Herbicide Injury To Corn – Reports Increase

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Observations and inquiries concerning corn injury from herbicides increased during the past week. Instances of injury seem to be found across Illinois rather than localized to a particular area. The two most common causes appear related to direct application of postemergence herbicides and persistence of herbicides applied last season.

Injury following application of postemergence corn herbicides is not uncommon. Many such herbicides routinely cause some level of corn injury, but some producers feel the injury so far in 2012 is more than usual. Several factors can influence the sensitivity of corn to injury from postemergence herbicides, including these:

Hybrid: Hybrids can vary in their sensitivity to herbicides labeled for use in corn. For example, certain corn hybrids are more sensitive to specific ALS-inhibiting herbicides and are prone to exhibit a great deal of injury following application. The labels of some corn herbicides (especially postemergence corn herbicides) have precautionary statements about the potential for certain hybrids to be more sensitive than others to the particular active ingredient.

Environmental conditions: High air temperatures and relative humidity levels favor rapid absorption of foliar-applied herbicides, and environment-induced crop stress can enhance injury from herbicides. Cool air temperatures and wet soil are examples of environmental conditions that can induce crop stress. Crops under stress often cannot metabolize herbicide rapidly enough to preclude injury symptoms.

Spray additives: Spray additives applied with a postemergence herbicide or tank-mix combination may enhance crop response by increasing the rate of herbicide absorption into the plant. Be sure to read all label suggestions and precautions related to spray additives that should be either included or avoided when applying herbicides postemergence.

Contamination: Herbicide residues from prior applications are sometimes inadvertently applied with a postemergence corn herbicide. These residues may be soybean herbicides or other corn herbicides that, either alone or in combination with the postemergence corn herbicide, enhance the amount of corn injury. Severity of corn response to spray contamination depends on numerous factors, including the specific contaminating herbicide and the dose at which it is applied.

Soil residues of herbicides applied during the previous growing season (i.e., carryover) appear to be another source of corn injury. Herbicide persistence in the soil is influenced by many factors, including the specific chemistry of the herbicide and a myriad of edaphic factors. Two predominant routes of herbicide degradation in soil are chemical and microbial.

Soil pH is a critical factor affecting the persistence and degradation of many herbicides, including sulfonylurea and triazine herbicides. The rate of chemical degradation through the process known as hydrolysis is influenced by soil pH. High pH (7.0 and above) may slow the dissipation of certain herbicides by reducing the rate of hydrolysis. Even under conditions of adequate soil moisture, degradation of some triazine and sulfonylurea herbicides in high-pH soil can be reduced enough to result in carryover.

Soil moisture is often the most critical factor governing the efficacy and persistence of soil-residual herbicides. Many herbicides are degraded in soil by the activity of soil microorganisms, whose populations can be greatly depressed when moisture is limited. Dry soils also can enhance herbicide adsorption to soil colloids, rendering the herbicide unavailable for plant uptake and degradation by soil microbes.

Corn leaf striping from fomesafen carryover.

The very dry soil conditions during some of the 2011 growing season likely slowed the degradation of some soil-residual herbicides, particularly those degraded by soil microorganisms. Dry soil conditions early in 2012 allowed for unusually early corn planting, which in some instances occurred before the rotational interval of the herbicide used in 2011 had expired.

Several reports have described corn injury symptoms characteristic of those caused by fomesafen carryover. Its most common symptom is veinal chlorosis or necrosis, which results in a striping effect on the leaves. In some instances the veins almost appear clear or transparent. The roots of affected plants usually show no symptoms, unless the foliar symptoms are extremely severe.

Fomesafen has the longest soil residual activity of the three postemergence diphenylether herbicides (the others being acifluorfen [Ultra Blazer] and lactofen [Cobra]). Soil half-life values (the time required for half of the applied herbicide to degrade) for fomesafen have been reported to be from 100 days to 6 to 12 months. The range depends on several factors, including soil type and soil moisture. For example, the soil half-life of fomesafen under anerobic conditions (flooded soil) is only 3 weeks, but persistence is extended as soil moisture becomes more limited. Because of the soil persistence of fomesafen and the sensitivity of corn to fomesafen residues, the labels of most fomesafen-containing products, including Flexstar, Flextar GT, and Prefix, indicate a 10-month rotational interval for corn. Δ

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