Assessing Limited Growing Season Production Risk to Dryland Cotton Using GOSSYM Crop Growth Simulation. (A03-baumhardt121947-Poster)

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Abstract:

Cotton (Gossypium hirsutum L.) production on the semiarid southern Great Plains may be limited by inadequate growing season length; however, its greater profit potential compared with grain crops has stimulated interest in this crop. Cotton yield potential, risk, and best management practices information is needed for this area north of 35oN. The objective was to assess these factors for cotton with crop simulation. Using the cotton simulation model GOSSYM, Pullman soil (fine, mixed, superactive, thermic Torrertic Paleustoll) properties, and long-term (1958-1999) weather records, cotton yield was projected for a crop planted 15 May and at 9, 13, and 17 plants/m^2 with 0.76 m between rows. For validation, model projected cotton yields were similar to the limited dryland observations. Modeled yields declined as the plant population increased. When freeze injury was negated, projected yields averaged 565 (SD = 25) kg/ha compared with freeze enabled conditions that averaged 517 (SD = 8) kg/ha. Model projected dryland cotton yields of less than 375 kg/ha occurred fewer than 10% of 43 test years and exceeded 500 kg/ha during more than 60% of the years.

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