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Fomesafen Carryover to Corn

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Fomesafen Carryover to Corn

Abstract
ISU Extension and Outreach Field Agronomists continue to receive calls regarding fomesafen carryover injury to rotational corn. There are several factors resulting in this injury: 1) continued problems with waterhemp result in late-season applications, 2) fomesafen is relatively persistent, and 3) many areas of Iowa received less than average late-season rainfall in 2017. In most cases, this carryover injury has been limited to relatively small sprayer overlap areas, though some fields are showing injury on a more widespread area.

Disciplines
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ISU Extension and Outreach Field Agronomists continue to receive calls regarding fomesafen carryover injury to rotational corn. There are several factors resulting in this injury: 1) continued problems with waterhemp result in late-season applications, 2) fomesafen is relatively persistent, and 3) many areas of Iowa received less than average late-season rainfall in 2017. In most cases, this carryover injury has been limited to relatively small sprayer overlap areas, though some fields are showing injury on a more widespread area.

Characteristics of the primary products used postemergence to control waterhemp in Iowa are listed in Table 1. For an herbicide to pose carryover risks, it must persist at toxic concentrations into the following growing season and be biologically available. Both fomesafen and glyphosate are relatively persistent compared to the other herbicides. The $K_{OC}$ is a measure of how tightly a chemical is held to soil colloids. As the $K_{OC}$ value increases, less herbicide is available to be absorbed by plants. Whereas fomesafen can be readily absorbed by plants due to low adsorption to soil colloids, glyphosate is unavailable to plants due to tight binding to soil particles.

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Brand Name</th>
<th>Half-Life</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>fomesafen</td>
<td>Flexstar</td>
<td>100 days</td>
<td>60</td>
</tr>
<tr>
<td>lactofen</td>
<td>Cobra</td>
<td>3 days</td>
<td>10,000</td>
</tr>
<tr>
<td>glufosinate</td>
<td>Liberty</td>
<td>7 days</td>
<td>100</td>
</tr>
<tr>
<td>dicamba</td>
<td>Xtendimax</td>
<td>14 days</td>
<td>2</td>
</tr>
<tr>
<td>glyphosate</td>
<td>Roundup</td>
<td>47 days</td>
<td>24,000</td>
</tr>
</tbody>
</table>

The relatively long half-life of fomesafen, combined with below average rainfall late-season rain in central Iowa, is the reason for the increased issues with carryover in 2018. Much of central Iowa received between 2-5 inches less rain than normal during July and August of 2017 (Figure 1).
The primary symptom of fomesafen injury is striped leaves due to chlorotic or necrotic veins on the leaves (Figures 2 and 3). Other factors can cause striping on leaves, but fomesafen is unique in that the veins are affected rather than interveinal tissue. Some of the leaves may fold over midway due to loss of integrity of the leaf midvein. Frequently only two or three leaves are affected and injured plants recover quickly. However, at times there can be stand loss and the only way to determine the potential impact is to determine the percentage of plants affected and closely monitor the rate of recovery.
Figure 2. Veinal chlorosis typical of fomesafen carryover on corn
Rather than focusing on the problem of corn injury due to fomesafen, I think it is more important to consider why late-season applications of postemergence herbicides are required. An integrated program relying on full rates of effective preemergence herbicides and early postemergence applications, along with an increased emphasis on driving down the size of the weed seed bank, should minimize the need for the late-season applications.

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Category:  Weeds

Crop:  Corn

Tags:  fomesafen  carryover  herbicide injury  herbicide persistence

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