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Rice variety guide 2024–25

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The rice variety guide provides information on grain yield, agronomy, and phenology for all varieties to help growers and agronomists when deciding which variety to grow.

District variety agronomy experiments

To obtain a robust dataset, all varieties are tested in experiments conducted in growers' commercial crops over a range of seasons, locations, and sowing methods (Figure 1).

The results are used to develop the recommendations presented in this publication and the individual variety growing guides.

Figure 1. Variety by nitrogen experiment at Coleambally in the 2024 season.

Choosing a rice variety

Each field and individual growing situation has specific characteristics that suit some varieties more than others. It is important to look at each varieties traits to determine which is best suited to each situation.

It is recommended to grow a mix of varieties over a range of sowing dates and methods to minimise the risk of a cold event reducing grain yield across all your crops.

Yield potential

The grain yield of each variety is compared with the standard Reiziq(h) in the Murrumbidgee Valley (Table 1a) and the Murray Valley (Table 1b).

The data in Tables 1a and 1b are derived from experiments conducted using all sowing methods at recommended sowing times and nitrogen (N) rates. All sowing methods, i.e. aerial, dry broadcast, drill and delayed permanent water (DPW), have the same grain yield potential when managed appropriately, so the data are combined to add rigour to varietal differences.

Table 1. Variety grain yields relative to Reiziq(h) (%) from agronomy experiments conducted in commercial rice fields in the Murrumbidgee (1a) and Murray Valley (1b). Average of aerial, dry broadcast, conventional drill and delayed permanent water (DPW) growing methods.

1a. Murrumbidgee Valley Grain yields relative to Reiziq(h) (%)

Harvest year Average Reiziq(h) yield (t/ha)	**2019** **11.09**	**2020** **13.23**	**2021** **12.77**	**2022** **13.19**	**2023** **10.57**	**2024** **12.38**	**Average** **12.20**	Number of experiments
Reiziq(h)	100	100	100	100	100	100	100	29
V071(h)	–	114	104	112	114	109	111	14
Sherpa(h)	110	105	108	101	116	108	108	20
Viand(h)	95	98	111	97	110	95	101	15
Langi	98	89	90	–	97	93	93	18
Topaz(h)	84	87	–	–	94	89	88	13
Doongara	109	100	–	–	100	96	101	13

Colours represent yield ranges	<89	90–96	97–104	>105

1b. Murray Valley Grain yields relative to Reiziq(h) (%)

Harvest year Average Reiziq(h) yield (t/ha)	**2019** **11.75**	**2020** **11.13**	**2021** **11.00**	**2022** **13.26**	**2023** **10.26**	**2024** **12.08**	**Average** **11.58**	Number of experiments
Reiziq(h)	100	100	100	100	100	100	100	21
V071(h)	–	121	117	113	115	106	114	16
Sherpa(h)	107	122	116	103	112	109	112	14
Viand(h)	106	–	93	98	113	100	102	9
Opus(h)	91	111	96	105	103	102	101	15
Koshihikari	88	92	94	–	–	96	93	9

Colours represent yield ranges	<89	90–96	97–104	>105

Maturity

Varietal differences in development duration are compared by measuring the number of days from sowing (aerial sown) or first flush (drill sown) to mid-flowering. Rice development is delayed by cool temperatures, increasing nitrogen and reducing the period of ponding (i.e. drill and DPW). The relative days to mid-flower in Table 2 are at commercial nitrogen rates and averaged across regions, seasons, and sowing methods.

Viand(h) is the only short season variety currently grown and takes on average 14 days less to reach mid-flowering than Reiziq(h) (Figure 2).

Table 2. Maturity data (days) for all varieties.

Variety	Sowing/flush to mid-flower	Mid-flower to 22%
Viand$^{(b)}$	95	52
Sherpa$^{(b)}$	104	57
Langi	105	49
Topaz$^{(b)}$	108	49
Reiziq$^{(b)}$	109	57
Opus$^{(b)}$	109	52
Doongara	111	45
V071$^{(b)}$	112	54
Koshi	113	52

Figure 2. The difference in maturity between Viand$^{(b)}$ (left) and V071$^{(b)}$ (right) at flowering.

