

Raingrown cotton: the viable alternative



PHOTO: STUART CUMMING/APR

GROWING raingrown cotton has become easier in recent times, due to major improvements in the farming system.

If you're considering your options for a rotational crop this summer, you have a full moisture profile and the forecast is promising for more rainfall, **raingrown cotton makes good business sense.**

Did you know? Growers with cotton in their rotations achieve higher returns over the rotation cycle, compared with growers with solely grain-based rotations. And improvements in variety characteristics, performance and technology traits over recent years have simplified the process of growing raingrown cotton – making it a safer, more reliable and consistent performer.

This summer, consider raingrown cotton for these benefits:

Greater returns.

Decisions on what crop to grow are primarily based on commodity price, experience, risks and potential returns. The predictions from cotton marketers for the 2016 cotton season is for \$500 per bale – which, for some growers is a key determinant in considering raingrown cotton as a rotational option. And, as long-term growers know, cotton is the most profitable rotational crop over the long-term.

Less risk.

Major advances in the cropping system over the last decade has reduced the risk and heightened the reward for growers. All raingrown crops are highly dependent on the season, and yields obviously can't be guaranteed in any farming operation, but advances in raingrown cotton mean yields have increased and pests are more manageable with Bollgard 2, therefore production risks are reduced and yields have increased. Now, with Bollgard 3 on the horizon (slated for commercial release in 2016-17) allowing greater flexibility in planting windows and possibly no need to pupae bust, the risks are fewer than ever.

Cash flow management.

End point royalty systems are available, meaning major costs, like insect control, are pushed to the end of the season, and you only pay for what you pick.

Raingrown returns.

CONVERTING moisture into returns is the focus for all raingrown cropping farmers. Over time, raingrown cotton's profitability has been proven to out-perform other rotational options (provided costs are kept in check, reasonable yields and quality are achieved and a competitive bale price is realised) and advances in the system over the past decade mean less risk and more reward.

Weather excepted, **you have more control.** A new suite of high yielding and high quality varieties developed specifically for raingrown cotton production, combined with the use of different planting row configurations, helps you manage your yield potential, fibre quality and production costs.

Advances in biotechnology have resulted in fewer insecticide sprays to manage pests in cotton – a great thing for both the environment and your bottom line. It means **reduced labour costs, reduced input costs and a more manageable cash flow.**

Why cotton over another rotational option?

Recent benchmarking studies conducted by Cotton Seed Distributors (CSD) comparing many cropping enterprises have shown that cotton provides the best dollar return to the farming enterprise. Raingrown cotton, when examined over the full term of a rotational cycle, has proven to be consistently providing the highest gross margin return.



"Growing raingrown cotton is a benefit to my system from a profitability point of view."

- Mike Pearce, raingrown grower, Cecil Plains.

Did you know?

You can compare cotton and sorghum gross margins for your farm by using the **Gross Margin Calculator** at www.drylandcotton.com.au/useful-tools/gross-margin-calculator

Let's get down to the numbers.

This table from CSD shows the actual yields and returns for a raingrown cotton grower, located between Goondiwindi and Moree, who uses both cotton and sorghum as the summer crops in his rotation. Annually, the farm has areas sown to both crops, based on a five year rotation program.

8 YEAR AVERAGE	COTTON	SORGHUM
Yield	3.05 b/ha	3.49 t/ha
Price	\$467 b	\$220 t
Variable costs/ha	\$942	\$437
Gross margin/ha	\$497	\$332

Source: CSD Facts on Friday

About these comparisons:

- Yield – Actual farm averages for both crops in a similar planting window. Please note that the yield potential of cotton is 87 percent that of sorghum.
- Prices – Actual farm prices after premium/discounts. Cotton includes seed proceeds.
- Variable Costs – Using CSD's Dryland Gross Margin Budgets
- Row Configurations – Cotton, Double Skip, Sorghum, Solid (1m).
- It should be noted that the yields, growing costs and commodity price received fluctuates from season to season. The average yield for the cotton is 3.05 b/ha with a range of 1.5-4.5 b/ha. (Higher yields when rain fell post New Year) The average yield for sorghum is 14.4 percent higher at 3.49 t/ha (higher yields when rain fell before the end of December).

