Cereal farming, and particularly durum wheat, is a very important crop in the structure of Tunisian agricultural production. However, the yield of this crop is often limited and below the genetic potential of the varieties used and the target yield. An improvement in the yield of cereals is achievable through the good mastery of the "technological package" of which mineral fertilization plays an important role. The management of the nutrient fertilization is based on the old concept of Liibig’s "Law of the minimum", that is any deficiency of one nutrient will severely limit the efficiency of others. N fertilization is largely controlled and much research has shown that durum wheat requirements are dependent on soil moisture and crop development stage and yield (Marsi 1995, Souli et al. 1992). On the other hand, potash fertilization of durum wheat remains, up to now, a controversial issue, where opinions are divided and sometimes even divergent as to its justification, specifically in the semi-arid zones of Tunisia.

This work is part of a development research program on the reasoning of potassium fertilization of durum wheat grown in two different bioclimatic stages of Tunisia and proposes by means of field experiments, compare the effects of different modes of potassium intake on the nutritional yield and behavior of this crop.

**BACKGROUND AND AIM**

The experimental trials were carried out at the INGC experimental platforms, Hkim platform of Oued Mite delegation-governorate of Jendouba and El Gnaidli platform of Beja. The experimentation was carried out at the Governorate of Beja (Figure 1).

The weather conditions that prevailed, in 2015/2016 cropping season, at both platforms of trials during the crop growth cycle are summarized in figure 2.

**MATERIALS AND METHODS**

Sites are characterized by soils of alluvial origin. The characteristics of their surface layers are shown in table 1.

<table>
<thead>
<tr>
<th>Table 1: Characteristics of the surface layers of the two platforms soil</th>
<th>Characteristic</th>
<th>Beja (cm)</th>
<th>Jendouba (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texture</td>
<td>Clay loam</td>
<td>Clay loam</td>
<td>Clay loam</td>
</tr>
<tr>
<td>pH</td>
<td>8.1</td>
<td>8.1</td>
<td>8.1</td>
</tr>
<tr>
<td>SOM (g/kg)</td>
<td>18.5</td>
<td>18.5</td>
<td>18.5</td>
</tr>
<tr>
<td>CEC (meq/l)</td>
<td>38.7</td>
<td>38.7</td>
<td>38.7</td>
</tr>
<tr>
<td>K2O (ppm)</td>
<td>395</td>
<td>395</td>
<td>395</td>
</tr>
</tbody>
</table>

The different treatments of potassium fertilization consisted of three doses of K; K0 (control) 0 kg/ha) and K100 (100 kg/ha) applied at sowing in the form of granulated sulphate of potash and K-foliar (KF) treatment in the form of foliar fertilizer NPK (3-2-5) applied in a spray (5 l/ha) at the beginning of the heading. Shoots were collected at different growth stages for N, P and K analyses.

The harvest was carried out using an experimental harvester and the various parameters of the yield components as grains yield (g/ha) and PMG (kg) were carried out according to the standards.

The results were analyzed statistically using the SPSS version 20 software. For each analysis the mean and the coefficient of variation (CV) were determined. An analysis of variance (ANOVA) was conducted. The TUREY test was used for carrying out the comparisons. Differences with P < 0.05 were considered significant.

**RESULTS AND DISCUSSION**

Effects of potassium fertilization on grains yield and yield components

The average wheat grain yield obtained from the fertilized treatments was 15.06 t/ha, 19.9% higher than from the control in Hkim platform and 36.45 t/ha, 10% higher than from the control in El Gnaidli platform (Figure 4).

The intake of basal potassium fertilizer (granulated sulphate of potash) at sowing positively increased grain yield in both platforms. On the other hand, KF intake produced an increase in grain yield of 30% at El Gnaidli platform site and 11% at El Gnaidli platform site.

The statistical analysis (Table 2), has shown that the treatments which provided potassium significantly increased the grain yield and at K100 (KF) prevailed, that by fixing the objective (15 t/ha), the potassium contribution to the Kf of the stages of upward growth and heading was more advantageous than the contribution of K to the soil with, in addition, of the smaller quantities to be applied. This effect is only verified under culture conditions where water is not a limiting factor.

**CONCLUSION**

This study highlight the effects of potassium fertilizers on the yield and quality of the grains of durum wheat under two different bioclimatic stages. The addition of potassium fertilizers produced in an increase in the values of the grain yield and potassium content of the grains, in the two experiments. This contribution of K to the stages of upward growth and heading was more advantageous than the contribution of K, therefore, potassium fertilizers are recommended in the semi-arid conditions, with positive effects on the yield and quality of the grains of durum wheat. Due to the high potassium content of the grains, it is recommended to fertilize the soil with potassium fertilizers for better growth and yield of the crop.

**LEGEND**

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