a greater uptake of phosphorus from the soil. Soil application was the most successful treatment in enhancing crop productivity.

TABLE 1: Effect of thio-urea seed treatment on plant growth and yield of seed potato

S.N.	Concentration	No. of Stem/ Plant	No. of Tuber/Plant	Yield (MT/Ha)
1	T1	3.3 ± 0.25	5 ± 0.33	10.5 ± 0.85
2	T2	3.3 ± 0.08	6 ± 0.02	13.2 ± 0.35
3	T3	3.5 ± 0.10	6 ± 0.55	16.2 ± 1.40
4	T4	4.5 ± 0.25	6 ± 0.87	17.1 ± 1.50
5	T5	3.3 ± 0.15	4 ± 0.67	13.5 ± 1.90
	C.D. at 5%	0.575*	1.515*	2.882**
	S.E. (m)	0.175	0.470	0.883
	S.E. (d)	0.245	0.660	1.250
	C.V.	8.570	15.390	12.723

*Significant at 1%, **Significant at 5%

CONCLUSION

The present study indicates that 10 kg/ha thio-urea is found most suitable concentration for higher number of tuber per plant and highest yield of potato crop. It is also observed that with the increases in thio-urea concentration the number of tuber per plant as well as yield is also increases.

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