Conclusions that can be drawn:

- **Raingrown cotton is 50 percent more profitable than sorghum (over the past eight summer seasons).**
- It highlights the importance of having cotton in the rotational program each year to ride out the difficult years and take advantage of the years when price and seasonal conditions combine. Overall cotton had the best return, but the 2006-07 season recorded a negative gross margin.
- A mixture of both crops gives the opportunity of benefiting from in-crop rainfall – whenever it falls in a particular season. It also is an avenue for disease and weed breaks which are important in modern farming practices.

Marketing your cotton.

THE price of cotton in Australian dollar terms is subject to daily variability. This variability is caused by fluctuations in the underlying futures prices, currency rates and basis levels. This can create major uncertainties and risk for growers when deciding if to plant cotton and when to sell.

The ability to 'lock in' a price for some or the entire crop before harvest can be a major advantage, but it can also be risky for raingrown cotton growers, due to uncertain production levels.

Types of contracts for raingrown growers.

A forward cotton contract is a customised agreement between two parties to deliver cotton on an agreed future date for an agreed price. Price will be determined in reference to the other terms of the contract – quality, quantity and the time and place of delivery.

Force majeure contacts are designed to help manage risk, and therefore can be an important consideration for raingrown cotton growers. Force majeure means 'compelling force, unavoidable circumstances'. When a force majeure clause is attached to a cotton contract, it generally means that a production shortfall in the nominated bales set out in the contract need not be delivered. The variation is borne by the merchant.

Daily prices.

The major merchants publish their daily prices online, or communicate them via email or text message to growers. To be kept up to date with pricing movements, raingrown cotton growers are encouraged to contact the merchants and ask to be added to their daily price lists.

The role of merchants.

Cotton growers are well serviced by several cotton merchants who buy cotton from growers to sell in the

international market. Due to the relatively small size of the Australian cotton market, it is often the cotton merchants approaching growers to buy cotton, creating a price competitive market.

The merchant may require a guarantee of a specific grade or quality of the cotton, which, from a growers' perspective, may mean selling the cotton before it's been harvested (or in some cases, before it's been planted). There are a number of different forward marketing options: AUD fixed cash price, fixed bale pool, hectare contract, guaranteed minimum price, balance of crop and force majeure.

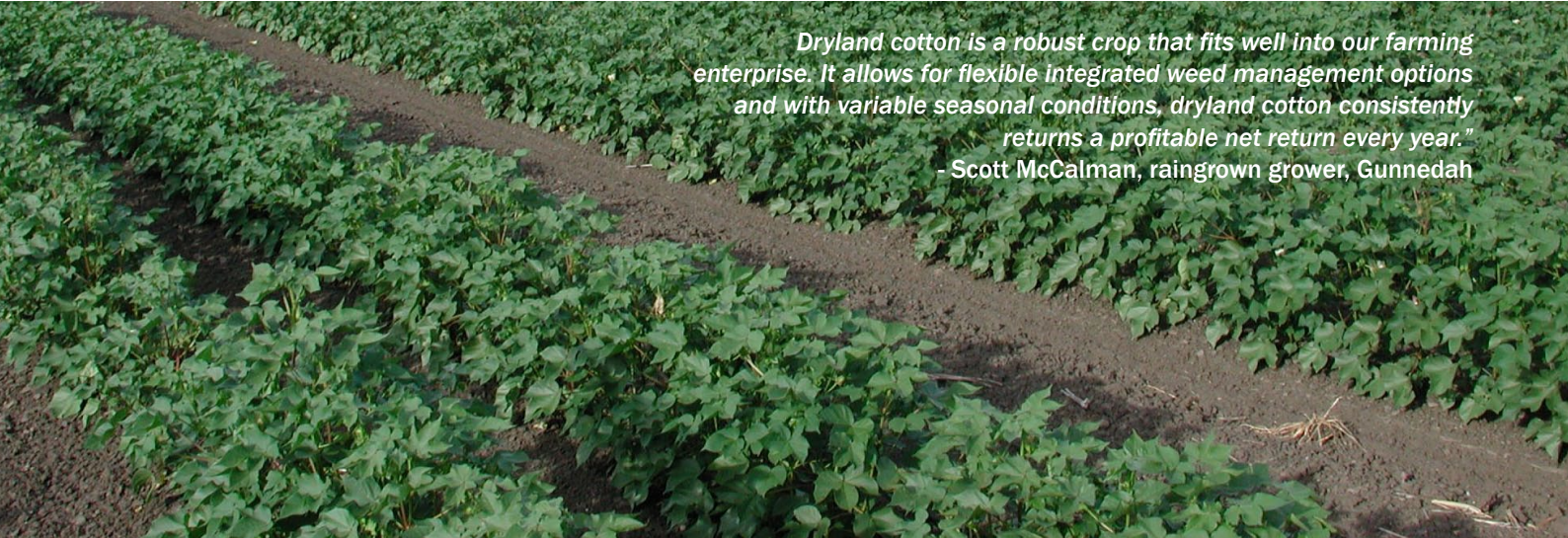
The impact of discounts.

