Department of Primary Industries
and Regional Department

Primefact

Opus$^{\Phi}$ growing guide

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Rice Research Agronomy Team*, NSW DPIRD

Opus$^{\Phi}$ is a semi-dwarf, short grain sushi variety only grown in the Murray Valley.

Yield potential

The yield potential of Opus$^{\Phi}$ is 95% of Matilda$^{\Phi}$ (V071; Table 1).

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

5 year average yield (t/ha)	Opus$^{\Phi}$	Matilda$^{\Phi}$
Experiment average	12.2	12.9
Grower average	10.0	11.1

Establishment vigour

Experiments show Opus$^{\Phi}$ to have moderate establishment vigour. Care should be taken when drill sowing not to sow the small Opus$^{\Phi}$ seed deeper than 3 cm.

Sowing method and date

All sowing methods, i.e. aerial, dry broadcast (DB), drill and delayed permanent water (DPW), are suitable for growing Opus$^{\Phi}$ and have the same grain yield potential when managed appropriately.

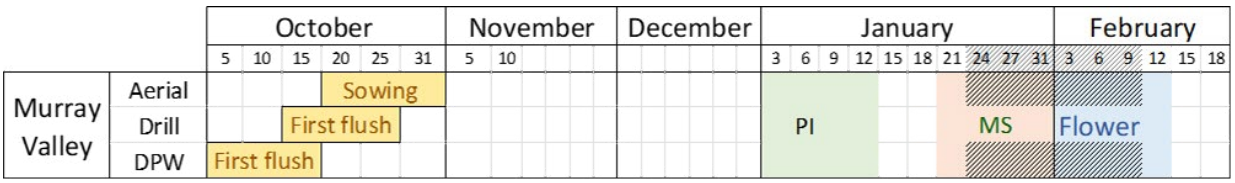
The recommended sowing and first flush windows for Opus$^{\Phi}$ are shown in Table 2.

Table 2. Target sowing and first flush dates for Opus$^{\Phi}$ for different methods in in the Murray Valley.

Aerial/dry broadcast	Drill	Delayed permanent water
15–31 Oct	10–25 Oct	1–15 Oct

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

Recommended sowing times are aimed at ensuring the critical microspore and flowering phases align with the period of least risk of low temperatures (Figure 1).



PI = panicle initiation, MS = microspore.

Figure 1. Recommended sowing and first flush dates for Opus$^{\phi}$ 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 Opus$^{\phi}$ be sown at 110 kg/ha for all sowing methods, aiming to establish between 100 and 200 plants/m^2. Sowing rates can be reduced by 10–20% when drill sowing if the seed is placed at a consistent depth and in good establishment conditions.

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

Cold tolerance

Opus$^{\phi}$ has a moderately high tolerance to cold stress during the early pollen microspore and flowering reproductive periods.

Plant height

Opus$^{\phi}$ has an average height of 79 cm, 1 cm shorter than Matilda$^{\phi}$.

Lodging potential

Opus$^{\phi}$ is moderately resistant to lodging, which can be induced by applying excessive nitrogen pre-permanent water (PW). The effect of pre-PW nitrogen application rates on lodging of Opus$^{\phi}$ is shown in Figure 2.

Grain shattering

Opus$^{\phi}$ is moderately resistant to shedding grain once the crop is mature.

Nitrogen management

Opus$^{\phi}$ is a durable variety with a long plateau before grain yield declines or lodging becomes a problem from excess nitrogen application (Figure 2). However, as it is a variety used for making sushi, which requires a lower grain protein level to access high-value markets, do not apply excessive nitrogen.

It is recommended to apply between **200 and 300 kg/ha urea at pre-PW** to Opus$^{\phi}$ (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.

To ensure grain protein is within required levels, plan for **a 70:30 split between PW and PI** applied nitrogen.

Any major field variability in nitrogen should be amended pre-PW. Nitrogen uptake maps of previous rice crops grown in the field are a good resource for identifying soil nitrogen variability.

Results from a nitrogen rate by timing experiment show that maximum grain yield for Opus$^{\phi}$ can be achieved with split nitrogen applications (Figure 3). The pre-PW and PI nitrogen split treatments produced equal or higher grain yield than when all urea was applied pre-PW, and also resulted in lower grain protein levels (Figure 3). There was no lodging in the experiment.

