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RESEARCH ARTICLE

EFFECT OF DIFFERENT BIO-STIMULANTS ON GROWTH, QUALITY AND YIELD OF CHRYSANTHEMUM

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ABSTRACT

The present investigation entitled effect of different bio-stimulants on growth, quality and yield of Chrysanthemumwas carried out during the *rabi* season 2021 on the field of ASPEE, Agricultural Research and Development Foundation, Tansa Farm, At- Nare, Taluka- Wada, Dist- Palghar, Maharashtra, India. The experiment was laid out in Randomized Block Design (RBD). The nine treatments of different bio-stimulants(novel organic liquid nutrient (1%), novel prime organic liquid nutrient (1%), novel organic liquid nutrient (2%), novel prime organic liquid nutrient (2%), cow urin (1%), cow urin (2%), vermiwash (1%), vermiwash (2%) along with control were replicated three times. The plant height (cm) and number of branches per plant at harvest were found maximum with the spraying of Novel prime organic liquid nutrient (2%). The highest number of flowers per plant, flower size andstock length were found with the application of Novel prime organic liquid nutrient (2%) in Chrysanthemum. While, the lowest plant height, number of branches per plant, no. of flowers per plant,flower size and stock length was found in the control treatment. The data clearly indicated that the yield obtained with treatment T4 (Novel prime organic liquid nutrient (2%) was significantly higher than all other treatments, and also for growth parameters.

INTRODUCTION

Chrysanthemum (Dendranthemagrandiflora Tzvelev) belongs to family Asteraceae and native to Northern hemisphere chiefly Europe and Asia. It is the national flower of Japan and commonly called as “Queen of the East,” Guldaudi in India and mum in America. The number of species in the genus chrysanthemum varies from 100 to 200. It ranks second after rose in spray type while seventh in standard type in term of consumption. It is most popular due to its wide range of flower colour, growth habit, size and shape. It is used for cut flower and loose flower as well as making garlands, venis, gajras and religious offering. Chrysanthemum is a short day plant and cannot normally form flower buds when the day length exceeds 14.5 hours and developed them when it exceeds 13.5 hours. Due to nature of flowering under short-day conditions, availability of chrysanthemum flower is restricted to short span of not more than three months. As, it requires long days for vegetative growth and short days for flowering. It is grown under wide range of climatic conditions but the performance of the genotype varies with the region, season and other growing conditions. Due to of intensive research done by scientists and practical experience of many growers, its flowers can be produced throughout the year to precise schedules at any time by environmental manipulation, fertilization and using growth regulating chemical. However, ability to produce chrysanthemum year round depends on an understanding the complex interaction between the plant and its environment.

MATERIALS AND METHODS

A field experiment was conducted at ASPEE, Agricultural Research and Development Foundation Farm, Village- Nare, Taluka- Wada, District, Palghar in the *rabi* season during 2021 in Randomized Block Design (RBD) with three replications (r=3) (Panse and Sukhatme, 1967). The experimental site was located at 19.650 N latitudes and 73.130 E longitudes with an average annual rainfall of 3600 mm. The eight different treatments of bio-stimulants (novel organic liquid nutrient (1%), novel prime organic liquid nutrient (1%), novel organic liquid nutrient (2%), novel prime organic liquid nutrient (2%), cow urin (1%), Cow urin (2%), vermiwash (1%), vermiwash (2%) along with control were replicated threetimes. Treatments were applied twice by spraying over a standing crop. The first spray was applied at 30 days after sowing, while the second spray was applied 45 days after sowing in field. Five plants were randomly selected from each replication for carrying out performance studies. All the recommended practices were followed.

The data on various vegetative characters and floral characters were recorded and statistically analysed.

