

Brian Hearn Shield for water use efficiency joins the CSD awards

THE winners of the inaugural CSD Brian Hearn Shield for Water Use Efficiency are Stuart, Maxine and Tyson Armitage from Cecil Plains for their 2019–20 CSD variety trial.

The award honours the impact of pioneering Australian cotton researcher, Brian Hearn, who was instrumental in the development of a number of cotton crop simulation models which have been widely adopted by the Australian cotton industry.

Born in England, Brian's career began as an agronomist in Malawi and he later worked in Yemen and Uganda, researching cotton crop physiology. He came to Australia in 1970 as a cotton research agronomist with the CSIRO in the Ord Irrigation Area, and later Narrabri, where his modelling research led to the development of a number of software programs, including OZCOT and hydroLOGIC.

The Brian Hearn Shield for Water Use Efficiency complements the series of accolades that CSD awards to high achieving growers in their variety trial and Ambassador Network programs. CSD's five-year strategic plan has a focus on increasing water use efficiency in line with overall industry targets and the award also gives them an opportunity to pay tribute to the work of Brian Hearn through this award.

The Brian Hearn Shield to the Armitage family takes its place with other CSD awards from the 2019–20 season, all named in recognition of other legends in the cotton industry, particularly in the development of CSD and Australian cotton varieties:

- The Alan Brimblecombe Shield for the highest yielding dryland cotton variety trial and named in honour of a pioneer of the Queensland cotton industry and long time member of the CSD board.



Peter Graham, Brian Hearn and James Quinn.

- The John Grellman Shield for the highest yielding irrigated variety trial. Namoi grower John Grellman has devoted his life to the cause of cotton research and variety development and spent many years on the board of CSD as well as 11 years as Chairman.
- The Dr Norm Thomson Shield for the highest quality variety trial. Norm Thomson should need no introduction as the instigator and driving force behind the breeding of the spectacularly successful Australian cotton varieties.

The Brian Hearn Shield for Water Use Efficiency

The Armitage family of Wamara Farming has been growing cotton for 26 years on the Darling Downs. They are long-term CSD variety trial co-operators, and have hosted a range of industry trials over a number of years. They have also been a part of the CSD Ambassador Network Program since it began.

They grow around 100 hectares of irrigated cotton on their 700 hectare farm, along with sorghum, wheat, chickpeas and mungbeans. The trial field was planted to Sicot 748B3F after growing pigeon pea in the previous season. Prior to that, biosolids were applied to the field in 2018.

The crop was planted and watered up at the end of October into very good field conditions. Once watered up and after an initial slow start, the crop progressed well through squaring

Wamara Farming – five tips for good management for water use efficiency

1. Plant late October/early November to delay first irrigation.
2. Water up cotton so that it starts with a full profile.
3. Only have required nitrogen available – do not load up on fertiliser.
4. Balance nutrient needs of the plant – 'NPK'.
5. Budget irrigations back from last one on crop, to keep within water budget.



Tyson and Stuart Armitage.

and up until flowering, setting up with good potential. The first irrigation applied in crop went on about one week prior to first flower. Good rain fell just prior to the next scheduled irrigation – enough to delay the irrigation and the second in-crop irrigation was not applied until after cut out, in late February. A total of 1.9 ML per hectare was applied in crop.

Overall, this crop performed exceptionally well. Carefully managed throughout the season and part of a well-planned cropping system, both yield and quality were very good. Considering that only two in-crop irrigations were applied, alongside well timed, effective rainfall, the result was an outstanding water use efficiency (WUE) figure of 4.95 kg lint per mm.

Alan Brimblecombe Shield

The award for the highest yielding dryland variety trial for 2019–20 went to Ron Greentree and Tony Harrison at their pioneering Gulf of Carpentaria cotton farming operation at ‘Strathmore’ near Georgetown.

The Gulf Farming operation has been growing cotton on Strathmore Station for a number of seasons, with the area increasing in size each year as more country is developed. Cotton has been a part of the cropping system for the past few seasons,



Ron Greentree.



Peter Graham, Ron Greentree and Hamish McIntyre inspect the winning dryland trial.

each year with its own challenges. CSD variety trials have been hosted on the property for the past two seasons.

Cotton has been grown back to back in the farming operation for the past few seasons. Preparation is limited by the wet and dry season conditions, with minimal soil disturbance and weed control unable to be performed during the winter months, due to the hard setting soils.

Post-crop, the cotton is mulched and chemical control used to manage any volunteers or ratoon cotton. Pre-planting operations involve soil preparation once the wet season storms have allowed for suitable conditions. Fertiliser is applied in crop, but this also has its challenges, due to the cropping system and seasonal conditions.

Cotton is very new to the area and much is still to be learnt in terms of variety selection and management. This is exacerbated by the fact that each year is very different in terms of the wet season. Sicot 754B3F seems to perform well in the area, handling the hot conditions the best.

