



IRRIGATION RESEARCH & EXTENSION COMMITTEE

2006



FOR IRRIGATION CROPPERS

Cotton as a new enterprise

MATTHEW MITCHELL

Lachlan Farming Ltd

Ph: 02 6967 2908

Email: mmitchell@lfl.ruralfunds.com.au

IREC

C/- CSIRO Land and Water, Griffith
Private mail bag 3 Griffith NSW 2680

Tel: 02 69601550 **Fax:** 02 69601562 **Email:** irec@irec.org.au

The following paper will discuss the southern migration of Cotton as a viable enterprise and provide crop details to assist in the decision process when considering Cotton as an enterprise in your farming system.

Over the last 11 years of growing cotton in the Hillston region I have been asked on many occasions as to what's the difference between growing cotton compared to the more common maize and sorghum summer crops. The analogue I use is the Black Jack table at a casino, which is probably fitting sometimes for agriculture. "It's like moving from the \$5 table to the \$50 table, you are putting a lot more money at risk but the returns can be higher." I just hope the odds are more favourable for the player!

Why Cotton in the South?

Cotton has been restricted to the more northern regions but has recently established itself as a viable summer crop in Hillston and Hay. The crop cycle is restricted by soil temperature at sowing and first frost at defoliation. During this window the crop needs to accumulate adequate Day Degrees or heat units to produce roots, stems and leaves, then fruiting parts, and then mature these fruit to a harvestable state, while at the same time maintaining yield and quality.

The last two seasons have been favourable for producing cotton in southern areas due to the high accumulation of Day Degrees and has resulted in higher than average yields.

The Table below indicates progression dates for various crop development stages. Obviously these dates will change depending on temperatures.

Table 1.0: Physiological progression dates

Growth stage	Total Day degrees	Crop Planted 1 st Oct Hillston
Sowing to Emergence	80	19 th October
5 th True leaf	330	25 th November
1 st Square	505	9 th December
1 st Flower	777	25 th December
Peak Flower	1302	28 th January
1 st Open Boll	1527	14 th February
60% Open	2050	25 th March

It is important when you consider cotton that we look at production levels based on historical yields and not just on last year's experience. The growth stage dates in the above Table would change considerably based on an average season rather than the hot summer experienced last year.

With this in mind however there are many aspects of cotton management that can influence cotton growth rates and thus yield potential. A lot of these are targeted at earliness and encouraging early vigour. In southern areas we have adequate heat and radiation levels for high production during the middle of summer, it's just that we take longer to warm up at the start and are quicker to cool down. By understanding our environmental limitations we can manage our crop differently to suit.

The following is a calendar of events for cotton growing and where necessary highlighting important consideration for southern growers.

1. Planning – May onwards...

This is a critical aspect of cotton production, especially down south as we don't have the season length to make up for setbacks (errors) we have during the season. The following things should be ticked off;

- Financial Budgets
- BMP (Pesticide Application Management Plans)
- Crop Consultant
- Water budgets
- Operations Calendar

Cotton Australia has representatives for various regions and can assist with the implementation of Best Management Practices.

2. Ground Preparation – March to July

Select your Row configuration. Consider all options but I recommend not changing current system at this stage. If you are on 36 inch then use this system. The issue with narrower spacing is harvesting availability. If you gain one week earliness but cannot harvest then you have lost your advantage.

Aim of this operation is to ensure you have an adequate seedbed to plant into and have a percentage of fertilizer applied. It is critical that the hill is in good condition as seed placement is critical in establishing the crop. By having this operation completed early you can retain winter/spring rainfall to assist in establishing the crop.

Refer to Machinery Pack from Cotton CRC.

3. Planting – September...

The text book will state 15 degrees and rising but you could be waiting till November. Be ready to start in the third week in September. If you get 12 degrees and rising consider starting. This will depend on area to cover, establishment method and long-term weather forecast.

Need a precision planter similar to maize and attention to detail will pay dividends in this operation. Plant population should allow for historical seedling losses and remember that in our region it is easier to manage a higher stand than a low plant stand. We plant 16–18 seeds to establish 10–12.

Variety selection should focus on short season varieties. The use of Bollgard technology will also provide a level earliness. Anything that will assist in seedling establishment should be considered.

4. Plant Monitoring

Need to appoint consultant. Experience if possible. Member of the Cotton Consultants Association (CCA). This resource should be utilised in the planning stage and crop monitoring program should be discussed prior to planting.

For southern areas there are two things you can be, early or on time! You cannot afford to be Late!

Need to frequently monitor crops for insects, nutrition and growth rates. All about footsteps in the paddock to detect any issues before they become Yield limiting. Cotton CRC website contains various crop growth tools.

5. Nutrition

N, P, Zn and K are the important ones. Soil tests should be taken to provide indication of current nutrient status. Need to understand cotton requirements of various nutrients and the timing. Cannot afford to be late or be responsive with nutrition management.

Nitrogen – 70 % upfront and balance in-crop. If you have issues in applying in-crop applications then apply all up front. We target 220 kg N/Ha.

Phosphorus and Zinc – apply as close to planting as possible/practical. Foliar applications to promote early vigour should be considered.

Potassium – need to monitor with tissue tests.

Refer to NutriLogic on Cotton CRC website.

6. Irrigation

Understand the crop water-use curve for cotton. Need to have allocated enough total megalitres for the crop but just as important is the delivery of this water during peak demand. Need to be able to irrigate in 8–10 day intervals during peak. Budget on eight in-crop irrigations but will depend on soil type.

Most important aspect of growing the crop. Don't try and save water as you will only cap yield potential. Water-use efficiency is made up of not just low water-use but high yield. Practices employed to improve water efficiency also have a positive impact on yield. High flow rates to move water on and off the field faster will reduce water logging.

Yield loss from water stress is exponential. Table below shows yield loss from water stress at different growth stages.

Growth Stage	Decrease in yield/ day (kg lint/ha)
Squaring	9.2
Peak Flowering	18.8
Late Flowering	16.1
Boll Maturation	3.6

7. Defoliation

A lot of crop management during the season will influence the performance of this process. Soil moisture profile needs to be at refill point and growth managed. Need to prepare the crop for picking to ensure timely operation and quality product. Needs to be completed prior to first frost date.

8. Picking

This operation should be organised well in advance. Need to monitor carefully to ensure adequate job and contamination free. Even though this is the final operation on the farm need to follow through to ginning.

Conclusion

The growing of cotton is not dissimilar to other summer crops, the main difference being that we have a restricted window of opportunity to grow the crop. It's doing the little things well that will give you the best shot at producing a very profitable crop.