# A Modeling Approach to the Evaluation of Alternative Cropping Systems. (A03-andales113832-Oral)

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### **Abstract:**

The Great Plains Framework for Agricultural Resource Management (GPFARM) decision support system (DSS) version 2.01 was used to evaluate three rotations (wheat-fallow, wheat-corn (or sorghum)-fallow, and wheatcorn (or sorghum)-proso millet-fallow) at three dryland sites in Eastern Colorado. All cropping systems were managed with no-till techniques under rain fed conditions. The three sites represent three levels of potential evapotranspiration (ET): Sterling (low), Stratton (medium), and Walsh (high). Experimental data from 1987 to 1999 were used in the multi-year simulations. GPFARM performed better in predicting long-term average grain yields than in predicting yearly variations. Predicted cropping system performance agreed with observations and showed that annualized yield (mean dry matter yield per year) and water use efficiency increased with increasing cropping intensification. Predicted annualized yields followed the observed trend -Stratton was the most productive and Walsh was the least. Despite its inadequacies, GPFARM can be used in strategic planning to determine the effects of cropping intensification on long term productivity and water use efficiency.

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