Companion planting pattern of Salvia leucantha Cav. and Tagetes erecta L. regulates population dynamics of natural enemies and pests in tea plantation

Maoyu Nie[1], Yueying Gu[1], Ziwen Long[1], Mingjie Liang[1], Xia Zhou[1], and linhong Jin[1]

[1]Guizhou University

March 31, 2024

Abstract

Biological control is an element of an integrated pest management approach by restoring or maintaining biodiversity and associated ecosystem services. Introducing flowering plants into crop management may promote the top-down pest suppression by natural enemies and reduce the reliance on pesticide use. Sage (Salvia farinacea Cav.) and marigold (Tagetes erecta L.) were planted in tea gardens in this paper to investigate the effect of sage and marigold, that of different layouts on the pest and natural enemy populations in tea gardens. It was found that sage and marigold, the checkerboard planting layout could consistently increase the population of natural enemies such as spiders, coccinellids, ladybird beetles, flower bugs, etc., and suppress the population of major pests (aphids, thrips, whiteflies, etc.) in tea gardens. At the same time, it was also found that the pests did not show significant tropism when flower plants and tea trees were present simultaneously, suggesting that flower plants may mask the ability of the host plant to achieve protection of the target crop. Additionally, the content composition of tea leaves, such as tea polyphenols and free amino acids, was significantly improved in the treated area planted with sage compared to the blank treatment group. Thus, it suggests that planting sage and marigold in tea gardens are not only a good measure to regulate the population density of natural enemies and pests, but also can have a positive impact on tea quality.

Hosted file

`Nie-EE-manuscript.docx` available at https://authorea.com/users/761608/articles/737754-companion-planting-pattern-of-salvia-leucantha-cav-and-tagetes-erecta-l-regulates-population-dynamics-of-natural-enemies-and-pests-in-tea-plantation