

Germinating ideas

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With the 2002–03 cotton season now upon us it is timely to look at a number of key issues facing cotton growers this year.

- Roundup Ready application windows;
- Dryland fibre quality;
- Cotton plant development in relation to day degrees; and,
- Late plant options.

ROUNDUP READY APPLICATIONS

With Roundup Ready cotton now commercially available in some varieties it is important to closely monitor fields to accurately plan Roundup Ready applications. CSD has conducted a number of trials to determine 'days to fourth leaf stage' in different growing regions.

The timing of applications must be within the label guidelines and over-the-top applications carried out up to and including the four-leaf stage. A maximum of two over-the-row applications are allowed within this window. For this study, we deemed the window to have finished when five per cent of plants are showing a fifth true leaf.

Tables 1, 2 and 3 indicate the large variations between growing areas. There are also variations between fields with different soil types, planting depths and planting times.

The biggest factor is temperature and the hotter areas have a much-reduced window of application to stay within the label direc-



Four leaf cotton.

tions. Close monitoring of all Roundup Ready cotton fields will help achieve maximum benefits of this technology.

DRYLAND FIBRE QUALITY

Generally the greatest limitation on dryland cotton production is the lack of soil water. Moisture stress can occur at different stages of the crop's development, which can have a large impact on both yields and fibre quality.

Staple length can be affected by soil water shortages at flowering. The first 20 days or 1/3 of a boll's development is when fibre length is determined (see Table 4). Staple length shorter than 1.08 inches, or

35/32 inch, can result in severe discounts.

Low micronaire can also cause discounts. Low micronaire in dryland cotton is generally caused when a late planted crop runs out of resources after boll set. High micronaire can also occur in dryland when a crop with a light boll load has a very good finish to the season and excess photosynthate partitioning goes to fibre thickening.

Varieties such as Siokra V-16 and Siokra 1-4 produce the longest staple. Sicot 80 also exhibits a characteristic long staple. Table 4 shows a summary of 11 CSD dryland trials in fibre quality over the past two seasons.

TABLE 1: Percentage of plants at various leaf stages at Emerald 26 days after planting

Variety	2 leaf	3 leaf	4 leaf	5 leaf
Siokra V-16	0	18.5	75	6.5
Sicot 80	8	28	63	1
Delta Ttopaz	0	11	70.5	18.5

Planting date: September 20, 2000.

Source: CSD Agronomy Trials 2000–01

TABLE 2: Percentage of plants at various leaf stages at Dalby 36 days after planting

Variety	2 leaf	3 leaf	4 leaf	5 leaf
Sicot 289i	4.5	26	67	0.5
Sicala V-3i	6	12	73	9
Sicala V-3 RRI	2	12	81	5

Planting date: October 8, 2000.

Source: CSD Agronomy Trials 2000–01

TABLE 3: Variations in time to reach the four leaf stage at several locations

Region	Date planted	Days to 4 leaf stage	Other factors
Emerald	20/09/00	26	Back to back, black clay
Emerald	03/10/01	23	Back to back, black clay
Goondiwindi	04/10/00	34	Fallow, heavy grey clay
Dalby	08/10/00	36	Fallow, heavy black clay
Dalby	10/10/01	35	Back to back, heavy black clay
Macalister	24/10/01	31	Back to back, heavy black clay
Dalby	22/10/01	29	Long fallow, light brigalow clay
Emerald	20/01/02	18	Wheat stubble, sandy clay loam

Source: CSD Agronomy Trials 2000–01 and 2001–02.

TABLE 4: Summary of 11 CSD dryland trials in fibre quality over the past two seasons

	Length (insx32nds)	Micronaire	Strength (grams/tex)
Siokra V-16	1.13 (36)	4.7	31.8
Siokra 1-4	1.12 (36)	4.7	31.1
Sicot 80	1.12 (36)	4.8	31.5

PLANT DEVELOPMENT IN RELATION TO DAY DEGREES

Cotton plant growth is dependent on heat units or day degrees to allow normal physiological development to occur. Day degrees are recorded at many sites and the actual number of DD units are readily available from several different sources including the DPI and the Cotton CRC website.

Using 11°C as the base temperature, the following information is applicable:

From planting to?	Day degrees
Emergence	80
5th true leaf	330
1st Square	505
1st Flower	777
Peak flower	1302
Open boll	1527
60 per cent open	2050

Source: *Cotton CRC and Qld DPI Information Sheet for Consultants Jan. 2002.*

Following are some typical times for various cotton plant development periods with days at 28°C and nights at 20°C:

Planting to final emergence	7 days
Planting to squaring	42 days
Planting to 1st Flower	65 days
1st Flower to open boll	63 days
Planting to crop maturity	171 days

By using long-term weather data, dates can be estimated for the crop stage at cer-



Timing of Roundup Ready applications is vital.

tain times during the season. For example, Table 5 gives expected dates for cotton development at Trangie.

LATE PLANT OPTIONS

With unreliable planting rain and low water levels in most dams and river systems, planting seed has not been ordered for many fields in many regions. With a favourable change in the weather and adequate planting rain this could change very quickly. The right choice of late varieties becomes important, along with several other agronomic and management factors. These include:

- Varietal maturity — that is, choosing suitable 'quicker' varieties;
- Preference for back to back fields;

TABLE 5: Earliest date for crop stage using Trangie averages for crop planted October 1

Emergence	October 13
5th true leaf	November 14
1st Square	December 2
1st Flower	December 24
Peak flower	January 31
Open boll	February 16
60% open	April 6

- Adjusting nitrogen rates to avoid potential excessive late season growth;
- Adjusting the planting rate — there is better seedling establishment late season;
- Awareness of potential low micronaire problems with a late plant;
- Roundup Ready varieties may offer greater flexibility in weed control; and,
- Preference for solid planting in dry-land situations.

The affect on yield potential can be greatly influenced by planting date. For example, planting cotton at Dalby on November 29 gives only a 65 per cent relative lint yield potential compared to planting on October 7. Full details of planting dates and relative lint yields can be found on the *CSD Replanting Guide* or on the CSD website: <http://www.csd.net.au> under Agronomy Tools. 