PRODUCTIVITY OF AEROBIC RICE GROWTH SYSTEM CAN BE ENHANCED BY POTASSIUM FERTILIZATION

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INTRODUCTION

Rice lodging and water shortage are one of possible factors reducing rice yield and grain quality in anaerobic rice production system and switches towards water saving aerobic cultivation. It has been reported that potassium (K) has significant role to decrease panicle sterility in cereals. Its deficiency is obvious for rice under aerobic condition due to lack of K gradient coming with irrigation water and lowered indigenous K release from soils. Therefore present study was conducted with objectives to investigate the K fertilization effect on rice yield and its possible role to decrease panicle sterility faced under aerobic rice production system.

MATERIALS AND METHODS

A field experiment was conducted in district Sheikhupura (latitude 31.81 N and longitude 74.24 E; altitude 236 m), Punjab, Pakistan.

Potassium Fertilizer levels
- K_0 (No K_2O)
- K_1 (90 kg ha^{-1} K_2O)
- K_2 (180 kg ha^{-1} K_2O)

Rice Varieties
- Basmati 515, Super Basmati

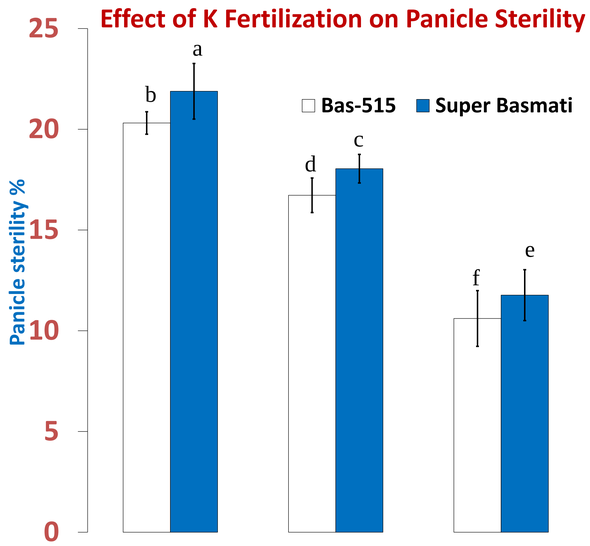
Replications
- Four

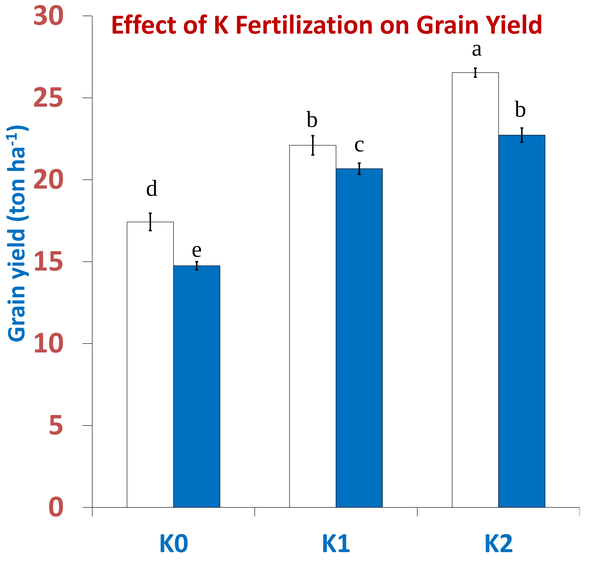
Statistical Design
- Two way Factorial with LSD

The experimental soil was clay loam with pH 8.0, EC 0.30 dS m^{-1} and 90 mg K_2O kg^{-1} soil.

Potassium in shoot, husk and grain were determined by flame photometer after wet digestion of samples using mixture of nitric and perchloric acids with ratio 2:1.

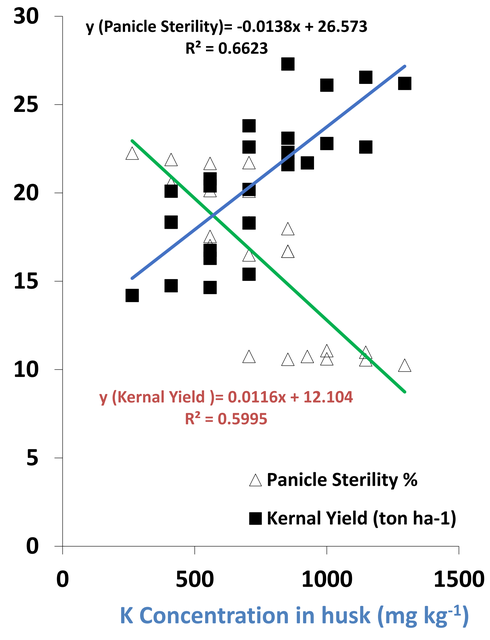
RESULTS & DISCUSSION

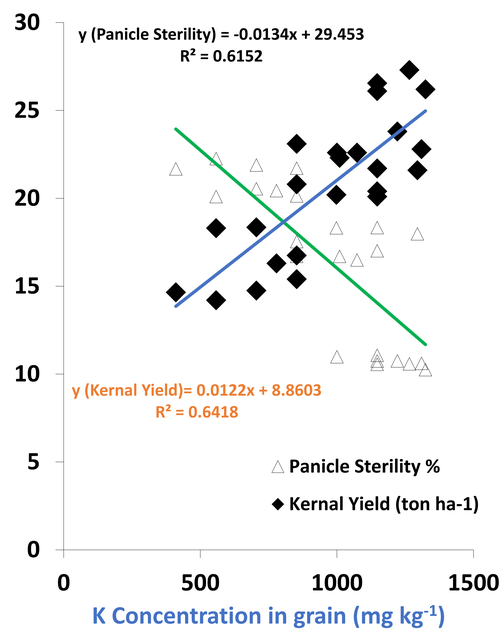




Increase in K fertilization up to the optimum level decreased the panicle sterility percentage in aerobic rice and even further decreased at higher K levels. K fertilization has progressive effect on grain filling in rice because its deficiency creates pollen sterility which reduces the number of filled grains as observed in present study (Esfehani *et al.,* 2005). Increased K fertilizer levels improved the uptake of K by rice plants and its distribution throughout the plant parts as the K concentration in all parts of the rice plants is higher than that in control.

Positive correlation of K concentration in grain and husk with panicle sterility and kernel yield





CONCLUSION

Application of K fertilizers showed significant increase in yield, because of significant decrease in sterility of rice in aerobic production system.

REFERENCES

Esfehani, M., S.M. Sadrzade, M. Kavoosi and A. Dabagh-Mohammad-Nasab. 2005. Study on the effect of different levels of nitrogen and potassium fertilizers on growth, grain yield, yield components of rice (*Oryza sativa* L.) cv. Khazar. Iran Agron. J. 7: 226-241.