

Definition of the Terms Describing the Reaction of Plants to Pests¹ for the Vegetable Seed Industry

(Adopted by the ISF Vegetable and Ornamental Crops Section in May 2017)

1. Introduction

The relationship between a plant and a pest is very complex. The terms that describe the reaction of a plant variety to a pest are determined by tests with known and characterized biotypes, pathotypes, races or strains of the pest in question.

In practice however, the ability of a pest to cause disease in or damage to a plant depends on environmental conditions, the properties of the organism itself and the capacity of the plant to defend itself. Plant varieties within a species can differ in their ability to defend themselves. Under different conditions, such as age of the plant, pest pressure and degree of virulence or adverse environmental conditions, the interaction between the same plant variety and pest may have different outcomes.

Pests are known to develop and form new biotypes, pathotypes, races or strains that can cause disease in or damage to plants that remain unaffected by the original form of the pest.

To promote consistency in the terms used to describe the reaction of a plant to a pest, ISF Vegetable and Ornamental Crops Section has defined the following terms.

2. Definitions

Susceptibility is the inability of a plant variety to restrict the growth and/or development of a specified pest.

Resistance is the ability of a plant variety to restrict the growth and/or development of a specified pest and/or the damage it causes when compared to susceptible plant varieties under similar environmental conditions and pest pressure.

Resistant varieties may exhibit some disease symptoms or damage under heavy pest pressure. Two levels of resistance are defined.

High resistance (HR): plant varieties that highly restrict the growth and/or development of the specified pest and/or the damage it causes under normal pest pressure when compared to susceptible varieties. These plant varieties may, however, exhibit some symptoms or damage under heavy pest pressure.

Intermediate resistance (IR): plant varieties that restrict the growth and/or development of the specified pest and/or the damage it causes but may exhibit a greater range of symptoms or damage compared to high resistant varieties. Intermediate resistant plant varieties will still show less severe symptoms or damage than susceptible plant varieties when grown under similar environmental conditions and/or pest pressure.

¹ FAO defines a pest as: Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products.
<http://www.fao.org/docrep/W3587E/w3587e01.htm>

Pathogens (microorganisms such as bacteria, viruses and fungi that cause a disease) are, therefore, included in the term "pest".

Varieties claiming the same level of resistance against a specific pest may exhibit a different resistance response due to a different genetic makeup of a variety.

It is to be noted that if a resistance is claimed in a plant variety it is *limited to the specified biotypes, pathotypes, races or strains of the pest*.

If no biotypes, pathotypes, races or strains are specified in the resistance claim for the variety, it is because no generally accepted classification of the cited pest by biotype, pathotype, race or strain exists. In this case resistance is only claimed against certain not further specified isolates of that pathogen. New biotypes, pathotypes, races or strains that may emerge are not covered by the original resistance claim.

Immunity is when a plant is not subject to attack or infection by a specified pest.

3. Statement

The ISF Vegetable and Ornamental Crops Section recommends that vegetable seed companies use the terms susceptibility, high or intermediate resistance, and immunity to describe the reaction of plants to pests in communication with their customers. The standard abbreviations HR (high resistance) and IR (intermediate resistance) shall be used in all languages.

Vegetable seed companies should avoid the term tolerance for this purpose. They may continue to use the term tolerance to describe the ability of a plant variety to endure abiotic stresses without serious consequences for growth, appearance and yield.

These definitions and recommendations will be reviewed in five years.