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Abstract

Evaluation of Zucchini (*Cucurbita pepo* var. Dunja) yield grown in various cover crops and termination methods in organic management systems

This research aimed to identify optimal combinations of cover crops and termination methods to enhance the yield performance of organic Zucchini (*Cucurbita pepo* var. Dunja). Field experiment was conducted during the spring-summer 2024 on certified organic land at the Tennessee State University in Nashville. Ten cover crops namely, Crimson Clover, Mammoth Red Clover, Medium Red Clover, White Clover, Daikon Radish, Tillage Radish, Field Peas, Barley, Winter Rye and Hairy Vetch in four replications were established in a randomized complete block design method, each plot measuring 16'x7' (length x width). Organic management practices followed per National Organic Program (NOP) standards. Four termination methods evaluated for cover crops, Crimp Roller, Sickle Bar, Rotary Blade, and Tillage. Weed barriers were applied to inhibit regrowth of cover crops, and drip irrigation was installed to ensure uniform moisture availability. Organic zucchini seeds were obtained from High Mowing Seed Company and, soaked in fulvic acid solution (4%) for 24 hours before direct sowing into the field. Sowing was performed in the weed barriers after four weeks of cover crop termination. Seed germination started in 4-5 Days After Sowing (DAS) and fruiting commenced by 45-50 DAS. Zucchini fruits were harvested and weighed, bi-weekly over four weeks specific to the cover crop and termination method. Yield data was statistically analyzed using two-way ANOVA in R to evaluate the effects of cover crop type and termination method on the fruit yield. Among four termination methods, Tillage method produced the highest overall yield (398.23 lbs./800 ft^2), followed by Rotary Blade (241.14 lbs./800 ft^2), Crimp Roller (229.14 lbs./800 ft^2) and Sickle Bar (154.27 lbs./800 ft^2). Zucchini yields showed significant variability grown in different cover crops: Mammoth Red Clover under Tillage method (58.37 lbs./80 ft^2), Winter Rye under Crimp Roller method (48.62 lbs./80 ft^2), Daikon Radish under Rotary Blade method (44.52 lbs./80 ft^2) and White Clover under Sickle Bar method (27.12 lbs./80 ft^2) yielded the highest Zucchini fruits per each termination method. Preliminary findings suggest the importance of selecting appropriate cover crop and termination method to optimize organic Zucchini yield performance.