RESULTS AND DISCUSSION

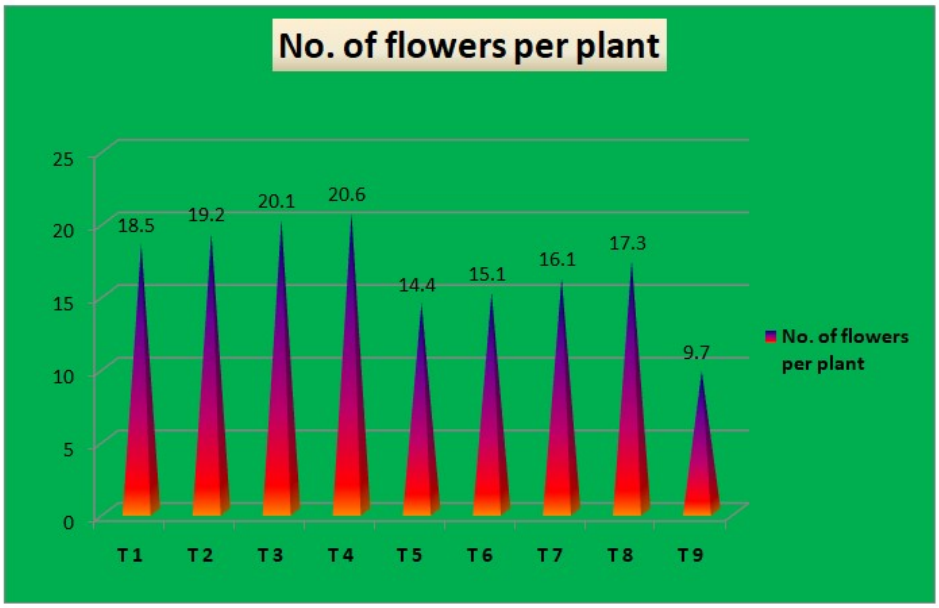
The data recorded on growth and flowering parameters presented in Table 1 revealed significant variations among the different spray on chrysanthemum. Among the different treatments T4 (novel organic liquid nutrient 2%) recorded maximum plant height (93.17 cm), plant spread (42.47cm) and higher no. of branches (12.1). The incremental in plant height might be due to the fostered meristematic activities which was catalyzed by growth regulator contains in Novel organic liquid nutrient viz. gibberellic acid, naphthalene acetic acid and cytokinin which leads to enhance cell division and elongation (Desai *et.al*., 2018).

The number of flowers per plant determines the better growth and flower yield of chrysanthemum. Poonam and Ashok Kumar (2007) and Kumar *et al*., (2015) reported that vegetative growth significantly contribute towards the flower yield of chrysanthemum. Variation in number of flowers was observed by Yadav*et al*., (2014).

Treatment T4 recorded maximum duration of flowering (35.2 days) followed by T3 (33.3 days) while minimum (22.2 days) was recorded by control treatment. The variation in flowering duration was attributed to genotype of the plant, environmental influence and other management factors as reported by Srilatha*et al.*(2015) in chrysanthemum. The treatment T4 recorded maximum stalk length (31.3 cm) while minimum stalk length (16.2 cm) was recorded in control treatment. It was observed that the cultivars with higher plant height produced

Table 1. Effect of different bio-stimulants on growth, quality and yield of chrysanthemum

Treatment	Plant Height (cm)	Plant Spread (cm)	No. of branches	No. of flowers per plant	Flower size (cm)	Stalk length (cm)	Duration of flowering	Post Harvest life (days)
T 1	81.22	34.13	10.2	18.5	7.3	23.1	30.3	6.5
T 2	84.76	36.1	10.8	19.2	7.4	27.1	31.7	6.7
T 3	88.44	39.17	11.3	20.1	7.5	29	33.3	6.9
T 4	93.17	42.47	12.1	20.6	7.7	31.3	35.2	7.5
T 5	73.49	28.5	7.5	14.4	6.3	19.2	26.0	5.7
T 6	74.8	30.4	8.5	15.1	6.6	20	27.1	5.9
T 7	76.65	31.07	9.3	16.1	6.8	20.9	28.0	6.1
T 8	78.94	33.1	9.7	17.3	7.2	21.8	29.2	6.3
T 9	64.91	24.4	5.9	9.7	6	16.2	22.2	4.6
S.Em.±	0.43	0.08	0.31	0.42	0.09	0.08	0.02	0.02
CD	1.3	0.25	0.94	1.25	0.28	0.26	0.7	0.05



Another reason might be the ample amount of nitrogen content of liquid nutrient which enhances cell division, cell elongation as well as formation of more tissues resulting in luxuriant vegetative growth which leads to increase in plant height (Chotalia*et. al.* 2018). The perusal of data from Table 1 envisages that maximum numbers of flowers per plant were observed in T4 (novel prime organic liquid nutrient (2%)) followed by T3 (novel organic liquid nutrient (2%)). On the other hand, minimum numbers of flowers were observed in control treatment (9.7).

the longer flower stalk as compared to cultivars with smaller plant as stated by Jamal *et al.* (2015) in chrysanthemum. The flowers treated by treatment T4 lasts longer (7.5 days) with distilled water whereas minimum (4.6 days) was recorded by control treatment. The variations in vase life may be due to the different accumulation of carbohydrates due to varied leaf production and sensitivity of cultivars to ethylene and turn variations in these aspects might be due to genetically makeup of genotypes was reported by Vetrivel and Jawaharlal (2014) in chrysanthemum.

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