The duration from mid-flowering to harvest maturity (22% grain moisture) varies with variety, crop nitrogen level and temperature. For average temperatures and nitrogen, medium grain varieties take 55 days from mid-flowering to 22% moisture, short grains 52 days and long grains 48 days (Table 2). Although the canopy of V071$^{(b)}$ stays greener than Reiziq$^{(b)}$, it takes a few days less from flowering to maturity (Table 2). Growers should take this into account when draining the crop for harvest.

Table 3. Rice variety agronomic characteristics

Variety	Maturity (days to mid-flower different than Reiziq$^{(b)}$)	Cold stress tolerance 1 = low 5 = strong	Establishment vigour 1 = weak 5 = strong	Lodging tolerance 1 = prone 5 = resistant	Shattering tolerance 1 = prone 5 = resistant
Reiziq$^{(b)}$	Standard	3	5	5	1
V071$^{(b)}$	3	5	5	5	3
Sherpa$^{(b)}$	−5	5	4	4	3
Viand$^{(b)}$	−14	4	4	2	3
Langi	−4	3	2	2	2
Topaz$^{(b)}$	2	1	1	5	4
Doongara	2	1	3	5	3
Opus$^{(b)}$	0	4	3	3	4
Koshihikari	4	4	3	1	5

Cold stress tolerance

Each variety is ranked for its relative tolerance to low temperatures at microspore and flowering (Table 3). Varieties with a low tolerance to cold stress (i.e. Topaz$^{(b)}$ and Doongara) should be sown at the recommended time to reduce their chance of being exposed to low temperatures during the critical reproductive periods. High levels of pre-permanent water (PW) nitrogen increase the susceptibility to cold-induced sterility in all varieties, but nitrogen applied at panicle initiation (PI) has little effect.

Establishment vigour

All varieties have been assessed for establishment vigour in several field and laboratory experiments where the varieties were exposed to the same conditions. Reiziq[PBR] and V071[PBR] have the best establishment vigour, while Topaz[PBR] has the weakest establishment vigour and requires extra care to ensure good establishment (Table 3).

Lodging

Lodging increases harvest time and cost and reduces grain yield. Aerial sowing increases lodging potential compared to drill-sowing, as does excessive nitrogen applied pre-PW and dense plant populations. Varieties have different tolerances to lodging and the most susceptible, Koshihikari and Viand[PBR], should only be drill sown (Table 3). Lodging due to haying-off is a result of draining the water from the field before the crop is ready and is not variety-related.

Grain shattering

Tolerance to shattering is an important trait when delayed harvest occurs and is worse with severe weather conditions. It is important to give the highest harvest priority to varieties prone to shattering (i.e. Reiziq[PBR] and Langi[PBR]) (Table 3).

Variety characteristics

Reiziq[PBR] is a semi-dwarf, bold, medium grain variety with high yield potential. It has strong establishment vigour and is resistant to lodging but is moderately susceptible to cold during the reproductive period. In cool seasons, its development is delayed, so it should not be sown late. Reiziq[PBR] is a loose threshing variety with the potential for shattering if harvest is delayed after the crop is mature.

V071[PBR] is a semi-dwarf, bold, medium grain variety with high yield potential, outperforming Reiziq[PBR] in grain yield in all our district experiments. V071[PBR] has higher cold stress tolerance and reduced shattering compared with Reiziq[PBR]. V071[PBR] has a similar growth duration to Reiziq[PBR] but has the advantage of continuing to develop during periods of cool temperature. Although the canopy of V071[PBR] stays greener at maturity than Reiziq's[PBR] canopy, V071[PBR] matures a few days quicker from flowering.

Sherpa[PBR] is a semi-dwarf, medium grain variety with high cold stress tolerance and moderate establishment vigour. It has high yield potential and maintains grain yield levels better than Reiziq[PBR] in cooler seasons. Sherpa[PBR] is a hard threshing variety.

