CHAPTER - 6

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The importance of the problem "Potassium nutrition of triticale" has been considered in brief. The effect of various levels of potassium, nitrogen and phosphorus on growth, yield and grain quality in triticale was studied. Justification has been put forward for undertaking the present work (Chapter 1). The available information pertaining to potassium nutrition of triticale has been reviewed (Chapter 2). The details of the materials and methods employed for the five field experiments performed have been given with relevant meteorological and edaphic data (Chapter 3).

Experiment 1 was a field trial conducted according to factorial randomized block design during winter (Rabi) season to study the effect of four doses of potassium, applied with adequate nitrogen and phosphorus, at the time of sowing, on the growth, yield and quality, including NPK content of grain, of two cultivars of triticale, viz. "Delfin" and "TL-419" and one of wheat "HD-2204" (included as check) to determine the optimum dose of potassium and the better responding triticale for later investigations.
Field Experiment 2 was conducted next year. The aim was to investigate the effect of four doses of basal potassium and three of basal nitrogen separately and in combination on the growth, yield and quality of better performing cultivar of triticale grown with a uniform basal dose of phosphorus.

Experiment 3 was carried out simultaneously with Experiment 2. In this experiment an attempt was made to study the effect of four doses of soil-applied potassium and three of phosphorus on the growth, yield and quality of the same cultivar of triticale, applied with a uniform basal dose of nitrogen.

Experiment 4 was conducted during the next rabi season to study the effect of split application of nitrogen (basal + top dressing) and compare it with one time application at sowing, taking two levels of basal potassium, on the cultivar of triticale selected earlier and grown with adequate basal phosphorus.

Experiment 5 was conducted side by side with Experiment 4 on the same cultivar of triticale. Its aim was again to investigate the prospects of increasing productivity and quality coupled with fertilizer economy, using split application of nitrogen replacing supplemental top dressing with foliar spray, taking the same two levels of basal potassium and a uniform dose of phosphorus applied at sowing.
The data of the five field trials were subjected to statistical analysis where ‘F’ value was found significant (as in most cases) at P<0.05, C.D. was calculated (Chapter 4).

The significant results of the investigation have been discussed in the light of earlier findings at Aligarh and elsewhere (Chapter 5) and the important findings are summarized below.

1. Potassium treatment $K_{60}$ proved better than the other treatments and almost all the growth and yield characteristics responded to it optimally in all five field trials.

2. Potassium dose $K_{60}$ increased the grain yield most in the various cultivars selected for Experiments 1 to 5.

3. Like growth and yield characteristics, potassium treatment $K_{60}$ also proved best for grain quality.

4. Delfin out-yielded the other cultivar of triticale as well as the local wheat check in Experiment 1 and was selected for later experiments.

5. The basal dose of nitrogen $N_{150}$ proved optimum for all the growth, yield and quality characteristics of Delfin.

6. The interaction effect of $K_{60} \times N_{150}$ was found superior to that of all other combinations.

7. The basal dose of phosphorus $P_{60}$ gave the maximum values for all the growth, yield and quality characteristics.
8. The K x P combination $K_{60} \times P_{60}$ gave the best results.

9. Split application of nitrogen (basal + top dressing/foliar spray) proved better than one time basal application for yield and quality of Delfin.

10. In the top dressing experiment, $BN_{90} + TN_{30}$ out yielded all other treatments and also resulted in saving of nitrogenous fertilizer. $K_{60} \times BN_{90} + TN_{30}$ proved the best combination.

11. Spray application of nitrogen also proved beneficial both for productivity and quality of Delfin.

12. Treatment $BN_{120} + FN_{10}$ and the combination $K_{60} \times BN_{120} + FN_{10}$ produced maximum grains of superior quality.

13. It may, therefore, be concluded that triticale cultivar Delfin may profitably replace wheat in Aligarh and adjoining areas with basal $K_{60}$ and $P_{60}$, nitrogen being applied either as $N_{90}$ at sowing and $N_{30}$ by top dressing or as $N_{120}$ at sowing and $N_{10}$ by foliar spray. The higher protein content of Delfin compared with wheat would also help to solve the problem of malnutrition to some extent.

The present summary (Chapter 6) is followed by relevant references.