COMMON BEAN GENOTYPES RESISTANT TO ANGULAR LEAF SPOT

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Bean angular leaf spot, caused by the fungus *Phaeoisariopsis griseola* (Sacc.) Ferraris, is world wide in distribution. It is found in more than sixty countries throughout the world. In recent years, in Brazil, this disease turned out to be one of the most important bean production constraints. The disease is favored by intermittent dry-wet and warm-cool weather. Losses due to the disease can be as high as 70% under disease favorable environmental. Angular leaf spot can be efficiently controlled through fungicide sprays and resistant cultivars. Although chemical control should be considered as an important control method, it can be dangerous to nature, farmer and consumer. The development of resistant cultivars, however, has been complicated by the pathogenic variability of the fungus. The objective of this study was to characterize some bean cultivars for their angular leaf spot resistance.

A set of 78 genotypes released as bean cultivars in Brazil, 35 F_6 breeding lines and two accessions were tested against six different *P. griseola* pathotypes including pathotypes 63-15, 63-23, 63-31, 63-39, 63-47 and 63-63 (Table 1). Pathotype 63-39 was collected in State of Paraíba, and were included in this study due to its high level of pathogenicity. Fourteen to sixteen days old plants, grown in the greenhouse, were inoculated with 2×10^4 conidia.ml^{-1}. Inoculations were performed on the first trifoliate leaves by spraying the inoculum to run off. Inoculated plants were incubated for 48 hours in a humid chamber (RH > 95%) at 25 ± 2°C, with a 12 h photoperiod. After this period of time, plants were transferred to greenhouse benches (28 ± 2°C). Disease severity was scored 14 to 18 days after inoculation, according to the percentage of leaf area affected and the presence or not of sporulating lesions. If in the greenhouse plants with up to 2.0 % of the leaf surface area showing few small no-sporulating lesions were observed, they were transferred to a moist chamber for 20-24 hours. After this period of time plants exhibiting non-sporulating lesions were considered resistant.

Most genotypes were susceptible to all pathotypes. In Table 1, it can be observed that only three breeding lines, three cultivars and two accessions showed some resistance to some of the pathotypes tested. Accessions AND 277 (Andean) and Cornell 49-242 (Meso American) were the two most resistant genotypes. They presented resistance reaction to four (63-15, 63-23, 63-31 and 63-63) out of six used pathotypes. However, these two cultivars are not released for commercial cultivation. Since genotype Cornell 49-242 is one of the twelve differential cultivars, it was not supposed to present a resistant reaction to the pathotype 63-63. So, the resistant reaction presented by this genotype (Table 1) during this test, maybe due to different seed source: although it remains to be checked seeds from the differential set were susceptible while those from Embrapa Rice and Beans Germplasm Bank (used in this study) were resistant. This is a very common situation in a bean germplasm bank where there are so many entries under the same name. The resistance presented by breeding lines 97200203, 97200213 and 97200311 is derived from the genotype Cornell 49242. The two most resistant cultivars released for cultivation by the farmers were IAPAR 0031 and Ouro Negro which were resistant to pathotypes 63-31, 63-63 and 63-31, 63-47, respectively. Guateiam 6662 was resistant to one pathotype only. There were no resistant cultivars for the pathotype 63-39. This fact means that the search for new resistance source to this pathotype must continue. Although cultivar Cornell 49-242 was resistant to four pathotypes, when cultivated in the field, it may react as susceptible due to the *P.griseola* pathogenic variability found in nature. This and other results suggest that due to the great pathogenic

variability showed by this pathogen it seems unlikely that, in the field, one cultivar could be resistant to all pathotypes. As a result, a breeding program, to be successful, should consider pyramiding several genes (or block of genes) in just one genotype.

Table 1. Bean genotypes and released cultivars, tested in the greenhouse that presented resistant reaction to *Phaeoisariopsis griseola*. Embrapa Rice and Beans, 2000/2001.

CULTIVARS	ISOL. [1] 525.4 PAT. [2] 63-23			ISOL. 629.2 PAT. 63-63			ISOL. 648.3 PAT. 63-47			ISOL. 384.5 PAT. 63-31			ISOL. 60.4 PAT. 63-39			ISOL. 584.3 PAT. 63-15		
	DS[3]	LS[4]	SP[5]	DS	LS	SP	DS	LS	SP	DS	LS	SP	DS	LS	SP	DS	LS	SP
97200203	2	1.5	N	5	1.5	S	80	4.0	S	2	1.5	N	10	3.0	S	1	1,0	N
97200213	20	3.0	S	0	0	N	40	3.0	S	10	2.5	S	30	4.0	S	30	3.0	S
97200311	0	0	N	0	0	N	30	3.0	S	0	0	N	60	2.5	S	0	0	N
AND 0277	1	1.0	N	0	0	N	40	2,0	S	1	2.0	N	7	2.5	S	1	1	N
CORNELL 49-242	0	0	N	0	0	N	40	4,0	S	0	0	N	50	4.0	S	0	0	N
GUATEIAN 662	2	3.0	S	1	3.0	S	60	4,0	S	20	3.0	S	80	4,0	S	0	0	N
IAPAR 0031	1	3.0	S	0	0	N	50	4,0	S	0	0	N	10	2.5	S	1	2.5	S
OURO NEGRO	99	4.0	S	20	4.0	S	0	0	N	5	1,5	N	40	4,0	S	1	2,0	S

[1] ISOL = Isolate
[2] PAT. = Pathotype
[3] DS = Disease Severity
[4] LS = Lesion Size
[5] SP = Sporulation

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