HERBICIDE DAMAGE SYMPTOMS GUIDE

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Introduction

This guide shows some of the more typical damage symptoms seen in Australian cotton from exposure to a range of herbicides. Images were obtained from experiments where known rates of herbicide were applied to irrigated cotton at specific growth stages. The symptoms of herbicide damage displayed by cotton plants are affected by the type of herbicide, the herbicide rate, the crop growth stage, and environmental factors such as soil moisture, temperature and humidity. Under different conditions, crops may not display the symptoms of damage indicated in these photos.

Herbicide Damage Symptoms

Phenoxy Herbicides

A range of herbicides, collectively known as the phenoxy herbicides and synthetic auxins, affect the plant in a manner similar to endogenous auxin (IAA), a natural plant growth hormone. At low rates they can distort plant growth. At higher concentrations they affect cell walls and nucleic acid metabolism and inhibit cell division and growth, leading to plant death. They are effective in controlling a wide range of broad-leaf weeds, but can be very damaging to cotton, even at very low rates.

2,4-D – (symptoms from plants exposed to 8 g a.i./ha at 12 nodes)

Group I – Synthetic Auxin

15 days after exposure

28 days after exposure

Clopyralid – (symptoms from plants exposed to 45 g a.i./ha at 12 nodes)

Group I – Synthetic Auxin

14 days after exposure

20 days after exposure

Dicamba – (symptoms from plants exposed to 28 g a.i./ha at 11 nodes) Group I – Synthetic Auxin

6 days after exposure

28 days after exposure

Fluroxypyr – (symptoms from plants exposed to 36 g a.i./ha at 11 nodes) Group I – Synthetic Auxin

6 days after exposure

28 days after exposure

MCPA – (symptoms from plants exposed to 105 g a.i./ha at 11 nodes) Group I – Synthetic Auxin

6 days after exposure

28 days after exposure

2,4-D plus picloram – (plants exposed to 30 + 7.5 g a.i./ha at 8 nodes) Group I – Synthetic Auxin

7 days after exposure

28 days after exposure

Glyphosate & 2,4-D – (plants exposed to 35 + 8 g a.i./ha at 12 nodes) Groups M & I – Syn Auxin

15 days after exposure

28 days after exposure

MCPA plus picloram – (plants exposed to 42 + 2.6 g a.i./ha at 8 nodes) Group I – Synthetic Auxin

9 days after exposure

28 days after exposure

Triclopyr plus picloram – (plants exposed to 15 + 0.5 g a.i./ha at 8 nodes) Group Is – Syn Auxin

7 days after exposure

37 days after exposure

Other Herbicides - Bleachers

A wide range of herbicides other than the phenoxys are commonly used in agriculture and can cause mild to severe damage to cotton. Damaged plants can display a wide range of symptoms, but as with the phenoxys, some symptoms may be fairly general, over a number of herbicides. An example is the Group C herbicides, which disrupt photosynthesis and at lower rates cause leaf bleaching. At higher rates, they can cause necrosis and leaf death.

Atrazine – (symptoms from plants exposed to 200 g a.i./ha at 8 nodes) Group C - Bleacher

15 days after exposure

28 days after exposure

Bromoxynil – (symptoms from plants exposed to 30 g a.i./ha at 11 nodes) Group C - Bleacher

6 days after exposure

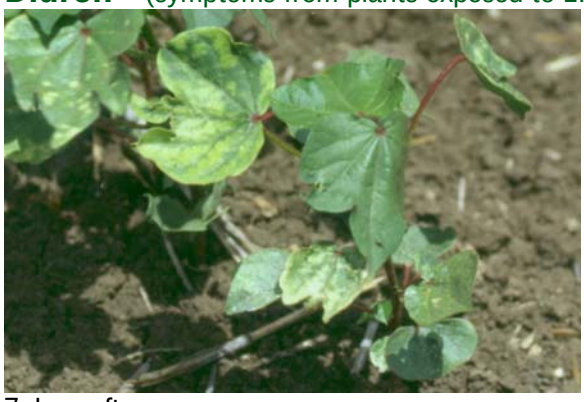
16 days after exposure

Cyanazine – (symptoms from plants exposed to 1.3 kg a.i./ha at 5 nodes) Group C - Bleacher

7 days after exposure

7 days after exposure

Diuron – (symptoms from plants exposed to 1.8 kg a.i./ha at 5 nodes) Group C - Bleacher



7 days after exposure

7 days after exposure

Fluometuron – (symptoms from plants exposed to 1 kg a.i./ha pre-planting) Group C - Bleacher

Prometryn – (plants exposed to 2.3 kg a.i./ha at 5 nodes and 15 nodes) Group C - Bleacher

7 days after exposure

Simazine – (symptoms from plants exposed to 1.5 kg a.i./ha at 8 nodes) Group C - Bleacher

