Potential yield effects from root lodging of corn

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Potential yield effects from root lodging of corn

Abstract
One July 10, a storm with hurricane-force winds made a swath from Sac to Guthrie and Dallas counties. About 30 minutes before the wind struck, rain fell, softening the ground where corn brace roots were becoming established. As reported in last week’s Integrated Crop Management newsletter, widespread root lodging occurred. One week later, most damaged fields had shown good recovery, with pollination progressing fairly well, but there are some considerations in fields affected by this storm.

Keywords
Entomology

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences | Entomology | Meteorology

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The following information is from a study conducted in Wisconsin where soil in corn plots was surface-saturated and then the plants were manually lodged by pushing at the base perpendicular to the row. The study focuses on effects from root lodging and does not include stalk breakage problems.

Yield losses observed were mainly due to physiological problems associated with the lodging, including the reduced ability of plants to take up moisture and nutrients because of their compromised root and vascular system, and less efficient interception of light. Also, these fields are more affected by late-season stresses than undamaged fields. Additional losses may arise from the increased incidents of some corn diseases and from increased mechanical harvest losses. A rule is that if the ear is approximately 18 inches or more off the ground at pollination, kernel set should be adequate.

The following plant responses were observed. The upper parts of plants straightened to vertical within 2 days after lodging, and lodging did not affect subsequent timing of plant development compared with nonlodged controls. Plants that were lodged at earlier vegetative stages, V10-V12, straightened more than those damaged closer to tasselling (V17-R1), which means that ears were higher at harvest when the damage occurred earlier in corn vegetative development. Hand-harvested yield losses compared with the control were V10-V12 (2-6 percent), V13-V15 (5-15 percent), and V17-R1 (13 to 31 percent) (Table 1).

Farmers should scout these wind-damaged areas closely as they mature. Harvest will be a challenge in some fields, and the development of stalk rot will increase mechanical harvest losses.

Table 1. Yield response to lodging at various corn developmental stages.

<table>
<thead>
<tr>
<th>Developmental stage when lodging occurs</th>
<th>Yield as a percentage of undamaged control</th>
</tr>
</thead>
<tbody>
<tr>
<td>V10</td>
<td>90-98</td>
</tr>
<tr>
<td>Stage</td>
<td>Percent of Dead Nymphs</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------</td>
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<tr>
<td>V12</td>
<td>88-94</td>
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<tr>
<td>V14</td>
<td>86-94</td>
</tr>
<tr>
<td>V16</td>
<td>84-93</td>
</tr>
<tr>
<td>V18</td>
<td>80-90</td>
</tr>
<tr>
<td>V20/R1</td>
<td>70-88</td>
</tr>
</tbody>
</table>

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