

EFFECT OF COMMERCIAL FORMULATION OF BRASSINOLIDE ON GROWTH, YIELD AND QUALITY OF FLUE CURED VIRGINIA TOBACCO

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Brassinolide seed treatment beyond 10 ppm delayed the process of germination and reduced the per cent germination in tobacco seed. Foliar spray of brassinolide has no effect on growth and vigour of seedlings in tobacco nursery and yield and quality of tobacco crop.

Key words : Brassinolide, growth, quality, FCV tobacco, vigour, yield.

Brassinosteroides are a group of naturally occurring plant hormones which are effective at very low concentration. Brassinosteroids are shown to improve germination and seedling growth of groundnut (Vidyavardhini and Seetharamarao 1996), plant growth of rice (Kim and Sa 1989) grain yield of wheat, rice and mustard, pod yield in groundnut, tuber yield in potato and seed cotton yield (Ram Raj *et al.* 1997). Tobacco being a leafy crop may have potential for improvement in yield through the application of brassinosteroids. A trial was therefore, conducted to study the effect of seed treatment and foliar application with brassinolide in laboratory and field conditions respectively.

Seeds of FCV tobacco variety Hema were soaked in 1, 10, 50 and 100 ppm brassinolide solution for 24 h. Control seeds were soaked in distilled water for the same duration. One unsoaked control was also kept. 100 seeds were placed in each petridish lined with whatman filter paper No.1. Per cent germination was recorded from 6th day of soaking. Similarly 100 seeds of each treatment were sown in pots and % germination and total number of seedlings were recorded. A nursery trial was conducted and seedlings on 30th and 40th day after sowing were given foliar spray of 0.05, 0.10 and 0.25 ppm of brassinolide along with control (water spray). Observations on growth,

vigour and number of transplantable seedlings were recorded.

A field trial was conducted under conserved soil moisture in Vertisols of CTRI farm, Katheru with four concentrations of brassinolide as foliar spray (0.05, 0.10, 0.25 and 0.50 ppm) along with water spray and no spray in a randomized block design with four replications. Plot size was 5.6m x 4.2m in which FCV tobacco variety Hema was planted at the spacing of 70 x 70 cm. Final leaf area was measured at the time of harvest. Data on green leaf yield, cured leaf yield and grade index were recorded. Cured leaf samples were analyzed for nicotine, reducing sugars (Harvey *et al.* 1969) and chlorides (Hanumantharao *et al.* 1980). The data were analyzed statistically (Panse and Sukhatme 1967).

Brassinolide seed treatment showed that higher concentrations reduced per cent germination and also delayed the germination (Fig.1). Foliar spray of brassinolide (0, 0.05, 0.10, 0.25 ppm) at 30th and 40th day after sowing in tobacco nursery did not influence total and transplantable seedlings and 50 seedlings weight (Fig. 2). Foliar spray of brassinolide (0.05, 0.10, 0.25 and 0.50 ppm) had no significant effect on leaf area and yield characters, green leaf yield, cured leaf yield and grade

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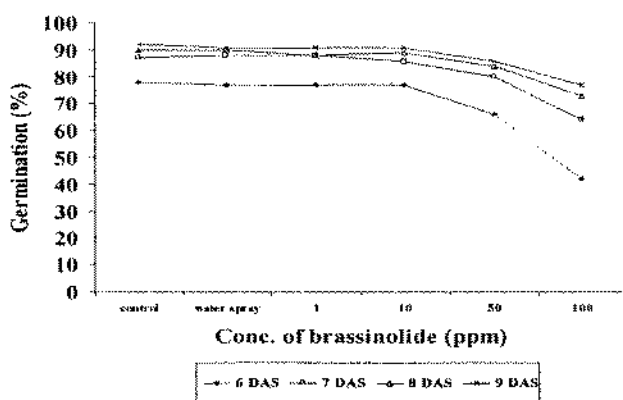


