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Intercropping Marigold with Tomato: A Sustainable Approach to Crop Production and Pest Management

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Intercropping tomato (*Solanum lycopersicum L.*) with marigold (*Tagetes spp.*) is a smart and eco-friendly farming practice. It boosts crop yield, improves soil health and manages pests naturally. Marigold plants release compounds that repel insects and suppress nematodes, major tomato pests. This system not only increases tomato production but also gives farmers an extra income from selling marigold flowers, making it both profitable and sustainable.

Introduction

Tomato is one of the most popular vegetable crops globally, valued for its taste, nutrition and many uses. However, tomato cultivation often faces issues with pests and diseases, especially the fruit borer (Helicoverpa armigera), whiteflies and root-knot nematodes (*Meloidogyne spp.*). These pests can significantly reduce yields if not managed properly. Marigold, an ornamental flower crop commonly grown for decoration and garlands, has notable pest-repelling properties. When grown alongside tomato, marigold serves as a natural protector, helping to reduce pest attacks and lessen the need for chemical pesticides. This combination supports an effective Integrated Pest Management (IPM) system and promotes sustainable agriculture.

Concept of Intercropping

Intercropping involves growing two or more crops in the same field simultaneously. The goal is to make better use of space, light, water and nutrients while also improving overall farm productivity. In the case of tomato and marigold, marigold functions as a trap crop, attracting harmful insects like fruit borers and keeping them away from the tomato plants.

Compatibility of Tomato and Marigold

Tomato and marigold thrive together because both prefer warm and sunny conditions. They have different growth patterns, allowing efficient space sharing. Marigold's shorter height lets sunlight and air reach tomato plants, reducing humidity and helping to control fungal diseases naturally.

Major Benefits of Tomato–Marigold Intercropping

a) Natural Pest and Disease Control

- Nematode management: Marigold roots have natural chemicals called thiophenes that kill or repel nematodes in the soil.

- Control of fruit borers: Marigold flowers attract Helicoverpa armigera moths, keeping them away from tomato fruits.
- Reduction in whiteflies and aphids: The strong scent of marigold discourages sap-sucking insects from attacking tomato plants.

b) Higher Yield and Better Quality

- By lowering pest pressure and improving plant health, tomato–marigold intercropping can increase tomato yield by 10–25% compared to growing tomato alone. The fruits are often healthier and of better market quality.

c) Economic Advantage

- This system offers two sources of income—tomatoes and marigold flowers. Even if tomato prices drop, selling marigold ensures steady returns, helping farmers manage risks better.

d) Improved Soil Health

- After harvest, marigold residues add organic matter to the soil, which enhances its texture, microbial activity and long-term fertility.

Limitations

- While this intercropping system has many benefits, it requires proper management practices:
- Improper spacing can lead to competition for nutrients and light.
- If not pruned, marigold plants may overshadow tomato crops.
- The timing of flowering and harvesting for both crops must be planned carefully to avoid overlapping labour.

Conclusion

Intercropping tomato with marigold is a simple yet effective way to boost farm productivity and ecological health. It reduces pest attacks, lowers pesticide use, improves soil fertility and increases profitability. By adopting this system, farmers can move towards more sustainable and environmentally friendly vegetable production, benefiting both the farm and the ecosystem.

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