

Growing high yielding rice with less water

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Under conventional methods of growing rice in N.S.W., ponded water or permanent flood is maintained within the bay from the early seedling stage to physiological maturity, a period of approximately five months. During this period the average water consumption would be 15N1/ha. Charges for this water represent a major cost to the rice grower. In addition the high water consumption by rice often limits the water available for irrigating other crops in the farm rotation.

Experiments were commenced in the 1981/82 season at Yanco Agricultural Institute to evaluate the potential for improving the efficiency of water use by rice. The main results were that delaying permanent flood until just prior to panicle initiation (PI) combined with split applications of N fertilizer resulted in 23% water saving but did not significantly reduce grain yields. Water was applied at seven day intervals prior to PI. When the crop was intermittently irrigated throughout the whole season the resulting grain yields were very low, maturity was delayed by about 2.5 weeks and the quality of grain was poor.

During the 1982/83 season delaying permanent flood until PI reduced yields of Calrose by 15% while savings in water were 22%. Yields of other varieties were reduced by similar or higher amounts. The reasons for the slight differences between the two sets of results could be related to differences in timing of permanent flood around PI, soil fertility or seasonal conditions.

One of the experiments during the 1983/84 season examined the importance of timing of permanent flood around PI. Results indicate that yields were reduced if the permanent flood is delayed until PI or 1.5 weeks later. However, there was no significant yield reduction when permanent flood was applied two weeks prior to PI.

These results suggest that water use efficiency of rice can be improved by delaying permanent flood. The optimum timing of permanent flood close to PI could well depend on seasonal conditions particularly those occurring at and after PI. It is also appreciated that acceptance of this method of water management will depend to a large part on the development of an efficient weed control technique in the absence of early permanent flooding.