

Marigold: A Diagnostic Tool for BGM Forecasting and Management in Chickpea

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Botrytis gray mould (BGM) is a disease that mainly attacks the reproductive structures of a chickpea plant. Flower abortion is a common symptom of the disease (Fig. 1) which remains undiscovered until the damage is visible on the canopy. As a result, timely application of fungicides is hampered in the integrated disease management. The predictive models (Shtienberg and Elad 1997) to estimate disease severity and timing are based on complex mathematical calculations, and they do not account for inoculum pressure. To identify an alternative indicator for a reliable diagnosis, forecasting and management of BGM, several ornamental plants commonly grown during the chickpea season as a collateral host of *Botrytis cinerea* were evaluated.

The controlled environment investigations on host pathogen interaction were carried out with marigold (*Tagetes erecta* L.). Flowering plants of marigold when spray-inoculated with *B. cinerea* (3×10^5 conidia mL⁻¹) from chickpea and incubated in an environment (15°C and 100% RH) needed for BGM development, produced



Figure 1. BGM infection on chickpea flowers.

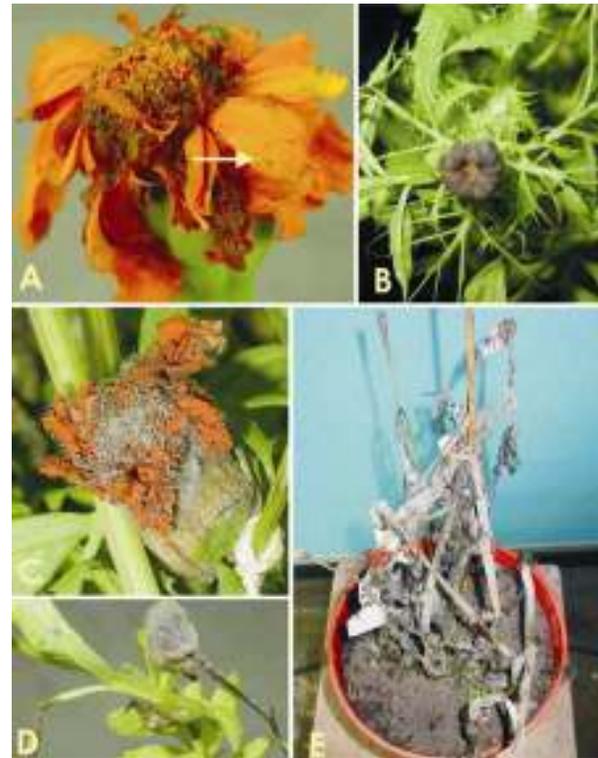


Figure 2. Progressive symptoms of *Botrytis cinerea* infection on marigold: (A) Initial lesion development and sporulation on bloomed flowers and (B) rotted young buds; (C) sporulation on flowers; (D) sporulation on flower buds and lesion development on leaves; (E) sporulation on all the aerial plant parts.

symptoms on the leaves, flowers, flower buds and stems. Six days after inoculation (DAI), dark lesions were observed on a fully bloomed flower (Fig. 2A). Concurrently, all the young buds appeared completely rotted, but did not support sporulation (Fig. 2B). By 12 DAI, masses of wind blown grey sporulation on flowers and flower buds were clearly visible (Fig. 2C and 2D). Between 15 and 20 DAI, profuse grey sporulation was observed on all the aerial plant parts (Fig. 2E).

The early infection of *B. cinerea* causing moldy infection on marigold clearly identified its usefulness to farmers as a diagnostic tool to predict BGM epidemics and its management in chickpea. Marigold as an indicator plant to apply prophylactic fungicidal protection to chickpea crop in Nepal has been successfully validated. Infection of *B. cinerea* on the flowers of marigold and Dahlia, grown at Ishurdi and Jessore in Bangladesh, indicates the possible integration of this farmer friendly, low-cost BGM forecasting system.

Reference

Shtienberg D and **Elad Y.** 1997. Incorporation of weather forecasting in integrated, biological-chemical management of *Botrytis cinerea*. *Phytopathology* 87:332–340.