

Effect of plant growth regulators on yield and quality of Clusterbean (*Cyamopsis tetragonaloba* L.) cv. 'PUSA NAVBAHAR'

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ABSTRACT

The field trial was conducted during late *kharif* season of the year 2002-03 at Lal Baugh, Junagadh Agricultural University, Junagadh in order to find out the effect of plant growth regulators on yield and quality of clusterbean cv. 'PUSA NAVBAHAR'. The experiment was conducted using randomized block design considering total ten treatments of plant growth regulators *viz.*, three concentrations of each of Gibberellic acid (GA₃ 50, 100, 150 ppm), Naphthalene acetic acid (NAA 50, 100, 150 ppm) and Cycocel (CCC 1000, 1500, 2000 ppm) along with control (Water Spray). The results revealed that the maximum number of tender pods per plant, length, width, volume and total crude protein content of pods were observed with CCC 1000 ppm. While the highest seed yield was obtained with CCC 2000 ppm.

Key words : Gibberellic acid, Cycocel, Naphthalene acetic acid, Clusterbean

Clusterbean (*Cyamopsis tetragonaloba* L.) belongs to leguminoceae family. It is draught hardy, deep rooted, summer annual legume. It is good source of protein. It's tender green pods are widely used for vegetable purpose and also feed for livestock and poultry. The yield and quality of clusterbean crop can be improved by use of plant growth regulators. They increase the yield of fruits and seeds as well as improve the quality by affecting physiological behaviour of plant systems. Therefore present investigation was conducted on yield and quality of clusterbean in relation to plant growth regulators.

MATERIALS AND METHODS

The field trial was conducted on clusterbean cv. 'PUSA NAVBAHAR' during late *kharif* season of the year 2002-03 at Lal Baugh, Junagadh Agricultural University, Junagadh. It was laid out in randomized block design with three replications. There were ten treatments of plant growth regulators *viz.*, three concentrations of each of Gibberellic acid (GA₃ 50, 100, 150 ppm), Naphthalene acetic acid (NAA 50, 100, 150 ppm) and Cycocel (CCC 1000, 1500, 2000 ppm) along with water spray as a control. The sowing of seeds was done manually on 17th Aug, 2002 at depth of 3-4cm and spacing 60x30cm as per treatments. All experimental plots received recommended dose of fertilizers *viz.*, N (25 kg/ha), P₂O₅ (37.5 Kg/ha) and K₂O (37.5 Kg/ha). The plants were selected randomly and tagged for recording data on number of pods per plant, length of pod (cm), width of pod (cm), volume of pod (cm)³, seed yield (q/ha) and total crude protein content

of pod (%). The data were statistically analysed.

RESULTS AND DISCUSSION

Effect of Cycocel (CCC):

The result from Table 1 indicate that maximum number of tender pods per plant, length and width of pods, volume of pods and total crude protein content were observed with CCC 1000 ppm. While the highest seed yield was received by CCC 2000 ppm. The probable reasons for enhanced length, width and volume of pod might be due to greater accumulation of carbohydrates by photosynthetic activity which might have helped in increasing carbohydrates content of pods and responsible for pod development and seed yield. It was observed that at all concentrations of Cycocel significantly increased total crude protein content of pods. This might be responsible for beneficial effect of Cycocel. These findings are in agreement with Singh *et al.* (1987), Rathore *et al.* (1990) in clusterbean, Patel and Singh (1991), Gowda *et al.* (1992) in okra and Deka and Shadeque (1996) in capsicum.

Effect of Naphthalene acetic acid (NAA):

It was also observed from Table 1 that NAA 50 ppm, which had been statistically at par with Cycocel treatments, increased number of tender pods per plant, length of pod, volume of pod and seed yield. Probable reasons behind this might be attributed due to enhanced growth and faster rate of plant development. The physiological action of NAA is cell enlargement, cell division and differentiation, which in turn resulted into