In years of extreme seasonal conditions, or when cotton has been planted late, raingrown cotton can be subject to fibre quality discounting due to adverse impacts on staple length, micronaire and grade. Variety selection and row configuration can help to mitigate this risk.

Managing production risk

Dryland cotton crops are exposed to a variety of natural perils that can impact on both crop yield and lint quality. The most critical risk factor is moisture stress due to insufficient rainfall – this is a difficult risk to manage and at present cannot be insured, however weather derivatives may provide a viable risk management solution to this risk.

At present, cotton crops can be insured for the financial consequences of a yield loss due to fire and hail. The cover is very comprehensive from emergence of the crop to delivery of the modules to the gin yard and can be tailored specifically for raingrown growers with different crop planting configurations, cost structures and yield expectations. The most important point to remember when insuring your raingrown cotton crop is ensuring the policy can cater for significant yield variability.



Dryland cotton is a robust crop that fits well into our farming enterprise. It allows for flexible integrated weed management options and with variable seasonal conditions, dryland cotton consistently returns a profitable net return every year."
- Scott McCalman, raingrown grower, Gunnedah

Controlling insects.

BIOTECHNOLOGY has transformed the cotton industry. 99 percent of Australia's crop - including both irrigated and raingrown - is now grown with varieties containing the biotech traits.

Bollgard II cotton was introduced to the Australian market in 2005. It has resulted in a major decrease in insecticide use: down 95 percent over the past 15 years. This has not only benefited growers, through saved time and money, but has also significantly benefited the environment, which is critically important for the industry's long-term sustainability.

The industry's focus on controlling insects is through the use of an integrated insect and mite management approach (otherwise known as Integrated Pest Management or IPM).

IPM incorporates a range of tactics and resources to reduce pest outbreaks and reduce the reliance on insecticides for their management. It's a year-round approach to managing pests, as cropping decisions made in the autumn and winter can impact on pest management during the summer. It is also an approach that considers the dynamics of pests in the surrounding cropping areas as well as in the natural vegetation in and around the farm.

The bottom line for growers?

Advances in biotechnology have greatly benefited raingrown cotton growers - resulting in fewer insecticide sprays, reduced labour costs, reduced input costs and a more manageable cash flow. With a few on-farm management controls that all growers, irrigated and raingrown, must implement - like the IPM and the Bollgard II RMP - the technology will remain effective in controlling cotton's pests. And with end point royalty systems in place, you can push insect control costs to the end of the season, and only pay for what you pick.

Using nature to fight nature.

At the heart of IPM is the conservation of natural enemies. A key tactic in conserving natural enemies is making well informed and rational pest management decisions. These decisions can help reduce the overall need to spray, and therefore help conserve beneficial species such as predatory insects, spiders, bats and birds.

IPM's a win-win. It helps manage pests over the long-term, helps reduce over-reliance on insecticides (and therefore reduce resistance), helps to cut costs for growers, and minimises the risks to our health and the environment.

Managing resistance in raingrown cotton.

