

IREC FIELD STATION REPORT

The IREC Field Station at Whitton is where we road test new irrigation layouts, new cropping systems, new products, new gear and sometimes we revisit old crops and old systems with new technology applied. Everything that happens at the field station comes from the suggestions made by IREC members in our annual survey.

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Chair, IREC
Irrigator, Gogeldrie

After cotton – 2020



Click on the image above to watch a short video clip (52 seconds) of cultivation of cotton residue in 2020.

AT the field station, we endeavour to keep plants actively growing for as many months of the year as practicable. This report follows 3 systems of winter crop followed by summer crop, which were grown directly after cotton in 2019–20.

After the cotton was picked and root cut, crop residue was mulched. The field was then cultivated using a K-line speed buster – this pass also ticked the box for compulsory pupae busting.

A rubber-tyred roller was run over the field before planting the next crop to consolidate the beds.

Winter crops were planted in autumn 2020 and summer crops for 2020–21 were planted off the back of actively growing winter crops.

Three different crop systems were established and observed – Field A, Field B and Field C. These are described and pictured on the following pages.

Here is how it played out.

Field A observations

- **Residual nitrogen** left from the chicken litter trial, that ran for 3 seasons, caused yield variation in barley and rice – the higher the litter rate, the higher the yield one season later.
- **Weed pressure** in the field was low due to cotton history and post-emergent control of grass and broadleaf weeds using Agixa®.
- **Good wind protection** from barley stubble helped rice from the seedling stage through to early tillering.
- **Rice did not lodge** because most of the fertiliser nitrogen was applied at early pollen microspore.
- **Good water savings** resulted from delayed permanent water on high water use country.
- **Reasonable water productivity** was achieved 0.62 ML/t (13 ML/ha for average yield of 8 t/ha) – not great but good recovery none the less.

Barley – winter 2020

Baudin barley was planted 11 June 2020. The photo below shows the crop in July. To the left, the crop is green and lush where 16 t/ha of litter was applied previously. In the centre, the crop is growing on the nil strip and is nitrogen deficient.



To ensure the timely sowing of the next crop, the barley was sprayed out 9 August. The photo below was taken 30 September, with the crop still showing patches of green.



Rice – summer 2020–21

Viand rice was planted 2 November into standing barley stubble with a single disc seeder. The field was watered up 30 October. Permanent water was delayed, going on 1 January 2021.



At PI, the plants were very short with poor vegetative growth. The crop was top dressed with 215 kg urea/ha. Grain yield varied from 3 t/ha to 12 t/ha due to ongoing differences in soil nitrogen from the chicken litter trial.



Field B observations

- **Good planting technology** helped with good seed placement and a dense plant population of the cover crop.
- The green manure was mulched but not sprayed and the oats kept growing. The field looked terrible but the oats **provided wind protection** for cotton at the cotyledon stage. Every plant came through.
- A green manure crop has the potential to **increase arbuscular mycorrhiza** (AM), formerly referred to as vesicular arbuscular mycorrhiza (VAM), but soil tests did not show such a response this season.

Green manure – winter 2020

A cover crop mix for green manure was spread before rain 17 June 2020. The mix contained oats, barley, vetch, peas and canola.



The field was mulched green 5 September. Mulching was followed by hilling up to incorporate green manure and to band fertiliser for the following cotton crop. Up-front urea (280 kg/ha) was applied.



Click on the image above to watch a short video clip (55 seconds) of hilling up and fertiliser application.

Cotton – summer 2020–21

A second pass of the hilling-up rig occurred 18 September to get a deeper furrow, and then there was a pre-plant pass of the ring roller 29 September.



Cotton was sown 7 October, which had an incredible start in an ugly seedbed. The field was watered up 9 October. The oats were cleaned up with an in-crop application of Roundup®. No in-crop nitrogen was applied. Yield was 11.48 bales/ha with no discounts.



Field C observations

- **Short season crops** like mungbeans (90 days) cannot suffer any setbacks, such as poor drainage.
- **One metre spacing** was too wide for mungbeans. The plant population was too low for a plant with poor stem strength. The crop fell into the furrows and late summer rains reduced grain quality.
- **Strong, standing stubble** is essential for mungbeans. The volume of lodged barley stubble in furrows restricted drainage to the detriment of mungbean crop, and barley grain on the ground contaminated the mungbean sample.
- **Drainage is king.** Clean paddocks and furrows are critical in surface irrigated systems.
- **Maintaining winter crop stubble** provided a good mouse breeding environment.
- **Yields of 3 t/ha** are possible for mungbeans in a favourable year and 2 t/ha crops were achieved in the MIA in 2021. Mungbean yield at the field station was disappointing, but much was learned about growing the crop. 🌤️

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Barley – winter 2020

One of the aims of the Field C crop system was to assess the role of barley in a double cropping system with mungbeans. There are good marketing opportunities for mungbeans. While the crop is low cost to grow, it is high risk for getting a good result.

Barley was planted on 1 m hills on a pipe-through-the-bank layout.

The crop grew well but lodged heavily. A substantial amount of grain remained on the ground after harvest, contaminating the sample of the subsequent mungbean crop.

The extent of lodged barley and residue laying in the furrow affected watering up and drainage for the next crop. Irrigation water could not run down the furrows and instead went over the tops of the hills, so the system did not operate as raised beds should.



Mungbeans – summer 2020–21

Opal mungbeans were sown at 1 m spacings into full stubble on hills, using a cotton planter.

The field was pre-irrigated and the crop was sown into moisture. After sowing, watering took 15 hours to get through the layout but establishment was satisfactory. The crop grew well through summer.



Growing season rainfall was satisfactory but 2 in-crop irrigations were required. Poor drainage caused waterlogging and the crop didn't flower well.



Click on the image above to watch a short video clip (28 seconds) of mungbean harvest.

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