Best Management Practices for Colorado Corn

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Plant injury symptoms often indicate the chemical that caused the problem.

- Leaf twisting or curling, yellowing or whitening of leaves
- Plant tissue browning or burning
- Stunted root or shoot growth
- Root or shoot malformation, stalk brittleness, leaf crinkling

Herbicide injury checklist:

- Document corn injury symptoms and patterns.
- Contact the applicator or chemical representative.
- Photograph injury symptoms.
- Check growing points to determine plant recovery potential.
- Count damaged plants to determine the extent of injury.
- Map areas of the field damaged.
- Keep records of crop yield losses.

Herbicide Injury

Even when herbicides are applied according the label, injury can occur. Many times injury results from:

- herbicide carry-over from previous crop applications,
- drift from nearby applications, and/or
- improper application of labeled chemicals.

Identifying herbicide injury

Herbicide injury symptoms can be confused with nutrient deficiencies or toxicities, waterlogged soils, mechanical damage, cultural damage, frost or wind damage, or other pest damage. Hybrids may vary in their response to herbicides.

Look for patterns in the field associated with soil types and with overspray at field borders or overlap patterns from application equipment. Crop advisers, commercial applicators and other experts can help farmers determine why the injury happened. Operator error (high rates, wrong chemical and overlaps) can be the cause, but the interaction of temperature, crop vigor, moisture and soil type often combine to cause injury, even when the chemical is properly applied. Many times, the corn plant will recover when growing conditions become more favorable.

BMP

Use band and spot applications of pesticides where appropriate to reduce environmental hazards and treatment costs.

Avoid overspray and drift, especially when surface water is in close proximity to treated fields.

Establish buffer zones a safe distance (minimum of 50 to 100 feet recommended) from wells and surface water, where pesticide is not applied.

Herbicide injury symptoms and causes by mode of action and chemical family

Growth regulators

Phenoxy acids

Example: 2,4-D

Injury Symptoms

- Rolled leaves
- Fused brace roots
- Stalk bending & brittleness
- Missing kernels

Injury Cause

- Applied to rapidly growing corn
- Applied too late

2,4-D injury

Photos U. of MN

Benzoic acids

Example: dicamba (Banvel)

Injury Symptoms

- Similar to 2,4-D

Injury Cause

- Same as 2,4-D
- Variable hybrid sensitivity

dicamba injury

Amino acid synthesis inhibitors

Imidazolines

Example: imazethapyr (Pursuit)

Injury Symptoms

- Stunted
- Emerging leaves trapped, and yellow to translucent
- Root pruning

Injury Cause

- Drift, carryover
- Misapplied to non-tolerant corn

Amino Acid Derivatives

Example: glyphosate (Roundup)

Injury Symptoms

- Yellow, then brown foliage
- Growing point necrosis, then plant dies

Injury Cause

- Misapplied to non-tolerant corn

glyphosate injury

Photos P. Westra

Phosphoric acids

Example: glufosinate (Liberty)

Injury Symptoms

- Pale, yellow, or purplish leaves
- Water soaked lesions

Injury Cause

- Applied too late
- Misapplied to non-tolerant corn

glufosinate injury

Photo P. Westra

imidazoline injury

Photo U. of MN

Herbicide Injury

primsulfuron injury

Photo M. van Gessel

sethoxydim injury

Photo U. of MN

trifluralin injury

Photo U. of MN

Amino acid synthesis inhibitors, continued

Sulfonylureas

Example: primsulfuron (Beacon)

Injury Symptoms

- Stunted, yellow to translucent leaves

Injury Cause

- Variable hybrid sensitivity

Lipid synthesis inhibitors

Cyclohexanediones

Example: sethoxydim (Poast)

Injury Symptoms

- Chlorotic to necrotic new leaf tissue

Injury Cause

- Misapplication

Seedling growth inhibitors

Dinitroanilines

Example: trifluralin (Treflan), pendimethalin (Prowl)

Injury Symptoms

- Stunted plants
- Roots are short and thickened

Injury Cause

- Carryover, misapplication, over-application

Acetanilides

Example: alachlor (Lasso), metalochlor (Dual), propachlor (Ramrod)

Injury Symptoms

- Poor emergence
- Stunting
- Leaf-out before emergence
- Leaf entrapment

Injury Cause

- Over-application

Thiocarbamates

Example: EPTC (eradicane), butylate (Sutan+)

Injury Symptoms

- Leaf entrapment, buggy whipping, stunting

Injury Cause

- Cool, wet soils
- Over-application

BMP

Read all label instructions prior to chemical mixing.

Herbicide Injury

Photosynthetic inhibitors

Triazines

Example: atrazine, simazine (Princep)

Injury Symptoms

- Yellow and brown leaf tissue

Injury Cause

- Cool, wet soils
- Crop oil synergy

Nitriles

Example: bromoxynil (Buctril)

Injury Symptoms

- Yellow or spotted leaf tissue

Injury Cause

- Crop oil synergy

Chlorophyll inhibitor

Ioxazole

Example: isoxaflutole (Balance)

Injury Symptoms

- Whitened tissue, poor emergence, stunting

Injury Cause

- Over-application on cool, wet or sandy soils

Cell membrane disrupter

Bipyridyliums

Example: paraquat (Gramoxone)

Injury Symptoms

- Limp, water soaked lesions, spotting

Injury Cause

- Drift

isoxaflutole injury

Photo A. Hagar, U. of IL

thiocarbamate injury

Photo M. van Gessel

bromoxynil injury

Photo M. van Gessel

paraquat injury

Photo W.M. Brown