

Germinating Ideas

By Craig McDonald, CSD Extension and Development Agronomist

With the 2004–05 cotton season well in progress this edition of Germinating Ideas will cover limited water options and how best to use your available water, Bollgard II checking programs and locust problems in some districts.

LIMITED WATER

There are some regions and many farms where irrigation water may be short at some stage of the crop life cycle and strategies will have to be adopted to maximise returns per megalitre. Summer rainfall, particularly in the northern areas, may reduce the demand on irrigation supplies but this cannot be relied on.

There have been studies done into potential returns per megalitre. It is always a calculated risk as to how much cotton can be grown if the water supply is limiting.

Simulations using the OZCOT model suggest that five ML per hectare in northern areas and six ML per hectare in southern areas will maximise production and increase the chance of at least breaking even.

A crop's demand for water varies throughout the growing season and the likely affect of water stress will depend on what stage of development the crop is at and also how long the stress occurs for.



There is increased interest in drip irrigation to improve water use efficiency.

Irrigation deficits can be increased and watering can be delayed by a few days but yields can suffer. Stretching of irrigations may not be as detrimental as eliminating a late season watering.

Figure 1 shows the affects of increasing the water deficit from 70 to 85 mm for each irrigation. This resulted in a saving of one irrigation, but caused a yield penalty of

1.45 bales per hectare. In the same trial, normal deficits were used and the final irrigation was not applied. This resulted in yield reduction of 1.62 bales per hectare.

Crop yields and water stress

The impact of water shortages is related to the crop stage when the water shortage occurs. Stress during peak flowering can cause double the yield loss compared to early or late seasonal stress. These yield reductions can be cumulative if moisture stress is ongoing.

Yield is not the only thing affected by moisture stress. Fibre quality can also be impacted upon with large discounts for lint below the base grade.

TABLE 1: Water supply required on September 1 (pre establishment) and re assessed prior to first crop irrigation (December 1)

Region	Supply (ML/ha) on September 1 to:		Supply (ML/ha) on December 1 to:	
	Break-even in 9 years out of 10	Maximise returns per megalitre	Break-even in 9 years out of 10	Maximise returns per megalitre
Emerald	4.5	5	2.3	3
Darling Downs	5.0	5	3.2	3
St George	5.5	5	3.5	3
Border Rivers	5.2	6	3.2	4
Gwydir Valley	5.3	6	3.4	4
Namoi Valley	5.2	6	3.2	4
Macquarie Valley	6.3	6	4.0	4

- To reduce the risk of failing to break even to less than one in 10; and,
- The supply that maximises returns per megalitre (NB assumes an irrigation efficiency of 75 per cent) Source Milroy, Harris and Larsen 2002.

TABLE 2: The effect of water stress at different stages on cotton yield

Growth stage	Reduction in yield with one day of stress (kg/ha)
Squaring	9.2
Peak flowering	18.8
Late flowering	16.1
Boll maturation	3.6

Source Greg Constable and Brian Hearn.

MONITORING BOLLGARD II CROPS

As with conventional cotton, regular monitoring of Bollgard II crops will allow for timely decisions to be made to help achieve maximum returns.

Several areas will need to be monitored including:

- Fruit retention;
- Tip damage;
- Plant Growth, including the Vegetative Growth Rate (VGR) for growth regulator decisions, squaring nodes and Nodes Above White Flower (NAWF);
- Sucking pests;
- Mites;
- Beneficial insects;
- Boll damage; and,
- Helicoverpa presence.

All of this monitoring combines to give an objective summary of how each crop is performing. This performance can then be compared with known standards and decisions can then be made to modify inputs if required.

Decisions for insect control and product choice can impact on beneficial insects. For example, Fipronil will kill thrips, which are an important predator of mites. Organophosphates will kill parasitoids that attack silverleaf whitefly.

