RESEARCH NOTES

INOCULATION METHODS, SOURCES OF RESISTANCE AND GENETICS OF THE REACTION TO BRAZILIAN RUST RACE B_{11} IN PHASEOLUS VULGARIS

Eliane Augustin-1, D. P. Coyne, and M. L. Schuster
University of Nebraska, Lincoln, Nebraska, U.S.A.

The development of rust resistant varieties is an important factor in increasing dry bean yields in South Brazil. The bean rust fungus is a highly specialized pathogen consisting of distinct physiologic races. Race B_{11} has been the most virulent race described presently in South Brazil. The research reported here involved the standardization of uniform testing conditions, evaluation of varieties to determine sources of resistance to Brazilian race B_{11} and the inheritance of the disease resistant reaction.

A standard procedure of inoculation of bean seedlings with urediospores of *Uromyces phaseoli* var. *typica* was developed which produced an even distribution of numerous pustules on the leaves. The seedlings were inoculated by spraying a suspension of urediospores in Freon-113 on the upper and lower surfaces of the bean leaves. The plants were then placed in a moist chamber for 18 hours under a low light intensity of 0.00002 μ einsteins cm^{-2} sec^{-1}, before being transferred to the greenhouse. A greater degree of infection developed under this treatment than when plants were placed under continuous light (0.003 μ einsteins cm^{-2} sec^{-1}, or under darkness for 6 hours and light for 12 hours.

Out of 75 varieties tested, two sources of resistance to Brazilian race B_{11} were found; varieties Great Northern 1140 (grade 1) and Kentucky Wonder Wax (No. 765) (grade 2). Disease reaction was classified according to grade system described by Crispin and Dongo (Plant Disease Rept. (6) 411-413. 1962).

The inheritance of resistance to race B_{11} was studied in the F_{2} generation of the crosses Gallatin 50 (susceptible) x Great Northern 1140 (resistant) and Great Northern 1140 x P.I. 165078 (susceptible). The resistant reaction was dominant in the F_{1} Great Northern 1140 x Nebraska 67-101 (susceptible), F_{1} Great Northern 1140 x Tempo (susceptible) and its reciprocal. The resistant reaction of Great Northern 1140 to race B_{11} was controlled by a single dominant gene designated R_{B_{11}}. Linkage was not detected between genes controlling plant habit (indeterminate versus determinate) and disease reaction.

1/ Present address: Setor De Fitopatologia - I.P.E.A.S. - Caixa/Postal "E" - Pelotas - RS - Brazil

*****