Resistance is an outcome of exposing pest or weed populations to a strong selection pressure, like an insecticide. Over time, resistant genes can increase in frequency as resistant individuals - in our case pests - become more likely to survive and reproduce. Managing this resistance is therefore critically important to ensure Bt cotton remains effective, and this is done through specific control measures written into the Resistance Management Plan (RMP).

The Bollgard II RMP is based around five key elements that impose limitations and requirements for management:

1. the mandatory growing of refuges,
2. control of volunteer and ratoon plants,
3. a defined planting window,
4. restrictions on the use of foliar Bt, and
5. pupae destruction.

The combined interaction of all of these elements should effectively slow the evolution of resistance.



*"The bad old days of putting 13 insect sprays on conventional cotton are gone."
- Jack Gooderham, raingrown grower,
Tulloona NSW*

Row spacing and weed control.

THE impact of row spacing.

The vigorous taproot of the cotton plant allows for wider exploration of the soil profile for moisture and nutrients, particularly when compared with fibrous root type crops like corn and sorghum.

This characteristic has led to the use of wide row configurations in raingrown cotton that increase the total amount of soil moisture available to the plants, extending the time before in-crop rainfall is required.

In row configuration trials, fibre quality – especially fibre length – improved with wider row configurations in dry years. Therefore the row configuration chosen, combined with the seasonal conditions experienced, will have an influence on the likelihood of achieving base grade for your harvest.

And, savings in variable costs of inputs such as planting seed, insecticides, defoliants and the picking operation are also more likely with wider row configurations. Raingrown cotton has a couple of ‘big ticket’ items that make up the majority of the growing costs, namely picking, ginning and technology licence fees.

In wide row configurations, efficiencies in picking can be made through not trafficking every pass, with some contractors charging on a green hectare basis. The Monsanto technology licence fee can either be based on a green hectare rate or an end point royalty system, where the licence fee paid is related to the yield achieved. This not only minimises your risk, it also assists you with cost management as the fee is not paid until ginning.

Image (right): CSD Dryland Cotton Gross Margin analysis for planting date and row configuration interactions.

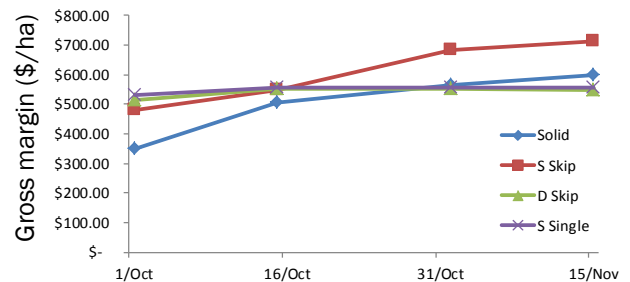
Declare war on weeds.

Rotating away from a cereal-based program with a broadleaf crop such as cotton allows the insertion of a disease and weed break into the crop rotation plan, while the added ability to apply a herbicide, like glyphosate, over the top of a herbicide-tolerant cotton, like Roundup Ready Flex® or LibertyLink® simplifies weed management.

These are major benefits for raingrown cotton growers. Unfortunately, however, glyphosate resistance poses a serious threat to the long-term viability of all Australian farming systems, including raingrown cotton. As a result, growers wishing to use glyphosate need to implement Integrated Weed Management strategies (or IWM) to ensure it can continue to be an effective weed control strategy.

Resistance has been confirmed in 36 weeds in Australia. In cotton growing areas, five common grass weeds (awnless barnyard grass, liverseed grass, sweet summer grass, windmill grass and annual ryegrass) and one broadleaf species (flaxleaf fleabane) are known to be resistant. Correctly identifying weeds and enacting the appropriate responses (including right product, right rate, right time) are key to IWM.

Average seasonal conditions and yields



“Dryland cotton has no peer when it comes cropping profitability, and offers the greatest ability to control summer grasses when included in your rotation.”

- Ian Carter, raingrown grower, Quirindi



Standing by to support you.

CRITICALLY, if you are considering growing raingrown cotton this summer, you are not alone. There's a whole team of people, and a whole host of resources, standing by to help.

