

Original Research Article

Impact of Front Line Demonstration on Effect of Boron on Fruit cracking and Yield of Water melon

M. Ravi Venkanna Babu* and Ch. Varaprasada Rao

Department of Horticulture, K.V.K, Darsi, India

*Corresponding author

ABSTRACT

The present investigation entitled “Impact of Front Line Demonstration on Effect of Boron on Fruit cracking management in Water melon cv. Sweety.” at farmer’s fields of Nellore district, Andhra Pradesh during the year 2014-15 to 2016-17. The main objective of front line demonstrations (FLDs) was to demonstrate study the Effect of Boron on Fruit cracking management in Water melon cv. Sweety. and to recommend boron application for getting good yields. The results showed that when sprayed Boron @ 3gm per lit of water once at 2 to 4 leaf stage and flowering stage (T_1) all the yield attributing characters were high in demo plot viz., Minimum Fruit cracking (11.43%), fruit weight (6.03kg), number of fruits plant⁻¹ (4), fruit yield plant⁻¹ (23.9 kg), fruit yield ha⁻¹ (26.16 t). The minimum of all these characters were obtained in control (T_2) where no spraying of boron practiced. Net returns and B: C ratios were found to increased in demonstrated plots over farmers practice.

Keywords

Boron, Fruit cracking, Water melon

Introduction

Water melon is one of the most important fruit vegetables of Cucurbitaceae family which is cultivated in most regions of India from centuries. It is one the main crops of hot arid regions. It is a warm season crop and requires relatively high temperature for quality fruit production. In India, water melon is grown in garden lands as well as in riverbeds where mix-cropping system is followed hence the exact area and production is not known.

It is a common man's fruit relished by poor and rich alike. The sweet juicy pulp of the ripe fruit is eaten fresh. The fruit is delicious and nourishing and exerts a cooling effect in hot summer months. The fruit juice is also consumed by many, after adding a pinch of

salt and black pepper. The seed is also eaten as a snack after roasting with salt. The seed kernels are also used in various sweets and other delicacies. The unripe fruits are also cooked as a vegetable in some parts of India.

The rind of ripe fruit is used to make pickles and vegetables. Beer is prepared from the fermented juice in Russia.

Watermelon is sprawling, Monoecious annual vine with highly branched thin, hairy, angular, grooved stem, having pinnatifid lobed leaves and branched tendrils at each node. The roots are extensive but shallow, with a taproot and lateral roots. fruit is a special type of berry with edible placenta with hard outer covering, termed as pepo.

Materials and Methods

Krishi Vigyan Kendra, Darsi, Prakasam, has conducted 10 locations under real farming situations (Irrigated red soils) between 2014-15 and 2016-17 in 6 different villages located in different blocks under KVK operational area.

Experimental research design was used for the study total population of 10 farmers (N=10) in whose plots FLDs were conducted along with control plot was taken into consideration for the study to find out the effect of boron on fruit cracking management in water melon. The area under each demonstration was 0.4 ha (4000 m²) from each location consisting of 0.8 ha (8000m²) each of demo and control plots. The details are given in Table.1 The demonstration comprised of one treatment viz., T1- Spraying of Boron @ 3gm / lit of water once at 2 to 4 leaf stage and another at flowering satage. Timely Irrigations and fertilizer application and T2-Farmers practice (No Boron application). Seeds of water melon cv. Sweety sown at a spacing of 6ft x 2ft. Spraying with Boron @ 3gm / lit of water was done at 2 to 4 leaf stage and flowering stage. Monitored regular application of irrigation and fertilizer application.

Data on yields, expenditure incurred by the farmer on control (Farmer's practice) and demo plots were collected and analyzed. Gross income was calculated based on local market prices of water melon and net income by subtracting the total cost of cultivation from gross income. Benefit: cost ratio was computed by dividing gross returns with cost of cultivation. The main aim of effect of Boron on fruit cracking management in water melon and to recommend the Boron application for getting good yields.

Results and Discussion

Fruit cracking (%)

The fruit cracking (%) of Water melon cv. Sweety under demo recorded were 11.2 %, 10.6% and 12.5%, in compared to control 22.2%, 18.9% and 21.6% during 2014-15, 2015-16 and 2016-17 respectively. The cumulative effect of technological intervention over three years, revealed an average fruit cracking (%) were 11.43% in compared to control 20.90%.

Yield attributes

Due to spraying of Boron @ 3gm per lit of water, Timely Irrigations and fertilizer application, marked effect on fruit yield in Water melon cv. Sweety was observed in the present demo. The yield performance indicators are presented in Table 2.

The data presented in Table 2 revealed that under demo plot, the performance of Water melon yield was found to be substantially higher than that under control (farmer practices) during all the years (2014-15 to 2016-2017).

The fruit weight (kg) of Water melon cv. Sweety under demo recorded were 5.1 kg, 6.1kg and 36.8kg, in compared to control 3.6kg, 4.8kg and 4.5kg during 2014-15, 2015-16 and 2016-17 respectively. The cumulative effect of technological intervention over three years, revealed an average fruit weight were 6.03kg in compared to control 4.30kg. The number of fruits plant⁻¹ under demo recorded were 4, 5 and 3, compared to control 3, 4 and 3 during 2014-15, 2015-16 and 2016-17 respectively. The cumulative effect of technological intervention over three years, revealed an average number of fruits plant⁻¹ 4, whereas in control 3.

