VIRULENCE OF HUNGARIAN AND STANDARD STRAINS OF PSEUDOMONAS PHASEOLICOLA ON BEANS (PHASEOLUS VULGARIS L.)

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The most important bacterial pathogen of beans in Hungary is Pseudomonas phaseolicola. Information on race and strain composition is essential in resistance breeding, so we study every year the Hungarian isolates of this pathogen.

The pathogenity of collected isolates was determined by the pod-inoculation of a susceptible bean variety, Res. Kinghorn Wax. The virulence of strains is well characterized by the diameter of watersoaked spots on the pods, around the point of inoculation.

In 1975 we collected 166 isolates of Ps. phaseolicola from some important growing districts of Hungary. In addition to these isolates, we used Race 1, Race 2 and the Dutch Ps. phaseolicola strains No. 111, No. 112 and No. 113 in our investigation. The frequency distribution of the pod lesion diameters obtained from the Hungarian isolates and the mean pod lesion obtained from those isolates, as well as those from foreign strains, is presented in Fig. 1.

The diameter of watersoaked spots of the Hungarian isolates ranged from 1 to 10 mm. This range contains the degrees of virulence of the foreign races and strains too.

We also tested the pods of different resistant bean lines to various isolates (Table 1).

Table 1. Testing of the pods of resistant bean lines with the standard strains and isolates of Ps. phaseolicola.

Races and strains of Ps. phaseolicola	The diameter of watersoaked spots on pods (mm)							
	Susceptible and resistant bean lines							
	Res. Kinghorn Wax	Bo 19	Red Mexican lines RM 35	RM 36	RM 37	GN Nebr. #1 Sel. 27	PI 150414	Opal
Race 1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Race 2	4.0	0.7	0.1	0.4	0.1	0.3	0.7	1.8
No. 111	2.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0
No. 112	2.2	0.0	0.3	0.7	0.3	0.2	0.0	0.7
No. 113	5.5	1.3	0.4	1.1	1.3	1.2	0.6	2.6
MH Str +	5.9	1.3	0.1	1.5	1.1	1.0	0.4	1.4

+MH Str - a mixture of isolates that represent the Hungarian Ps. phaseolicola.

The virulence of Ps. phaseolicola Race 1 is weak. Its infectivity is moderate on the sensitive variety, Res. Kinghorn Wax. The more aggressive

