Laboratory Observations on Rate of Development and Oviposition of *Callosobruchus maculatus* on Different Varieties of Green Gram

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THE pulse beetle *Callosobruchus maculatus* (Bruchidae, Coleoptera) is the most important storage pest of green gram (*Vigna radiata*) in Sri Lanka. The pest initiates damage in the field where green gram is grown as a rotational field crop in the dry zone of Sri Lanka, and completes its life cycle when brought into the storehouse. El-Sawaf (1956) bred *C. maculatus* on cowpea over the range 18–35°C and 55–90% RH. Rahman et al. (1943) have compared the susceptibility of 11 kinds of seeds to attack by *C. maculatus*.

The rate of development and oviposition of *C. maculatus* was studied over a wide range of constant temperatures and humidity with the use of different varieties. The mean developmental period of the pest was shortest at 30°C and 70% RH, although most beetles emerged at 25°C. As components of this development period, the duration of the egg stage was shortest at 70% RH (and longest at 30% RH) and 90% egg hatch occurred at 70% RH (poorest egg hatch occurred at 90% RH). Similarly high (80%) egg hatch occurred at 20–30°C, and no eggs hatched at 40°C. Green gram varieties Utong 1, H101 and CES 87 were considered relatively resistant to beetle damage with prolonged developmental periods. MI 3, Local CVI, Type 51 varieties were heavily susceptible to beetle attack. Most of the eggs were laid on the first day of free adult life in all experimental conditions by *C. maculatus*.

The most important lines for future research with *C. maculatus* would appear to be nutritional studies analysing dietetic requirements, inhibitory factors and influence of physical properties of seeds and oviposition studies determining attractiveness of seeds.

El-Sawaf, S.K. 1956. Bull. Ent. Soc. Egypt, 40, 29–95.
Rahman, A., Solu, G.S. and Sapra, A.N. 1943. Indian J. Agric. Sci. 12, 851–864.

The Value of Disease-Resistant Pigeonpea

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PIGEONPEA (*Cajanus cajan*), an important food legume crop, is grown in the Indian subcontinent, Southeast Asia, Africa, Central America and Australia. More than 50 pathogens have been reported to affect pigeonpea (Nene et al. 1984) but only a few are of economic importance (Kannaiyan et al. 1984). These are fusarium wilt (*Fusarium udum*) in the Indian subcontinent and Africa, sterility mosaic (virus?) and phytophthora blight (*Phytophthora drechsleri* f.sp. *cajani*) in India, Witches Broom (mycoplasma?) and rust (*Uredo cajani*) in the Americas and leaf spot (*Mycovellosiella cajani*) in Africa.

Based on the pigeonpea disease surveys conducted during 1975–1980 Kannaiyan et al. (1984) estimated annual loss of US$113 million due to fusarium wilt and sterility mosaic in India alone and a loss of $5 million due to fusarium wilt in eastern and southern Africa.

The most effective means of minimising such huge losses is to grow resistant varieties. ICRISAT realised this and started research on developing resistant cultivars. Effective field and glasshouse techniques to screen a large number of genetic resources, accessions and breeding materials against fusarium wilt, sterility mosaic and phytophthora blight were developed. Several sources of resistance to fusarium wilt (Nene and Kannaiyan 1982), sterility mosaic (Nene and Reddy 1976), and phytophthora blight (Kannaiyan et al. 1981) were identified. Some of these have multiple resistance to two or more diseases and are being used in ICRISAT's breeding program. Multilocation screening of sterility mosaic-resistant lines in India and of some wilt-resistant lines in India and parts of Africa indicated that some (e.g. ICP 7786 for sterility mosaic, ICP 8863 for wilt) have resistance across locations.

Some pigeonpea lines from ICRISAT have been released for cultivation in India and Fiji. ICP 8863 was released as 'Maruthi' for cultivation in Karnataka state of India mainly for its fusarium-wilt resistance. ICPL 151 (tolerant to sterility mosaic) is a candidate for release in northern India and ICP 7035 (resistant to fusarium wilt and sterility mosaic and tolerant to Phytophthora blight) has been released in Fiji as Kamica.

Kannaiyan, J., Nene, Y.L. Raju, T.N. and Sheila, V.K. 1981. Plant Disease, 65, 61–62.
Kannaiyan, J., Nene, Y.L., Reddy, M.V., Ryan, J.G. and Raju, T.N. 1984. Tropical Pest Management, 30, 62–71.
Nene, Y.L. and Kannaiyan, J. 1982. Plant Disease, 66, 306–307.
Nene, Y.L. and Reddy, M.V. 1976. Plant Disease Reporter, 60, 1034–1036.
Nene, Y.L., Sheila, V.K. and Sharma, S.B. 1984. ICRISAT Pulse Pathology Progress Report No. 32, 1–14.