Germinating ideas

By Craig McDonald, CSD Extension and Development Agronomist

This edition of *Germinating Ideas* will cover some of the issues relating to late season Bollgard II management and also look at the season's progress of several crops that have been monitored for development.

CROP MONITORING USING THE EARLY SEASON DIAGNOSTIC (ESD) TOOL

This season CSD has carried out extensive monitoring of selected varieties at several sites across Queensland and NSW. The monitoring details and results have all been made available on the CSD website for growers and consultants to see and compare with their own crops. Sicot 71BR has been the major variety selected at all of the sites where it was planted in the CRDC approved variety trials. Other sites have included conventional and Roundup Ready trials and also dryland sites in applicable areas.

Monitoring has been carried out using the Early Season Diagnostic tool which is available on the Cotton CRC website. This has enabled the crops to be compared to a known standard crop development chart. Actions were then taken if the crop was showing signs of deviating from the desired growth and development pattern.

Macquarie Valley consultant Campbell Muldoon discusses a crop's progress on the ESD tool with grower, Scott McCalman.

There are several different methods for monitoring crop growth including:

- Fruiting factor, which looks at the total number of fruit over the total number of fruiting branches. Fruiting factors of 1.3–1.4 at peak flowering and 1.0 at boll maturity are optimum;
- Top five retention percentage — the number of fruit retained on the top five fruiting branches — is generally used up to first flower;
- Whole plant fruit retention percentage — the number of fruit retained across the whole plant using mainly first and second position fruit; and,
- Vegetative growth rate — crop internode length growth at around first flower comparing crop height and number of nodes over at least two measurements. These measurements, combined with fruit retention numbers, varietal information and field history can help make more informed decisions about the need for plant growth regulators such as Pix.

It is possible to use one or a combination of the above systems to help manage crop growth for maximum production. Other monitoring programs can add more specific measurements — for example plant tissue testing.

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Scott Brimblecombe in the St George variety trial.

The use of the ESD tool has been taken up by many consultants and growers this season with the numbers of visits to the Cotton CRC website pages containing the tool increasing due to its easier to use format and quicker access to Day Degrees for site specific requirements.

Examples of using the ESD tool

Figures 1 and 2 are examples of the Early Season Diagnostic tool being used to monitor cotton varieties at two sites, St George and Trangie. The purple line is a normal growth pattern of squaring nodes up to flowering. The blue line shows Nodes Above White Flower (NAWF) as a standard after around 800 Day degrees right through to plant cut out at around 1,100–1,200 Day Degrees.

Observations from the field are entered onto the ESD webpage (Cotton CRC website) and then a point on the graph is plotted using local Day Degrees results (available through this website). The performance of the crop can then be compared. The green line shows the squaring node performance up to flowering and the red line plots the NAWF and continues through to plant cut out.

Mirid damaged Boll.

The three varieties monitored at the St George site generally were ahead in development. There was a slight dip in growth just prior to first flowering. This was caused by a waterlogging event following 140 mm of rain. The crop recovered quite quickly and fruit retention was not adversely affected.

The growth details in Figure 2 shows that crop growth across all monitored vari-

FIGURE 1: Growth charts for three Bollgard II/ Roundup Ready varieties at the St George variety trial

