

V071

Case Studies

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V071: New variety leading the way for an industry step change

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The rice variety V071 has generated some pleasing results in the recent growing season, with the semi-dwarf, bold, medium grain rice variety delivering high yielding potential. It has superior grain yield, tolerance to cold temperatures, and experiences less shattering than the Reiziq variety.

V071 has also proved to be photoperiod sensitive (responds to day length) whereas Reiziq is more susceptible to temperature. V071 will continue to grow through cold periods whereas Reiziq tends to shut down (stop growing), as most growers experienced in C21. The other advantage of V071 responding to day length is that it tends to 'place itself' in a more favourable time for the critical reproductive periods.

Throughout the C21 season, Rice Extension and the SunRice Grower Services teams monitored 14 commercial V071 crops totalling 320 ha across the Murray and Murrumbidgee Valleys. The performance of 13 commercial V071 crops were compared to Reiziq crops

grown under similar farmer management practices, often in adjoining paddocks. The V071 crops were grown under all sowing methods, including drill sown, dry broadcast and aerial, and a range of soil types.

The performance of V071 varied between the valleys. In the Murrumbidgee Irrigation Area (MIA), it was on par with Reiziq; however, V071 significantly outperformed Reiziq in the Eastern Murray Valley (EMV) and the Western Murray Valley (WMV). In long-term variety trials, V071 has outyielded Reiziq by an average of 14%.

The yields of the V071 and comparable Reiziq crops (see Table 1) give an in-depth summary of performance under the different variables.

Analysis of four crops

This document examines four crops that represent both valleys and different sowing methods to share the management practices and growers' experience of growing V071.

For more-technical information, refer to the NSW DPI Prime fact [V071 growing guide](#).

| Regions | Sowing method | V071 yield (t/ha) | Reiziq yield (t/ha) | Yield difference (t/ha) | Yield % difference |
|---------|---------------|-------------------|---------------------|-------------------------|--------------------|
| MIA | Direct drill | 13.8 | 13.5 | +0.3 | +1% |
| | Dry broadcast | 15.5 | 15.1 | +0.4 | +3% |
| | Direct drill | 14.4 | 13.6 | +0.8 | +6% |
| | Dry broadcast | 13.9 | 14.2 | -0.3 | - 2% |
| | Direct drill | 12.9 | 14.2 | -1.3 | -9% |
| | Direct drill | 9.8 | 8.6 | +1.2 | +12% |
| EMV | Aerial | 12.4 | 7.6 | +4.8 | +39% |
| | Direct drill | 11.8 | 7.8 | +3.0 | +34% |
| | Direct drill | 11.7 | 7.8 | +2.9 | +33% |
| | Direct drill | 11.2 | 8.7 | +2.5 | +23% |
| | Dry broadcast | 10.8 | 6.5 | +4.3 | +40% |
| WMV | Dry broadcast | 13.2 | 10.4 | +2.8 | +27% |
| | Aerial | 10.1 | - * | N/A | |
| | Direct drill | 12.7 | 4.2 | +8.5 | +330% |

Table 1. V071 comparative data to Reiziq crops from C21 season. (Source: SunRice Grower Services)

Wilbriggie, MIA, dry broadcast

Crop One was 20 ha dry broadcast at Wilbriggie in the MIA.

Preseason preparation

The paddock had been fallowed after two years of wheat crops.

It was scarified in 2019 and kept clean over summer with fallow sprays. Then 200 kg of Bouncer (Granulock Z and Single Superphosphate mix) was spread before being scarified again and flat rolled in late July 2020.

Establishment

On 10 October 2020, 330 kg of urea was direct drilled before being flat rolled again.

On 17 October 2020, 140 kg of seed was dry broadcast, and rice was then ring rolled. It took 10 days to flush and fill, with the paddock filled by 27 October 2020.

The average plant establishment count was 175 plants/m².

Water management

Water was kept low throughout the early vegetative stage. This crop remaining quite short throughout the entire season. Deep water was reached on 14 January 2021, and was kept at 25 cm or higher until mid-flowering on 6 February 2021.

Weed and pest control

The crop was checked weekly. Weed and pest control was excellent with minimal pressure. The weed chemical program was 2 L/ha of Taipan, 2.5 L/ha of Ordram. Bloodworm was controlled with 150 mL/ha of Lorsban.

