

## Herbicide damage guide for cotton

Photographs & material by:

Graham Charles  
NSW Dept. Primary Industries

**Herbicide:** atrazine  
**Rate:** 1 kg a.i./ha  
**% of typical field rate** 50%  
**Date of exposure:** 13<sup>th</sup> Jan  
(12 weeks post-emergence)  
**Growth stage at exposure:** 17 nodes

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

### Herbicidal action

**Herbicide group:** C  
**Translocation:** readily absorbed by roots and translocated to shoots, absorbed by leaves  
**Mode of action:** inhibits photosynthesis  
**Residual activity:** prolonged residual activity. Plant-back period may exceed 1-2 years depending on rate, soil moisture and temperature  
**Soil half-life:** 60 days. Breakdown is slower in dry, alkaline soils and cold conditions.



Gesaprim® granules 900 WG (atrazine) applied broadcast at 1.1 kg/ha to 17 node cotton. Photo taken on 20<sup>th</sup> Jan, 7 days after exposure.

Mild symptoms of atrazine damage were becoming apparent on many of the expanded leaves 7 days after exposure. Damaged leaves had a mottled appearance, with patches of inter-veinal yellowing between green veins.



Gesaprim® granules 900 WG (atrazine) applied broadcast at 1.1 kg/ha to 17 node cotton. Photo taken on 5<sup>th</sup> Feb, 23 days after exposure.

Symptoms of atrazine damage were readily apparent on some of the outer leaves 23 days after exposure. Damaged leaves had a mottled appearance, with patches of inter-veinal yellowing between green veins. Necrotic patches were apparent on some leaves.



Gesaprim® granules 900 WG (atrazine) applied broadcast at 1.1 kg/ha to 17 node cotton. Photo taken on 10<sup>th</sup> Feb, 28 days after exposure.

Symptoms of atrazine damage remain apparent on some of the outer leaves 28 days after exposure, with patches of inter-veinal yellowing and necrotic patches on many leaves.



Gesaprim® granules 900 WG (atrazine) applied broadcast at 1.1 kg/ha to 17 node cotton. Photo taken on 11<sup>th</sup> Mar, 57 days after exposure.

Symptoms of atrazine damage were still readily apparent on many of the lower leaves of these plants 57 days after exposure.

### Impact on plant growth

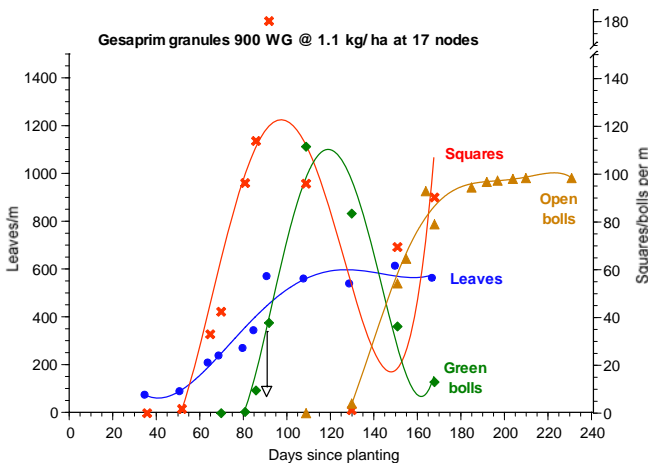
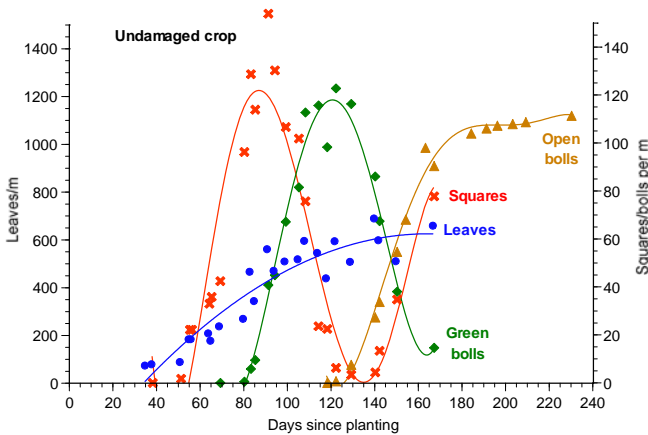
**Plants:** exposed to the 50% rate of atrazine at 17 nodes were 1.9 nodes and 10 cm shorter and 11% lighter than undamaged plants at picking.

**Leaves:** the herbicide caused leaf damage to many of the outer leaves, with inter-veinal yellowing and necrotic patches. The plants had 15% fewer leaves and 18% less leaf area at the last observation.

**Squares:** there was no apparent effect on square production.

**Bolls:** the herbicide damage affected boll retention, with a higher proportion of bolls retained on the lower nodes. The final boll load was reduced by only 5%, but the average weight of open bolls was down by 9% and there were 13% fewer mature bolls open at picking.

**Lint:** ginning turnout and lint quality were unaffected by the herbicide damage, but lint yield was reduced by 16%.



<b>Final plant count data</b>		
	<b>undamaged</b>	<b>atrazine</b>
<b>Nodes/plant</b>	30.9	29.0
<b>Leaves/m*</b>	657	560
<b>Leaf area (cm<sup>2</sup>/m)*</b>	21196	17466
<b>Reduction in leaf area*</b>		18%
<b>Bolls/m</b>	132	125
<b>Boll weight (g/open boll)</b>	5.3	4.8
<b>Retention in posit's 1-3<sup>^</sup></b>	95%	94%
<b>Nodes carrying &gt;80% bolls<sup>#</sup></b>	7 - 18	7 - 16
<b>Days to 50% open bolls</b>	157	150
<b>Maturity delay (days)</b>		-
<b>% Open bolls at picking</b>	85%	74%
<b>Lint yield/ha</b>	2380	1999

Exposure to 50% of a field rate of atrazine at 17 nodes caused damage to many of the outer leaves. Plant height, weight and node number, leaf number and leaf area were all reduced.

Square and boll production were less impacted, with no delay in crop maturity or reduction in lint quality. However, some later bolls were shed, with fewer bolls were open at picking and lint yield was down by 16%.

Note\* These parameters were last recorded 167 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.