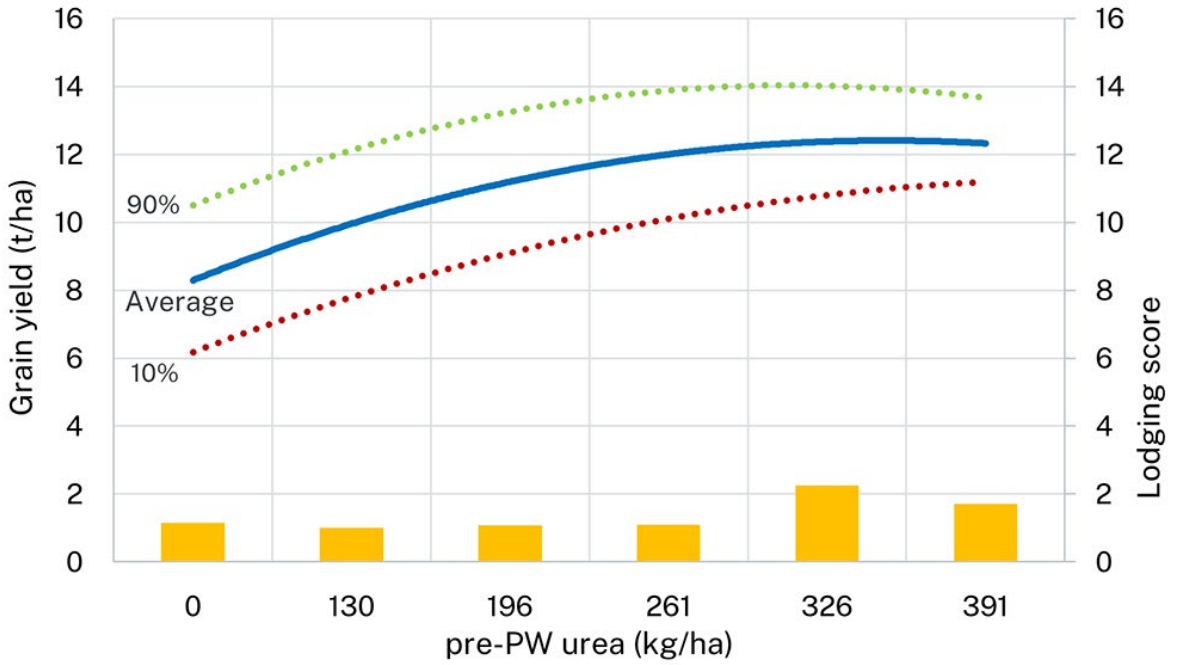


Figure 2. Opus grain yield (average, 10 and 90 percentiles) and average lodging score (orange bars, 1 = standing, 10 = flat) results for pre-PW (permanent water) nitrogen application rates (no panicle initiation (PI) applied nitrogen). Results are from 226 plots in 27 experiments conducted over 10 seasons with a range of soil types, fertility levels and sowing methods.

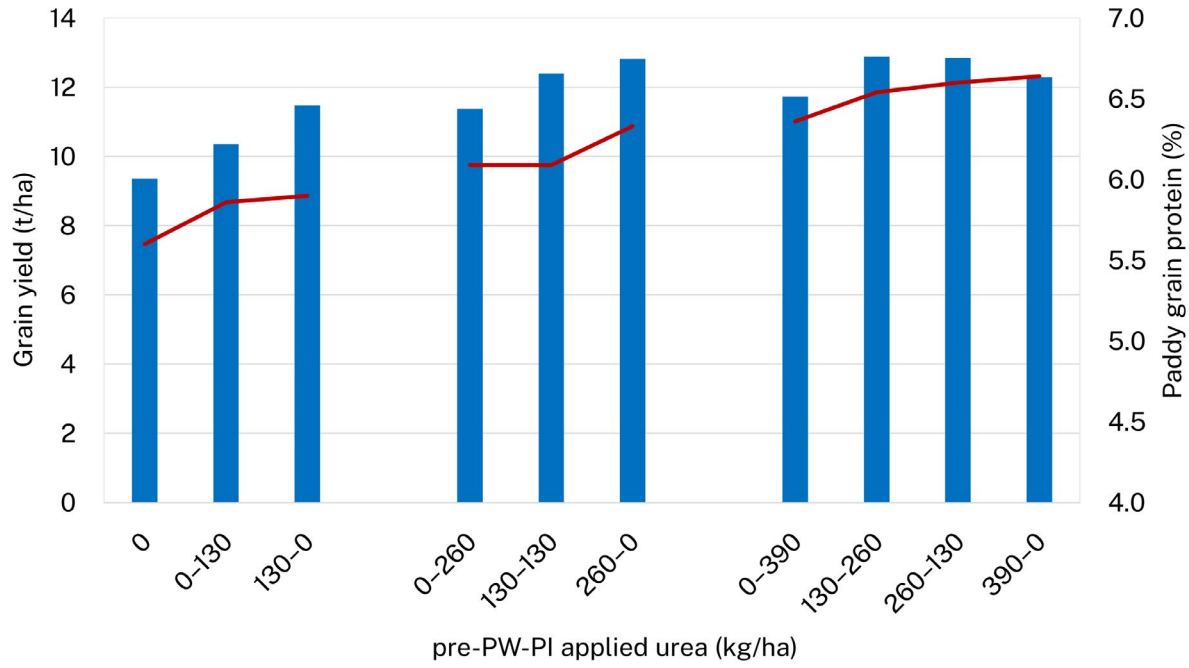


Figure 3. Grain yield results (blue bars) and grain protein levels (red lines) for Opus from a nitrogen rate by timing experiment conducted at Jerilderie.

Panicle initiation nitrogen

For maximum grain yield with lower grain protein and reduced lodging, it is important to use nitrogen uptake maps and the NIR tissue test to determine PI nitrogen top-dressing rates. Higher than required nitrogen rates applied at PI can also increase grain protein levels and lodging and reduce profitability.

Grain protein

Opus$^{\Phi}$ is a short grain variety used to make sushi, which requires specific grain quality attributes. Protein levels of paddy grain below approximately 6.9% are preferred, but high-value markets require paddy protein levels below approximately 6.4%.

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

Harvest

Be prepared to start harvesting Opus$^{\Phi}$ 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.

Acknowledgements

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