15% wilted plants) to fusarium wilt. These F_2-derived lines were selected from single and three-way crosses involving nine desi wilt-resistant, three kabuli wilt-susceptible (Macarena, Hermosille, and Pitic), and a local wilt-resistant cultivar (Surutato 77) in a wilt-sick plot in 1982. Some of these lines have better quality grains and produce equal or better yield than Surutato 77 (Table 1); the latter being the only fusarium wilt tolerant variety commercially available in Mexico. These selections are now being tested in yield trials, and we expect to register them as varieties very soon.

Upright growth habit: At present, all the cultivated kabuli chickpeas have spreading growth habit, which makes the harvesting operation expensive because of high labor cost. When harvested mechanically, these varieties with spreading growth habit suffer yield losses of up to 300 kg ha^{-1}. In Hermosillo, we have about 10 advanced uniform lines that are well adapted to mechanical harvesting with upright growth habit and good quality grain. These lines are in a preliminary yield trial.

Two generations per annum: In the Northeast region of Sonora, summer cultivation of kabuli chickpea is possible. Thus the crosses made in winter at Hermosillo can be advanced in the off-season during summer making it possible to raise two generations in a year. This off-season facility has been used for the advancement of materials during the past 3 years.

-- **G.J.A. Morales (Campo Agricola Experimental Costa de Hermosillo, Apartado Postal 1031, Hermosillo, Sonora, Mexico)**

Entomology

Insect damage to chickpea root nodules

Since 1976, we have occasionally observed insect damage in the root nodules of chickpea excavated from Vertisol at ICRISAT Center. The symptoms of this damage are small holes in the nodule surface which lead into extensive tunneling in the internal tissues (Fig. 1). Up to 25% of the nodules were damaged in samples examined in 1978. The incidence of damage was greatest in old, senescing nodules but some active pink-green nodules were also affected. We have observed this damage on farmers' fields in Andhra Pradesh but do not know how widespread it is in India. We would welcome reports on this. We have not seen this damage at our subcenter at Hisar (17^{o}N) in a large number of nodule samples that we examined.

Attempts to find the insects responsible for such damage were unsuccessful until 1985 when we detected them in large numbers in the nodules of cv K 850 growing in a Vertisol field at ICRISAT Center. Up to 21 (average = 6) small (3-4 mm) dipteran larvae were found in damaged nodules. Some brown puparia were also found in these nodules.

Damaged nodules were placed on moist filter paper discs in glass jars. Small, brown, soft-bodied flies emerged within a few days. An average of 3 flies emerged per nodule (range 0 to 21). A 20% honey solution was provided as food for these flies, but all died mostly within a day.

Preserved samples of the larvae, puparia, and adults were sent to Dr R.H.L. Disney, University of Cambridge, UK. He identified them as a new species of Metopina (Diptera: Phoridae) and intends to publish a description of this species in the near future.

This is the first record of a dipteran feeding on nodules of chickpea. In Syria, the larvae of a weevil, Sitona macularius (Marsham), feed on roots and nodules, but less than 5% of the nodules

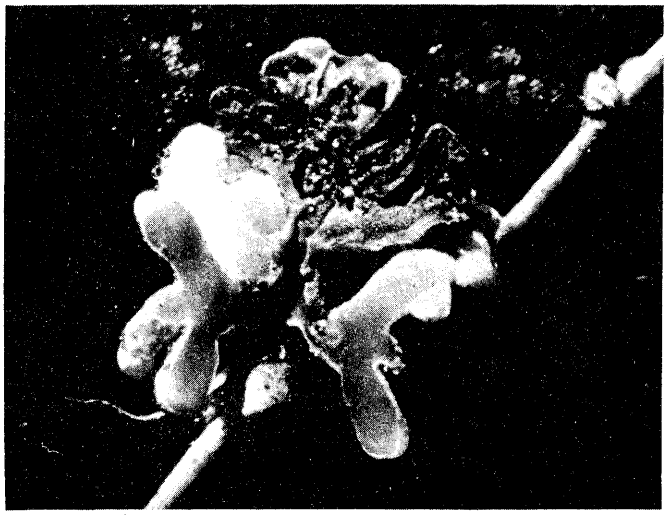

Figure 1. Chickpea nodule showing internal damage due to Metopina sp.

are damaged (Reed et al. in press). The help extended by Dr Disney in the preliminary identification of Metopina sp is gratefully acknowledged.

-- **S. Sithanantham and O.P. Rupela (ICRISAT, Patancheru, Andhra Pradesh 502 324, India)**

Reed, W., Cardona, C., Sithanantham, S., and **Lateef, S.S.** (in press). The chickpea insect pests and their control. In "The Chickpeas" (Saxena, M.C., and Singh, K.B. eds.), ICARDA/CAB.

Microbiology

Identification of a nonnodulating spontaneous mutant in chickpea

Nonnodulating legume genotypes can be used as nonfixing controls in the quantification of N_2 fixation by legumes. Further, by comparing growth of nonnodulating and nodulating legumes the ability of the soil to supply N for plant growth may be ascertained. Nonnodulating lines of soybean and groundnut have been used for these purposes for several years. Recently, Davis et al. (1985) reported nonnodulating mutants, induced by gamma-irradiation, of a double-podded chickpea line ICC 640. This communication reports on identification of a spontaneous nonnodulating mutant from a chickpea accession ICC 435.

During routine nodulation observations in the postrainy season of 1985, a plant without nodules was found amongst well-nodulated plants of 24-day-old ICC 435 growing in a Vertisol field at ICRISAT Center. To determine whether this was of a genetic nature, the nonnodulated plant, which looked similar in growth and color to the nodulated plants, was potted for seed production and cared for as described by Rupela and Dart (1982) after inoculating the pots with ~10^9 rhizobia per pot. Watering was done, whenever required, with 1/4 strength Arnon solution containing 25 ppm N as KNO_3 for about 3 weeks at first and then with tap water subsequently.

Individual pods from the potted plant were harvested when they turned pale, to allow continuous flowering and podding so as to maximize seed production. In a growth period of 122 days under greenhouse conditions, 24 pods were harvested having a total of 32 seeds. The plant was uprooted and the roots exposed for nodule observations while it was still flowering and podding, but no nodules could be found.

In an unreplicated test, the seeds produced were sown separately in 10-cm diameter pots having sterilized sand and at least 10^9 rhizobia of four strains F 75, H 45, IC 59, and IC 76. Seeds of the parent line ICC 435 were also inoculated with all the strains in separate pots to serve as a control. Watering was done with 1/4 strength Arnon solution without N. None of the four strains could nodulate the plants of the apparent spontaneous mutant while all the plants of the parent line were well nodulated when observed 42 days after sowing (Figure 1 and 2). Under these N-deficient conditions, all the