

Differential Sets

Peronospora farinosa f. sp. *Spinaciae*

Downy mildew of spinach is caused by *Peronospora farinosa* f. sp. *spinaciae* (Pfs). Resistance of spinach to this pathogen is usually based on major genes that can be overcome by specific races of the pathogen.

The number of races of Pfs has increased substantially from five in 1996 to sixteen in 2016. All new races were evaluated by the International Working Group on Pfs in spinach (IWGP) before denomination.

Spinach breeders and independent researchers collaborate within IWGP to denominate new races as soon as possible on the basis of proven relevance to the spinach industry. The use of a common set of differentials is crucial for this collaboration.

Researchers all over the world are invited to join the IWGP initiative and use the common host differential set to identify new isolates. A limited amount of seed of each differential can be obtained from Naktuinbouw in The Netherlands. Naktuinbouw can also deliver type isolates of all denominated races, except type isolate Pfs: 9

For more information you can consult the literature references or contact
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Differential	Race															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Viroflay	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Resistoflay	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Califlay	-	+	-	+	-	+	+	-	-	+	-	-	+	-	+	-
Clermont	-	-	-	-	+	+	+	+	+	+	+	+	+	+	-	+
Campania	-	-	-	-	-	+	-	+	+	+	-	+	+/-	+	-	-
Boeing	-	-	-	-	-	-	-	+	-	+	-	+	-	+	-	+
Lion	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
Lazio	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+
Whale	-	-	-	(-)	-	(-)	(-)	-	-	+	-	(-)	+	(-)	+	-
Pigeon	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
Caladonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
Meerkat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+

Legend:

- + susceptible
- HR resistant
- (-) IR intermediate resistant
- +/- variability in number of resistant and susceptible plants observed

References

Feng, C., Correll, J. C., Kammeijer, K. E., and Koike, S. T. (2014) Identification of new races and deviating strains of the spinach downy mildew pathogen *Peronospora farinosa* f. sp. *spinaciae*.

Plant Disease 98:145-152.

Correll, J., du Toit, L., Koike, S., and van Ettehoven, K. (2015) Guidelines for Spinach Downy Mildew: *Peronospora farinosa* f. sp. *spinaciae* (Pfs), available at www.cpsi.org



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