Department of Primary Industries
and Regional Department

Primefact

Koshihikari growing guide

August 2025, Primefact 1486, fifth edition
Rice Research Agronomy Team*, NSW DPIRD

Koshihikari is a premium, short grain, Japanese variety considered as a benchmark for sushi. It is a tall variety that is susceptible to lodging and should not be aerial sown.

Yield potential

The yield potential of Koshihikari is 81% of Matilda$^{\Phi}$ (V071; Table 1), but it is extremely susceptible to lodging at high yields.

Table 1. Average grain yield of Koshihikari and Matilda$^{\Phi}$ from experiments and commercial fields over 5 seasons.

5 year average yield (t/ha)	Koshihikari	Matilda$^{\Phi}$
Experiment average	10.5	13.8
Grower average	8.3	11.7

Establishment vigour

Experiments show Koshihikari to have moderate establishment vigour.

Sowing method and date

Koshihikari should **only be drill sown** as it is prone to lodging when aerial sown.

Drill sown crops have better root anchorage and resistance against stem bending, which reduces their lodging susceptibility.

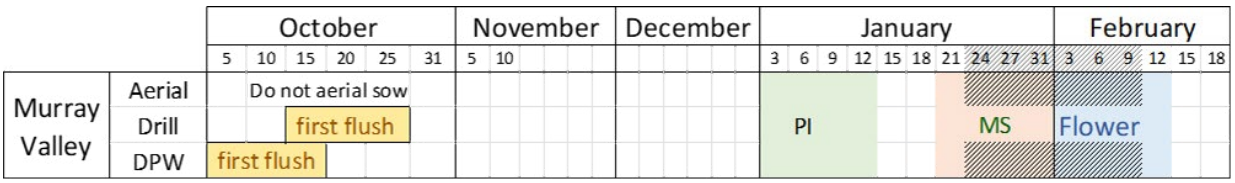
The recommended first flush windows for Koshihikari are shown in Table 2.

Table 2. Target first flush dates for Koshihikari for different sowing methods in the Murray Valley.

Aerial/dry broadcast	Drill	Delayed permanent water
Do not aerial sow	10–25 Oct	1–15 Oct

Sowing date recommendations for Koshihikari aim to ensure the critical microspore and flowering phases align with the period of least risk of low temperatures (Figure 1).

Sowing earlier or later than recommended increases the risk of exposure to low temperatures during microspore and flowering, which can reduce grain yield.



DPW = delayed permanent water, PI = panicle initiation, MS = microspore.

Figure 1. Recommended first flush dates for Koshihikari and the subsequent panicle initiation (PI), microspore (MS) and flowering timing when sown in the recommended period for each sowing method in the Murray Valley. The hatched area shows the time of least risk of low temperatures.

Sowing rate

It is recommended that Koshihikari be sown at 100 kg/ha for all sowing methods, aiming to establish between 100 and 150 plants/m^2. Sowing rates can be reduced by 10–20% when the seed is placed at a consistent depth and in good establishment conditions. Lower plant densities reduce lodging potential.

Sow a compound fertiliser containing phosphorus and zinc with the seed when drill sowing.

Cold tolerance

Koshihikari has a moderately high tolerance to cold stress during the early pollen microspore and flowering reproductive periods.

Plant height

Koshihikari has an average height of 91 cm, 11 cm taller than Matilda[4].

Lodging potential

Koshihikari is highly susceptible to lodging, which is made worse by applying excessive nitrogen pre-permanent water (PW), aerial sowing or high plant densities.

Grain shattering

Koshihikari is resistant to shedding grain after maturity.

Straighthead susceptibility

Koshihikari is susceptible to straighthead, which reduces grain yield. Symptoms present as floret sterility, particularly in low nitrogen areas. Severe straighthead has the characteristic parrot beaking symptoms and missing florets (refer to Primefact 1346, *Straighthead in Australian rice crops*).

Nitrogen management

Nitrogen management of Koshihikari presents a trade-off between grain yield and lodging.

