This Week
Growth Regulator Decisions
8th Jan 2010
Facts On Friday
Compiled by the CSD Extension and Development Team

Growth Regulator Decisions:

Throughout the Christmas, New Year period, most districts received encouraging rainfall events which when combined with the excellent growing conditions of the last week has promoted rapid growth into flowering and boll fill.

Mepiquat chloride is the main growth regulator used on Australian cotton crops; it is sold under other numerous brand names such as Ensign® and Reward® although in this document we refer to Pix® throughout.

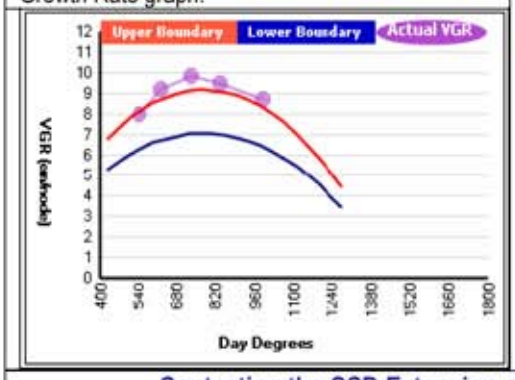
Plant Vegetative Growth Rate: Extensive research by Greg Constable (CSIRO) and James Holden (formerly NSW Agriculture) in the early 1990's showed that the best way to monitor plant vigour **under Australian growing conditions** was to use Vegetative Growth Rate (VGR) measurement technique. This involves measuring height and number of nodes for a crop on two occasions, about a week apart and determining the rate of internode increase in cm per node during that period. Generally a VGR of greater than 5.5 cm/node suggests that a Pix application should be considered.

VGR and the Crop Development Tool (CDT):
Many growers and consultants may be aware of the Crop Development Tool developed by the CSIRO and Cotton CRC decision support team. This tool not only provides information on the rate of node and fruit development as most are accustomed to but as a new inclusion also the use of Vegetative Growth Rate.

This function of the CDT plots the VGR as a function of the day degrees accumulated for the crop during the flowering period. In Figure 1, Upper and lower limit indicator lines are included to assist with the decision making on the crop. The aim is to have the crops VGR to fall between the upper and lower limit lines. Consequently VGR above the upper limit should be considered for an application of Pix and those reading below the lower limit indicate that the crop is slow growing and may need some encouragement.

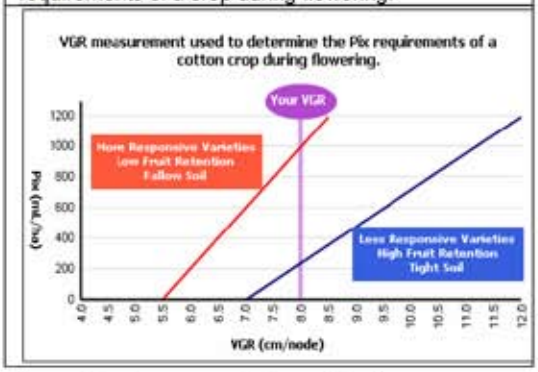
When the VGR exceeds the target line, there are many factors that need considering determining if an application of Pix is required, and what rate.

Figure 1: Crop Development Tool Vegetative Growth Rate graph.



The CDT can assist in determining an appropriate rate. Figure 2 gives an indication of the required rate of application of Pix for a crop with VGR of 8cm/ node. In this example the required rate could vary from 1000ml to 200ml depending on crop variables and circumstances. Some of these aspects are outlined below.

Figure 2: VGR measurement to determine the Pix requirements of a crop during flowering.



Fruit Status: High fruit retention can limit vegetative growth as the plant needs to allocate resources to filling young bolls, and hence less is available to produce vegetative growth. The opposite applies for crops with low retention.

Moisture Status: Pix applications combined with moisture stress can result in yield reductions. Before applying Pix, consider if there is any chance that the crop may get 'hot' or water logged within the days or week after application.

Field History: Growers and consultants will know from experience if some fields (or parts of fields) are prone to rank growth or alternatively grow poorly. This will influence sampling for VGR and may lead to differential application rates. Often fallow fields may be more prone to excessive growth than back-to-back fields.

Variety: A number of trials have been conducted to look at the response of different CSD varieties to Pix® applications. The trials have shown that varieties vary in yield responsiveness to applications of Pix®, often independent of height responsiveness.

VARIETIES TO KEEP AN EYE ON: Sicot 80/24 Family: Since the introduction of Roundup Ready Flex® varieties, many growers are trying this new technology in a variety they have had little previous experience with. Both Sicot 80BRF, Siokra 24 BRF and Sicot 80RRF are vigorous, full season varieties which should be viewed as a highly responsive to applications of Pix. Both have the tendency to rapidly grow if conditions suit. These varieties are also being trialled in skip row configurations where moisture and nutrients will be non-limiting. Careful and frequent monitoring of the VGR in these types of varieties will be required to ensure there full potential is reached.

FURTHER INFORMATION:
- **Growth Regulator Decisions for Cotton:** CSD Grower information. November 2004.
- **Australian Cotton CRC/ CSIRO Crop Development Tool. http://www.cotton.crc.org.au/CottonLOGIC/Cdt/**

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Sicot, Sicala, Siokra and Sipima cotton varieties are a result of a research program conducted by CSIRO.
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