Fig. 1. Effect of brassinolide seed treatment on germination

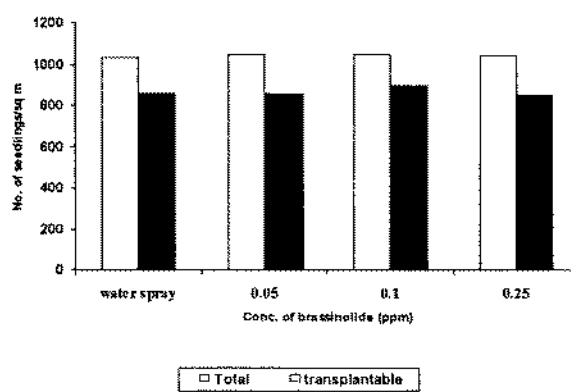


Fig. 2. Effect of foliar spray of brassinolide on seedling growth and vigour

Table 1. Effect of foliar spray of brassinolide (Br) on leaf area, yield characters and quality parameters of FCV tobacco

| Treatments | Green leaf yield kg/ha | Cured leaf yield kg/ha | Grade index | Leaf area m ² /plant | Reducing sugars (%) | Nicotine (%) | Chlorides (%) |
|-------------|------------------------|------------------------|-------------|---------------------------------|---------------------|--------------|---------------|
| T1 | 12432 | 1805 | 1223 | 1.680 | 13.47 | 1.99 | 1.46 |
| T2 | 12388 | 1709 | 1110 | 1.745 | 14.80 | 2.10 | 1.37 |
| T3 | 11713 | 1644 | 1095 | 1.813 | 13.25 | 1.94 | 1.31 |
| T4 | 12411 | 1716 | 1217 | 1.660 | 12.65 | 1.98 | 1.52 |
| T5 | 11543 | 1590 | 1109 | 1.774 | 11.88 | 2.15 | 1.36 |
| T6 | 12297 | 1614 | 1192 | 1.822 | 11.62 | 2.08 | 1.21 |
| Mean | 12131 | 1680 | 1158 | 1.732 | 12.95 | 2.04 | 1.37 |
| SEm± | 632 | 97 | 81 | 0.168 | 1.13 | 0.07 | 0.10 |
| C.D. (0.05) | NS | NS | NS | NS | NS | NS | NS |
| CV (%) | 10.57 | 11.63 | 14.18 | 16.76 | 17.4 | 6.5 | 15.1 |

T1 = no spray, T2 = water spray, T3 = 0.05ppm Br spray, T4 = 0.10ppm Br spray, T5 = 0.25 ppm Br spray, T6 = 0.50 ppm Br spray

index (Table 1). RamRaj *et al.* (1997) reported, increase in grain yield in wheat, rice and mustard, pod yield in groundnut, tuber yield in potato and seed cotton yield by brassinolide over control. Quality parameters (per cent) nicotine, reducing sugars and chlorides were also not affected by foliar spray of brassinolide. The present study showed that high concentration of brassinolide seed treatment reduced tobacco seed germination and delayed the process of germination. Foliar spray had no effect on growth and vigour of seedlings in tobacco nursery and yield and quality of tobacco crop.

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REFERENCES

- Kim, K.S. and Sa, J.G. (1989). The effects of plant growth regulator brassinolide on seedling growth of rice. *Korea Republic Res. Report of Rural Develop. Adm., Rice* 31: 49-53.

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- Hanumantha Rao, A., Gopala Krishna, C.V.S.S.V. and Satyanarayana Murthy, B.V.V. (1980). Determination of chlorides in tobacco by auto analyzer. *Tob Res.* 7: 92-95.
- Harvey, W.R., Starh, H.M. and Smith, W.C. (1969). Automated determination of reducing sugars and nicotine alkaloids on the same extract of tobacco leaf. *Tob. Res.* 13:13-15.
- RamRaj, V.M., Vyas, B.N., Godrej, N.B., Mistry K.B., Swami, B.N. and Singh N. (1997). Effects of 28-homobrassinolide on yields of wheat, rice, groundnut, mustard, potato and cotton. *J. Agri. Sci.* 128: 405-413.
- Panse, V.G. and Sukhatme, P.V. (1954). Statistical Methods for Agricultural Workers. Indian Council of Agricultural Research publication, New Delhi.
- Vidyavardhini, B. and Seetharamarao, S. (1996). Effect of brassinolides on germination of groundnut (*Arachis hypogea* L.) seeds. *Indian J. Plant Physiol.* 1: 223-224.