To maximise grain yield, reduce lodging and ensure grain protein is within required levels. Plan for a **50:50 split between pre-PW and PI** applied nitrogen. As Koshihikari is a variety used for making sushi, lower grain protein levels are required to access high-value markets.

It is recommended to only apply between **100 and 150 kg/ha urea** to Koshihikari pre-PW and top-dress at PI (Figure 2). Fields with a history of legumes might require less nitrogen pre-PW, and some continuous-cropped fields with heavy clay soil might require more nitrogen.

Any major field variability in nitrogen should be amended pre-PW. Red-edge imagery of previous rice crops grown in the field is a good resource for identifying soil nitrogen variability.

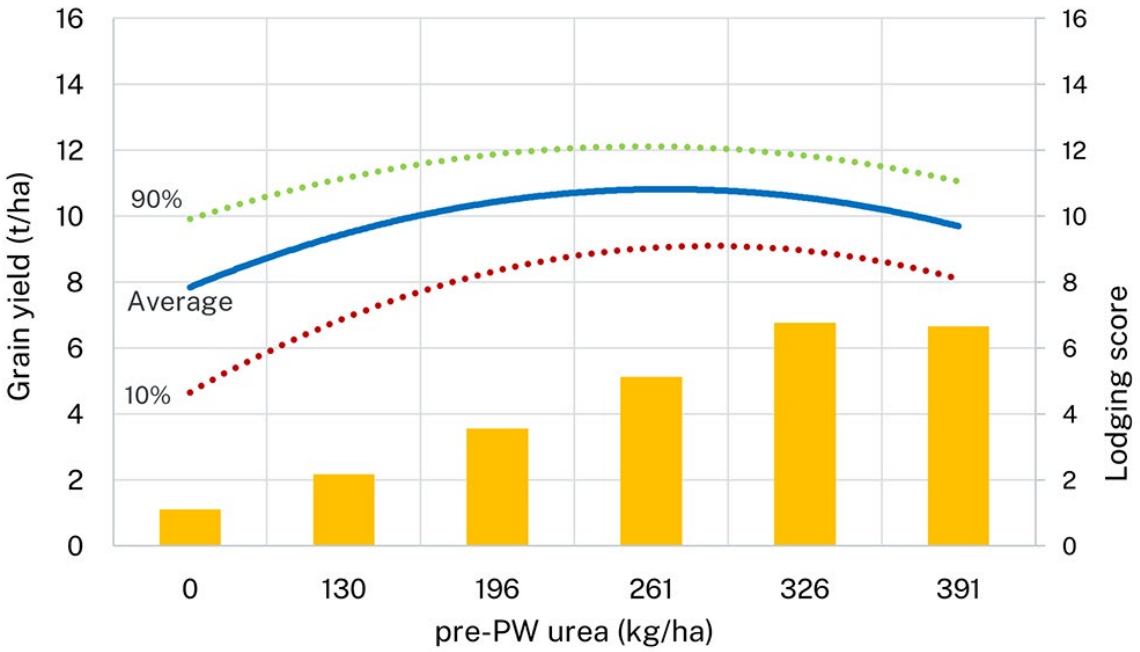


Figure 2. Koshihikari grain yield (average, 10 and 90 percentiles) and average lodging score (orange bars, 1 = standing, 10 = flat) results for pre-PW (permanent water) nitrogen application rates (no panicle initiation (PI) applied nitrogen). Results are from 109 plots in 15 experiments conducted over 7 seasons with a range of soil types, fertility levels and sowing methods.

Koshihikari produces a high grain yield with reduced susceptibility to lodging and lower grain protein levels when nitrogen is split between pre-PW and PI (Figure 3).

Results from a nitrogen rate by timing experiment at Jerilderie show that high grain yields with reduced lodging and split nitrogen applications resulted in lower grain protein levels for Koshihikari (Figure 3).

