

Pathology

Prevalence of Pigeonpea Wilt and Sterility Mosaic in India (1975-80)

A survey to determine the incidence of pigeonpea diseases with special reference to wilt (*Fusarium udum*) and sterility mosaic (SM) was carried out in 11 Indian states between 1975 and 1980. The major pigeonpea growing areas were traversed and observations were recorded in farmers' fields. The incidence of wilt and SM was determined by calculating the percentage of incidence from 500 plants taken at random in each field. This is the first overall summary of these survey results. Both wilt and SM were widespread on pigeonpea in India.

The range of incidence based on average percentage of wilt and SM for each State surveyed is presented in summary form in Figures 4 and 5, respectively. (Percentage incidence of wilt varied from 0.1 in Rajasthan to 22.6 in Maharashtra and from 0 to 97 in individual fields.) It was moderate to severe in Bihar (18.3%), Maharashtra (22.6%), and Uttar Pradesh (8.2%). SM ranged between 0.2% in West Bengal to 21.4% in Bihar and from 0% to 100% in individual fields. Incidence of SM was moderate to severe in Bihar (21.4%), Gujarat (12.2%), Karnataka (9.8%), Tamil Nadu (12.8%), and Uttar Pradesh (15.4%). (Sources of resistance to wilt and SM identified at ICRISAT Center can be utilized in States where the disease problems are moderate to severe.) Some details of this survey are reported in Volume 2 of the Proceedings of the International Workshop on Pigeonpeas (ICRISAT, in press). A full detailed report will be published as a Pulse Pathology Progress Report towards the end of 1981.

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Preliminary Studies of the Eriophyid Vector of Sterility Mosaic

There is a considerable body of evidence that the eriophyid mite, (synonym *Aceria cajani* Channabasavanna) *Eriophyes cajani* (Channabasavanna) is a vector of the causal agent of the sterility mosaic disease of pigeonpea.

This causal agent has not yet been identified, but is believed to be a virus. Several lines of pigeonpea have been found to be highly resistant to sterility mosaic at ICRISAT Center and, in most cases, this resistance appears to be against the mite vector. However, when these resistant lines were field-tested at Dholi in Bihar, many were found to be susceptible. It is not known whether this difference in susceptibility at two locations was a result of a different strain or species of vector being present, or whether any environmental factor negated the resistance mechanism of the plants. As a result of this complicating development it was decided that it was essential to obtain more knowledge of the vector. Consequently Dr. Oldfield, of the United States Department of Agriculture's Boyden Entomology Laboratory of the University of California at Riverside, who has extensive research experience in the biology and ecology of eriophyids, was invited to visit ICRISAT for 3 weeks to initiate a study of the mite and to train our staff in the various techniques of handling and experimentation.

During his visit Dr. Oldfield was able to identify the mite eggs, which had previously evaded detection. The eggs were eventually found on the vegetative tips of a number of plants. These eggs measured about 30 x 40 μ , were parallel-sided and rounded at the ends. They were loosely attached to the plant, usually to a filamentous trichome. Although they appear similar to glandular trichomes that occur among the other trichomes, the eggs were slightly smaller and were milky white rather than pale yellow. They were found mainly among the filamentous trichomes of the vegetative terminals, frequently on tissue protected by bud scales. The transfer of eggs to uninfested leaves permitted observation of the young nymphs. The observations made revealed that eggs may hatch in 3 days, but more usually after 4 or 5 days.

A number of detached leaves held in small petri dishes were infested with various stages of the mite in order to study its biology. We were not successful in determining the duration of the first-stage nymphs but the second stage was found to last from less than 48 hours to more than 5 days. At the end of the second nymphal stage each mite attaches its caudum to the leaf and develops into an adult over the following 24 hours. The females, after a preoviposition period of 24 hours or more, laid one to three eggs daily.

The males are slightly smaller than the