Table 3 gives a guide to key areas that can be monitored and how often to do them in each crop. As every farm and every crop is different, there will obviously be variations to these guidelines. These areas are in addition to regular Helicoverpa monitoring.

Soil nutrition, soil moisture, disease and weed monitoring should also occur regularly.

Locust damage in cotton

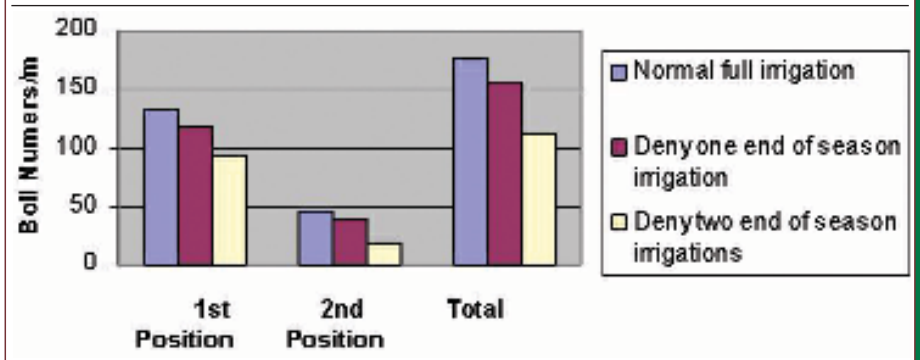
The Australian plague locust (*Chortoicetes terminifera*) has caused extensive damage in many cotton crops in central and southern NSW this season. This damage has occurred from locusts in the second to fifth instar nymph stage that were banding, right through to swarming adults.

TABLE 3: Monitoring Bollard II cotton

What	How	How often
Mirids	Beat sheet	2-3 per week*
Mites	Visual	Weekly*
Aphids	Visual	Weekly*
Whitefly	Visual	Weekly*
Beneficials	Beat sheet	Weekly*
Plant vigour	Plant map	Weekly*
Plant damage	Plant map	Weekly*

* More often if approaching a decision.

FIGURE 1: Late season water stress and boll numbers per metre (irrigation trial 1992-93)



Damaged cotton caused by the Australian plague locust.

Plants have been chewed at or above ground level causing the whole plant to fall over with subsequent death. Both conventional and transgenic crops have been damaged. This feeding has been significant in many crops with reports of up to 40 hectares destroyed on one farm alone.

Damage to cotton by locusts in previous years has been attributed to the spur-throated locust (*Austacris guttulosa*) and the migratory locust (*Locusta migratoria*). This has occurred mainly in the Central Highlands of Queensland.

Control decisions should be based more on damage than just the presence of the pests. Regular monitoring is required in peak times of locust activity. An outbreak can suddenly relocate after a mass take-off at dusk. It is possible for the swarm to travel 200-500 kilometres in a night on suitable high altitude winds.

Significant plant loss has occurred within one day on many fields. A crop inspection early morning found no presence or damage but another inspection at midday showed a large number of locusts present with resulting damage.

Australasian Centre for Sustainable Agriculture

Recently in Moree three entities incorporated to formalise a body known as the Australasian Centre for Sustainable Agriculture (ACSA). It will be the role of the Moree Plains Council, TAFE NSW New England Institute and the Australian Cotton Trade Show to drive the project in establishing a National Centre for Sustainable Agriculture.

"This is the next step after a series of scoping exercises to test the concept," said Kevin Humphries, project co-ordinator.

"The end result will be a best practice training, education, research and development site dedicated to supporting industry development, growth and uptake of sustainable agricultural practice. There is no place like it currently in the country and we see this project as an opportunity to put on show what our region does best — setting the pace in agricultural production activity."

Moree Plains Economic Development Officer Anthony Kunkel said that the Council was committed to the development of the site as they see it as an opportunity to develop the area by creating opportunity for existing business to expand and attracting new commercial business to the site.

"Interfacing with the new bypass and Newell Highway frontage to the site will attract both visitors and business," said Anthony. "It is a high impact location which can be developed into a Business, Learning, Training and Showcase Park."

