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Introduction
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Recent improvements in agro-techniques for the cultivation of field crops, especially cereals, to meet the rising needs of the ever-increasing population, have been the main subject of researches in agriculture. In India, the problem of food production has deepened further due to the poor financial capacity of the farmer who is unable to apply the required dose of fertilisers to newly released high yielding cultivars of cereals.

Our farm scientists have targeted annual food production at 300 million tonnes by the end of this century to offset any food crisis. The efforts of agriculturists have resulted in the development of a number of improved high yielding varieties, as also a few intergeneric hybrids with high productivity as well as high protein content. “Triticale” is one of the remarkable achievements in this direction, successfully competing with the yield of traditional cereals in various countries and even surpassing them in grain quality and adaptability.

It is a hybrid produced by the intergeneric cross between wheat (Triticum) and rye ( Secale) which combines the high yielding ability and protein content of wheat with the high lysine content of rye. In addition, it also possesses the desirable quality of
drought and disease resistance of rye (Hulse and Spurgeon, 1974; Lees, 1979; Baier, 1991). Thus, triticale is gaining acceptance by growers and consumers and it seems likely that, in future, it will compete successfully with traditional cereals. At present, it is cultivated in more than 50 countries including Australia, Canada, China, Mexico, and USA and several improved triticale cultivars have been released for commercial use (Anonymous, 1980; 1982). In India too, interest is being developed in its cultivation and one cultivar TL-419 was released during 1980’s for Punjab’s farmers and very recently another improved cultivar DT-46 has been released for cultivation in hilly regions.

To ensure high yield of a cultivar, emphasis should be paid to systematic investigation of its optimum nutritional need as well as mode of application of fertilisers. Although most of the essential nutrients are present in the soil in different quantities in available forms, crop yield is limited by three primary fertiliser nutrients N, P and K as these are removed in large quantities. Thus soil fertility can be maintained by supplying these nutrients as fertiliser in appropriate quantities as and when required.

Of the essential and indispensable nutrients for all forms of life, including plants, potassium plays a major role, influencing a number of physical, physico-chemical and metabolic pathways at the cellular level, thus affecting the ultimate growth and productivity of a plant (Barkar and Maynard, 1969).
The potassium ion is preferentially absorbed in the cells and remains as a free ion in the cell sap, together with other substances, to create an osmotic balance against the turgor pressure of cell wall (Amberger, 1968). It also regulates the absorption of near infra red radiation and maintains the heat balance in the plant system (Shugarov, 1967). Potassium also activates certain important enzymes related to glycolysis and amino acid and amide synthesis, acting as the cofactor (Evans and Sorger, 1966; Wilson and Evans, 1968). It also plays an important role in activating enzymes specific for adenine (Hiatt, 1963) and protein (Webster and Varner, 1954) synthesis.

In many crops, nitrogen and potassium uptake are nearly equal. However, potassium efficient plants require only low potassium. With higher nitrogen, potassium definitely increases the yield of economic parts and protein.

The attention of farm scientists has recently been focussed on mineral nutritional requirements of triticale so as to exploit its full yield potential with an efficient and economical use of fertilisers. Among other centres, encouraging results of mineral nutritional studies on triticale have been obtained at Aligarh by Afridi, Samiullah, Inam and their associates (Afridi et al., 1977; Abbas, 1980; Inam et al., 1982 a,b; Abbas et al., 1983 a,b; Inam et al., 1985; Moinuddin et al., 1990 a,b; Aziz, 1991; Samiullah et al., 1991; Inam, 1992; Inam et al., 1992; Inam et al., 1993;
Fatima, 1994, Samiullah et al., 1996; Shah, 1996). Most of these trials, however, were conducted to investigate the nitrogen and phosphorus requirements of triticale. The effect of potassium on the growth, yield and quality of triticale has not been investigated in detail. In view of the importance of this essential macronutrient, its need for a crop plant can not be ignored as even its slight deficiency could adversely affect crop productivity. Moreover, like the other essential nutrients, every crop has an optimum requirement for potassium, as its excess could have a negative effect on the yield and quality of grain (Krishchenko and Karamatova, 1983; McCallister et al., 1987).

Taking these points into consideration, it seems desirable to investigate the potassium requirement of some selected high yielding cultivars of triticale that have shown promise at Aligarh in earlier trials with other macronutrients. Therefore, it was decided by the present author to conduct the following field experiments on the potassium nutrition of selected high yielding cultivars of triticale.

1. To study the effect of varying levels of potassium applied at the time of sowing, on the growth, yield and quality of two cultivars of triticale viz. “Delfin” and “TL-419”, and one of wheat (HD-2204) as check, to determine the optimum doses, giving uniform basal doses of nitrogen and phosphorus.
2. To investigate the interaction effect of varying doses of potassium and nitrogen (applied basally) on the growth, yield and quality of the better performing cultivar of triticale with a uniform basal dose of phosphorus, on the basis of the data of Experiment 1.

3. To study the interaction effect of potassium and phosphorus on the growth, yield and quality of the cultivar of triticale selected for Experiment 2, by varying their levels applied basally, with a uniform basal dose of nitrogen.

4. To study the effect of split application of nitrogen applied twice at sowing (basal) and early heading (top dressing), taking two levels of potassium on the cultivar of triticale selected for Experiments 2 and 3 together with the optimum basal dose of phosphorus obtained in Experiment 3.

5. To investigate the prospect of fertilizer economy with split application of nitrogen replacing the dose of top dressing with a lower dose applied at early heading stage by foliar spray and taking two levels of potassium on the selected cultivar of triticale as in Experiment 4, applying a uniform basal dose of phosphorus selected on the basis of data of Experiment 3.