Viand[PBR] is a short-season, semi-dwarf medium grain variety with similar yield potential to Reiziq[PBR]. It has strong establishment vigour, is moderately resistant to cold during the reproductive period, but is moderately susceptible to lodging. To reduce lodging, it is recommended that Viand[PBR] only be drill sown and N applications split between pre-PW and PI.

Langi is a semi-dwarf, long grain soft cooking (low amylose) variety grown only in the Murrumbidgee Irrigation Area (MIA) and Coleambally Irrigation Area (CIA). Langi has moderate establishment vigour and cold stress tolerance and is moderately resistant to lodging. Early harvest is recommended as it is a loose threshing variety with the potential for shattering if left to stand in the field.

Topaz⦶ is a semi-dwarf fragrant long grain variety only grown in the MIA and CIA. Topaz⦶ has poor establishment vigour and care should be taken to ensure good establishment. Topaz⦶ is highly susceptible to low temperatures during the reproductive period, which can significantly reduce grain yield. Topaz⦶ is susceptible to straighthead but resistant to lodging.

Doongara is a semi-dwarf long grain hard cooking (high amylose) variety with a low glycaemic index (GI) and is resistant to lodging. It is susceptible to low temperatures during the reproductive period, which can significantly reduce yield. It is also susceptible to straighthead.

Opus⦶ is a semi-dwarf short grain sushi variety only grown in the Murray Valley. It has moderate establishment vigour, is resistant to lodging and moderately resistant to cold during the reproductive period. It is a pubescent variety and is susceptible to straighthead with symptoms presenting as floret sterility.

Koshihikari is a premium short grain Japanese variety that is tall. It is a lower-yielding variety, but a premium is paid to compensate. Koshihikari is very susceptible to lodging and should not be aerially sown. To minimise lodging, reduce the total applied N by 50% compared with Reiziq⦶. Koshihikari is a pubescent variety and is susceptible to straighthead.

Ideal sowing time

The recommended sowing window for each variety is based on the crop being at microspore (MS) and flowering when there is the least risk of low temperatures (Table 4). Griffith and Deniliquin temperature data show the period of least risk of low temperatures is between 21 January and 9 February (shown by the hatched areas in Table 4).

Rice development is slower when it is not ponded (aerobic) than when growing in water. Therefore, crops planned for DPW should be sown earlier than conventional drill sown crops, and aerial sown and dry broadcast crops should be sown last as they are fastest to develop (Table 4).

Table 4. Recommended sowing and first flush dates for Reiziq⦶, V071⦶, Topaz⦶, Doongara, Opus⦶ and Koshihikari (not aerial) and the subsequent panicle initiation (PI), microspore (MS) and flowering timing when sown in the recommended period for each district and sowing method. The hatched area shows the time of least risk of low temperatures.

		October						November	December	January										February					
		5	10	15	20	25	31	5		3	6	9	12	15	18	21	24	27	31	3	6	9	12	15	18
MIA & CIA	Aerial					Sowing																			
	Drill				First flush					PI						MS				Flower					
	DPW		First flush																						
Murray Valley	Aerial				Sowing																				
	Drill			First flush						PI						MS				Flower					
	DPW	First flush																							

Panicle initiation is, on average, 31 days before mid-flowering, so PI should be between 1 January and 12 January for MS and flowering to occur when there is the least risk of low temperatures.

The earlier maturing varieties are sown later than the standard varieties. Temperatures in the Murray Valley are generally a couple of degrees lower than in the MIA and CIA, slowing crop development. Therefore, earlier sowing dates are recommended for crops grown in the Murray Valley (Table 5).

Table 5. Recommended sowing/first flush dates for rice varieties, regions and sowing methods.

Variety	MIA/CIA			Murray Valley		
	Delayed permanent water	Drill	Aerial/dry broadcast	Delayed permanent water	Drill	Aerial/dry Broadcast
Reiziqⓓ V071ⓓ Opusⓓ Topazⓓ Doongara	5–20 October	15–31 October	20 October–5 November	1–15 October	10–25 October	15–31 October
Koshihikari*	5–20 October	15–31 October	Not advised	1–15 October	10–25 October	Not advised
Sherpaⓓ Langi	10–25 October	20 October – 5 November	25 October – 10 November	5–20 October	15–30 October	20 October–5 November
Viandⓓ	25 Oct–10 November	5–20 November	Not advised	20 October–5 November	1–15 November	Not advised

* Do not aerial sow or dry broadcast Koshihikari as this will increase lodging potential.
MIA/CIA = Murrumbidgee Irrigation Area/Coleambally Irrigation Area.