Within three weeks of sowing, a second herbicide and insecticide application was applied consisting of 3.75 L/ha Saturn and 100 mL/ha Dominex Duo.

Mid-season and PI nitrogen management

On 8 December 2020, the crop was given a mid-season blanket topdress of 150 kg/ha of Gran-Am because the grower felt it was lacking vigour. PI was reached on 1 January 2021, so a few days later the crop was top-dressed with a variable rate of 140-180 kg/ha of urea.

The total nitrogen applied to this crop is typical around Wilbriggie due to very low organic carbon levels in soil and a big cropping history.

Drainage and harvest

The crop was drained on 17 March 2021. Harvest took just over a week from 31 March to 7 April 2021, with an average moisture of 18%. The crop yield was 15.4 t/ha.

In comparison, the Reiziq crop was drained three days after the V071 crop even though it had many more milky grains. When rain was forecast, the boards were pulled, the grower assessing that this rainfall would get the crop through to maturity. Two and a half weeks later, the Reiziq crop was harvested, including some loads at high moisture.

Crop One: Lessons learnt and grower's comment

“The crop stayed short all season, and looked almost underdone, even at harvest. In comparison, the neighbouring Reiziq crop, which was treated the same and sown two days earlier, was green and rank, with the heads never above the flag. The difference in maturity between the two crops was about 2.5 weeks between harvest times. Next year, I’ll treat the crop the same again.”

Crop 01

| Crop management | V071 | Reiziq |
|--|--------------------|------------|
| 200 kg/ha Bouncer spread before scarified | July | July |
| 330 kg/ha of urea direct drilled | 10 October | 10 October |
| Sowing: Dry broadcast 130 kg/ha V071 seed Ridge rolled | 17 October | 15 October |
| Foundation herbicide Ordram – 2.5 L/ha Taipan – 2 L/ha Lorsban – 150 mL/ha | 27 October | 27 October |
| 2nd herbicide 3.75 L/ha of Saturn and 100 mL/ha of Dominex Duo | 6 November | 6 November |
| Mid-season 150 kg/ha of Gran-Am | 8 December | 8 December |
| PI date | 1 January | 1 January |
| Topdressing (PI) Urea variable rate 140-180 kg/ha | 5 January | 5 January |
| Drainage | 17 March | 20 March |
| Harvest dates | 31 March – 7 April | 7–26 April |
| Average harvest moisture | 18% | 21% |
| Yield | 15.4 t/ha | 15.35 t/ha |

Table 2. Crop management for Crop One: Wilbriggie, dry broadcast.



Figure 1: V071 (front) was grown adjacent to Reiziq crop (back). Both were treated the same, with only three days difference in watering up. While both yielded over 15 t/ha, the Reiziq crop was harvested 2.5 weeks later than the V071 crop.

Widgelli, MIA, drill sown

Crop Two was drill sown over 31 ha at Widgelli, MIA

Preseason preparation

This paddock was freshly lasered before a sunflower and sorghum crop in 2018-19 followed by wheat in 2019. The paddock was then prepared and was ready for a canola crop on beds in March 2020. However, the decision was made to grow rice instead, and the beds were disced in. Cut-and-fill maps were used to apply a variable rate of chook manure (1-5 t/ha), gypsum (0.5-5 t/ha) and Granulock Z and Single Superphosphate blend (100-150 kg/ha) before it was scarified twice and rolled throughout July and August 2020.

Sowing

The crop was direct drilled on 5 October 2020 with 130 kg/ha of seed and 180 kg/ha of starter (Granulock Z and Single Superphosphate blend).

Establishment

The crop emerged on 16 October 2020. Plant counts ranged from 80 to 250 plants/m², with most of the paddock at 150. Cut areas of the two bottom bays had poorer establishment, but although numbers were lower, they were evenly spaced.

Weed and pest control

The three-way mix was applied on 15 October 2020. The crop was also sprayed for armyworm using Strikeout in the first week of March 2021.

Water management

The crop was flushed twice before permanent water was applied on 10 November 2020.

Low water height was maintained at 5 cm throughout the vegetative period. Deep water was reached and then maintained for three weeks from 5 January 2021.

