

# ISF guidelines on the nomination of novel plant pest races

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## INTRODUCTION

Disease resistance is a major goal in breeding new varieties and plays a key role in vegetable crop production as part of integrated pest management practices. It is also carefully described to differentiate new varieties from current or older varieties on the market. The objective of the Working Group on Disease Resistance Terminology at the International Seed Federation is to promote the consistent use of terminology in relation to disease resistance.

The Working Group consists of representatives from seed companies and other organizations such as GEVES, Naktuinbouw and Collaboration for Plant Pathogen Strain Identification (CPPSI) that work on disease resistance terminology.

## Working Group's tasks

- Codes pathogens for which companies claim disease resistance for their varieties
- Promotes harmonized terminology across the industry to avoid any liability due to miscommunication
- Develops host differentials
- Establishes validated procedures based on peer-reviewed scientific publications and industry practices to identify pathogen races/strains

## Objectives of the guidelines

Disharmonized numbering of pest races can create confusion in the seed market. ISF does not have the intention to overwrite the already existing nomination systems or interfere with any scientific researches in this area, but to provide clarity for the nomination of economically important newly emerged pest races.

## Examples of race naming systems being practiced

- The same races are named differently (e.g. *Fusarium oxysporum* in tomato where same races are numbered differently in Europe and US; Fig 1, Table 1).
- or
- There is a global mechanism in place to test uncommon field isolates on a fixed, common host differential set of varieties that contain the full range of available resistances, and denominate new economically important races (e.g. *Peronospora effusa* (= *P. farinosa* f. sp. *spinaciae*) in spinach).



Fig. 1 *Fusarium oxysporum* f. sp. *lycopersici* (Fol) – Tomato (S) variety in the middle

Differential hosts	Fol: 0EU/1US	Fol: 1EU/2US	Fol: 2EU/3US
Bonny Best, Early Pak 7, uc 82, Marmande verte, Marmande, Resal	S	S	S
VFN8, Pakmor, Marporum, Larissa	HR	S	S
Florida MH-1, Walter, Motelle	HR	HR	S
Florida 7547, Florida 7481	HR	HR	HR

S = susceptible; HR = highly resistant

Table 1 Differential table *Fusarium oxysporum* f. sp. *lycopersici* (Fol) -Tomato

## ISF GUIDELINES

To support the decision making process associated with the nomination of novel races, the Working Group has formulated the following guidelines:

### Criteria of nominating novel races

1. The pathogenicity and/or resistance-breaking event observed on the pest-host interaction should be novel.
2. The pathogenicity and/or resistance-breaking event should fulfil at least two of the three conditions below:
  - 2.1 The pest should have caused significant economic damage at least once.
  - 2.2 The geographical extent of this event should be of significance.
  - 2.3 The event should be recurrent in time having been observed over multiple growing seasons and/or years.
3. A stable isolate must be available and established as reference material.
4. Using the reference isolate, the characteristic of the event must be reproducible in a controlled disease test.
5. Nomination of a new race cannot be done by a single stakeholder, but several independent stakeholders.

### Recommendation for naming

ISF WG DRT recommends using the following guidelines when naming a novel race:

1. A race name should consist of the abbreviated pest species name followed by the number of the race. (A list of ISF approved abbreviations and formatting rules can be found in the ISF website.)
2. For each pest-crop combination where the first resistance-breaking event is characterized, the isolate breaking the resistance should be nominated as race 1. The original isolates for a pest-crop combination prior to the resistance breaking isolate(s) being characterized becomes denominated as race 0.
3. Further discoveries of resistant-breaking isolates should lead to an incremental numeric system (2,3,4,5 etc.) for naming additional novel races.

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