

## Herbicide damage guide for cotton

Photographs & material by:

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**Herbicide:** **triclopyr + picloram**  
**Rate:** **75 g + 25 g a.i./ha**  
**% of typical field rate** **50%**  
**Date of exposure:** **25<sup>th</sup> Nov**  
**(5 weeks post-emergence)**  
**Growth stage at exposure:** **5 nodes**

| <u>Damage key:</u>        |          |
|---------------------------|----------|
| <b>Leaf loss</b>          |          |
| <b>Leaf distortion</b>    | <b>x</b> |
| <b>Petiole distortion</b> | <b>x</b> |
| <b>Plant stunting</b>     | <b>x</b> |
| <b>Square shedding</b>    |          |
| <b>Boll shedding</b>      | <b>x</b> |

### Herbicidal action

**Herbicide group:** I

#### **triclopyr**

**Translocation:** readily moves to the plant growth points  
**Mode of action:** an auxin-type (phenoxy) herbicide that affects cell wall plasticity & nucleic acid metabolism. Low concentrations cause uncontrolled cell division & growth, leading to plant death.

**Residual activity:** some activity. Translocated to the growing points following root absorption  
**Soil half-life:** around 30 days

#### **picloram**

**Translocation:** readily absorbed by roots and foliage and moves to the growing points  
**Mode of action:** an auxin-type herbicide  
**Residual activity:** strong residual activity and readily absorbed by plant roots  
**Soil half-life:** 90 days, but can be up to 200 days. Breakdown is slower in dry, cool conditions.



Grazon DS (triclopyr + picloram) applied broadcast at 250 ml/ha to 5 node cotton. Photo taken on 1<sup>st</sup> Dec, 6 days after exposure.

Symptoms of Grazon damage were obvious within 6 days of exposure. Stems and leaf petioles were very red and were beginning to distort.



Grazon DS (triclopyr + picloram) applied broadcast at 250 ml/ha to 5 node cotton. Photo taken on 17<sup>th</sup> Dec, 22 days after exposure.

Plants were stunted and highly distorted 22 days after exposure. Some new leaves had emerged, but these were small and distorted, blistered, cupped and yellowish, with some orange to red discoloration on the margins.



Grazon DS (triclopyr + picloram) applied broadcast at 250 ml/ha to 5 node cotton. Photo taken on 14<sup>th</sup> Jan, 50 days after exposure.

Plants had resumed growth by 36 days after exposure, but new leaves were distorted, roundish in shape and leathery in appearance, with prominent veins.

Distorted growth is readily apparent in this photo taken 50 days after exposure and was still apparent up to 60 days after exposure.

### Impact on plant growth

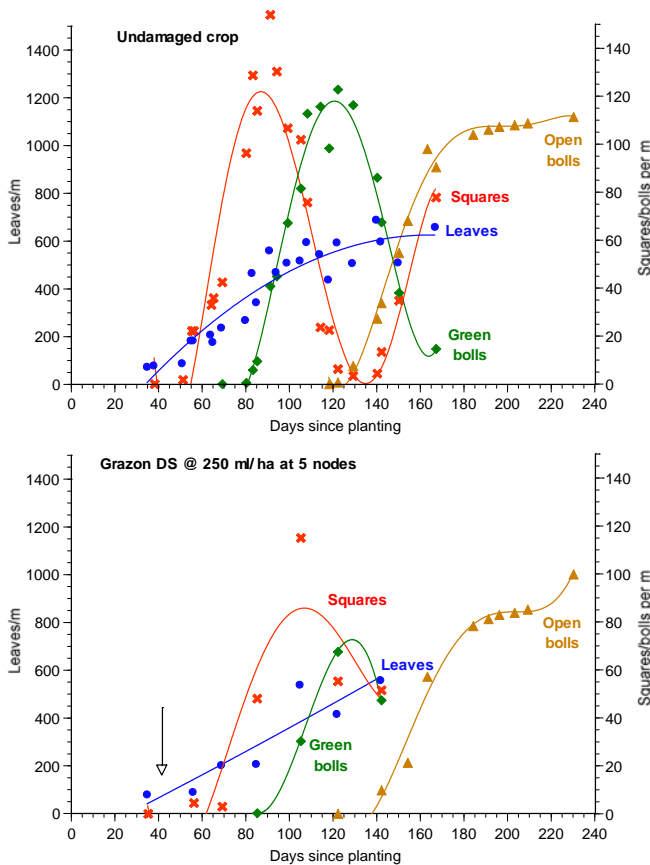
**Plants:** exposure to triclopyr + picloram at 5 nodes caused extensive damage. 50% of plants were tipped-out. Plants were initially stunted and were still 22 cm shorter and 26% lighter at picking.

**Leaves:** new leaves were distorted following exposure. Plants had 7% fewer leaves and 13% less leaf area at the last observation.

**Squares:** square production was delayed by about 15 days, and peak square production by around 10 days. Peak square production was down by 25%.

**Bolls:** there was a 20 days delay in the start of boll production, a 45% reduction in peak boll production and a 17% reduction in the final boll load. A proportion of mid-season bolls were shed, with bolls retained higher up the plant. These bolls were smaller, reducing average boll weight by 9% and there was a 7 days delay in crop maturity.

**Lint:** ginning turnout and fibre quality were unaffected by the herbicide damage, but lint yield was reduced by 31%.



| Final plant count data               |                |                      |
|--------------------------------------|----------------|----------------------|
|                                      | undamaged crop | triclopyr + picloram |
| <b>Nodes/plant</b>                   | 30.9           | 31.1                 |
| <b>Leaves/m*</b>                     | 595            | 556                  |
| <b>Leaf area (cm<sup>2</sup>/m)*</b> | 24900          | 21717                |
| <b>Reduction in leaf area*</b>       |                | 13%                  |
| <b>Bolls/m</b>                       | 132            | 110                  |
| <b>Boll weight (g/open boll)</b>     | 5.3            | 4.8                  |
| <b>Retention in posit's 1-3^</b>     | 95%            | 91%                  |
| <b>Nodes carrying &gt;80% bolls#</b> | 7 - 18         | 7 - 21               |
| <b>Days to 50% open bolls</b>        | 157            | 164                  |
| <b>Maturity delay (days)</b>         |                | 7                    |
| <b>% Open bolls at picking</b>       | 85%            | 91%                  |
| <b>Lint yield/ha</b>                 | 2380           | 1631                 |

Exposure to 50% of a typical field rate of triclopyr + picloram residues caused extensive damage. Plants were very stunted and distorted. Leaf distortion continued for 60 days after exposure.

The damage reduced plant size, leaf area, square production, boll retention and boll size. Late bolls were retained higher up the plant and on the outer fruiting positions. There was a 7 day delay in average crop maturity. Lint yield was reduced by 31%.

Note\* These parameters were last recorded 142 days after planting.

Note^ Percentage of retained bolls in positions 1-3.

Note# The spread of nodes carrying more than 80% of open bolls.