

Interaction between GA₃ and CCC on growth, chlorophyll content, yield and oil content of sesamum (*Sesamum indicum* L.)

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SUMMARY

Sesamum (*Sesamum indicum* L.) is an important oilseed crop grown widely in India during *kharif* and summer seasons. An experiment was conducted with plant growth regulators (GA₃ and CCC) to examine the effect on growth and development, chlorophyll content, oil content and yield of sesamum, var. ST 1683 with 20 treatment combinations in randomized block design. Recommended package and practices for sesamum were followed and treatments were made 15 days after sowing. Among all the applied treatment combinations GA₃ 250 + CCC 500 µg/ml gave the best results on plant growth, yield attributes and chlorophyll content of leaves. These results were closely followed by the treatment combination GA₃ 250 + CCC 250, GA₃ 250 + CCC 100 and GA₃ 100 + CCC 250 µg/ml. Highest oil content (54.85 per cent) was recorded at the combination of GA₃ 250 µg/ml plus CCC 500 µg/ml.

Key words : Sesamum, Plant growth regulators, Growth, Yield, Chlorophyll content

Sesamum (*Sesamum indicum* L.) is one of the ancient crops cultivated in India as oilseed crop for using in religious ceremonies. The crop produces low yield in the north-eastern region of India and one of the reasons of low productivity is that no definite nutrient management programme is followed for this region. This is not because of its inability to make good use of the added nutrients but it can be grown with less amount of expensive fertilizers than many other tropical crops (Ninan, 1989). The introduction of chemical growth regulators have added a new dimension to the possibility for modifying plant growth. The potential uses of effective growth retardants are almost as numerous and valuable as those for growth promoters. Beneficial effect of growth regulators on growth and productivity of different crop has been reported by several workers (Sontakey *et al.*, 1991, Devi Sharma and Sarma, 1997). But the information of combined effect of growth promoter (GA₃) and growth retardant (CCC) on growth and yield of sesamum has been rather meagre. Hence, the present investigation was planned.

MATERIALS AND METHODS

The present experiment was carried out during *kharif* season at Botanical garden of Gauhati University, Assam. The soil for the experiment is well drained and

slightly acidic (pH 5.8-6.5) with high water holding capacity. As per recommendation for this zone, fertilizers doses of 30 kg N (as urea), 20 kg P₂O₅ (as single super phosphate), 20 kg K₂O₅ (as murate of potash) per hectare were mixed together and applied to experimental field. The experiment was laid out with 20 treatment combinations in randomized block design with three replications. Normal package of practices for the cultivation of sesamum were followed. Four level of gibberellic acids (0, 100, 250, 500 µg/ml) and five levels of CCC (0, 100, 250, 500, 1000 µg/ml) were taken for different treatments. The concentration of individual chemicals was prepared by adding required quantity of water to measured quantity of chemicals. The prepared solutions were sprayed uniformly during morning hours at 15 days after sowing and in control distilled water was sprayed. Observation on shoot length and number of leaves per plant was made at different growth stages. Chlorophyll content was estimated in the laboratory following the method of Arnon (1949). Numbers of capsules per plant, seed weight per plant, seed yield were recorded at maturity. Oil content was estimated following the method of Kartha and Sethi (1975). The pooled data were analyzed statistically.

RESULTS AND DISCUSSION

All the treatments of GA₃ + CCC increased the shoot length, while the different concentrations of CCC had reduced the shoot length (Table 1). The highest 38.10 cm and 105.07 cm shoot elongation was achieved at 500 µg/ml of GA₃ after 30 and 60 DAS, respectively. On the other hand, CCC retarded the shoot length with increasing concentration. The interaction between both the chemicals

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