

# INTRASPECIFIC VARIABILITY OF *COLLETOTRICHUM LINDEMUTHIANUM*

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Anthracois is one of the most expressive disease that affect productivity and grain quality of common bean. The pathogenic variability and amount of pathotypes of *Colletotrichum lindemuthianum* within species becomes a limiting factor in the selection of resistant bean genotypes to the major pathotypes found in the field. Among the control measures, genetic resistance is the most effective, both because of lower production costs as the reduction of damage to the environment.

This study aimed to evaluate the change in the resistance reaction of 41 bean genotypes inoculated with two isolates representing the same pathotype, and a mixture of eight different pathotypes in the same inoculum suspension.

Two representatives from eight pathotypes isolated from different regions of bean were inoculated into 41 genotypes and twelve differential cultivars planted in trays (Figure 1). The representatives of the two pathotypes: isolates CNPAFCI 1304 and 1355 (representing pathotype 65), CNPAFCI 1143 and 1224 (pathotype 73), CNPAFCI 1333 and 1334 (pathotype 77), CNPAFCI 1164 and 1251 (pathotype 81), CNPAFCI 1247 and 1312 (pathotype 91), CNPAFCI 1315 and 1322 (pathotype 475), CNPAFCI 1324 and 1328 (pathotype 479) and CI CNPAF 1294 and 1311 (pathotype 1609) were inoculated individually and mixed in the same suspension ( $1.2 \times 10^6$  spores/mL). Inoculation was performed seven days after planting and the plants were maintained at a temperature of 24 ° C in a greenhouse. The evaluation was performed seven days after inoculation using a scale ranging from 1 to 9. Plants with scores 1, 2, 3 were considered resistant and plants with a score greater than or equal to 4 were considered susceptible.

Intraspecific variability was observed for the pathotypes 77, 81, 479 and 1609 of *Colletotrichum lindemuthianum*, through the presence of contrasting reaction in the genotypes BRSMG União, Aporé, Vereda, BRS Marfim, CNFC 10408 and CNFC 10470, respectively (Table 1). These genotypes showed susceptibility to an isolate and resistance to another isolate representative of the same pathotype. Other genotypes showed no reversal in the reaction of resistance and susceptibility among isolates of the same race (pathotype).

Pathotype 65 showed no symptoms in the differential series, so the mixture was obtained only with a combination of pathotypes 73, 77 and 81 and mixing with the combination of the two pathotypes 91, 475, 479 and 1609 in the same inoculum suspension, which resulted in the identification of races 93 and 2015 respectively, completely distinct from those that were inoculated. This fact can be explained by the combination of joint reaction symptoms in the differential cultivars in comparison with the reaction isolated from each pathotype. It was found that the set of differential cultivars is not efficient to identify the pathogen variability and to determine the pathotypes of *C. lindemuthianum* with the precision necessary for common bean breeding program. Therefore, the genotypes BRSMG União, Aporé, Vereda, BRS Marfim, CNFC 10408 and CNFC 10470 are candidates for the formation of a new set of differential cultivars and the inoculation of a mixture of races is feasible for the selection of genotypes resistant to diseases.

