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Effect of foliar application of micronutrients and growth regulators on seed yield of onion (*Allium cepa* L.)

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Abstract

Field experiment was conducted during 2017 to 2018 at College of Horticulture, Bidar, to know the effect of micronutrients and growth regulators on growth parameters of onion. The experiment was laid out using RCBD design with total 11 treatments and three replications, the pooled data revealed that Significantly maximum Seed yield per umbel of 3.92 g, significantly maximum number of 1000seed weight (4.43g), Significantly maximum Germination of 95.78 per cent and Seed yield/ha (66.29 quintal/ha) was noticed in the treatment T₁₀ (Boron 0.1%+ GA3 100 ppm at 40 DAP).

Keywords: Micronutrients and growth regulators and seed yield

Introduction

Onion (*Allium cepa* L.) belonging to family *Alliaceae* is an important monocotyledonous, cross pollinated cool season vegetable crop of India grown for its bulbs. The crop is grown for consumption both in the green state as well as in mature bulbs. Onions exhibit particular diversity in the eastern Mediterranean countries, through Turkmenistan, Tajikistan to Pakistan and India, which are the most important sources of genetic diversity and believed to be center of origin (Brewster, 2008) [3].

It is considered as "Queen of Kitchen" is one of the most important commercial crop not only in India but also in the world. Onion is cultivated under an area of 1270 (000 ha) with a production of 21564 (000 Mt) with productivity of 17.0 Mt/ha in the India (Anonymous, 2017) [1].

The response of onion seed crop to various growth substances has been well documented by many workers. Use of plant growth regulators to the onion crop alters the physiology of crop growth and influences the storage life of bulbs and seeds besides affecting seed quality. The role played by different plant growth regulators differs from each other. In this context, foliar application of growth substances assumes paramount importance for better productivity of the seed crop.

Material and method

Field experiment was conducted during 2017 to 2018 at College of Horticulture, Bidar, to know the effect of micronutrients and growth regulators on growth parameters of onion. The experiment was laid out using RCBD design with total 11 treatments and three replications, the treatments included in table number.1. The crop was raised with recommended package of practices of UHS, Bagalkot in a plot size 3 x 2 m² under irrigated condition. Foliar spray of growth regulators and Micronutrients were given during interval of 20 and 40 Days after planting. The plots were irrigated immediately after the completion of Transplanting. Thinning of excess seedlings and gap filling was undertaken one week after Establishment. All cultural practices have followed as per package of practices of UHS, Bagalkot. The observations viz., Seed yield/umbel, 1000 seed weight, Germination and Seed yield/ha were recorded the collected data were subjected for statistical analysis.

Results and Discussion

Pooled analysis of data over the years 2016-17 and 2017-18 revealed that Seed yield per umbel varies significantly among different treatments. Significantly maximum Seed yield per umbel of 3.92 g in treatment T₁₀ (Boron 0.1%+ GA3 100 ppm at 40 DAP). Whereas control recorded

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significantly lower values for Seed yield per umbel (2.76 g) (Table 2). Results obtained were in agreement with the findings of Shukla *et al.* (2010), Jagati Yadagiri *et al.* (2017)^[8, 5] in onion 1000 seed weight varies significantly among the different treatments, Treatment T₁₀ (Boron 0.1%+ GA3 100 ppm at 40 DAP) records significantly maximum number of 1000seed weight (4.43g). Whereas control recorded significantly lower 1000seed weight (3.02 g) (Table 2). Nehra *et al.* (1992)^[6] in onion

Significantly maximum Germination of 95.78 per cent and Seed yield/ha (6.29 quintal/ha) was recorded with treatment T₁₀ (Boron 0.1%+ GA3 100 ppm at 40 DAP) as compared to other treatments, while significantly lower values of Germination of 90.26 per cent and Seed yield/ha (5.06 quintal/ha) recorded in control (Table 3) Shaikh *et al.* (2002),

Geetharani *et al.* (2008), Sultana (2006), Bhople *et al.* (1999) and Wagh and Deore (1995)^[7, 4, 9, 2, 10] in onion

