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Effects of planting dates, densities, and varieties on ecophysiology of pigeonpea in the Southeastern United States

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ABSTRACT

Pigeonpea [*Cajanus cajan* (L.) Millsp.] is an important legume crop widely cultivated in tropical and subtropical climates of the world. Interest in this crop is growing in many countries because of its multiple uses as a source of food, feed, fuel, and fertilizer. However, the performance of pigeonpea in Southeastern US has not been well investigated. We conducted an experiment in Nashville, Tennessee to test the effects of two planting dates, three densities, and four varieties on pigeonpea ecophysiology that included leaf photosynthesis, stomatal conductance, transpiration, water use efficiency (WUE), leaf area index (LAI) and soil respiration. Results indicated that the plants in the late planting plots had higher photosynthetic rate, stomatal conductance and transpiration. There were significant differences in the levels of leaf photosynthesis, stomatal conductance, transpiration, WUE and LAI among all four varieties. W3 and G1 showed higher photosynthetic rate and LAI than W1, and W3 had higher WUE than G2 and W1. Planting densities had no significant effect on all variables studied. This study indicated that late planting of variety G1 or W3 resulted in higher WUE and yield, but did no significant influence soil CO_2 emission.

KEYWORDS

Leaf Area Index; Photosynthesis; Soil Respiration; Transpiration; Water Use Efficiency

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