

Effect of nitrogen and irrigation levels on growth and yield of durum wheat

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ABSTRACT

A field experiment was conducted during 2005 - 2006 to study the response of durum wheat to nitrogen and irrigation levels on growth and yield of durum wheat. The findings of the study indicated that using NIDW 15 was found to be beneficial in increasing growth and yield of wheat. Application of 120 kg N ha⁻¹ and irrigation at CRI + tillering + flowering + grain development was observed to be beneficial in increasing growth and yield of wheat.

Key words : Wheat, Nitrogen and irrigation, CRI.

Durum wheat (*Triticum durum* Desf.) the second major species of wheat accounts for about four per cent of the total wheat production of the world. India is one of the major durum wheat producer in the world but almost all the durum produced is used to meet the domestic requirements.

Durum wheat fetches higher prices in the local market and in addition durum produced in Maharashtra particularly in Marathwada region has a bright future for producing and exporting due to its good quality. But the productivity is very low as compared to the northern states. Hence, it is necessary to increase the productivity of durum wheat in Maharashtra particularly in Marathwada region. Among various agronomic practices optimum dose of nitrogen and irrigation level are important for increasing the productivity of durum wheat about which the information is very little. Therefore, the present investigation was planned and carried out.

MATERIALS AND METHODS

A field trial was conducted during the winter (*rabi*) season of 2005 - 06 at the Agricultural College Farm, Latur (M.S.). The experiment was laid out in split plot design with three replications on medium black soil. The treatments consisted of two varieties *viz.* NIDW 15 and NIDW 295 and three levels of nitrogen *viz.*, 40 kg N ha⁻¹, 80 kg N ha⁻¹ and 120 kg N ha⁻¹ as main plot treatments and three levels of irrigations *viz.* CRI + flowering (I₁), tillering + panicle initiation + grain development (I₂) and CRI + tillering + flowering + grain development (I₃) as subplot treatments. The sowing was done with spacing of 22.5 cm. The plot size was 5 x 4.5 m. gross and 3 x 2.6 m net. The recommended cultural practices and plant protection measures were followed

during the experimentation.

RESULTS AND DISCUSSION

Varieties :

The data on growth and yield contributing characters (Table 1) revealed that the mean plant height of variety NIDW 15 (126.67 cm) was found to be significantly superior over NIDW 295 at harvest. Similar trend in respect of number of functional leaves per plant, number of tillers per plant, number of panicle per plant, weight of grain per panicle was observed. Only increasing of 1000 grain weight (Test weight) of variety NIDW 295 was found to be significantly superior over the variety NIDW 15.

As regards the performance of different varieties, it was observed that the NIDW - 15 gave the highest seed yield (63.20 q ha⁻¹), which was higher than the variety NIDW - 295.

Nitrogen levels :

A dose of 120 kg N ha⁻¹ produced higher plant height than 80 kg N ha⁻¹ and 40 kg N ha⁻¹. Similar trend in respect of number of functional leaves per plant, number of tillers per plant, number of panicle per plant, number of grain per panicle and weight of grain per panicle and 1000 grain weight was observed. The nitrogen level of 120 kg N ha⁻¹ was observed significantly superior (60.94 q ha⁻¹) over all other nitrogen levels *i.e.* 80 kg N ha⁻¹ (55.12 q ha⁻¹) and 40 kg N ha⁻¹ (54.63 q ha⁻¹). Similar results were reported by Agrawal *et al.* (1978) and Singh *et al.* (2000).

Irrigation levels :

Irrigation level I₃ (CRI + tillering + flowering + grain development) produced significantly higher plant height, number of functional leaves, number of tillers per plant,