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Research Notes

## **Influence of nitrogen levels and its time of application on yield and quality parameters of hybrid cotton**

S. ALAGUDURAI<sup>1</sup>, M. PREMSEKHAR, K.R. PUSHPANATHAN AND D. KUMAR

<sup>1</sup>*Krishi Vigyan Kendra, TANUVAS, Namakkal.*

*Department of Agronomy, Tamil Nadu Agricultural University, Coimbatore - 641 003.*

Cotton or 'White gold' is a premier cash crop and one of the prominent industrial crops of India generating sizeable employment. Cotton accounts for around 70 percent of total fibre consumption in the textile sector, which account for nearly 20 percent of India's industrial production. Nearly one third of the foreign exchange is earned by cotton and textile exports. The price of cotton is governed by its fibre quality, fibre length, fineness and bundle strength along with higher ginning out turn are the most important quality parameters. At present hybrids are contributing 50 percent of the country's total production. The growth rate of long and extra long staple was 6-7 percent due to predominant role of hybrids (Basu and Paroda, 1995). The information pertaining to nitrogen levels and its time of application on quality of cotton

is meagre. Therefore, the present investigation was undertaken to find out the optimum nitrogen levels and its time of application on the quality of hybrid cotton TCHB 213.

A field experiment was conducted during the winter season of 1998-'99 at Tamil Nadu Agricultural University, Coimbatore to know the effect of different levels and time of nitrogen application on yield and quality of hybrid cotton TCHB 213 under irrigated condition. The treatments included three levels of nitrogen (80, 120 and 160 kg N ha<sup>-1</sup>), different times of application viz., two equal splits at basal and 45 DAS, three equal splits at basal, 45 DAS and 65 DAS, four equal splits at basal, 45 DAS, 65 DAS and 85 DAS and control (no nitrogen). The experiment was laid out in factorial randomized

block design with three replications. The soil was sandy clay loam in texture and low in available nitrogen ( $187 \text{ kg ha}^{-1}$ ), medium in available phosphorus ( $13 \text{ kg ha}^{-1}$ ) and high in available potassium ( $418 \text{ kg ha}^{-1}$ ). Cotton seeds were sown on the sides of the ridges by adopting a spacing of  $120 \times 60 \text{ cm}$ . Nitrogen fertilizer (urea) was applied as per treatments. Entire dose of phosphorus and potassium each @  $60 \text{ kg ha}^{-1}$  were applied as basal dressing to all the treatments. Fluchloralin was applied @  $1 \text{ kg a.i ha}^{-1}$  as pre - emergence herbicide on the third day after sowing. Thinning was done on 25 DAS retaining one healthy seedling per hill. During the experimental crop period, a total rain fall of 688 mm was received in 26 rainy

days. Necessary irrigation and need based plant protection were given to the crop.

Different levels of nitrogen significantly influenced the seed cotton yield. Application of  $160 \text{ kg N ha}^{-1}$  recorded the highest seed cotton yield of  $2547 \text{ kg ha}^{-1}$  and was superior to other levels (Table 1). The enhanced yield with treatment was jointly due to relative contribution of various yield components like number of sympodial branches, bolls per plant and boll weight. These results are in conformity with the findings of Alagarpandyan and Irudhayaraj (1991) who reported a higher seed cotton yield with  $160 \text{ kg}$  compared to  $80 \text{ kg N ha}^{-1}$ . With regard to time of application of nitrogen four equal splits registered the

**Table 1. Effect of nitrogen levels and its time of application on seed cotton yield ( $\text{kg ha}^{-1}$ ) and quality parameters of cotton hybrid TCHB 213.**

Treatments	Seed cotton yield ( $\text{kg ha}^{-1}$ )	Ginning percentage	Seed index (g)	Lint index (g)
<i>N levels</i>				
80 $\text{kg ha}^{-1}$	2080	35.44	9.86	4.34
120 $\text{kg ha}^{-1}$	2322	35.23	10.22	4.55
160 $\text{kg ha}^{-1}$	2548	35.13	10.55	4.66
SEd	29.2	0.064	0.035	0.03
CD ( $p=0.05$ )	61.4	0.134	0.074	0.062
<i>Time of application</i>				
Two splits	2269	35.38	10.20	4.50
Three splits	2324	35.29	10.23	4.52
Four splits	2356	35.28	16.20	4.53
SEd	29.2	0.064	0.035	0.03
CD ( $p=0.05$ )	61.4	NS	NS	NS
Control	1649	35.67	9.46	3.98
SEd N vs control and T vs control	41.3	0.09	0.049	0.042
CD ( $p=0.05$ )	86.8	0.189	0.102	0.083

highest seed cotton yield of 2356 kg ha<sup>-1</sup> and was at par with three splits. These results are in agreement with the findings of Khan and Ahmed (1994) who reported that four equal splits of N at sowing, squaring, flowering and peak flowering stages registered the highest seed cotton yield than the two or three split applications.

Nitrogen level has influenced the quality parameters like seed index and lint index (Table 1). Lower level of nitrogen application had apparently increased the ginning percentage, which might be due to seed and lint weight. Application of N at 160 kg ha<sup>-1</sup> recorded lower ginning percentage. This results corroborates with the findings of Moolchand *et al.* (1997) who reported reduced ginning percentage due to higher N fertilization. Application of 160 kg N ha<sup>-1</sup> recorded higher seed index value of 10.55 g and lint index value of 4.66

g. Higher seed index and lint index values were mainly due to increase in the seed weight and lint weight. These results are in conformity with the findings of EI-Debaby *et al.* (1995) who reported increasing rate of N application increases the seed weight and lint percentage without affecting the fibre qualities. Time of N application did not influence the quality parameters *viz.* ginning percentage, seed index and lint index. These results are in conformity with the findings of Perichiappan (1986).

The results concluded that nitrogen application @ 160 kg ha<sup>-1</sup> recorded the highest seed cotton yield and quality parameters like seed index and lint index. Among the time of

application, four equal splits registered the highest seed cotton yield compared to other split applications. Time of application did not influence the quality characters of cotton fibre.

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