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Response of Peanuts to Irrigation Management at Different Crop Growth Stages

T. A. Howell, M. J. McFarland, D. L. Reddell, K. W. Brown, R. J. Newton, P. Dahmen

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Past irrigation research on peanuts has shown that when the plant is exposed to soil moisture stress at different crop growth stages, different responses seem to exist between the Spanish and the Florunner peanut varieties. The Spanish peanuts appear more susceptible to soil moisture stress during the blooming and pegging stage, while the Florunners seem more susceptible during the late maturation stage.

The objective of this experiment was to determine the optimum irrigation schedule for peanuts at different crop growth stages for the Spanish and the Florunner varieties. The yield of the two varieties was evaluated under seven different irrigation treatments including a "no stress" check treatment and a dryland treatment. Each treatment had a different schedule of either irrigating or stressing the peanut plant during one or more of three crop growth stages. The three crop growth stages were: (1) pegging; (2) early maturation; and (3) late maturation. Rainfall during the vegetative and blooming stage ensured adequate moisture for both of the crop growth stages.

Evapotranspiration was monitored throughout the life cycle for both peanut varieties. The evapotranspiration was determined using a soil moisture balance equation.

Plant growth in the form of dry matter accumulation and leaf area index was also studied for the Spanish variety. No significant differences in the leaf area index existed between the treatments. The dry matter growth analysis showed that an irrigation during the pegging stage resulted in a faster pod weight accumulation during the early maturation stage than if no irrigation occurred during that stage.

The yield and evapotranspiration results showed that differences existed between the two peanut varieties. First, for the Spanish variety, the results indicated that soil moisture is needed during the pegging stage to obtain near maximum yields. Treatments with an irrigation during the pegging stage had a greater evapotranspiration and larger

yields, than the treatments without an irrigation during this stage. Second, if an irrigation is made during the pegging stage, an additional irrigation during the early maturation stage is unnecessary. Third, an irrigation during the late maturation stage will increase yield if dry climatic conditions normally exist during this stage. In the case of the Florunner variety, the yield results indicated that moisture stress should occur in no more than one of the crop growth stages if yield reductions are to be minimized. Also, an adequate supply of soil moisture during the late maturation stage is absolutely necessary in order to obtain maximum yields for Florunner peanuts. Treatments which had an irrigation during the late maturation stage had a steady evapotranspiration rate during this crop growth stage and had near maximum yields. Treatments which showed a decrease in the evapotranspiration rate during the late maturation stage produced a significantly lower yield.

Texas Water Resources Institute

1500 Research Parkway A110
2260 TAMU
College Station, TX 77843-2260

Phone:
979.845.1851
Fax: 979.845.0662
Email:

twri@tamu.edu

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