Table 1: Treatments Details

T1- NAA100 ppm at 20 DAP
T2 -NAA 100 ppm at 40 DAP
T3- GA3-100 ppm at 20 DAP
T4- GA3-100 ppm at 40 DAP
T5 – Boron-0.1% at 20 DAP
T6 – Boron-0.1% at 40 DAP
T7 – Boron 0.1%+ NAA100 ppm at 20 DAP
T8 – Boron 0.1%+ NAA100 ppm at 40 DAP
T9- Boron 0.1%+ GA3 100 ppm at 20 DAP
T10- Boron 0.1%+ GA3 100 ppm at 40 DAP
T11 - Control

Table 2: Effect of micronutrients and growth regulators on Seed yield per umbel and 1000 seed weight of onion

Treatments	Seed yield (g)/umbel			1000seed weight(g)		
	2016- 17	2017-18	pooled	2016-17	2017-18	pooled
T1- NAA100 ppm at 20 DAP	3.02	3.05	3.04	3.44	3.58	3.51
T2 -NAA 100 ppm at 40 DAP	2.98	3.01	3.00	3.10	3.22	3.16
T3- GA3-100 ppm at 20 DAP	3.28	3.31	3.30	3.87	4.02	3.95
T4- GA3-100 ppm at 40 DAP	3.52	3.55	3.53	3.91	4.07	3.99
T5 – Boron-0.1% at 20 DAP	2.88	2.91	2.89	3.04	3.16	3.10
T6 – Boron-0.1% at 40 DAP	2.87	2.90	2.89	3.58	3.72	3.65
T7 – Boron 0.1%+ NAA100 ppm at 20 DAP	2.92	2.95	2.93	3.63	3.78	3.70
T8 – Boron 0.1%+ NAA100 ppm at 40 DAP	2.90	2.93	2.91	3.91	4.07	3.99
T9- Boron 0.1%+ GA3 100 ppm at 20 DAP	2.93	2.96	2.95	3.92	4.08	4.00
T10- Boron 0.1%+ GA3 100 ppm at 40 DAP	3.90	3.94	3.92	4.34	4.51	4.43
T11 - Control	2.74	2.78	2.76	2.96	3.08	3.02
Mean	3.09	3.12	3.10	3.60	3.75	3.68
SEm±	0.12	0.16	0.13	0.238	0.180	0.190
CD(0.05)	0.36	0.47	0.39	0.70	0.53	0.56
CV(%)	6.80	8.90	7.37	11.43	8.31	8.96

Table 3: Effect of micronutrients and growth regulators on Germination and Seed yield of onion

Treatments	Germination (%)			Seed yield(qt) /ha		
	2016-17	2017-18	pooled	2016- 17	2017-18	pooled
T1- NAA100 ppm at 20 DAP	91.00	91.91	91.46	4.92	5.33	5.12
T2 -NAA 100 ppm at 40 DAP	92.00	92.92	92.46	5.01	5.47	5.24
T3- GA3-100 ppm at 20 DAP	92.70	93.63	93.16	4.93	5.35	5.14
T4- GA3-100 ppm at 40 DAP	94.00	94.94	94.47	5.28	5.70	5.49
T5 – Boron-0.1% at 20 DAP	90.30	92.07	91.19	4.95	5.36	5.16
T6 – Boron-0.1% at 40 DAP	92.70	93.63	93.16	4.90	5.30	5.10
T7 – Boron 0.1%+ NAA100 ppm at 20 DAP	92.70	93.63	93.16	4.95	5.35	5.15
T8 – Boron 0.1%+ NAA100 ppm at 40 DAP	94.30	95.24	94.77	4.91	5.33	5.12
T9- Boron 0.1%+ GA3 100 ppm at 20 DAP	93.00	93.93	93.47	4.92	5.34	5.13
T10- Boron 0.1%+ GA3 100 ppm at 40 DAP	95.30	96.25	95.78	6.05	6.53	6.29
T11 - Control	90.30	90.21	90.26	4.86	5.27	5.06
Mean	92.57	93.48	93.03	5.06	5.48	5.27
SEm±	0.904	0.876	0.855	0.305	0.477	0.361
CD(0.05)	2.66	2.58	2.52	0.90	1.40	1.06
CV(%)	1.69	1.62	1.59	10.43	15.07	11.87

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