Agronomists and consultants. The raingrown cotton industry is well serviced by experienced and knowledgeable agronomists and consultants, who can provide agronomic advice to help you with your business decision making.

Technology Service Providers. Technology Service Providers (TSPs) help you manage your biotechnology and ensure you meet your licence requirements. TSPs are generally local crop input suppliers.

Contractors. Many contractors help service the cotton industry, from planting to picking. Contractors can be a cost effective alternative to investing in capital intensive machinery for new or infrequent raingrown cotton growers.

Research, development and extension (RD&E). The cotton industry has invested heavily in its RD&E over many years – both in the private and public sectors - building up a wealth of knowledge, information and research about cotton, including raingrown cotton. The cotton industry's joint extension program, CottonInfo, and the industry's best management practices program, *myBMP*, contain important information and resources for growers.

Merchants. Many merchants service the raingrown cotton industry, helping growers to market their cotton to international buyers.

Insurance providers. Insurance providers help growers manage risk through the provision of insurance and other products.

Industry organisations. The Australian cotton industry is united, progressive, coordinated, innovative and visionary, supported by a wealth of industry organisations.

The Raingrown Cotton Initiative. The Raingrown Cotton Initiative is a collective of organisations who have joined forces to assist raingrown cotton growers access the information, resources and support they need.

The Initiative is made up of eight organisations:

- **AgriRisk** is a specialist agribusiness insurance broker for cotton, wheat, cereals, grapes, vines and citrus. www.agririsk.com.au
- **Cotton Australia** is the industry's advocacy organisation, developing policy and representing the interests of cotton growers to Government. www.cottonaustralia.com.au
- **Cotton Growers Services** (CGS) is a cotton specialist supplier, distributing a large range of precision planting equipment, services & solutions, cotton seed and biotechnology, as well as premium brand crop protection & production products. www.cgs.com.au
- **Cotton Research and Development Corporation** (CRDC) invests in RD&E to enhance the performance of the industry on behalf of the Australian Government and cotton growers. www.crdc.com.au
- **Cotton Seed Distributors** (CSD) is the supplier of quality cotton planting seed to the cotton industry, and a major investor in cotton breeding and R&D. www.csd.net.au
- **CottonInfo** is the industry's joint extension program, co-funded by Cotton Australia, CRDC and CSD to connect growers with research. www.cottoninfo.net.au
- **Crop Consultants Association** (CCA) is the association for those that provide agronomic advice to cotton, grains, pulse and oilseed producers in Australia. www.cropconsultants.com.au
- **Monsanto** is a leading agricultural biotechnology company that pioneered the use of biotechnology in cotton. www.monsanto.com/global/au

These united organisations are standing with you in your raingrown cotton crop:



Looking over the fence.

JOHN 'Cowboy' Cameron.

Cowboy was one of the few growers on the Darling Downs who planted raingrown cotton during the 2014-15 season:

“Approaching late September, usually considered a bit early for planting in our part of the world, the soil temperature planting prediction was looking good, the soil moisture profile was full but surface moisture was getting away quickly. We decided to go for it, moving about six inches of soil aside, and plugging the seed into a wet bottom. Then we walked away from it and left the young crop to its own devices – weeds weren't an issue and we ignored the hammering thrips coming off surrounding wheat crops were giving it.”

The season stayed dry and hotter than average until late November, when some reasonable rainfall events started to string themselves together. John has seen it before but was still impressed by the plant's ability to come back from a tough start. “By the end of December, the crop was powering, rapidly compensating in size and in fruit numbers from where it had been a month before.”

Having grown raingrown cotton on the Central Downs for over twenty years, John knows from experience that a good plant frame work at Christmas and late January rainfall are key ingredients to a successful crop. “I was elated by the 95mm of rain received on the block late January and early February. The icing on the cake came from another 60mm during the last week of February, which helped fill the late bolls,” he said.

The cotton crop, which included a CSD Bollgard 3 trial was picked in early April, and the top yielding variety has produced nine bales/ha. “This is a great end result, considering where it was in late November. It is worth noting that this same field grew a 10.4 bale/ha crop in 2012-13, and then quite successful double crop wheat, the standing stubble from this crop being an important cornerstone for moisture capture and overland flooding management during the fallow,” John said.