**Table 1:** Evaluation of some genotypes that showed variability in pathogenicity

Isolates	CNPAF CI 1333		CNPAF CI 1334		CNPAF CI 1164		CNPAF CI 1251		CNPAF CI 1324		CNPAF CI 1328		CNPAF CI 1294		CNPAF CI 1311	
Cultivars/ Pathotypes	77				81				479				1609			
BRS Horizonte	9*	S	9	S	4	MR	4	MR	9	S	9	S	9	S	6	S
BRS Pontal	1	R	1	R	2	R	3	MR	9	S	9	S	4	MR	1	R
BRS Requite	1	R	1	R	2	R	2	R	9	S	9	S	3	MR	2	R
BRS Talismã	1	R	1	R	2	R	3	MR	9	S	9	S	2	R	2	R
Pérola	8	S	6	S	9	S	9	S	9	S	9	S	5	S	7	S
BRS MG Magestoso	9	S	9	S	2	R	2	R	9	S	9	S	1	R	4	MR
BRS 9435 Cometa	9	S	9	S	2	R	2	R	9	S	9	S	4	MR	4	MR
BRS Estilo	9	S	9	S	1	R	1	R	9	S	9	S	2	R	3	MR
BRS Campeiro	9	S	9	S	9	S	8	S	9	S	9	S	8	S	8	S
BRS Grafite	1	R	1	R	1	R	1	R	9	S	9	S	1	R	1	R
BRS Supremo	9	S	9	S	3	MR	3	MR	9	S	9	S	2	R	4	MR
BRS Valente	1	R	1	R	1	R	1	R	9	S	9	S	1	R	1	R
Diamante Negro	9	S	9	S	9	S	9	S	9	S	9	S	9	S	9	S
BRS Esplendor	2	R	3	MR	1	R	1	R	1	R	1	R	9	S	9	S
Emgopa 201-Ouro	1	R	1	R	1	R	1	R	9	S	9	S	1	R	2	R
BRS Vereda	9	S	9	S	1	R	2	R	9	S	9	S	2	R	4	MR
BRS Pitanga	1	R	1	R	4	MR	4	MR	9	S	9	S	4	MR	4	MR
BRS Timbó	1	R	1	R	2	R	4	MR	9	S	9	S	1	R	4	MR
<b>BRS Marfim</b>	1	R	1	R	1	R	4	MR	9	S	1	R	1	R	4	MR
BRS Executivo	9	S	9	S	9	S	9	S	9	S	9	S	9	S	9	S
BRS Embaixador	6	S	6	S	1	R	3	MR	9	S	9	S	2	R	3	MR
BRS Radiante	4	MR	8	S	8	S	7	S	4	MR	8	S	9	S	9	S
BRS MG Realce	1	R	1	R	1	R	2	R	1	R	1	R	3	MR	3	MR
BRS MG Tesouro	1	R	1	R	1	R	1	R	9	S	9	S	1	R	2	R
<b>BRS MG União</b>	2	R	8	S	9	S	9	S	4	MR	8	S	9	S	9	S
<b>Aporé</b>	9	S	8	S	1	R	9	S	9	S	1	R	8	S	7	S
<b>Vereda</b>	9	S	9	S	3	MR	1	R	9	S	9	S	1	R	5	S
Pioneiro	9	S	9	S	2	R	1	R	9	S	7	S	4	MR	4	MR
Ouro Branco	9	S	9	S	2	R	3	MR	9	S	9	S	4	MR	4	MR
Corrente	1	R	1	R	3	MR	3	MR	9	S	9	S	4	MR	4	MR
Ouro Vermelho	1	R	1	R	1	R	2	R	6	S	8	S	3	MR	1	R
Expedito	9	S	9	S	1	R	1	R	9	S	9	S	4	MR	1	R
CNFC 10429	9	S	9	S	2	R	2	R	9	S	9	S	2	R	3	MR
CNFC 10729	9	S	9	S	1	R	2	R	9	S	9	S	2	R	3	MR
CNFC 10733	9	S	9	S	1	R	2	R	9	S	9	S	1	R	3	MR
CNFC 10120	1	R	1	R	1	R	1	R	1	R	1	R	9	S	9	S
CNFC 10762	1	R	1	R	1	R	1	R	8	S	9	S	1	R	1	R
<b>CNFC 10408</b>	1	R	1	R	1	R	1	R	7	S	1	R	1	R	2	R
<b>CNFC 10470</b>	1	R	1	R	1	R	1	R	9	S	1	R	1	R	1	R
CNFP 10132	5	S	8	S	1	R	1	R	2	R	1	R	9	S	9	S
Rosinha G2	6	S	6	S	9	S	9	S	7	S	7	S	9	S	9	S



\*Score 1: A total absence of symptoms; Score 2: A minimum of two little dark streaks in some veins of the lower leaf surface (very little perceived); Score 3: A greater number of already blackened grooves in the ribs of the underside of the leaves (easily perceived); Score 4: Score 3 identical symptoms, but already showing a minimum of grooves in the face Superior some veins of the leaves (very little perceived); Score 5: A large number of dark streaks in both the lower face but also on the upper surface of leaves (easily perceived); Score 6: Score 5 identical symptoms, but with some lesions on stems and stems of most plants; Score 7: The vast majority of the black veins with wilted leaves; Score 8: Symptoms similar to Score 7, but already showing some dead plants; Score 9: Most plant killed;