The participants witnessed various experiments on physiology, pathology, entomology, genetic resources, wide hybridization, genetics and breeding of chickpea, and had interactions with the scientists. They selected germplasm and breeding materials of their interests and submitted indents to ICRISAT for the supply of seed.

Contributed by PM Gaur
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Marigold: A Diagnostic Tool for BGM Forecasting and Management in Chickpea

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 (*Tagetus 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 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

Figure 1. BGM infection on chickpea flowers.

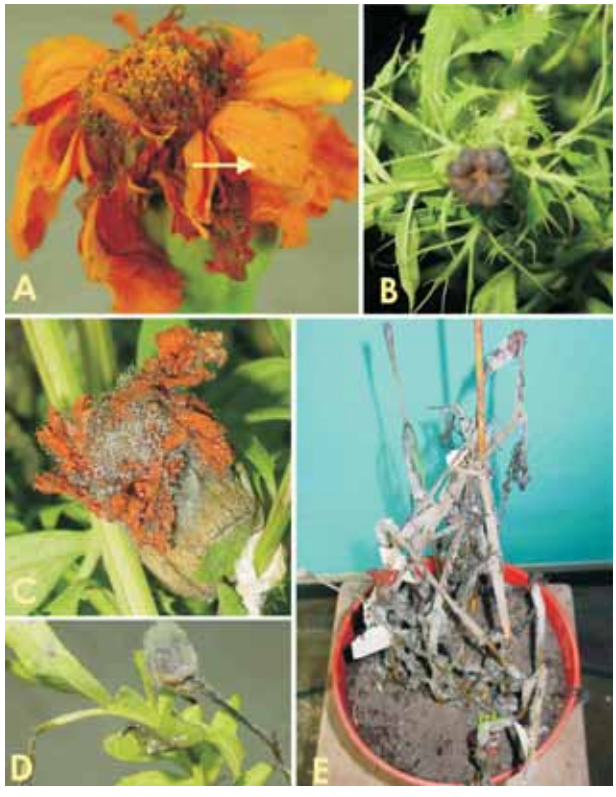

Figure 2. Progressive symptoms of *Botrytis cinerea* infection on marigold: (A) Initial lesion development and sporulation on bloomed flowers and (B) rotted young buds; (C) sporulation on flowers; (D) sporulation on flower buds and lesion development on leaves; (E) sporulation on all the aerial plant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

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.

Contributed by Suresh Pande, G Krishna Kishore and J Narayana Rao
Crop Improvement Theme
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Visiting Scientists

SL Dwivedi has joined ICRISAT Genetic Resources Unit as a Visiting Scientist to work on Generation Challenge Program supported chickpea project on "assessing the genetic diversity and allelic variation associated with beneficial traits in global composite chickpea core collection" in partnership with ICARDA, which is another CGIAR Center participating in this project. This composite core consists of 3000 accessions, drawn from vast collection of chickpea germplasm maintained at the ICRISAT and ICARDA gene banks – chickpea core collection, elite germplam, advanced lines/ cultivars, unique germplasm with specific traits, and wild *Cicer* species. Using ABI3700 and SSR markers, the accessions will be molecularly profiled at MS Swaminathan Applied Genomics Laboratory, ICRISAT, to define the genetic structure of the global composite collection, and to form a subset of 300 accessions representing the maximum diversity for the isolation of allelic variants of candidate gene associated with beneficial traits. It is expected that molecular biologists and plant breeders will have ample opportunities to use diverse lines in functional and comparative genetics, in the mapping and cloning of gene(s) of particular interest, and in applied breeding to diversify the genetic base of the populations which leads to the development of cultivars with superior performance.

Ranjana Bhattacharjee joined the Genetic Resources Unit (GRU), ICRISAT, as a Visiting Scientist for the project "molecular characterization of pigeonpea composite collection." The project is supported by the Generation Challenge Program of the Consultative Group on International Agricultural Research (CGIAR). Dr Bhattacharjee has a PhD on establishing pearl millet core collection, which she pursued at the GRU, ICRISAT, and at the Haryana Agriculture University. Following this, she worked at the International Institute of Tropical Agriculture (IITA), Nigeria, as Postdoctoral Fellow on cocoa molecular genetics. In her new stint at ICRISAT, she will be involved in characterizing pigeonpea accessions using micro-satellite markers to determine the genetic structure of the global pigeonpea composite collection. The results of this study will further diversify the genetic base of populations, and assist in mapping and cloning gene(s). Data generated will also contribute to comparative and functional genetics. Breeders will have opportunity to use genetically diverse parents in their program to develop broad based cultivars.