Pre-permanent water urea

A variable rate application of 280-340 kg/ha of urea was spread onto dry ground four days before permanent water.

PI and topdressing

The crop reached PI on 21 December 2020 and was topdressed with a variable rate application of 135-160 kg/ha of urea on 27 December 2020.

Drainage and harvest

The crop was drained on 23 March 2021 and was harvested over three days from 11 April to 13 April 2021 with an average moisture of 18%. The yield was 14.37 t/ha.

Crop Two: Lessons learnt and grower's comment

“It was a monster crop that just stayed green and took forever to come in. It was a bit more difficult to separate (although really it wasn't too bad), but I think we might have left a bit on the ground.”

“I was very impressed with the crop, and I think it has a fit on return ground. Its early crop vigour and growth was just so much better than my Reiziq crops.”

Crop 02

| Crop Management | V071 | Crop Management | Reiziq |
|----------------------------|--|------------------|--|
| 5 October | Sowing 130 kg/ha V071 seed 180kg/ha of Granulock Z /Single super blend | 7 October | Sowing 140 kg/ha |
| 15 October | Foundation herbicide 1.1 L/ha of Gramoxone 3.4 L/ha of Stomp 0.5 L/ha of Magister | 17 October | Foundation herbicide 1.1 L/ha of Gramoxone 3.4 L/ha of Stomp 0.5 L/ha of Magister |
| 7 November | Pre-permanent water urea VRT 280-340 kg/ha of urea | 9 November | Pre-permanent water urea 280-320 kg/ha |
| 11 November | Permanent water | 12 November | Permanent water |
| 21 December 27 December | PI and topdressing PI on 21 December Urea variable rate 135-160 kg/ha | 27 December | PI and topdressing PI on 27 December Urea variable rate 130-150 kg/ha |
| 23 March | Drainage | 23 March | Drainage |
| 11-13 April | Harvest Average moisture = 18% Yield = 14.37 t/ha | 14 April – 2 May | Harvest Average moisture = 20.5% Yield = 12.90 t/ha |

Table 3. Crop management for Crop Two: Widgelli, drill



Figure 2: V071 (front) was grown adjacent to Reiziq crop (back). Both were treated the same, with only three days difference in watering up. While both yielded over 15 t/ha, the Reiziq crop was harvested 2.5 weeks later than the V071 crop.

Moulamein, WMV, dry broadcast

Crop Three was 20 ha at Moulamein in WMV.

Preseason preparation and establishment

Before rice, this paddock had been fallowed for C20 and C19 seasons in preparation for rice, and clover pasture crop in C18 for sheep grazing.



Figure 3: Sowing V071 on top of the ground with an air seeder mimicking dry broadcast.

The paddock preparation began in June 2020, with paddock being plowed and banks being run to reduce chemical application before planting in October. Using cut-and-fill maps, on average 300kg/ha of urea was drilled in at variable rates to reduce paddock variation. The paddock was ridge rolled before sowing on 21 October 2020. The V071 seed was spread dry through an air-seeder at 120kg/ha, then watered was applied from 25 October. The decision to dry sow the seed was to reduce costs and management because this grower runs a predominately aerial-based rice system.

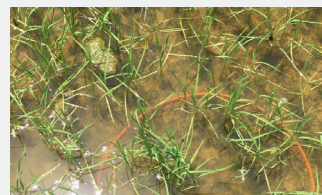


Figure 4: V071 was very quick to establish. This photo was taken on 30 October 2020, five days after permanent water was applied.

The paddock was filled up over 24 to 36 hours. The crop was quick to establish, with first sign of plant growth on 30 October 2020. Plant counts were between 180 and 250 plants/m², which resulted in a very even crop, as shown in the NDRE image (Figure 5).

Weed and pest control

Post-sowing, the crop was managed as a traditional aerial-sown crop, including checking the crop twice daily, with the agronomist also visiting twice a week.

SunRice imagery data

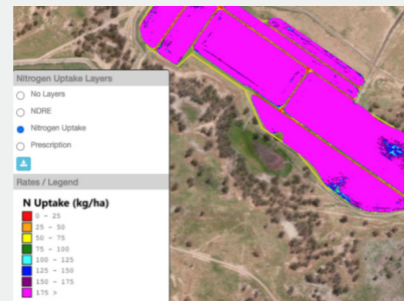


Figure 5: The NDRE image of the crop highlights evenness identified early in plant counts.