Sowing earlier than recommended can result in establishment difficulties due to low soil temperatures and poor grain quality due to high temperatures during grain fill. Sowing later than recommended increases the risk of cold-induced sterility and reduced grain yield.

Recommended sowing rates

Aim to achieve plant populations between 100 and 200 plants/m^2. Research has shown plant populations between 40 and 400 plants/m^2 achieve similar grain yields.

Rice maintains yield at low plant populations by increasing the number of tillers per plant and grains per panicle. High plant populations increase the risk of lodging, especially for varieties with high lodging potential, e.g. Koshihikari and Viandⓓ.

Sowing rates are the same for all sowing methods. Research has found similar seed establishment percentages for aerial sowing with pre-germinated seed (45%) and drill sowing (48%). See NSW DPI Primefact 1476: Rice plant population guide (https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/663716/Rice-plant-population-guide.pdf).

Establishing 200 plants/m^2 of V071ⓓ requires a maximum sowing rate of 130 kg/ha at a seed establishment percentage of 45%. As little as 25% establishment will result in 100 plants/m^2, which is more than enough to achieve maximum grain yield.

Recommended sowing rates are based on seed size and variety establishment percentages (Table 6). When drill sowing, rates can be reduced by 10–25% if sowing at a consistent seed depth and into soil with good structure and surface drainage.

Table 6. Sowing rates (kg/ha) required to achieve 200 plants/m^2 based on seed size, 95% germination and 45% seed establishment percentage.

	Variety								
	Reiziq⌽	V071⌽	Sherpa⌽	Viand⌽	Langi	Doongara	Topaz⌽	Opus⌽	Koshihikari
Sowing rate (kg/ha)	140	130	130	130	130	130	140*	110	100**
1,000 grain weight (g)	29.5	27.7	26.7	26.8	25.8	25.2	23.6	23.6	24

*Topaz⌽ has a higher sowing rate due to poor establishment vigour.

**Koshihikari has a lower sowing rate due to high lodging risk.

Nitrogen management

There is a strong relationship between pre-PW urea rate and yield for each variety (Figure 3).

