

# Understanding hormone damage

By Peter Birch, B&W Rural, Moree

Over the past 30 years of cotton growing in the Moree district there have been many cases of hormone sprays damaging cotton. In the early years of the cotton industry, 2,4-D Ester was widely used in the cropping areas as a very effective herbicide — particularly against weeds such as melons.

The issues with volatility are now well recognised and the use of 2,4-D Ester has dropped to almost nil in the cotton growing areas over summer. The use of alternate chemistries and increased awareness has seen damage levels reduced substantially in recent years.

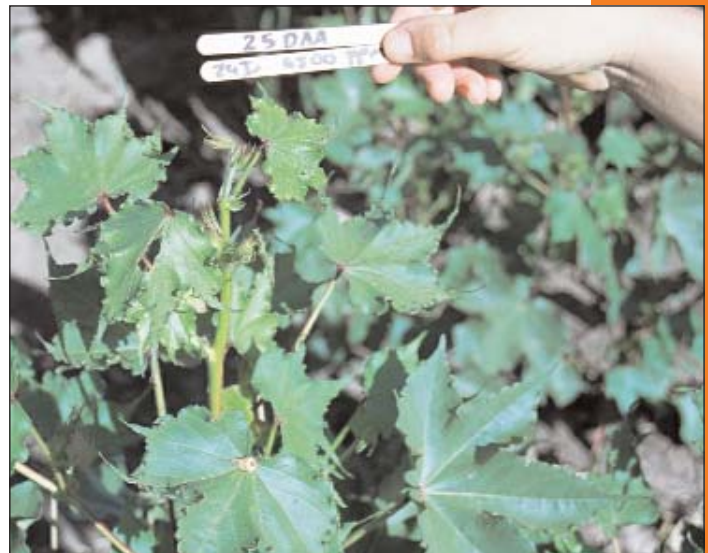
In 2004, hormone damage again reached disastrous levels in many areas of the Gwydir Valley. There were several reasons for this increase in damage.

- Due to publicity about the drought, there was a feeling among many broadacre growers that there was no cotton in their vicinity. They overlooked the fact that most irrigators still planted some cotton, even though it may only have been 10 or 20 per cent of their normal area and the geographic spread of cotton crops was not greatly different to that of a normal year.
- The effects of the drought, which had squeezed everyone financially, forced people to try and use cheaper options for summer weed control. This included many cotton growers.
- There is a widespread misconception about products containing the 2,4-D IPA salt (amine). Firstly, it is still not widely known that some of the trade names are herbicides which contain 2,4-D, and secondly there is a misconception that because these products are not volatile they do not represent as great a risk.

## At a glance...

- It is most likely that the vast majority of damage occurring to cotton plants is caused by physical drift and not volatility.
  - The amount of damage caused by 2,4-D formulations is many times greater at low levels of drift than that caused by other hormone type chemicals typically used in fallow weed control in the cotton areas.
  - The range of chemistry that now exists should allow farmers and agronomists to choose weed control options in various circumstances without needing to use 2,4-D formulations during the cotton season.
  - An education process outlining the factors affecting drift needs to continue among cotton growers, broadacre farmers and spraying contractors.
  - To highlight the urgency of the situation it has been suggested that cotton growers adopt a voluntary ban on the use of 2,4-D formulations from early September until April 1.
  - Much of the spraying particularly in the period before Christmas, was done in less than optimal environmental conditions.
- B&W Rural saw a need to better understand the effect of the various common hormone chemicals on cotton plants. So a trial was carried out on an area of dryland cotton that had emerged (after the January flood) after the original crop had been abandoned. The area had

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The effect of 2,4-D at 4500 ppm: Thirteen days after application (left) and 25 days after application (right).

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been resown to double skip sorghum but approximately one hectare of cotton emerged after the flood went through. The trial was sprayed with a backpack sprayer.

The chemicals used were Starane (fluoxypyr), Grazon (Picloram/Triclopyr), Garlon (Triclopyr), MCPA amine and 2,4-D as the IPA salt.

The trial was conducted at the full field rate of each chemical and then a series of dilutions down to parts per million for each product.

**RESULTS**

The results were as follows;

**Full field rate:** At the full field rate all treatments did extensive damage to the cotton plants. Starane (fluoxypyr) did the most damage as would be expected as this is the product of choice for controlling volunteer cotton.

**1/250 dilution:** At the 1/250 dilution the results were quite different and at this dilution there was only slight visual leaf damage from all treatments with the exception of the 2,4-D (4500 ppm) which still showed major plant damage. This damage stayed through until boll fill and was characterised by a large section of bolls missing from the plants.

**1/62,500 dilution:** There was no visible effect from any of the treatments except the 2,4-D (19.2 ppm) which still showed strong signs of leaf damage and some damage to the squares, flowers and bolls.

**1/15,625,000 dilution:** There was no visible effect from any of the treatments except the 2,4-D (0.8 ppm) which still showed some visual leaf effect.

**WHERE TO FROM HERE?**

- A more extensive irrigated trial — possibly taken through to yield — is planned for this season, assuming that a suitable trial site can be found.
- It is essential that the cotton industry makes growers throughout the area aware of where cotton crops are located. This year, in the Gwydir Valley, this is being done by the Gwydir Valley Cotton Growers Association and NSW Agriculture through a media campaign including a valley map indicating where cotton crops are located.
- An information campaign involving all resellers and agronomists is being conducted. This is focusing on awareness of the problem and the need for better information to be conveyed throughout the farming community.
- A voluntary ban on the use of products containing 2,4-D, by cotton growers, between September 1 and



The effect of 2,4-D at 19.2 ppm: Thirteen days after application (left) and 25 days after application (right).



The effect of 2,4-D at 0.077 ppm: Thirteen days after application (left) and 25 days after application (right).

April 1, is being considered by the Gwydir Valley Cotton Growers Association.

- A much better education process is needed so that farmers and contractors are better aware of which environmental conditions may cause problems. It is important to be aware that under certain environmental conditions all chemicals will drift. This is regardless of the boom set up and nozzle type even though many of the low drift nozzles certainly reduce the production of driftable droplets to a minimum. It is also important

to be aware that spraying at night is not the total answer in reducing drift. It is often harder for the operator to accurately gauge environmental conditions when spraying at night.

- Further information on spraying is available from many sources including the ACRI and NSW Agriculture.

A CD with all the photos from the trial is available from B&W Rural in Moree. Phone 0267525300. Contact Peter Birch, Sally Stevenson or Helen Mudford.