WORK SHOP 2022 MADRID

Halving nitrogen waste by 2030

Nitrogen use efficiency of wheat as affected by variable potassium sources and nitrogen levels

Aysha Kiran[1*], Abdul Wakeel[2], Zunaira Bano[1], Rania Baloch[1]
[1]Department of Botany, University of Agriculture Faisalabad, Pakistan.
[2]Institute of Soil and Environmental Sciences, University of Agriculture, Faisalabad, Pakistan.
Email: aysha.kiran@uaf.edu.pk

Background:

For sustainable wheat growth and yield nitrogen(N) and potassium (K) are considered as the integral components. N is differentially regulated from root absorption to accumulation in grain during all phenological stages. N availability is highly influenced by K because it competes with ammonium binding sites in soils and play role in electrochemical balance for nitrate, ultimately facilitating N uptake. Potassium also plays a significant role in N redistribution from leaves to grain and the production of protein in the grain.

Objective:

- To check the effect of different forms of K fertilizers on N use efficiency of wheat relative to the levels of N supply.

Material and Methods

Experimental setup

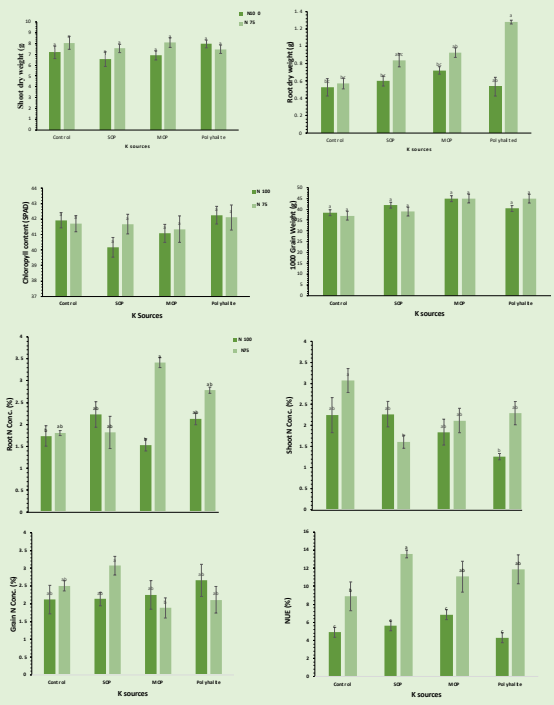
- Pot trail was conducted at old botanic garden ,University of Agriculture, Faisalabad
- **Experimental Design:** Completely randomized(CRD)
- **Treatments:** Four
- **Wheat variety:** Anaaj-08
- Pots were filled with 8 kg of soil and sand with the ratio of 60 and 40 percent respectively

Treatment plan

- Two levels of N 100% of the recommended and 75 % of the recommended were used
  - T0 (Urea + Phosphorous)
  - T1 (Urea +Sulfate of potash + Phosphorous)
  - T2 (Urea + Muriate of potash + Phosphorous)
  - T3 (Urea +Polyhalite + Phosphorous)
  - SSP was used as Phosphorous source

Experimental setup

Results



Summary:

- The results of the endeavor explain the overall good response of 75% of recommended level of N for all growth and morphological parameters whereas a non-significant relation between the K sources has been observed for chlorophyll content (SPAD) and 1000 grain weight
- Concerning N use efficiency and N content in root a significant difference between treatments have observed however for N conc. in shoot and grain, a non-significant relation between treatments has encountered.
- With respect to K sources MOP and SOP showed good response in 75% of N level as highest NUE has been estimated in SOP as compared to control with no potassium source however a non-significant difference can be observed in MOP and Polyhalite sources.

References:
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- Adnan, M. 2016. Yield response of wheat to nitrogen and potassium fertilization. Pure Appl. Biol. 5:868-373.