Rob and Penny Blatchford.

Rob and Penny farm east of Bellata and Gurley in north west NSW. They grow a range of winter and summer crops however cotton has been their preferred summer crop for over two decades. Dryland cotton has produced good returns in most seasons and has been an excellent rotation crop with cereals and legumes.

After waiting for planting rain in October and November which did not eventuate, crunch time came in early December for the Blatchfords. To plant or not to plant?

Planting the crop in December has always been considered a risk. Lower yield potential, insects and the high risk of quality discounts all had to be considered. The planting decision was made even more difficult as a result of the Bollgard planting window restriction. Any cotton planted would have to be non Bollgard - back to the endless nights on the boom spray!

Taking a punt, Rob planted approx. 1,450 ha of late cotton after falls of rain over 5 days that added up to 45mm in early December. After planting the seasonal conditions were very good.

Several falls of timely rain produced quite a tall crop with very good yield potential. An unpredicted 82mm in early January enabled the crop to get up and running. The only catch was maturing the late fruit. Unlike the past few years the late summer period and autumn have been cooler than average.

So how has it worked out? It takes a long time for December planted cotton to mature. With picking commencing in June, indications are for a yield around 5 bales/ha.



STUART CLUMMING/APN



The 9 golden rules.

The 'golden rules' to growing raingrown cotton:

- 1. Use an experienced agronomist.** Even the most experienced raingrown cotton growers use consultants
- 2. Know your soil type.** Cotton will perform best in soil with a high plant available water holding capacity (in excess of 180mm in the top 1.5m of soil). It is important to know the nutrient status, location and availability within the profile – cotton can pull nitrogen from depth. Ensure adequate phosphorus and zinc are present (as they're crucial for early development) and potassium (crucial for flowering and fibre development).
- 3. Plant into standing stubble.** It provides a better environment for establishment, extends the planting opportunity, improves the efficiency of rainfall capture, provides a home for beneficial insects and reduces the likelihood of sandblasting.
- 4. Have a plan for weeds.** Know your weed spectrum and have a plan for each. Utilise integrated weed management and do not rely solely on glyphosate for weed control (to help avoid resistance).
- 5. Plant on a full moisture profile.** Cotton is not the most vigorous seedling and is susceptible to adverse conditions at planting. Adequate soil moisture reserves allow the crop to grow for 2-3 months without rainfall.
- 6. Use an appropriate row configuration and variety combination.** Row configuration options include solid (1m rows); 60 inch (1.5 solid rows); single skip (2 in 1 out); 80 inch (1 in 1 out); double skip (2 in 2 out); super single (1 in 3 out). The ideal variety characteristics to look for are indeterminacy; reliable yield potential and inherently good fibre quality characteristics (length, strength and micronaire). Variety selection and row configuration advice is available at www.csd.net.au.
- 7. Establish an even, healthy plant stand.** Gaps in plant stand greater than 50cm can impact yield. Slow down your planting speed and check, check and re-check planter set up and operation. Increase your planting rate if conditions are less than ideal.
- 8. Get value out of post-harvest tillage operations.** Controlling volunteer and ratoon cotton is an integral part of the farming system, as it impacts on achieving good soil conditions, Bt and insecticide resistance, integrated pest, weed and disease management, biosecurity and your bottom line.
- 9. Fit cotton into your rotation.** Use the rotation to give your raingrown cotton the best chance of starting with a full moisture profile and a cover of stubble. This provides the best opportunity for a profitable crop in all but the toughest years.

Adapted from CSD's golden rules for raingrown cotton.

"We grow raingrown cotton because it has more upsides than any other crop, and it fits well into our three year rotation."

- James and Phil O'Reagan, raingrown growers, Narrabri.



Growing raingrown cotton could be the best decision you'll make this year!

As a starting point for more: visit www.drylandcotton.com.au; and download the **Australian Cotton Production Manual** from www.cottoninfo.com.au/publications.