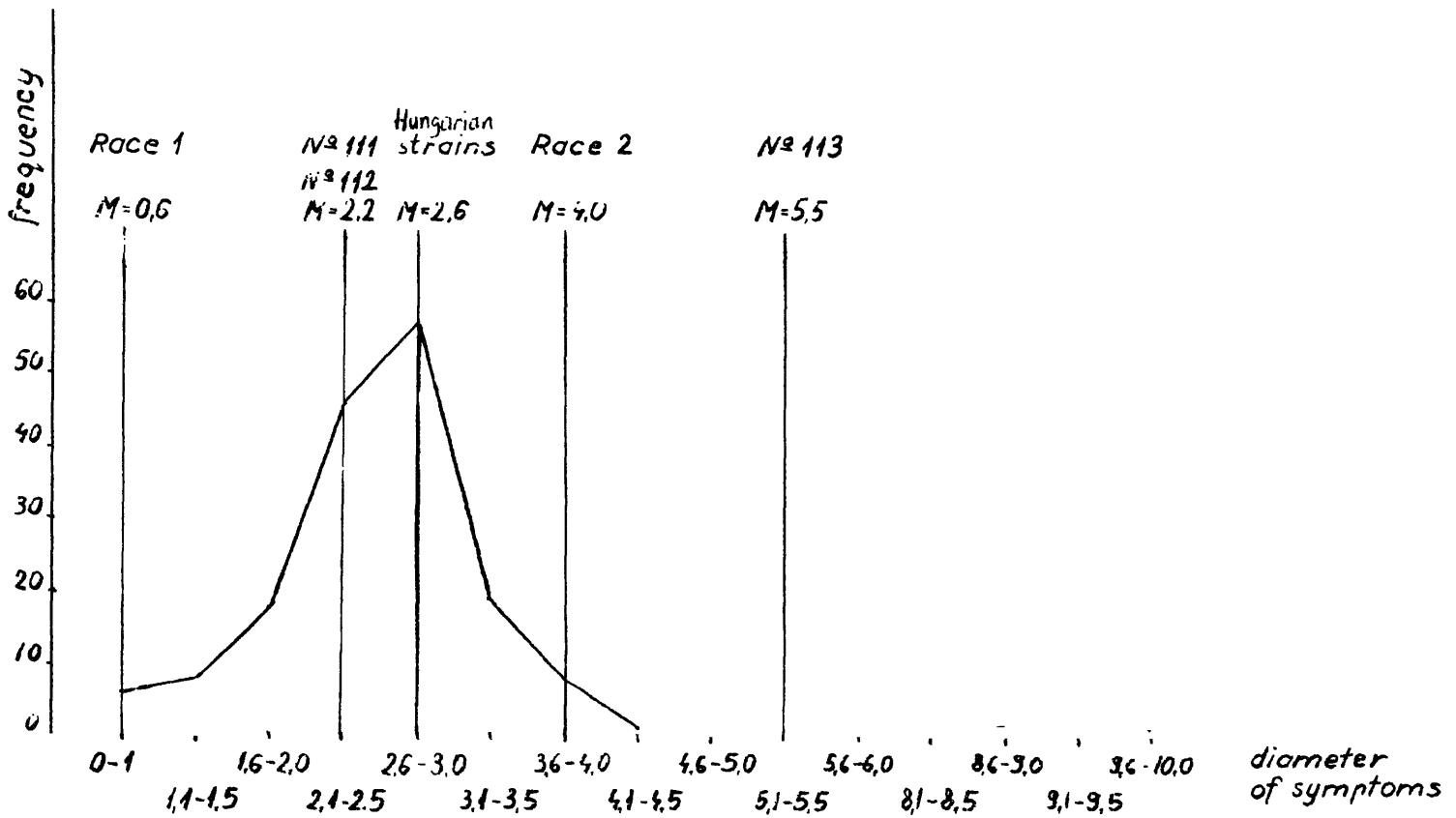

Fig. 1. The virulence of Hungarian (collected in 1975) and foreign isolates of Pseudomonas phaseolicola on Res. Kinghorn Wax.
(Origin of isolates: Race 1, G. Fouilloux - France
Race 2, Z. Klement - Hungary
Strains Nos. 111, 112, 113 - H. P. Maas Geesteranus - Holland)

strain, No. 111, was able to infect only RM 36 regardless of the sensitive control, while No. 112 infected the pods of RM 35, RM 36, RM 37, GN Nebr. 1, sel. 27 and Opal bean lines, too. Race 2, No. 113 and MH Str (Hungarian strains) cause disease symptoms on pods of all of the resistant bean lines.

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REDUCED TILLAGE SNAP BEANS

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Field tests were conducted in 1975 at the University of Tennessee Plateau Experiment Station to evaluate the feasibility of producing snap beans for commercial processing with reduced tillage systems. Objectives were to compare minimum tillage with conventional tillage in snap bean production and to compare four reduced tillage treatments for effectiveness in securing acceptable plant stands.

Snap beans of the Avalanche variety were planted July 17 in Hartsells sandy loam covered with barley stubble using four reduced tillage equipment systems (four treatments) with a control treatment prepared by the conventional plow-disc procedure (See Table 1 for definition of treatments). The treatments were arranged in a randomized complete block experimental design with four replications.

The control plots were turned with a moldboard plow, disked, and planted with a conventional plate-type planter in 91-cm rows. The seedbed for two treatments was prepared by two trips of a powered harrow which pulverized the top 13 cm of soil and incorporated the plant stubble. One of these treatments was planted with the conventional planter in 91-cm rows, and the other was seeded with a Winslow-Pacific planter with 15 cm between rows. No-tillage procedures were employed for the remaining two treatments. A fluted coulter furrow opener operating about 10 cm deep prepared the seed zone in one instance. Seedbed preparation in the remaining treatment was accomplished with an experimental vibratory furrow opener (Tompkins and Bledsoe, 1975) which opened the soil to a depth of about 13 cm. The soil cutting tool oscillated at 22 Hz with an amplitude of 6 mm. A commercially available plate-type, no-till planter was used with both the fluted coulter and the vibratory opener. Row spacing for both no-till treatments was 66 cm as the equipment available readily accommodated this spacing.

Granular fertilizer (8-12-6) was broadcast pre-plant at a rate of 900 kg/ha. Paraquat was applied at a rate of 2.3 liters/ha immediately following planting to kill the vegetation. Dinoseb at a rate of 4.6 liters/ha was applied at the cracking stage of seed emergence. Sevin was used as needed to control insect pests.