RegenPGC Graduate Education Community

Cameron Krumm

Breeding & Genetics

Iowa State University / Dr. Shui-Zhang Fei

Integrating perennial groundcover: species and suppression effects on maize growth

Abstract Conventional maize production maximizes yield through intense management but can degrade soil and ecosystem health. Integrating a perennial groundcover (PGC) system is a method that may be used to potentially mitigate some of the negative environmental effects while maintaining a balance of yield and economic feasibility for farmers. PGC systems use perennial cool-season grass grown as a living mulch alongside the target crop to improve nutrient retention, soil conservation, and overall ecological stability. Interspecific competition for water, sunlight, and nutrients remains a major challenge in PGC systems, often limiting crop growth and yield. Restricting competition early in the maize life cycle will reduce competitive pressure and improve system performance. A field trial was conducted in Boone, Iowa during 2025 to evaluate the effect of the PGC species and suppression methods on maize growth, yield, resource competition; and whether early suppression or summer dormancy traits can reduce interspecific competition. The experiment was a split-block design containing four replications. The main plot factor is management practice consisting of two treatments: unsuppressed and Liberty-suppressed (32 oz acre-1). The sub plot factor includes eight PGC cultivars of four different species and one control treatment of conventionally grown maize. Data was collected on reflected light quality, maize plant height and reproductive stage, grain yield, maize leaf-chlorophyll content, and PGC groundcover. Results from this study show that chemical suppression of PGC increased reflected light quality, maize height, and grain yield compared to unsuppressed PGC. Summer-dormant cultivars performed closer to the conventionally grown maize control. Early-season suppression and use of summer-dormant PGCs effectively reduced competition, resulting in maize yields comparable to those of the conventional cropping system.

Krumm, Cameron, Fei, Shui Zhang, Law, Q., & Moore, Kenneth J. (2025, November 12). Integrating perennial groundcover: species and suppression effects on maize growth [Abstract]. CANVAS 2025, Salt Lake City, UT, United States. https://scisoc.confex.com/scisoc/2025am/meetingapp.cgi/Paper/169622.