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Resource utilization and sustainability of conservation based rice-wheat cropping systems in Central Asia

Excessive and inefficient water use, intensive soil tillage and decreasing soil fertility threaten the sustainability of rice-wheat systems in the irrigated lowlands of Central Asia. Water-saving, such as alternate wet and dry irrigation (WAD), and conservation agriculture practices (minimum tillage and residue retention) can help counterbalancing these threats. Compared to conventional paddy rice, WAD irrigation has a 70% water-saving potential but at the price of a 42% reduction in rice yield, using currently available varieties. Surface seeding of wheat into the standing rice field is an efficient alternative for wheat cultivation in the rice-wheat system. With the current policy where water is for free, there is no incentive for farmers to shift to WAD. Adoption of conservation-based rice-wheat systems involving WAD and direct seeding will require the development of regionally adapted aerobic rice varieties that minimize the yield penalties in WAD.