This was proven in the variety trial, where this variety topped the yield.

The fibre quality from Sicot 754B3F also stood up very well.

Unfortunately, the northern wet season ended quite abruptly after a good start and by the end of April, the season had turned. With very little soil available moisture, the crop began to shed fruit and was in dire need of some relief. Thankfully, the good management of the crop early in the season meant that fruit which had set, was able to fill and there were some reasonable bolls on plants. The crop was picked in early July and results were quite good, considering the challenging season. Sicot 754B3F, which had previously shown its ability to handle the hot and dry conditions fared the best in the trial, with a yield of 4.28 bales per hectare.

Five things to get right for a top result

1. Plant under the best possible conditions.
2. Ensure the planting operation is conducted to a good standard, taking care with planting rate and seed placement.
3. Time the establishment of the crop as early as possible, to maximise wet season rainfall.
4. Ensure sufficient crop nutrition to prevent limiting yield potential.
5. Monitor crop growth rate and manage this using growth regulators when required.

*Aside from all of these things, the wet season is completely uncontrollable and has a major effect on the crop. Often this will determine the potential success of the crop.

John Grellman Shield

The award for the highest yielding irrigated variety trial for 2019–20 went to Will Carrigan from the Australian Food and Fibre (AFF) property Redmill, Moree.

This was Will’s first year managing Red Mill but AFF have been participants in the CSD Ambassador Network Program for six years.

Ground preparations for this crop was completed early after the field came out of barley in 2018. Spread with cotton blended fertiliser, anhydrous ammonium was applied in rows of six hills and then the hills are pulled up in rows of 12.

Once the fertiliser operations are completed, the hills were rolled tight. With no rain after the ground preparation work was carried out, the hills were still quite soft come planting. Their DeltaForce planter really helped here, so even with a soft hill there was still zero bulldozing at planting.



Will Carrigan from the AFF property Redmill, Moree.

Agronomist Mike Stone noted, “It was a fairly challenging year stemming from the environmental factors necessitating good water management.”

Five things to get right for a top result

1. Ground preparation, get it done as quick as possible after the previous crop.
2. Planting: our DeltaForce planter really helps with precision, placement and uniformity.
3. Getting water off fields as quickly as possible.
4. Managing irrigations around rainfall, making sure we do not waterlog the crop.
5. In a dry year, putting fields in that run on different irrigation fronts, so we can water the field when it needs it and not wait for another to finish.

Dr Norm Thomson Shield

The award for the highest quality variety trial in 2019–20 went to Paul and Georgie Krieg, “Glen Royal,” Brookstead for a crop of Sicot 754B3F.

The family has been growing cotton for 32 years and have been CSD variety trial co-operators since the mid-1990s. They have also been a part of the CSD Ambassador Network Program since it began.

The trial field was planted after a long fallow and pre-irrigated. Conditions during the establishment period were not ideal but were manageable with appropriate irrigation. A couple of days

Five things to get right for a top result

1. Good management throughout the season, from pre-planting until picking.
2. Set your expectations of what you want out of yield and quality and work to them.
3. Avoid stressing the crop if possible, especially during the boll fill period.
4. Aim for well timed, clean defoliation to avoid immature fibres.
5. Don't rush picking and avoid high moisture in bales, as it runs the risk of undoing all of the hard work throughout the season.



The Krieg family – George, Paul, Emma and Jim.



Paul Krieg with the Dr Norm Thomson Shield.

after planting there was a brief cold snap which likely slowed things down. Post planting until first flower, the crop incurred nine cold shock days. Cool nights persisted, coupled with hot and windy days during establishment and were followed by hotter than average conditions right through to flowering. At the end of the season the crop came through with three irrigations and used approximately 4.8 ML per hectare overall. The trial produced good yields and exceptional quality across the varieties. Sicot 754B3F yielded the lowest of all the varieties in the trial, but the quality was exceptional.

TABLE 1: Quality data

| | Sicot 754B3F | Sicot 714B3F | Sicot 746B3F | Sicot 748B3F |
|-------------------|--------------|--------------|--------------|--------------|
| Yield (b/ha) | 11.75 | 12.26 | 12.61 | 12.66 |
| Yield (b/ac) | 4.76 | 4.96 | 5.11 | 5.13 |
| Staple (decimal) | 1.29 | 1.20 | 1.24 | 1.26 |
| Staple (imperial) | 41 | 38 | 40 | 40 |
| Manual class | 21-1 | 21-2 | 11-2 | 11-2 |
| Micronaire | 4.1 | 4.4 | 4.1 | 4.2 |
| Strength (g/tex) | 33.3 | 32.2 | 33.0 | 33.3 |
| Turnout (%) | 41.6 | 42.3 | 44.2 | 43.0 |
| Uniformity (%) | 83.7 | 84.3 | 83.8 | 83.4 |