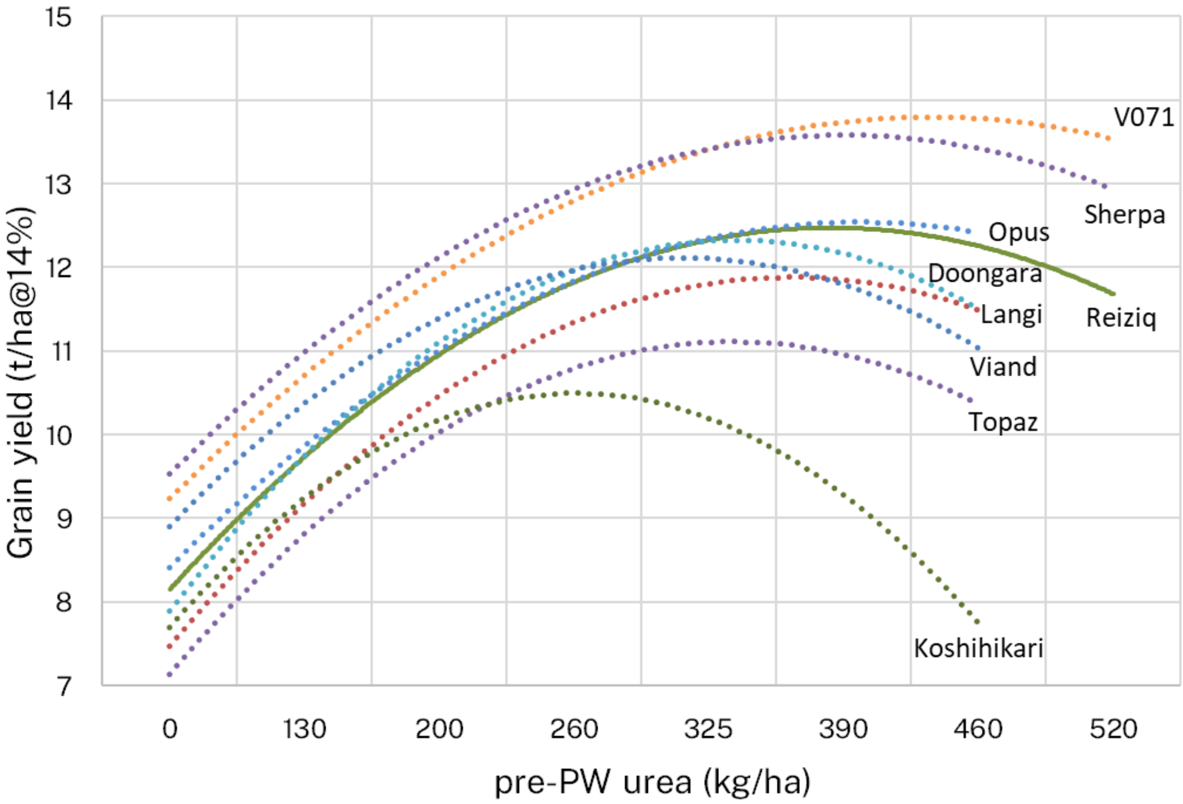

Figure 3. The average relationship between the rate of urea applied pre-permanent water (PW) and grain yield (t/ha) for commercial varieties. Data were collected from 60 experiments over 9 seasons, using all sowing methods and in all regions.

Although the yield potential for each variety is different, the amount of N required for most varieties to reach their yield potential is similar (Figure 3). The biggest exception is Koshihikari, a tall variety requiring very different N management. Varieties with high lodging potential or susceptibility to cold stress should have less N applied pre-PW and more at PI (Table 7).

Reiziq⌽ and Sherpa⌽ have similar N requirements to reach their yield potential. They require N from the soil and/or pre-PW fertiliser to reach a target PI N uptake of 100–140 kg N/ha (Table 7).

V071ᶲ has the highest yield potential and requires additional pre-PW nitrogen to reach its potential. A PI N uptake below this range can prevent the crop from reaching its yield potential.

All other varieties have a lower PI N uptake range due to their increased risk of lodging or cold damage. This further limits the amount of N that should be applied pre-PW (Table 7). Factors such as cropping history, land forming cut and fill, soil type, and legume history will all modify the pre-PW urea requirement range by influencing soil N supply.

Table 7. Pre-permanent water (PW) urea requirement and target panicle initiation nitrogen (PI N) uptake range for each variety; the factor most limiting pre-PW N application compared with Reiziqᶲ. Cut areas might require more N and fields with a legume history less N.

Variety	Pre-PW urea (kg/ha) range	Target PI N uptake (kg N/ha)	Pre-PW nitrogen limiting factor
V071ᶲ	220–380	110–160	–
Reiziqᶲ	200–340	100–140	–
Sherpaᶲ	200–340	100–140	–
Opusᶲ	200–300	100–130	Protein
Viandᶲ	180–260	90–120	Lodging
Topazᶲ	180–260	90–120	Cold risk
Doongara	180–260	90–120	Cold risk
Langi	180–260	90–120	Lodging and cold
Koshihikari	100–150	70–90	Lodging

Once the PI N uptake target range is achieved, the crop can be top-dressed with N at PI if required. Crop growth and nitrogen content can be measured using the PI tissue test to determine accurate PI N top-dressing rates.

More information on nitrogen management in rice is in Primefact 22/619: Managing nitrogen in rice (https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/1412935/Managing-nitrogen-in-rice.pdf).

Individual variety growing guides

Comprehensive rice growing guides are available for each variety on the NSW DPI website (https://www.dpi.nsw.gov.au/agriculture/broadacre-crops/summer-crops/rice-variety-guides).

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