Figure 6: Ben Heaslip, RRAPL Farm Manager, and Sophie Baulking, work experience student, inspect the V071 in the district trial for flowering, which was 7 days before Reiziq.



Figure 7: The V071 harvest was finished 3 weeks prior to the comparative Reiziq crop.

PI and topdressing

PI occurred on 5 January 2021. The NIR tissue test was taken and NDRE imagery was used before urea application. The NIR tissue test and the NDRE N uptake map from SunRice indicated similar results. Figure 5 shows the uniformity of the crop, and indicates N uptake rates of 50 kg/ha to greater than 175 kg/ha. The grower chose to apply 100 kg/ha of urea to the entire paddock because the crop showed signs of yellowing.

Drainage and harvest

The crop started to be drained in the week beginning 15 March. Paddy was delivered 9-11 April with an average moisture of 22.39%. The crop overall yielded 13.2 t/ha.

| Crop management | V071 | Reiziq |
|----------------------------------|---|--|
| Paddock history | Fallow Cultivation and banks worked No knockdown applied | Clover pasture Knockdown applied and cultivated |
| Sowing | 21 October Dry broadcast 120 kg/ha of seed Drill sown on average 300kg/ha Urea Fill up 24-36 hours | 26 October Pre-germinated: aerial sown 150 kg/ha of seed Drill sown on average 300kg/ha Urea Fill up 5-6 days |
| Foundation herbicide | 27 October Ordram 2 L/ha Taipan 3.75 L/ha Lorsban 150 mL/ha | 27 October |
| Insecticide | 5 November Alpha cypermethrin 100 mL/ha | 5 November |
| Snails and slimes | 14 November Bluestone | 14 November |
| 2nd herbicide/insecticide | 17 November Londax 50 g/ha Lepidex 850 mL/ha | 17 November |
| Grass herbicide | 15 December Agixa 2 L/ha | 15 December |
| Panicle initiation | 5 January Topdressed with 100 kg/ha of urea | 6 January 8 January |
| Drainage | 15 March Determined using NDVI imagery | 18 March |
| Harvest | 9-11 April Average moisture 22% Yield 13.2 t/ha | 10 April - 5 May 18% 10.48 t/ha |

Table 4. Crop management for Crop Three: Moulamein, WMV

| Area | Yield (t/ha) | Price (\$/t) | *Water use (ML/ha) | Gross income (\$/ha) | **Harvest cost (\$/ha) | Variable costs (\$/ha) | Gross margin (\$/ha) | Gross margin (\$/ML) |
|------|--------------|--------------|--------------------|----------------------|------------------------|------------------------|----------------------|----------------------|
| 20 | 13.2 | 475 | 14 | \$6100 | \$592 | \$2000 | \$3508 | \$251 |

Table 5. Gross margins for Crop Three: Moulamein, WMV *Grower average water cost = \$100
**Harvest cost = wet weight + cartage and harvest at contract rates.

Crop Three: Lessons learnt and grower's comment

- V071 is quick to establish, 4 to 5 days in front of the comparison Reiziq crops.
- Less shedding than Reiziq.
- Wouldn't change management from this season; probably didn't need final herbicide (Agixa spray was cosmetic).
- Won't dry sow seed again due to the movement in seed when filling the bays up.

"I'd definitely like to be growing V071 in 2022. It was quick to establish, easy to manage, and high yielding."

Wandook, WMV, drill sown

Crop 04

Crop Four was 23.5 ha at Wandook near Deniliquin.

Preseason preparation

Before rice, this paddock was a vetch crop that was cut for silage followed by a knockdown spray. Excess trash was removed from the paddock with a laser bucket. Rice and fertiliser were direct drilled at time of planting.

This grower has changed their crop rotation to ensure that vetch crop always precedes rice planting. This decision is directly related to nitrogen management of the rice crop to try to reduce urea application per ha.

The V071 was direct drilled on on 19 October 2020 and flushed on 21 October 2021 using 130 kg/ha of seed and 120 kg/ha DAP fertiliser.