Recently appointed Assistant Director (Trades & Primary Industries) of TAFE, John Michael, outlined the importance of the project for TAFE in the area of training and formalising pathways to Tertiary

Institutions such as UNE.

"Moree is the logical site for ACSA and the community will see a greater commitment by TAFE in providing local training opportunity and access to the site for regional and interstate trainees."

"We see ACSA as the key opportunity to develop the current Rural Skills Centre and concentrate rural skills training and associated trade activity on the site in conjunction with co-located industry. Training embedded in industry is the future and we want to work much more closely with industry at both the farm and industry cluster level."

Australian Cotton Trade Show coordinators see the ACSA venture as an opportunity to further consolidate the Cotton Trade Show and expand into other potential industry uptake and showcase opportunities.

"To consolidate the site and create opportunity for many of our exhibitors to permanently display their products and services would be a positive step forward," said Brian O'Connell.

The ACSA group will open up the proposal in the New Year to all industry sectors that may see a benefit in locating on the site. Government seed funding to establish site infrastructure will be pursued. Envisaged business on the site will include large showcase retailers with access to highway frontage through to trade, agricultural suppliers, service industry, compliance and research and development associated activity."

Contact Kevin Humphries 0428 120 006, John Michael 0427 211 90, Brian O'Connell 0413 130 777 or Anthony Kunkell 0428 160 835. 🌱



ACSA partners met recently at the Trade Show site. Left to right: John Forrest (Australian Cotton Trade Show); Kevin Humphries (ACSA Secretary); Anthony Kunkel (Moree Plains Shire Council); Brian O'Connell (Australian Cotton Trade Show); John Michael (New England Institute of TAFE); Phil Harris (solicitor advising).

New rotary hand pump

Australian fluid management design and manufacturing pioneer Macnaught Pty Ltd has announced the release of its new RB100 Rotary Booster Diesel Pump.



Macnaught describes the new unit as an economical high flow manual pump suitable for the transfer of a wide range of fluids and lubricants.

A cost-effective, portable and highly practical hand pump, the RB100 is designed to boost flow rates via the use of a 3:1 gear ratio.

This allows delivery of around 50 per cent more fuel per complete handle rotation than traditional manual fuel pumps.

The RB100 can transfer up to 75 litres (16 gallons) per minute resulting in shorter refueling times, increased efficiency and lower labour input.

The unit is supplied with a 1.8 metre (6ft) delivery hose and metal nozzle, a three piece threaded suction tube and a 51 mm (2 inch) sliding bung adapter.

This makes it a first class solution to the challenge of transferring diesel, petrol, kerosene and lubricating oils up to SAE 90.

The RB100 is suitable for use with drums from 60 to 205 litres (13-44 gallons) and is supplied with an optional 10 micron VA fuel filter.

The RB100 is constructed of premium grade aluminium, steel, heavy duty plastic and nitrite rubber and like all of Macnaught's premium-quality products, it is covered by Macnaught's exclusive five year warranty and guarantee of ten year parts availability.

Macnaught is exclusively distributed in Australia by Castrol Australia Pty Ltd. For more information on the RB Rotary Pump, contact Castrol on 1300 554 890.

Founded in Australia, Macnaught Pty Ltd has been designing, engineering and manufacturing high quality lubrication equipment for the agricultural, industrial and automotive markets since 1948.

Contact Kym Grainger on 02 9795 4922. 🌱

New era for cotton classing

Cotton classing in Australia is set to change with the announcement today of the industry's first truly independent classing service, owned by merchants, growers and a well known international cotton controlling and classing organisation.

Based at Goondiwindi, "ProClass", will offer growers and merchants a centralised, independent classing service for large volumes of cotton starting March 2005.

According to Interim Chairman, Mr Geoff Hewitt, ProClass was set up in response to cotton growers and merchants wanting a truly independent classing service.

