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A neuro-dynamic programming approach for optimal scheduling and feedback control of deficit irrigation systems

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A neuro-dynamic programming technique (NDP), which overcomes numerous limitations of dynamic programming (DP), is used for determining the optimal irrigation policy in deficit irrigation. The new simulation-based optimization algorithm for single crop intraseasonal scheduling operates together with general water flow and crop growth simulation models. Variable weather conditions are considered to show how NDP can respond immediately to external effects (e.g. rainfall) and guarantees maximum expected yield under these uncertainties. In the presentation, different management schemes are considered and crop-yield functions generated with the NDP optimization algorithm are compared.