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Effect of growth substances on flowering, yield and quality of flower stalks of golden rod (*Solidago canadensis* L.)

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ABSTRACT

An investigation was carried out during *Rabi* season of 2004-05 in order to study the effect of three concentrations of GA_3 (100, 150 and 200 ppm), CCC (250, 500 and 750 ppm) and NAA (50, 100 and 150 ppm) along with control (distilled water spray) on flowering, yield and quality of flower stalk of golden rod. It was concluded that foliar application of 200 ppm GA_3 has shown superiority in flowering, quality and yield characters *viz.*, number of days for first and 50% flowering (88.9 and 117.3 days, respectively), duration of flowering (66.2 days), number of inflorescence branches per panicle (58.4), length of panicle (110.4 cm), length of flowering region per panicle (56.8 cm), fresh and dry weight of panicles (123.40 and 74.01 g, respectively) and yield (number of panicles) per plant (5.20). Whereas, the highest longevity of panicle *in situ* (14.27 and 14.02 days, respectively) and keeping quality of panicle (7.10 and 7.21 days, respectively) was observed with CCC 500 and 750 ppm treatments.

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Key words : China aster, Growth substances, GA, NAA, CCC, Foliar spray

INTRODUCTION

Solidago commonly known as "Golden rod" belongs to the family Compositae, is an important international flower crop. It is used basically as filler material in flower arrangement and bouquets. It has a promising and untapped export potential, besides local demand. It serves as background and goes very well with other flowers like rose, gerbera, tuberose, carnation and gladiolus etc. in bouquets and vases. So far, very little work has been done to know the effect of foliar application of growth substances on its flowering, yield and quality of flower stalk. Hence the present investigation was carried out to study these aspects critically.

MATERIALS AND METHODS

The experiment was conducted at Horticultural Research Farm, Department of Horticulture, B.A. College of Agriculture, Anand Agricultural University, Anand during November, 2004 to May, 2005. The suckers were planted at the spacing of 30 cm. between rows as well as plants. The treatments comprised of three different concentrations of GA_3 *i.e.* 100, 150 and 200 ppm, CCC, 250, 500 and 750 ppm and NAA, 50, 100 and 150 ppm compared with control (distilled water spray). Growth substances were spread twice *i.e.* at 30 and 45 days after transplanting. The experiment was laid out in Randomized Block Design with ten treatments, replicated thrice.

RESULTS AND DISCUSSION

Data presented in Table 1 clearly indicated that 200 ppm spray of GA took remarkably less number of days for initiation as well as 50% flowering (88.9 and 117.3 days, respectively). Whereas it was delayed with CCC treatments. Early flowering due to GA_3 may be due to gibberellins reduction in juvenile period due to gibberellins and convention of apical meristem into flowering primordia instead of production of leaves, at the determination of juvenile phase, (Krishnamoorthy, 1975). Similar results were also reported by Patil *et al*. (1996) in golden rod and Pandya (2000) in marigold. Extended flowering duration by control vs GA_3 200 ppm difference in days of flowering duration days was observed with 200 ppm GA_3 treatment as compared to control. This might be due to the advanced initiation as well as flowering in GA treated plants. Similar results were also reported by Kumar and Ugherja (1998) in chrysanthemum and Singh *et al*. (1991) in marigold.

Maximum number of inflorescence branches per panicle (58.40), higher length of panicle as well as flowering region per panicle (110.40 cm and 56.80 cm, respectively) and more fresh and dry weight of panicles (123.40 and 74.01 g, respectively), higher yield (number of panicles) per plant (5.20) were also recorded in 200 ppm GA_3 treatment which was followed by GA_3 150 and 100ppm. Whereas, the lowest yield was observed with all concentration of CCC. These increases might be due

