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RESEARCH ARTICLE

INFLUENCE OF ORGANIC NUTRIENTS AND FOLIAR SPRAY OF GROWTH REGULATORS ON YIELD AND QUALITY OF GOLDENROD (*SOLIDAGO CANADENSIS L.*)

*Muruganandam, C., Angel, Y. and Sivasankar, S.

Department of Horticulture, Faculty of Agriculture, Annamalai University, Tamil Nadu, India-608002

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ABSTRACT

An investigation was conducted to study the Effect of organic inputs and growth regulators on yield and quality of Goldenrod (*Solidagocanadensis L.*) was conducted at the floriculture unit, Department of Horticulture, Faculty of Agriculture, Annamalai University during 2017-2018. The experiment was laid out in randomized block design with thirteen treatments. Various organic inputs and growth regulators including panchagavya @ 3%, Vermiwash 1: 5 dilutions, humic acid @ 0.2%, GA₃ @ 300ppm, NAA @ 250ppm were applied. The yield and quality characters were studied at different stages. The observations recorded viz: yield of flower stalks/ha, dry matter production, vase life. The results revealed that plants treated with NAA @ 250 ppm + panchagavya @ 3% (T₉) was observed in the highest flower stalk yield (1140.02 flower stalk/ha) dry matter production (15.38) and Vase life (2.50 days).

Key words: Growth regulators, yield, quality, Golden rod, vermiwash, NAA, Panchagavya.

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INTRODUCTION

Goldenrod (*Solidago canadensis L.*) belongs to the family Asteraceae. It is native to North America. English common names of goldenrod include Woundwort, Aaron's rod, Heathen wound herb and blue mountain tea. Goldenrods have small yellow clustered flowers, often seen in panicles, along a thin stick like stem. Some species of goldenrod produce white colour flowers are called silver rod. The genus *solidago* comprises of about 60 to 130 species. Some species yielded a dye and the leaves of many species of goldenrod used for medicinal preparations and tea making. There are reports that germens have grown this crop as a wound healing herb from ancient times. Essential oils, flavonoides, glycosides, tannins, saponins and various organic acids derived from *solidago* are used as anti-inflammatory agents in ointments for urinogenital and chronic skin problem, apart from being used as adjuvant along with other remedies for asthma, arthritis and rheumatism.

MATERIALS AND METHODS

The studies on "Effect of organic inputs and growth regulators on yield and quality of golden rod (*Solidago Canadensis L.*)" was carried out in the floriculture yard, Department of Horticulture, Annamalai University, Annamalainagar, Tamil Nadu during 2017 to 2018.

*Corresponding author: Muruganandam, C.,
Department of Horticulture, Faculty of Agriculture, Annamalai University,
Tamil Nadu, India-608002

The yield parameters viz., yield of flower stalks, dry matter production, vase life were analysed statistically (Pance, V.G and P.V. Sukhatme. 1978).

Treatment Details

T ₁	Gibberellic acid @ 300ppm
T ₂	Panchagavya @ 3%
T ₃	Vermiwash 1:5
T ₄	NAA @ 250ppm
T ₅	Humic acid @ 0.2 %
T ₆	Gibberellic acid @ 300ppm+ Panchagavya @ 3%
T ₇	Gibberellic acid @ 300ppm+ Vermiwash 1:5
T ₈	Gibberellic acid @ 300ppm+ Humic acid @ 0.2 %
T ₉	NAA @ 250ppm+ Panchagavya @ 3%
T ₁₀	NAA @ 250ppm + Vermiwash 1:5
T ₁₁	NAA @ 250ppm+ Humic acid @ 0.2 %
T ₁₂	Control

RESULTS AND DISCUSSIONS

The results of the present investigation revealed that the plants treated with NAA @ 250 ppm and Panchagavya @ 3% produced the maximum number of flower stalks per hectare and increased dry matter production. This increase is due to the auxin which stimulated availability of food materials and carbohydrate supply which ultimately effects the flower production. Such response due to NAA application were reported previously by Dutta et al. (1993 and 1995), Sharma et al. (1995), Kumar and Ugherja (1998) in chrysanthemum.

Effect of organic inputs and growth regulators on yield and quality of goldenrod

Treatment Details	Yield of flower stalks/ha ('000nos)	Dry matter production (g)	Vase life (days)
T ₁ - Gibberellic acid @ 300ppm	930.09	10.76	4.43
T ₂ -Panchagavya @ 3%	840.12	8.78	3.44
T ₃ -Vermiwash 1 : 5	870.11	9.44	3.77
T ₄ -NAA @ 250ppm	1020.06	12.74	5.42
T ₅ -Humic acid @ 0.2 %	900.10	10.10	4.10
T ₆ -Gibberellic acid @ 300ppm + Panchagavya @ 3%	1080.04	14.06	6.08
T ₇ -Gibberellic acid @ 300ppm + Vermiwash 1:5	990.07	12.08	5.09
T ₈ -Gibberellic acid @ 300ppm + Humic acid @ 0.2 %	960.08	11.42	9.76
T ₉ -NAA @ 250ppm + Panchagavya @ 3%	1140.02	15.38	6.74
T ₁₀ -NAA @ 250ppm + Vermiwash 1 :5	1110.03	14.72	6.41
T ₁₁ -NAA @ 250ppm + Humic acid @ 0.2 %	1050.05	13.40	5.75
T ₁₂ -Control	810.13	8.12	3.11
SE(d)	14.89	0.23	0.06
CD(0.05)	29.79	0.46	0.13

Waheeduzzama Mohd (2007) in anthurium and Rajesh *et al.* (2006) in gladiolus also reported foliar spray of panchagavya pronounced increase in yield. The increased yield might be due to sustained availability of nitrogen throughout the growing phase and also due to enhanced carbohydrate synthesis and effective translocation of photosynthates to the developing sink (flower). The proportion and activity of beneficial microbes would be at the higher rate in panchagavya which helps in synthesis of growth promoting substances that might have increase yield of spikes and floret. Vase life is another parameter important for all cut-flowers. Higher the vase life better will be the prices. The longest vase life was observed with the treatment of NAA @ 250 ppm and Panchagavya @ 3%. The higher effectiveness of NAA @ 250 ppm be attributed to higher auxin activity which has been reported to delay senescence and enhance the translocation of metabolites. Growth promoting substances like cytokinins and other promoters present in panchagavya might also be responsible for longer vase life of the flowers. These results were in accordance with Renukaradya (2005) in carnation and Rajesh *et al.* (2006) in gladiolus. Singh *et al.* (2006) reported that application of panchgavya recorded increased vase life in gladiolous. Hence, it can be concluded that application of NAA @ 250 ppm+ panchagavya @ 3% improved the yield and quality of goldenrod.

Conclusion

Based on the present investigation it can be concluded that combination of the application of NAA @ 250ppm + Panchagavya @ 3% recorded the highest yield and quality parameters in goldenrod.

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