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Cover Crop Based Reduced Tillage Management in Foral Hemp Cultivation

The legalization of industrial hemp under the 2018 Farm Bill marked a pivotal shift in U.S. agriculture, enabling its reintroduction as a high-value specialty crop. Despite its potential, floral hemp cultivation remains challenging due to stringent THC compliance regulatory requirements, pests, diseases, and weed pressure. This study, conducted at Tennessee State University's Agricultural Research farm, evaluates the effects of different mulch treatments (plastic, straw, and roll-crimped cover crop) combined with tillage practices and propagation materials (clone and seedling) on weed and disease management, cannabinoid production, THC compliance, and economic performance of floral hemp cultivation in a randomized complete block design replicated four times. Preliminary results indicate that straw mulch significantly reduced soil temperatures, weed density, and disease severity compared to black plastic mulch and no-mulch control, positioning it as an eco-friendly and cost-effective alternative. Seedling-propagated plants demonstrated greater plant growth parameters, while clones tended to lower southern blight disease. Additionally, cover-crop mulched organic farming systems reduced grass and broad leaf weed densities compared to conventional systems, highlighting the potential of sustainable practices to address regulatory and environmental challenges in hemp cultivation.

These findings emphasize the potential of integrating sustainable practices to enhance hemp production efficiency while meeting regulatory standards and provide actionable insights for farmers navigating the complexities of hemp cultivation. It contributes to the broader goals of economic sustainability, environmental stewardship, and agricultural resilience. An expanded study planned for 2025 will further examine different reduced tillage and weed management strategies under organic and conventional practices.