Table.1 Boron application for getting good yields

Sl. No.	Year	No. of Villages	No. of locations	Area (ha.)	
				Demo	Check
1	2014-15	2	2	4	0.8
2	2015-16	2	4	4	0.8
3	2016-17	2	4	4	0.8
Total		6	10	12	2.4

Table.2 Effect of Boron on fruit cracking and yield attributes of Water melon cv. Sweety

Year	Fruit cracking %		Fruit weight (kg)		No. of Fruits plant ⁻¹		Fruit yield plant ⁻¹ (Kg)		Fruit yield ha ⁻¹ (t/ha)		% increase in yield
	Demo	Check	Demo	Check	Demo	Check	Demo	Check	Demo	Check	
2014-15	11.2	22.2	5.2	3.6	4	3	20.8	10.8	26.5	21.25	24.70
2015-16	10.6	18.9	6.1	4.8	5	4	30.5	19.2	23.75	21	13.09
2016-17	12.5	21.6	6.8	4.5	3	3	20.4	13.5	28.25	24.25	16.49
Average	11.43	20.90	6.03	4.30	4	3	23.9	14.5	26.16	22.16	18.09

Table.3 Cost economics of water melon cv. Sweety

Year	Fruit yield ha ⁻¹ (t/ha)		Gross expenditure ha ⁻¹ (Rs.)		Gross returns ha ⁻¹ (Rs.)		Net returns ha ⁻¹ (Rs.)		B:C ratio	
	Demo	Check	Demo	Check	Demo	Check	Demo	Check	Demo	Check
2014-15	26.5	21.25	35000	31000	185500	148750	150500	117750	4.3	3.7
2015-16	23.75	21	32500	29500	166250	147000	133750	117500	4.1	3.9
2016-17	28.25	24.25	33000	30500	197750	169750	164750	139250	4.9	4.5
Average	26.16	22.16	33500	30333.33	183166.66	155166.66	149666.66	124833.33	4.4	3.9

Table.4 Significant difference between important parameters in demo over control for three years (2014-15 to 2016-17) (n-10)

Sl. No.	Parameters	Mean		Mean difference	't' – cal value
		Demo	Check		
1	Fruit Cracking (%)	11.43	20.90	9.47	3.24
1	Fruit weight (kg)	6.03	4.30	1.73	2.11
2	No. of Fruits plant ⁻¹	4	3	1	0.62
3	Fruit yield plant ⁻¹ (Kg)	23.9	14.5	9.4	3.04
4	Fruit yield t ha ⁻¹	26.16	22.16	4	2.00

The fruit yield plant⁻¹ under demo 20.8kg, 30.5 kg and 20.4 kg in compared to control 10.8kg, 19.2 kg and 24.5 kg during 2014-15, 2015-16 and 2016-17 respectively. The cumulative effects of technological

intervention over three years, revealed an average fruit yield plant⁻¹ were 23.9 kg, in compared to control 14.5 kg. The fruit yield ha⁻¹ under demo 26.5 t, 23.75 t and 28.25 t in compared to control 21.25 t, 21t and

24.25 t during 2014-15, 2015-16 and 2016-17 respectively. The cumulative effects of technological intervention over three years, revealed an average fruit yield ha^{-1} were 22.16 t, in compared to control 18.09 t. 18.09% increase in yield over control. The year-to-year fluctuations in yield and cost of cultivation can be explained on the basis of variations in prevailing social, economical and microclimatic condition of that particular village. Similar to the present findings Bradley, E.G. and J. W. Flemming. 1960. in water melons and cucumbers,

Bussler, w., 1960. Sunflowers, Calbo, m.e.r., Monnerat, P.H. & Shimoya, C., 1986. In onions (*Allium cepa* L.). Coetzer, I.a., Robbertse, P.I., Stoffberg, e., Holtzhausen, c.s. & Barnard, r.o. 1990. In tomato (*Lycopersicon esculentum*) and bean (*Phaseolus vulgaris*). S. Afr. J. Plant soil 7, 212-2/7. Hirsch, a., pengelly, w.l. & torrey, i.g., 1982. in sunflower.

Economic parameters

Economic indicators i.e. gross expenditure; gross returns, net returns and BC ratio of Front Line Demonstration are presented in Table 3. The data clearly revealed that, the net returns from the demo plot were substantially higher than control plot, i.e. farmers practice during all the years of demonstration. Average net returns from demo plot were Rs. 1,49,666 /ha in compared to control i.e. Rs 1,24,833/ha.

The gross expenditure from the demo plot were Rs. 33500/ha in compared to control Rs. 30333/ha. The gross returns from the demo plot were Rs. 1,83,166/ha in compared to control Rs. 1,55,166/ha Economic analysis of the yield performance revealed that benefit cost ratio of demonstration plots were observed significantly higher than control plot i.e., farmer practice.

The benefit cost ratio of demonstrated and control plots were 4.3, 4.1 and 4.9 and 3.7, 3.9 and 4.5 during 2014-15, 2015-16 and 2016-17 respectively. The cumulative effect of technological intervention over three years, revealed an average benefit cost ratio were 4.4 in compared to control 3.9.

Significance of differences among demo and control plots with respect to important indicators

In order to test the effectiveness of Boron application on yield attributes of Water melon cv. Sweety statistically 't' test was applied to find out, whether there is any significant difference existed between the demo and control plots in terms of fruit cracking (%), fruit weight (kg), number of fruits plant^{-1} , yield plant^{-1} and Yield t ha^{-1} , which is presented in Table.4

From the results it was revealed that timely application Boron i.e. 3 gm per lit of water at 2 to 4 leaf stage and at flowering stage is very effective for increasing female flowers and to control fruit cracking incidence, good fruit size and fruit quality. Higher yields were recorded by adopting this technique. Higher Fruit weight (kg), more number of fruits per plant^{-1} , high yield ha^{-1} (t) and economic parameters as compared to control.

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