Genotype By Seeding Rate Interaction in Wheat

Ana Julia Azevedo*, Sebastian Varela, Romulo Pisa Lollato and Ignacio A. Ciampitti*
Department of Agronomy, Kansas State University, Manhattan, KS
anajulia@ksu.edu

Introduction

The interaction between genotype and seeding rate can play a critical role in understanding wheat yield potential.

Objective

- Evaluate early season uniformity of plants;
- Quantify wheat yield response to seeding rates with contrasting genotype strategies.

Materials and Methods

The study was conducted at two sites in Kansas, Ashland Bottoms (dryland) and Topeka (irrigation). Soybean was the previous crop.

Table 1. Experimental factors (genotype and seeding rate) evaluated and each treatment combination is presented. Planting time was during the first two weeks of October in both sites (Ashland and Topeka, KS).

<table>
<thead>
<tr>
<th>Factors</th>
<th>Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genotype</td>
<td>Cedar Cedar Cedar Cedar 4458 4458 4458</td>
</tr>
<tr>
<td>Seeding rate (Kg/ha⁻¹)</td>
<td>45 90 135 180 45 90 135 180</td>
</tr>
</tbody>
</table>

Measurements consisted of stand count, percent of canopy coverage estimated via digital imagery, within-row gap length (missing plants), leaf area index (LAI), light interception, plant biomass and imagery collected via small-unmanned aerial vehicle systems (sUAVS).

Results

Emergence

Early growth emergence showed an expected progression, without portraying significant differences between treatments (Fig. 1).

Grain Yield at Harvest Time

- Final grain yield for Ashland (5.3 Mg ha⁻¹) was greater than Topeka (3.4 Mg ha⁻¹) site.
- Neither significant differences were reported for genotype and seeding rate nor interactions between factors at Topeka site.
- For Ashland site, smaller grain yield differences were observed for the seeding rate factor.
- Even though Ashland site presented superior yields and a clear trend between treatments, variability was also reported in this location.

Conclusions

- Topeka presented better stand of plants but lower yields when compared to Ashland site. That might be explained in part because of low temperature damage occurred at this location.
- No differences between seeding rates may be explained by the ability of wheat plants to compensate.