

HERBICIDE INJURY — PLANT GROWTH REGULATORS AND PIGMENT INHIBITORS



1. Onion Leafing in Corn



2. Elbowing, Lodging,
& Stalk Breakage in Corn



3. Corn Brace Root
Injury



4. Missing Corn Kernels



5. Improper Corn Root Development



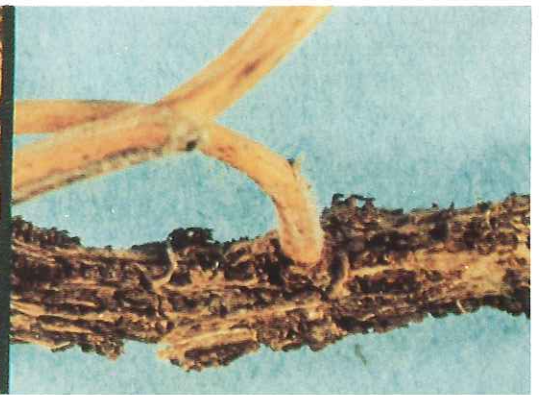
6. Soybean Leaf Puckering and Cupping



7. Soybean Leaf Puckering
/Distorted Growth



8. Soybean Stem Callus



9. Chlorotic/White Corn



10. Chlorotic/White Small Grains



11. Off-Target Bleaching

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PLANT GROWTH REGULATORS (Growth hormones).

The growth regulator type herbicides include the benzoic acids: chloramben (Amiben) and dicamba (Banvel and a component of Marksman); the phenoxy acetic acids which include 2,4-D, 2,4-DB (Butyrac and Butoxone), and MCPA; and the pyridines: picloram (Tordon) triclopyr (Garlon and a component of Crossbow), clopyralid (Lontrel), and fluroxypyr (Starane). All of these compounds are systemic. The plant growth regulator herbicides mimic different growth regulating compounds in the plant and may cause a variety of growth abnormalities in susceptible species. The injury symptoms generally are first seen in the newest leaves. Some injury symptoms may resemble those caused by meristematic inhibitor compounds.

1. **Onion Leafing in Corn.** 2,4-D applied postemergence may injure corn. Symptoms can include onion leafing, elbowing, and malformed brace roots. Certain corn hybrids are more sensitive to 2,4-D than others. Corn may occasionally be injured by applications of dicamba, however, the risk of injury may be less than with 2,4-D. Injury symptoms of dicamba are similar to those caused by 2,4-D.

2. **Elbowing, Lodging, and Stalk Breakage in Corn.** Corn stalks may become brittle for one or two weeks following 2,4-D application, increasing the risk of stalk breakage by wind or cultivation equipment. Excessive rates of 2,4-D, may result in "elbowing" or lodging of corn stalks, particularly when sensitive hybrids are grown. Elbowing and lodging symptoms in corn may look similar to damage caused by corn rootworm larvae. Avoid applying 2,4-D or dicamba to corn which is under stress from adverse weather conditions.

3. **Corn Brace Root Injury.** Excessive rates of 2,4-D or dicamba may cause malformation of corn brace roots, resulting in proliferation of roots, fusing or fasciation of roots, and roots growing upward rather than downward.

4. **Missing Corn Kernels.** Postemergence applications of 2,4-D and dicamba during the period from tassel to dough stage may result in lack of kernel set or ear development.

5. **Improper Corn Root Development.** The primary root system in seedling corn may appear proliferated and stubby where excessive rates of dicamba applied preemergence or a misapplication of chloramben contacts the germinating seed.

6. **Soybean Leaf Puckering and Cupping.** Dicamba applications to corn, small grains, or noncropland may drift and injure nearby soybeans and other desirable vegetation. Cupped and puckered leaves and abnormal bud development are symptoms of dicamba injury. Dicamba and 2,4-D drift injury look similar.

7. **Soybean Leaf Puckering/Distorted Growth.** 2,4-D applied postemergence to corn may drift and injure nearby soybeans and other desirable plants. Symptoms of injury include puckering of leaves, parallel venation or leaf strap-ping, distortion of stems, callus growth, and lodging. 2,4-DB applied postemergence over the top to soybeans can cause similar symptoms.

8. **Soybean Stem Callus.** Early season injury to soybeans from 2,4-D or 2,4-DB may cause abnormal growth near the soil surface which can result in soybean lodging.

PIGMENT INHIBITORS. The pigment inhibitors include clomazone (Command and a component of Commence) and amitrole. These herbicides inhibit the production of photosynthetic pigments in the plant. The pigment inhibitors are soil active, with intermediate to long soil persistence. Clomazone is registered for use in soybeans and may injure corn, small grains, forage legumes, and ornamentals through misapplication, drift, or carryover.

9. **Chlorotic/White Corn.** Corn injury from clomazone can occur through misapplication, drift, or carryover. Shortly after emergence, the corn may appear chlorotic, then bleached or white. The likelihood of corn recovering from clomazone injury is good as long as a portion of the plant remains green. Various inbreds and hybrids may respond differently to clomazone residues.

10. **Chlorotic/White Small Grains.** Small grains such as wheat and oats are very sensitive to clomazone residues. Plants appear chlorotic or bleached (white).

11. **Off-Target Bleaching.** Preemergence applications of clomazone may move off-target by particle or vapor drift. Sensitive ornamentals may appear chlorotic or white. Unless injury is severe, plants generally recover from clomazone injury due to movement outside the target area.