

## Leave it more to aquifer? Characterizing potential benefits and unintended consequences of weather index insurance on irrigated cropland

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Irrigation is commonly employed as the main strategy to maintain target crop production under climate fluctuations. Weather index insurance presents another mean to cope with climate uncertainty by providing farmers with additional financial resilience at low transaction cost, while avoiding moral hazard and adverse selection that plague traditional crop damage-based insurance. Thus, the integrated use of weather index insurance and irrigation has the potential to reduce groundwater use as irrigation presents a significant share of groundwater depletion. So far, however, weather index insurance has been used almost entirely on rain-fed cropland owing to technical difficulties in the conventional approach to insurance design. We propose an alternative approach to overcome these obstacles and demonstrate how to adopt weather index insurance optimally with available irrigation strategies from a financial perspective. This optimal result, however, may present either potential benefits or unintended consequences for aquifer management.

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