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FACTSHEET

WATER AND NITROGEN MANAGEMENT IN RICE CULTIVATION IN BAFRA

AWD: controlled wetting–drying cycle

The field is not kept continuously under deep water. Water level is monitored with an observation tube; irrigation resumes at the threshold appropriate for the growth stage.

DMPP nitrogen: ONE application only

Calculate the rate based on available nitrogen in the soil analysis. Do not reapply the DMPP product during the same growing season.

What is AWD?

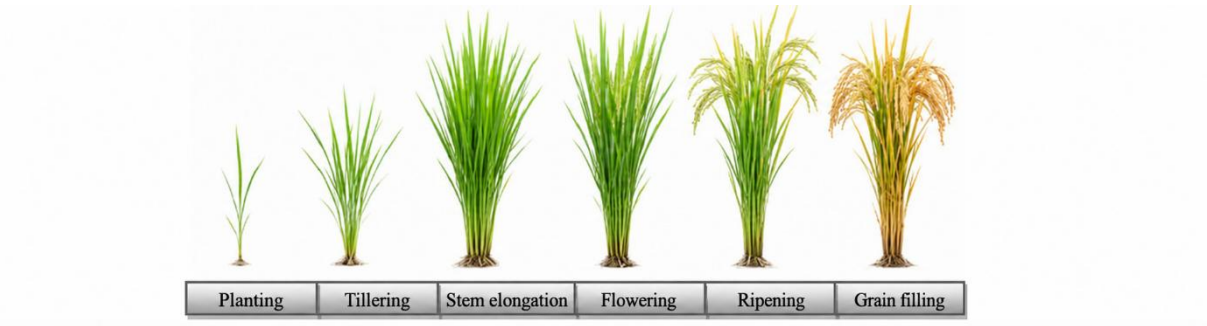
Alternate Wetting and Drying (AWD) is an irrigation method in which the water level in a rice field is allowed to fall in a controlled manner before the field is irrigated again at an appropriate threshold. The aim is not to deprive the crop of water, but to avoid maintaining an unnecessarily high water level continuously.

Important precaution

Avoid water stress during heading and especially flowering. Keep the field moist with shallow water; pause the drying phase of the AWD cycle.

What does DMPP do?

DMPP is a nitrification inhibitor that temporarily slows the conversion of ammonium nitrogen to nitrate. It is not a source of nitrogen itself and does not justify applying excess fertilizer. Effective use depends on accurate soil analysis, the correct product rate, and appropriate application timing.



Purpose of combining AWD and DMPP

AWD improves water use efficiency in rice production, while DMPP delays the conversion of ammonium nitrogen to nitrate, helping nitrogen remain available in the root zone for longer. Together, these practices aim to improve the efficiency of water and nitrogen inputs, limit nitrogen losses, and enhance environmental sustainability.

Water at the right time + nitrogen at the right rate = efficient resource use and sustainable rice production

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1) Field Trials (2024–2025)

- All irrigation × fertilization combinations were applied completely in both years.
- Soil, water, and plant samples were collected at four growth stages in each season.
- The 2024 harvest was completed on 2 November, and the 2025 harvest on 5 November.
- Laboratory analyses are continuing according to the project schedule.



2) Irrigation Water Use Results

Conventional Flooding
- 2024: 2539-4239 mm
- 2025: 2082-4209 mm

AWD (Alternate Wetting and Drying)
- 2024: 2307-3405 mm
- 2025: 2107-3216 mm

Drip Irrigation
- 2024: 1361 mm
- 2025: 1029 mm

➢ Drip Irrigaiton had the lowest water use in both years
➢ AWD provided substantial water saving compared with conventional flooding

