Journal of Tropical Forest Science 10(1): 130 - 132 (1997)

NOTES

EFFECT OF GROWTH REGULATORS ON SEEDLING ATTRIBUTES OF *ACACIA MELLIFERA*

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Growth and development of a plant are under the control of various growth regulating substances. External application of a particular growth regulator may cause promotion or inhibition depending upon the concentration of the applied solution (hormone or growth regulator). In the recent past, many growth regulating substances have been tried to boost the growth of various forest tree species with varying degrees of success (Cortrufo 1962, Hatano & Asakawa 1964). Such studies have been done extensively on cereals and legumes, but tree species still need attention. The present work includes the studies on the effect of different concentrations of growth regulators on the seed quality attributes of *Acacia mellifera* (Vahl.) Benth., which is well known for its calorific value of wood, fodder for livestocks, for sand-dune stabilisation, shelter belts and for soil conservation.

Seeds of *A. mellifera* collected from a natural stand were acid scarified with concentrated sulphuric acid for 10 min and washed free of acid with distilled water. After shade drying the scarified seeds for 12 h, they were soaked in 10 and 20 ppm solutions of CCC, GA, IAA, kinetin and riboflavin individually for 24 h at 500 seeds per treatment. Apart from the above individual treatments, the combination treatments, viz. GA 100 ppm + CCC 100 ppm, GA 100 ppm + kinetin 100 ppm, and GA 100 ppm + riboflavin 100 ppm were also tried. Germination tests of the 400 treated and imbibed seeds were conducted in sand media following the procedures outlined in ISTA (1985). After 21 days of sowing, germination count was taken on termination of the germination experiment. Root and shoot lengths of the seedlings were also recorded and vigour index was computed.

Acacia mellifera seeds soaked in GA 200 ppm recorded maximum germination (98%), root length (20.7 cm), shoot length (17.9 cm) and vigour index (3783) followed by kinetin 100 and 200 ppm (Table 1). Soaking of seeds in GA 100 and 200 ppm, IAA 100 ppm and kinetin 100 and 200 ppm differed significantly when tested at 5% level of significance in inducing better germination, increased root and shoot lengths and vigour index compared to other treatments. Water soaking recorded minimum values for the above parameters. The values recorded by the treatments CCC 100 and 200 ppm were similar to those by water soaking. Among the combination treatments, GA 100 ppm + IAA 100 ppm recorded higher values of germination and vigour compared to other combinations.

Enhancement in seed germination and vigour index due to growth regulator treatments has been recorded by many workers. GA has a strong promotional effect on stem elongation of *Dalbergia sissoo* (Mohinder Pal *et al.* 1991). Nanda *et al.* (1968) and Bhatnagar *et al.* (1968) reported the influence of IAA treatment on the promotion of root growth. Maurya (1972) found improvement of germination from 59.3 to 76.0 % in

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Dichanthium annulatum due to treatment of seeds with IAA 500 ppm solution. An increase of germination from 35.0 to 75.0 % in *Aleurites fordii* was reported by Chatterjee (1960) due to seed treatment with 500 ppm kinetin for 12 h.

Table 1. Effect of different growth regulators and their concentrations on seed attributes of *Acacia mellifera*

Treatment	Germination (%)	Root length (cm)	Shoot length (cm)	Vigour index
Water soaking	74.0 (59.3)	16.4	14.7	2299
CCC 100 ppm	76.0 (60.7)	16.6	15.0	2398
CCC 200 ppm	78.0 (62.0)	16.9	14.8	2464
GA 100 ppm	94.0 (75.8)	19.1	16.9	3380
GA 200 ppm	98.0 (81.9)	20.7	17.9	3783
IAA 100 ppm	92.0 (73.6)	18.2	17.1	3243
IAA 200 ppm	89.0 (70.6)	18.4	16.5	3104
Kinetin 100 ppm	96.0 (78.5)	20.1	17.7	3629
Kinetin 200 ppm	96.0 (78.5)	19.9	17.8	3609
Riboflavin 100 ppm	82.0 (64.9)	17.3	15.6	2689
Riboflavin 200 ppm	80.0 (63.4)	17.7	15.4	2640
GA + CCC 100 ppm	86.0 (68.0)	18.5	16.8	3032
GA + IAA 100 ppm	94.0 (75.8)	18.9	17.1	3375
GA + kinetin 100 ppm	84.0 (66.4)	17.7	15.4	2791
GA + riboflavin 100 ppm	90.0 (71.6)	18.4	16.3	3115
C.D. (p = 0.05)	6.77**	1.57**	0.05**	80.49**

(Figures in parentheses indicate transformed values).

Sankhla and Mathur (1968) found that the seed treatment with IAA and GA 100 ppm resulted in 84.0 % germination in *Cuminum cyminum* as against 46.0 % in the control. Bhatacharyya *et al.* (1991) recorded increased germination, root length, shoot length and vigour index with the seeds of *Eucalyptus* species due to treatment with various hormones. *Michelia champaca* seeds treated with GA had increased germination (Bahuguna *et al.* 1988). Verma and Tandon (1988) reported the influence of GA, IBA and IAA on the germinability and speed of germination of *Pinus kesiya* and *Schima khasiana*.

In the present study, the enhancement of germination, root and shoot lengths and vigour may be due to the stimulatory effect induced by the growth regulators on the embryo. This could have been made possible through the softening of the seed coat with acid scarification. The other possible reason may be the antagonistic effect of growth regulators on the growth inhibitory substances present in the seeds and enhancement of the rate of metabolism during germination.

Acknowledgement

The award of Senior Research Fellowship by the Council of Scientific and Industrial Research (C.S.I.R.), New Delhi, India to the first author is gratefully acknowledged.

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