Figure 8: Plant stand of V071 eight days after sowing.

Establishment

The V071 was quick to establish, with first sign of leaves just eight days after on Tuesday 27 October 2020. Plant counts were 120–180 plants/m².

Irrigation management

This crop was flushed twice before permanent water was applied on 10 November 2020. The grower attributed rain to reduced flushes in field, having measured 50 mm before permanent water date.

Weed/pest management

Due to issues with trafficability of the paddock, the crop had a foundation herbicide varied. The areas that were

trafficable before seed emergence had the standard three-way mix applied, which was 0.9 L/ha of Gramoxone, 0.4 L/ha of Magister, and 3.4 L/ha of Stomp. Where the seed had emerged, the Gramoxone was taken out and replaced with Propanil (Stam).

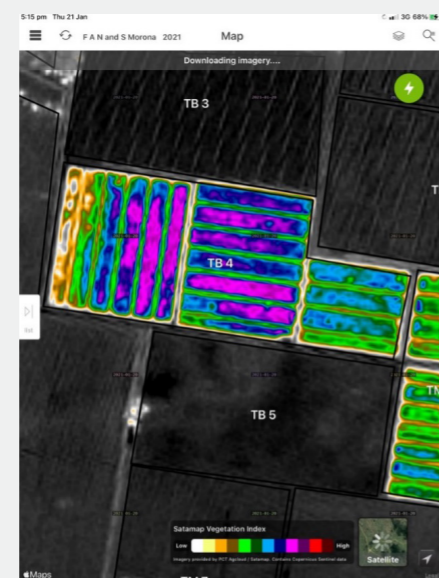


Figure 9: NDVI vegetative map at time of PI highlights growth difference in paddock, and determined the variable rate split.

PI and topdressing

PI occurred on 4 January 2021. On average, a total of 150 kg/ha of urea was applied with a variable rate split of 160 kg/130 kg. Variation in urea application was based on vegetative growth of crop, which can be seen in Figure 9. The grower took NIR tissue tests and used the NDRE imagery provided by SunRice as tools when determining the topdressing rates. The tissue tests resulted in Nitrogen Uptakes of between 68 kg/ha and 80 kg/ha from the three zones (cut, normal and fill).

Drainage and harvest

Paddy was delivered from 23-28 April 2021, averaging 11.68 t/ha. Average crop moisture for deliveries was 20.63%. The V071 was harvested 3-4 weeks before the Reiziq.

The paddock was double cropped for winter, stubble burnt (flag burn) and disc-seeded with soft wheat for grain production.

Crop Four: Lessons learnt and grower's comment

- Look at reducing fertiliser application in accordance with work on V071 produced by Brian Dunn.
- Vetch before rice is a good management tool.

“It fits nicely into our farming enterprise.”



Figure 10: The V071 was harvested three to four weeks before the Reiziq crop.

| Crop management | V071 | Reiziq |
|------------------------|--|--|
| Paddock history | Vetch, cut for silage | Vetch, cut for silage |
| Sowing | | |
| Direct drill: | 130 kg/ha | 130 kg/ha |
| Starter fertiliser: | DAP 120 kg/ha | DAP 120 kg/ha |
| 4 November | Foundation herbicide Magister 0.4 L/ha Stomp 3.4 L/ha Also used mixture of Gramoxone and Propanil | |
| 8 November | Fertiliser 1st application SOA 80 kg/ha (pre-permanent water) Fertiliser 2nd application Urea 225 kg/ha | Fertiliser 1st application SOA 80 kg/ha (pre-permanent water) Fertiliser 2nd application Urea 225 kg/ha |
| 10 November | Permanent water | Permanent water |
| 18 November | Herbicide Aura 0.375 L/ha | Herbicide Aura 0.375 L/ha |
| 4 January 5 January | Panicle initiation Urea application split: 160 kg/ha on cut bays 130 kg/ha on the rest | Panicle initiation 150 kg/ha urea |
| Harvest | 23 to 28 April Average moisture = 20.63% Yield = 11.68 t/ha | 13 to 21 May Average moisture = 19.46% Yield = 7.47 t/ha |

Table 6. Crop management for Crop 4: Wandook, WMV.



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