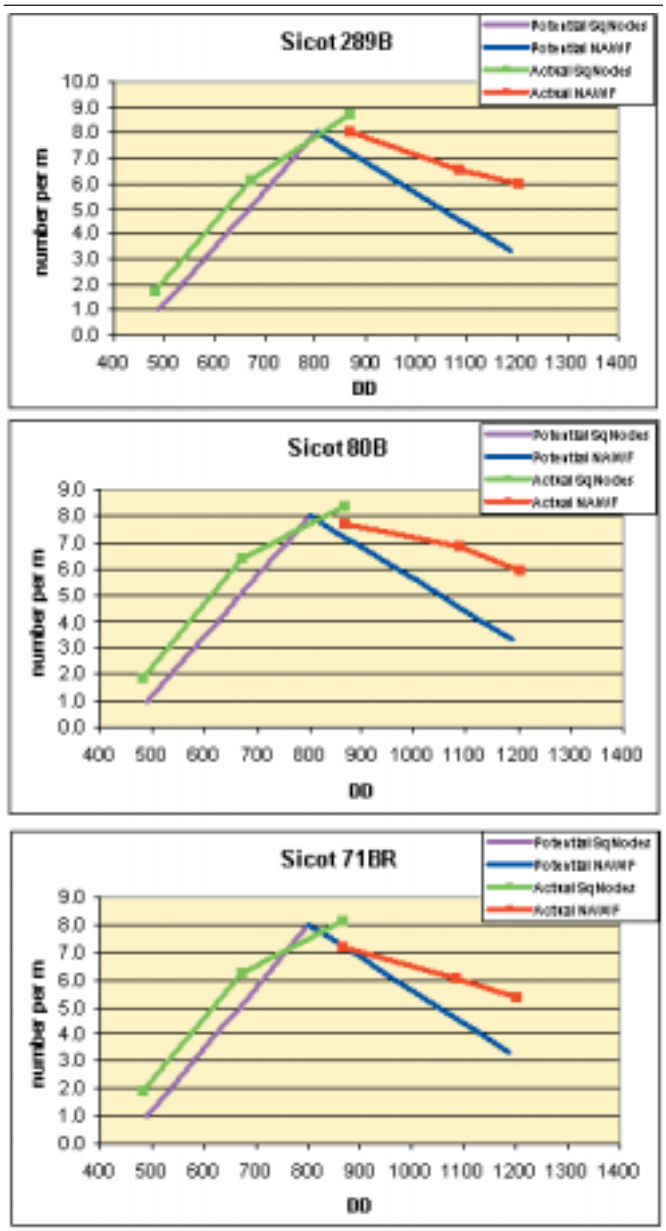


FIGURE 2: Crop growth curves for three Bollgard II/ Roundup Ready varieties at the Trangie Stack trial

eties at the Trangie site were behind the standard for much of the period up to first flower. This is despite a relatively early planting and watering up date.

A program of routine tissue sampling showed some nutrient deficiencies that may have been limiting crop growth. In response to the test results and the information from the crop monitoring, an extensive program of foliar fertiliser was carried out. These foliar applications were based on a multi nutrient spectrum but Potassium was one element concentrated on to help increase known low K levels.

The crop's progress since flowering has been ahead of the growth curve.

LATE SEASON BOLLGARD II MANAGEMENT

As the 2004-05 season begins to finish in many regions there are some key issues with Bollgard II management to help maximise returns.

Later fruit can contribute to yield

There is now an opportunity to utilise the later top crop. In the past we have been conditioned to significant late season Helicoverpa damage of later fruit. These later fruit can contribute to an increased yield and a more balanced fibre quality status. The crop's ability to produce significant top bolls will be dependent on other demands on the crop (still filling bottom bolls), seasonal conditions and availability of resources — particularly water and nutrients.

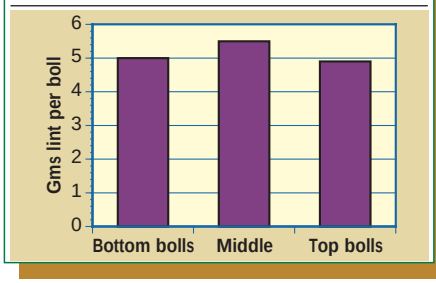
Once the last harvestable bolls have been determined, it is then possible to start a defoliation plan. Figure 3 shows the average boll weights across a Bollgard II crop in 2004 and how the top or later bolls can contribute to yield and fibre quality.

Late season pest monitoring

Insect scouting should continue well into crop maturity. Whitefly, mites and other pests can cause significant reductions in yields and fibre quality downgrades. Sucking pests such as mirids and stink bugs (green vegetable bugs and harlequin bugs) have traditionally not been a late season problem on conventional cotton as they are readily controlled with broad spectrum insecticides. These insects feed on young bolls by piercing the boll wall and sucking assimilates out of the developing cotton seeds.

Neil Mill at the Trangie site.

FIGURE 3: Boll weights in a 2004 Sicot 289BR crop



During the process they inject enzymes that break down the developing fibres and seeds. When damage occurs on bolls less than 10 days old the boll may be shed.

Older bolls will stay on the plant and they will have damaged locks that will be hard and unharvestable. Generally, bolls older than 20 days are not susceptible to damage from sucking pests. Cutting open 12–15 day old bolls and inspecting for warty growth or stained lint will show boll damage if present.