15 days after exposure

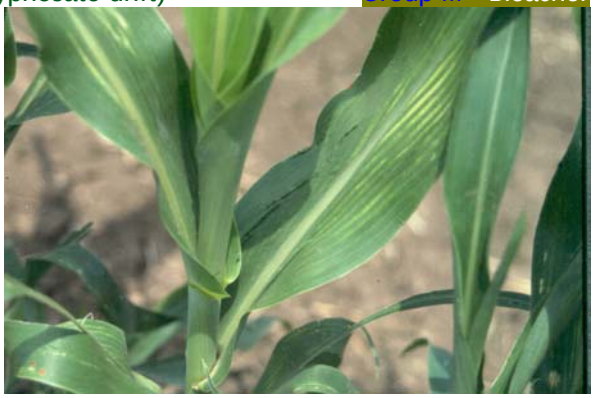
28 days after exposure

Isoxaflutole – (symptoms from plants exposed to 37.5 g a.i./ha at 9 nodes) Group F - Bleacher

7 days after exposure

23 days after exposure

Glyphosate – (symptoms from plants exposed to glyphosate drift) Group M - Bleacher



Glyphosate – (plants exposed to 35 g a.i./ha at 12 nodes) Group M - Minimal symptoms

6 days after exposure

28 days after exposure

Other Herbicides - yellowers

The Group B herbicides disrupt amino acid synthesis, affecting protein biosynthesis. Many of the Group B herbicides are effective at very low rates for the control of broadleaf and some grass weeds and are often used post-emergence in cereal crops. They can have a long plant-back to cotton, especially on alkaline soils. The symptoms of Group B damage can include bright yellowing of the growing tips.

Chlorsulfuron – (symptoms from plants exposed to 7.5 g a.i./ha at 4 nodes) Group B - Yellower

19 days after exposure

25 days after exposure

Iodosulfuron-methyl sodium plus mefenpyr diethyl

(symptoms from plants exposed to 5 + 15 g a.i./ha at 12 nodes) Group B - Yellower

14 days after exposure

28 days after exposure

Imazapic – (symptoms from plants exposed to 24 g a.i./ha at 4 nodes) Group B - Yellower

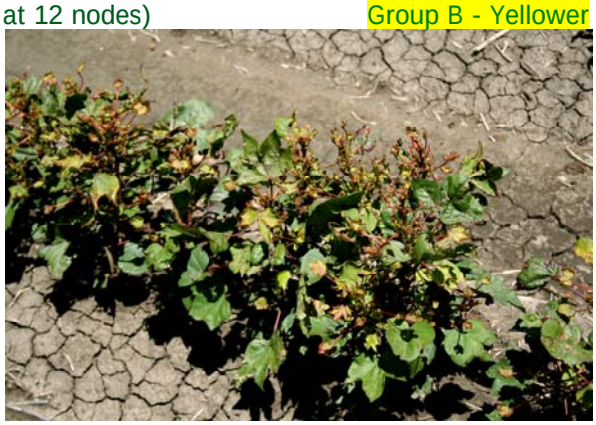
14 days after exposure

27 days after exposure

Imazamox plus imazapyr

(symptoms from plants exposed to 12.4 + 5.6 g a.i./ha at 12 nodes) Group B - Yellower

14 days after exposure

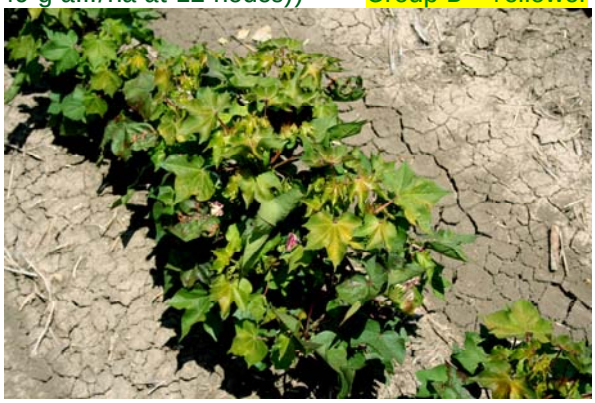


33 days after exposure

Imazapyr – (symptoms from seedlings exposed to soil residues) Group B - Yellower

Imazethapyr – (symptoms from plants exposed to 49 g a.i./ha at 12 nodes)) Group B - Yellower

14 days after exposure



20 days after exposure

Metsulfuron – (symptoms from plants exposed to 2.1 g a.i./ha at 4 nodes) Group B - Yellower

14 days after exposure

27 days after exposure

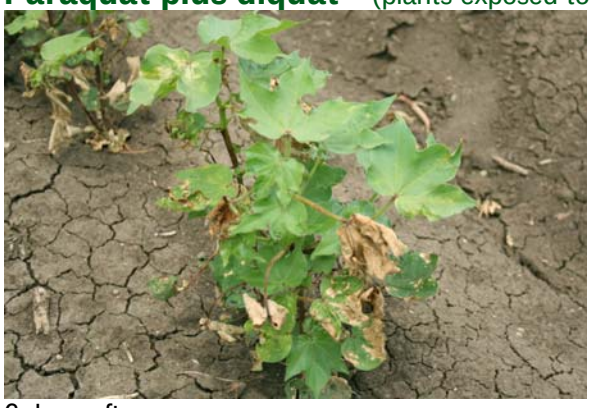
Other Herbicides that may Damage Cotton

Glufosinate – (symptoms from plants exposed to 75 g a.i./ha at 11 nodes) Group N - Desiccant

6 days after exposure

16 days after exposure

Paraquat plus diquat – (plants exposed to 43 + 37 g a.i./ha at 11 nodes) Group L - Desiccants



6 days after exposure

16 days after exposure