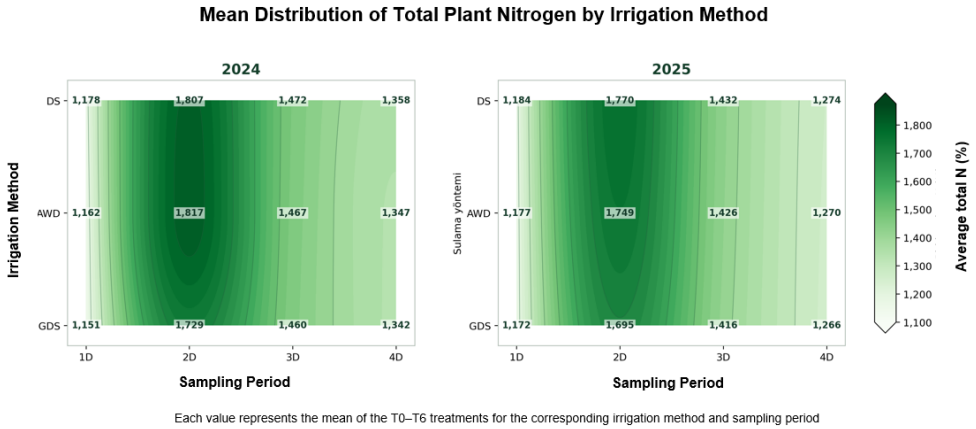


Yield Results

Based on the two-year results, the highest mean grain yield was **716 kg/da** under conventional flooding, followed by **653 kg/da** under AWD. Although **AWD** yield was approximately **%9** lower than under conventional flooding, the difference between these two methods was not statistically significant. Mean yield under drip irrigation was **608 kg/da**. Among nitrogen treatments, the highest yield, **24 kg N/da** was obtained with the **AS+DMPP** treatment (T6). The findings indicate that AWD, combined with appropriate nitrogen management, can save substantial water while maintaining rice yield close to that achieved under conventional irrigation.

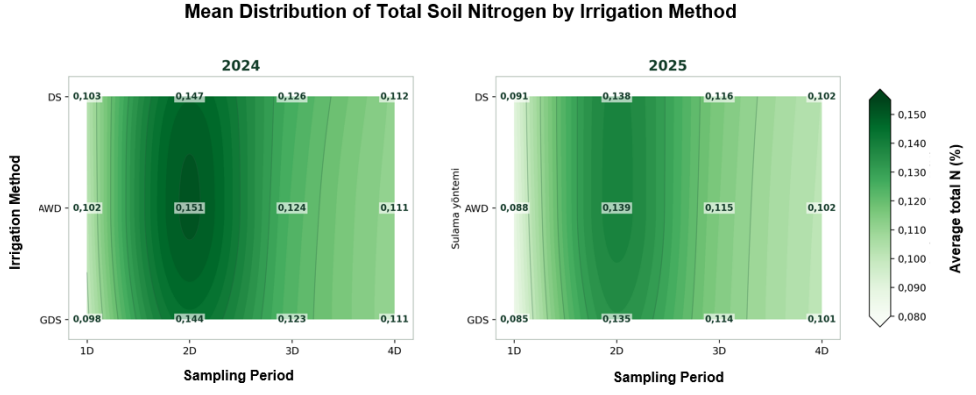
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Each value represents the mean of the T0–T6 treatments for the corresponding irrigation method and sampling period

Total soil N content reached its peak during the second sampling period across both years and all irrigation methods, subsequently declining. The highest values were recorded under the AWD treatment in both 2024 (0.151%) and 2025 (0.139%). The fact that AWD exhibited higher values compared to GDS and DS—particularly during the second period—suggests that soil nitrogen may have been better conserved under these conditions. However, the values for 2025 were generally lower than those for 2024. As the graph does not present a statistical comparison, differences between irrigation methods should be interpreted based on numerical trends.



Each value represents the mean of the T0–T6 treatments for the corresponding irrigation method and sampling period

In both years, the total plant N content reached its peak during the second sampling period—regardless of the irrigation method—and subsequently declined gradually. The highest values recorded in the second period were 1.817% for AWD in 2024 and 1.770% for DS in 2025. However, the numerical differences between the methods are limited; the graph alone does not indicate that these differences are statistically significant. The decline observed in the later stages may be attributed to the translocation of nitrogen to various plant organs during development and a dilution effect associated with dry matter accumulation.