The shareholding of the new business is drawn from several cotton industry sectors:

- Cotton growers represented by a group of six growers from six cotton regions from Emerald to the Macquarie Valley;
- Cotton merchants represented by Dunavant Enterprises and Macquarie Cotton;
- An independent international cotton controller and classing firm, Wakefield

Inspection Services, which has existing interests in cotton classing in Australia and many other countries; and,

- ProClass management.

The shareholders have established the company to provide a truly professional and independent cotton classing service.

"The structure of the company is specifically designed such that no one shareholder or shareholder group has a controlling stake in the business," Geoff said.

ProClass has invested in the most efficient HVI classing technology and established a team of expert classers with long term domestic and global experience.

"Not only will this benefit Australian growers and merchants, but will also meet the future needs of our mill customers, that are increasingly demanding data from cotton classed using the best available technology," he said.

"This world-class facility will add value to the way cotton is currently classed in Australia and we are extremely excited to be finally offering this best-practice service

to our industry, after many years of discussing the idea," Geoff said.

Stuart Thompson, with over 10 years cotton classing experience has been appointed to the position of General Manager. Patrick McDonnell of Wakefield Inspection Services will be engaged to class cotton on a seasonal basis, along with other experienced classers.

Goondiwindi was chosen as the site for the operation as a major regional centre, located at the junction of several major highways servicing the Australian cotton belt, and within a 250 kilometre radius to the bulk of the industry's ginning capacity.

A Board of Directors, made up of two growers, two merchants and one Wakefield representative will oversee the business.

The ProClass team will be operational by February 2005, in time to start classing cotton from the 2004-05 season. The service is open to all growers and merchants.

For more information on ProClass contact Stuart Thompson on 0438 714 456.



Focus on cotton health

Many growers and consultants are aware that the Focus Foliar nutrient range has been used in the cotton industry over the past four years with great success.

Manufactured by Ultimate Fertilisers, the Focus range provides every grower with treatment options to achieve the best results in the field.

Both Focus Plus and Focus Hi-K have excellent compatibility with agricultural chemicals (compatibility chart is available

on request). Also, with both products containing a full range of (chelated) trace elements, they help prevent any plant stress caused by trace element deficiencies, while also maximising the growth of the plant.

Ultimate will supply growers with a full written quotation for all their fertiliser needs.

For further details contact: Glen McDonald 0427 059 595, Ross Ledingham 0425 800 727 or Head Office 1800 003 244.



Channel Line

A major breakthrough in design and production has resulted in a cheaper yet stronger large diameter layflat pipe range that will mean savings for the irrigation industry in water and dollars. The pipes are ideal for short or long distance water transfer and even water storage.

CE Bartlett have been providing flexible flume (Ezyflume, Flexiflume and Pumpline) to the irrigation industry within Australia and overseas for over 15 years, but up until now the flume has only been available in a welded PVC or polyethylene fabric.

CE Bartlett have been working closely with Gale Pacific to further improve the recently released Channel Line. The new and improved Channel Line is currently available in 400 mm diameter and Bartlett and Gale have on-going plans for 600 mm diameter Channel Line. Bartlett are also developing other larger diameter custom made fluming solutions to compliment their existing range of fluming products.

For more information contact Andre Thompson at C.E.Bartlett on 1800 63 99 66.



TABLE 1: Treatment options and application timing

Growth stage	Product	Rate per hectare
8-10 leaf stage	Focus Plus	4-6 litres
Early squaring	Focus Plus	4-6 litres
Late squaring	Focus Plus	4-6 litres
Early flowering	Focus Hi-K	5-7 litres
Late flowering	Focus Hi-K	5-7 litres

TABLE 2: Full analysis

	%			PPM						
	N	P	K	Mg	Zn	Mn	B	Cu	Fe	Mo
Focus Plus	16	4	20	200	160	240	80	—	180	160
Focus Hi-K	—	5	30	200	160	240	80	240	180	160