Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2019; 8(5): 1616-1617
Received: 28-07-2019
Accepted: 30-08-2019

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Effect of plant growth regulators and thiourea on growth and yield of bottle gourd [*Legenaria siceraria* (mol.) standl] cv. Pusa Naveen

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Abstract
The effect of plant growth regulators and thiourea on growth and yield of bottle gourd an experiment was conducted during kharif Season 2016 at the instructional farm mjrp college of agriculture and research Jaipur (raj.). The experiment consisting 13 treatment (NAA 150,200 and 250 ppm. CCC 100,200 and 300 ppm. Thiourea 200, 500 and 700 ppm and control were replicated three time in a randomized block design keeping plot size of 6mx3m. The seed sowing was done on 11 july 2016 in the furrow spaced at 2.5m apart maintaining a plant to plant distance of 0.75m. The application of plant growth regulators and thiourea singnificant effect the vegetative as well as reproductive attribute of the crop.The exogenous application of NAA 250 ppm (T_3) recorded maximum vine length (6.70 m), nodes per vine (23.15) and leaf area (264.50 cm^2).The CCC 300 ppm (T_9) treatment produced maximum primary (20.95) and secondary branches (9.36) per vine but minimum vine length (4.33),nodes per vine (18.05) and leaf area (218.36 cm^2) were observed in this treatment The maximum net return (Rs.204440 per hectare) and b:c ratio (2.76) were recorded under ethrel 400 ppm.

Keywords: Bottel gourd, PGR and growth

Introduction
Bottle gourd [*Legenaria siceraria* (Mol.) Standl.] is a commonly grown and used as vegetable in India. It is economically found growing in Asia, Africa and Central America. It belongs to family cucurbitaceae.

It is an annual, tendrill bearing and disagreeably smelling climber. Stems are robust, obtusely quinquangular, deep longitudinally furrowed, light green densely clothed with soft, wool gland-tipped hairs and 5-10 m long. Leaves are distichous, long and simple. Flowers are large unisexual-monoecious, axillary, the two sexes on different branches. Flowers of both sexes are solitary and 7-10 cm in diameter. Ovary is inferior, ellipsoid, densely clothed with soft, woolly, gland-tipped hairs, light green or yellowish green and 2.5-3 cm long. Fruits are long peduncled, big, fleshy-watery, very variable as to shape and size, depressed globose, oblong-ellipsoid, 20-100 cm long and 10-15 cm diameter.

The fruits contain 0.2 percent protein, 2.9 per cent carbohydrate, 0.5 percent fat, 0.5 percent mineral matter, 0.044 mg thiamine, 0.023 mg riboflavin, 0.33 mg niacin and 12 mg vitamin C and 0.6 gm fibre per 100 gm fresh weight (Aykroyd, 1963), Bottle gourd has a lot of medicinal properties. The fruit has a cooling effect. It is cardiatonic and diuretic in effect. The pulp is good for overcoming constipation, cough, night blindness and as antidote against certain poisons. It is good for people suffering from biliousness and indigestion.

In India, bottle gourd is grown in the area of 11.69 thousand hectares with annual production of 142.82 thousand tonnes and having 12.21 tones/hectares productivity (Sidhu, 2002) [4]. It occupies 5,120 hectares area in Rajasthan producing 17857 metric tones with a productivity of 3.4876 tones ha^{-1} (Anonymous, 2011) [1]. In Jaipur district, is occupies 1164 hectares area producing 1419 metric tones with a productivity of 1.219 tones/hectare (Anonymous, 2011) [1].

Material and Methods
1 Net returns (₹ ha^{-1})
Net returns were estimated as net income obtained after deducting cost of cultivation from the gross returns.

Net returns (Rs ha^{-1}) = Gross returns (Rs ha^{-1}) – Cost of cultivation (Rs ha^{-1})

2 B: C ratio
Benefit Cost (B: C) ratio was calculated treatment-wise to ascertain economic viability of the treatments by using following formula

B: C ratio = Net returns (Rs ha-1)/Total cost (cost of cultivation + cost of treatments) (Rs ha^{-1})

Results and Discussion

Net returns and B: C ratio

The effect of plant growth regulators (NAA, ethrel, CCC) and thiourea on net returns and B: C ratio of fruits are presented in the Table 1 and depicted through The economics of the treatments was calculated on the basic of formula given in the chapter-3(material and methods). The treatments ethrel 400 ppm was found superior with maximum net income per hectare from sale of fruits, as compared to control. The sale price of one kg of fruits was Rs. 5.0. Amongst all the treatments, the B: C (Benefit: Cost) ratio was the maximum for treatment ethrel 400 ppm, whereas, the minimum in control.

Table 1: Effect of plant growth regulators and thiourea on net return and B: C ratio

Treatments	Net returns (Rs.)	B:C ratio
Control	130333.3	1.76
NAA 150 PPM	145933.3	1.96
NAA 200 PPM	154253.3	2.06
NAA 250 PPM	170893.3	2.27
ETHREL 200 PPM	177133.3	2.35
ETHREL 300 PPM	191000	2.52
ETHREL 400 PPM	204440	2.76
CCC 100 PPM	143893	1.91
CCC 200 PPM	153560	2.06
CCC 300 PPM	163960	2.19
Thiourea 200 PPM	142120	1.91
Thiourea 500 PPM	150093.3	2.01
Thiourea 700 PPM	161186.7	2.15

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