Experimental and computer simulation evaluation of wheat yield and grain nitrogen concentration spatial variability in eastern Washington. (A03-kemanian105951-Poster)

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Abstract:

In eastern WA, variable soils and topography result in a complex spatial pattern of grain yield (GY) and nitrogen concentration (GNC). This study was aimed at quantifying spatial and temporal factors affecting dryland wheat GY and GNC, and to test the ability of the model CropSyst to capture this variability. Spring wheat was grown at 4 positions: S-footslope, S-backslope, shoulder and N-backslope at an experimental farm near Pullman, WA, in 1999 and 2001. In 2001, an irrigated control was added. The S-backslope had the lowest GY in both years (219 and 408 g/m2) and the highest GNC (25.1 and 22.7 mg/kg). The maximum GY was found at the N-backslope in 1999 (323 g/m2) and at the S-toeslope in 2001 (525 g/m2). The N-backlslope consistently had the minimum GNC. Irrigation increased yields by 12%. Cropsyst simulated well biomass (B) and GY in dryland and irrigated plots, with relative RMSEs (%) for biomass (yield) of 1.5 (7.8) and 5.0 (6.9), respectively. The model overestimated the GNC by 10%, but captured the dilution caused by irrigation. The causes of the observed variability and the potential of Cropsyst to simulate B, GY, and GNC for site-specific management are discussed.

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