

Response of *Solanum viarum* to K fertilizer and growth retardant cycocel

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SUMMARY

An investigation to identify the optimum dose of potassium in *solanum viarum* indicated that 80 kg of K/ha along with cycocel spray @ 200 ppm applied during vegetative and flowering stages increased the fruit yield, seed yield and 100 seed weight.

Key words : *Solanum viarum*, Cycocel, Potassium

Among the various medicinal plants medicinal solanum (*Solanum viarum*) is used as raw material for the production of steroidal drugs. Seeds yield solasodine an active ingredient used for several medicines. Higher seed yield through the acclimatization of this crop for commercial cultivation is of recent origin, shortening the crop stature without affecting berry and seed yield is utmost important. The information on the response of potassium application with growth retardant cycocel on seed yield in medicinal solanum (*Solanum viarum*) is limited. Against this background, the study was carried out to elicit information on the optimum dosage of K fertilizer and cycocel for berry, seed yield and quality.

MATERIALS AND METHODS

The field experiment was carried out during July 2006 and July 2007 at Seed Science and Technology unit, Agricultural College and Research Institute, Madurai. Over a common dose of N@ 90 kg/ha in two split doses at basal and flowering and P @ 45 kg/ha as basal three levels of potassium viz., 40,60 and 80 kg/ha were applied during sowing. Three levels of growth retardant cycocel viz., 100,200 and 300 ppm at peak vegetative and flowering stages were sprayed. The experiment was conducted in a Randomized Block Design with 3 replications. One month old seedlings were transplanted. Observations on plant height, leaf area index, no. of berries/plant, fruit yield kg/ha, 100 seed weight and seed yield kg/plot were recorded at 90th day after of sowing. The data were statistically analysed after Snedecor and Cochran (1967).

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RESULTS AND DISCUSSION

Application of potassium at higher dosage significantly increased plant height, leaf area index, no. of berries, fruit yield, seed yield and 100 seed weight. All the doses of cycocel reduced the plant height. Gradual reduction in plant height from 60.0 cm (control) to 53.1 cm (200 ppm) due to cycocel treatment. Application of cycocel suppresses the concentration of gibberellin in leaves below some critical value and consequently decreases the growth of the crop. These results support the findings of Humphries(1963).The leaf area index had a linear increase up to 80 kg of K (5.0). At this dose the number of berries/plant (16.00, Table 1) was maximum. Application of K @ 80 kg along with CCC 200 ppm recorded higher leaf area index (5.2) and more number of berries /plant (18.6 Table 1). These may be due to increased rate of leaf production as well as thick and dark green foliage of high chlorophyll content. Solanum responds well to the increasing levels of K application in terms of growth characters reported by Bhaskar *et al.*(2002) . Fruit yield was maximum at 80 kg K (7.28 kg /ha) followed by 60 kg K (6.65 kg/ha) and control (5.49kg /ha Table 2). Application of cycocel 200 ppm increased the fruit yield (7.74 kg/ha), seed yield (2.784 kg/plot and 100 seed weight (0.222 g) over control (4.48, 1.139 and 0.218 for fruit yield, seed yield and 100 seed weight, respectively.) The above results are in agreement with the results of Hooda and Pandita (1973), Mohamed Yassin and Anbu (1996) and Ramaiah and Shukla (1985). Cycocel 100 ppm spray gave higher berries yield in *S. khasianum* reported by Hazarika (1984) and Bhaskar *et al.*(2002.).

In conclusion, among the treatments with cycocel 200 ppm and K application 80 kg at peak vegetative and flowering stages increased fruit yield, seed yield and 100 seed weight compared to other concentrations and control.

Table 1 : Response of *Solanum vitatum* to K fertilizers and cyocel on plant height, leaf area index and no. of berries/ plant after 90 days after sowing

Treatments	Plant height (cm)				Leaf area index				No. of berries /plant						
	Control	CCC 100ppm	CCC 200ppm	CCC 300ppm	Mean	Control	CCC 100ppm	CCC 200ppm	CCC 300ppm	Mean	Control	CCC 100ppm	CCC 200ppm	CCC 300ppm	Mean
	Control	60.0	55.8	55.5	46.8	54.5	3.9	4.2	4.4	4.2	4.2	10.8	14.3	15.2	11.8
40kg k	61.9	59.2	54.0	54.2	57.3	4.1	4.5	4.7	4.6	4.5	11.3	15.1	16.2	12.9	13.8
60 kg k	57.8	53.7	50.7	50.0	53.0	4.5	4.7	4.9	4.7	4.7	13.6	15.7	17.2	13.3	14.9
80 kg k	58.3	52.5	53.0	53.3	54.2	4.8	5.1	5.2	5.0	5.0	13.6	16.1	18.6	15.7	16.0
Mean	59.5	55.3	53.1	51.0	53.0	4.3	4.6	4.8	4.6	4.6	12.3	15.3	16.8	13.4	13.4
S.E. ±	0.80	0.80	0.80	0.80	1.60	0.06	0.06	0.05	0.05	0.12	0.40	0.40	0.40	0.40	0.81
C.D. (P=0.05)	1.63*	1.63*	1.63*	1.63*	3.27**	0.12*	0.10**	0.10**	0.10**	NS	0.80**	0.80**	0.80**	0.80**	NS

* and ** indicate significant of value at P=0.05 and 0.01, respectively

N.S.-Non significant

Table 2 : Response of *Solanum vitatum* to K fertilizers and cyocel on fruit, seed yield and 100 seed weight after 90 days after sowing

Treatments	Fruit yield (kg/ha)				Seed yield (kg/plot)				100seed weight						
	Control	CCC 100ppm	CCC 200ppm	CCC 300ppm	Mean	Control	CCC 100ppm	CCC 200ppm	CCC 300ppm	Mean	Control	CCC 100ppm	CCC 200ppm	CCC 300ppm	Mean
	Control	4.6	4.68	6.95	5.73	5.49	0.625	0.790	1.800	0.898	1.028	0.217	0.212	0.215	0.220
40kg k	4.68	5.35	7.65	7.25	6.23	0.853	1.825	2.000	1.830	1.627	0.223	0.222	0.224	0.221	0.223
60 kg k	4.50	7.08	7.60	7.43	6.65	1.775	2.195	2.065	1.110	1.786	0.218	0.220	0.224	0.220	0.221
80 kg k	4.15	7.75	8.75	8.45	7.28	1.305	1.415	3.045	2.085	1.962	0.219	0.220	0.224	0.223	0.222
Mean	4.48	6.21	7.74	7.21	6.65	1.139	1.556	2.784	1.480	1.627	0.219	0.219	0.222	0.221	0.222
S.E. ±	0.77	0.77	0.77	0.77	1.54	0.02	0.02	0.02	0.02	0.04	0.0008	0.0008	0.0008	0.0008	0.001
C.D. (P=0.05)	1.56**	1.56**	1.56**	1.56**	NS	0.04**	0.04**	0.04**	0.04**	0.08**	0.001**	0.001**	0.001**	0.001**	NS

* and ** indicate significant of values at P=0.05 and 0.01, respectively

N.S.-Non significant

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