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Poster

Towards diverse climate-resilient cotton systems using short-duration intercrops in India

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Abstract:

Cotton is an important cash crop in India, providing income and livelihoods to millions of smallholder farmer households. However, climate change and resulting irregular rainfall patterns have increasingly become a threat to rural cotton farmers and their livelihoods. The delayed onset of the monsoon and erratic rainfall patterns have caused yield losses in the study area in central India's Nimar Valley. Farmers must adapt their practices and develop sustainable strategies to increase their resilience. Short-duration intercrops may be one such strategy, generating additional income within a short cultivation time, and less prone to extreme weather events. A field trial in Nimar Valley tested the effects of intercropping cotton with apple gourd and cucumber on crop yields and system profitability. Conducted over one cotton season (June – November) in 2023, the trial employed a randomized block design with four replications. Data was collected on the yield of cotton and companion crops, input and labor costs, income generated from selling the harvest, and the resulting gross profit. Results from this first season show cotton with apple gourd to be the most profitable combination. In this combination, cotton yield was maintained and while total production costs were significantly increased, apple gourd also provided substantial additional income, resulting in an average gross profit of 227.60 USD ha−1 higher than in cotton monoculture. As a reference, The average monthly income per agricultural household was 100.70 USD in 2019. In contrast, cotton with cucumber was not a suitable combination as it reduced cotton yield, had higher production costs (e.g. costly cucumber seeds) and cucumber had a low market price, leading to an average gross profit of 49.77 USD ha−1 below cotton monoculture. The trial will be continued for another season. In addition, we will investigate the mechanisms that led to differences in cotton yield with the cucumber companion crop. Our study demonstrates the potential of short-duration intercrops to increase the profitability of organic cotton systems while highlighting the delicate interplay of market conditions and biophysical crop interactions affecting the system's profitability.

Keywords: Climate resilience, cotton, India, intercropping, organic agriculture

Biography:

Manish Singh Chouhan, have been working as a scientific researcher for a research organization for more than eight years. His graduation is in Biotechnology. I have a great interest in Agricultural research.

Research Interest: To find out the potential of short-duration intercrops to increase the profitability of organic cotton systems.

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