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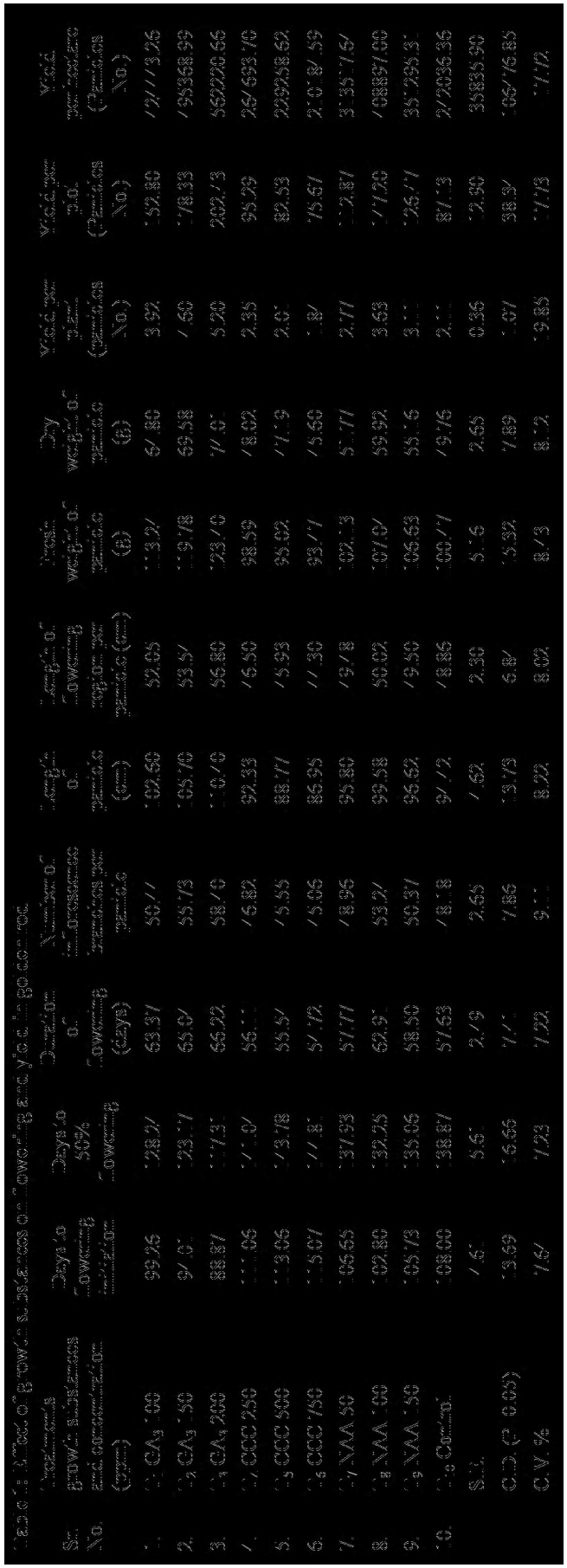

Table 2 : Effect of growth substances on longevity of panicle *in situ* and keeping quality of panicle in golden rod

Sr. No.	Treatments growth substances and concentration (ppm)	Longevity of panicle *in situ* (days)	Keeping quality of panicle (days)
1.	T_1 GA_3 100	11.55	4.31
2.	T_2 GA_3 150	13.50	6.18
3.	T_3 GA_3 200	13.97	6.91
4.	T_4 CCC 250	12.77	6.10
5.	T_5 CCC 500	14.27	7.10
6.	T_6 CCC 750	14.02	7.21
7.	T_7 NAA 50	10.73	4.05
8.	T_8 NAA 100	12.60	5.98
9.	T_9 NAA 150	12.10	5.38
10.	T_{10} Control	10.30	3.82
	S.E. ±	0.82	0.15
	C.D. (P=0.05)	2.43	0.45
	C.V. %	11.25	4.58

to promotion in vegetative growth, obviously resulting in photosynthetic and metabolic activities, causing more transport and utilization of the photosynthetic product. These results are in accordance with the findings of Patil *et al*. (1996) in golden rod; Maurya and Nagda (2002) in gladiolus and Nagarjuna *et al*. (1988) and Mohandass (1986) in chrysanthemum.

The results presented in Table 2 clearly revealed that longevity of panicle *in situ* and keeping quality of panicle was highest at 750 ppm spray of CCC (14.02 and 7.21 days, respectively), followed by CCC 500 and 250 ppm. This might be the result of retardation of growth due to CCC, which might have checked the metabolic processes and in them, reduction in senescence and in increased longevity of panicle *in situ*. These findings are in close confirmity with Maurya and Nagda (2002) in gladiolus. Restricted respiration due to inhibitory action of growth retardant, might have increased the keeping quality of golden rod. Similar results were also reported by Pandya (2000) in marigold.

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