

## 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:** **8<sup>th</sup> Dec**  
**(8 weeks post-emergence)**  
**Growth stage at exposure:** **9 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>x</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 9 node cotton. Photo taken on 17<sup>th</sup> Dec, 9 days after exposure.

Symptoms of Grazon damage were apparent soon after exposure. Stems and leaf petioles were red and distorted, changing the leaf orientation and giving the crop a wilted appearance 9 days after exposure.



Grazon DS (triclopyr + picloram) applied broadcast at 250 ml/ha to 9 node cotton. Photo taken on 5<sup>th</sup> Jan, 28 days after exposure.

Plants had resumed growth and appeared a more normal appearance by 28 days after exposure, but newly emerging leaves showed symptoms typical of Group I damage. New leaves were cupped and distorted, with curled edges, narrow 'fingers' and more prominent veins. Many expanded leaves were rounded in shape and leathery in appearance.



Grazon DS (triclopyr + picloram) applied broadcast at 250 ml/ha to 9 node cotton. Photo taken on 20<sup>th</sup> Jan, 43 days after exposure.

Distorted and leathery leaves were still readily apparent 43 days after exposure, but symptoms had disappeared by 60 days after exposure.

### Impact on plant growth

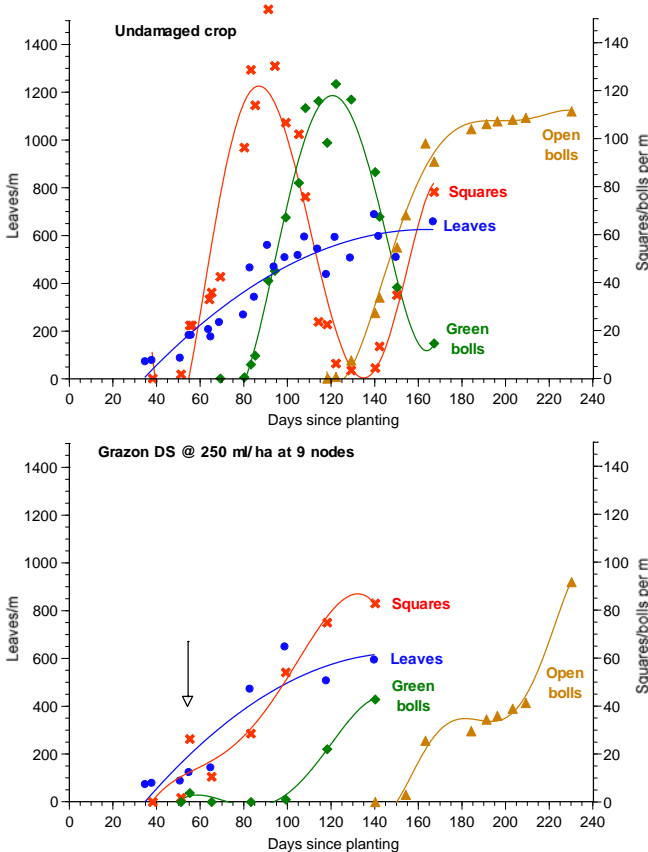
**Plants:** exposure to the 50% rate of triclopyr + picloram at 9 nodes caused petiole twisting, which was obvious within a few hours of exposure, giving the plants a wilted appearance. There was a 60% increase in the proportion of tipped-out plants. Plants were highly distorted and remained stunted for several weeks. Plants were 2.6 nodes and 18 cm shorter, and 27% smaller by weight at the last observations.

**Leaves:** plants had 14% fewer leaves but 11% more leaf area at the last observation.

**Squares:** peak square production was delayed by around 40 days and reduced by 46%.

**Bolls:** plants retained 23% fewer bolls, with fewer bolls on nodes 10 and 11, and in the first 3 positions of the other nodes. Bolls were retained to node 20, 2 nodes higher than the undamaged crop. There was a 48 day delay in crop maturity.

**Lint:** fibre quality was unaffected by the herbicide damage, but ginning turnout was reduced by 6% and lint yield by 65%.



Final plant count data		
	undamaged crop	triclopyr + picloram
<b>Nodes/plant</b>	30.9	28.3
<b>Leaves/m*</b>	687	592
<b>Leaf area (cm<sup>2</sup>/m)*</b>	23830	26509
<b>Reduction in leaf area*</b>		-
<b>Bolls/m</b>	132	101
<b>Boll weight (g/open boll)</b>	5.3	5.0
<b>Retention in posit's 1-3<sup>^</sup></b>	95%	88%
<b>Nodes carrying &gt;80% bolls<sup>#</sup></b>	7 - 18	8 - 20
<b>Days to 50% open bolls</b>	157	205
<b>Maturity delay (days)</b>		48
<b>% Open bolls at picking</b>	85%	91%
<b>Lint yield/ha</b>	2380	843

Exposure to 50% of a typical field rate of triclopyr + picloram at 9 nodes caused almost immediate petiole twisting and later caused extensive leaf damage. Plant growth and development were delayed by around 50 days, with reductions in plant height, size and leaf number.

The damage delayed square and boll initiation, reduced boll retention, delayed crop maturity, reduced ginning turnout and reduced lint yield by 65%.

Note\* These parameters were last recorded 140 days after planting.

Note<sup>^</sup> Percentage of retained bolls in positions 1-3.

Note<sup>#</sup> The spread of nodes carrying more than 80% of open bolls.