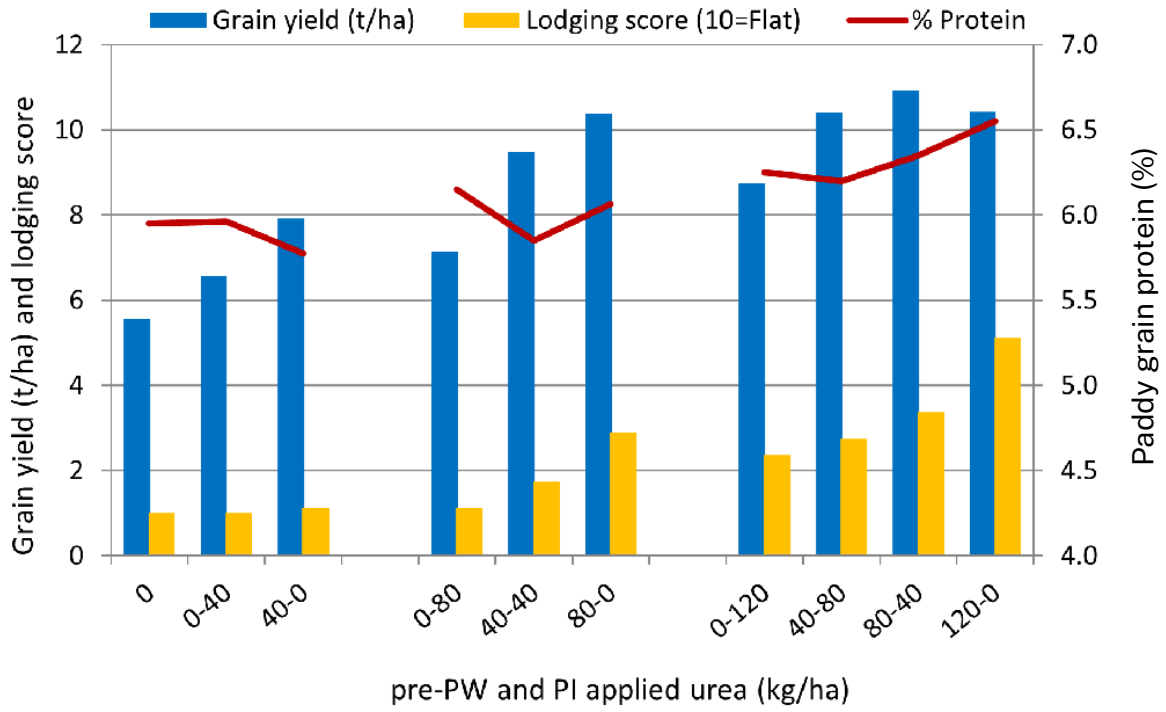


Figure 3. Grain yield results (blue bars), lodging scores (orange bars, 1 = standing, 10 = flat) and grain protein levels (red lines) for Koshihikari from a nitrogen rate by timing experiment conducted at Jerilderie.

Panicle initiation nitrogen

For maximum grain yield with reduced lodging and lower grain protein, it is important to use nitrogen uptake maps and the PI tissue test to determine PI nitrogen top-dressing rates.

Higher than required nitrogen rates applied at PI can significantly increase lodging and grain protein levels and reduce profitability.

Grain protein

Koshihikari is a short grain variety used to make sushi, which requires specific grain quality attributes. Grain protein levels of paddy grain below approximately 6.9% are preferred, but high-value markets require paddy protein levels below 6.4%.

Nitrogen management is very important for achieving maximum grain yield without unnecessarily increasing grain protein levels to access high-value markets.

Harvest

Be prepared to start harvesting Koshihikari as soon as the grain moisture drops to 22%. Delaying harvest will increase the risk of lodging, which can cause difficult harvesting conditions and reduce grain quality.

Further reading

Dunn B, Dunn T, Hodges C and Dawe C (2019) Effect of sowing rate, nitrogen rate and application timing on grain yield and protein of short grain rice. *Southern NSW Research Results 2019*, NSW Department of Primary Industries, 155–158, https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/1185480/SNSWRR2019-web-18Oct.pdf

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