

A System for the Distribution of Differential Host and Pathogen Sets



Gary A. Pederson¹ and David Ellis²
¹USDA, ARS, Griffin, GA, and ²USDA, ARS, Ft. Collins, CO



UID: 72521



Introduction

The vegetable seed industry has been concerned with inconsistent naming of pathogen strains and races which has led to confusion in disease resistance claims. In August 2007, an American Phytopathological Society ad hoc committee in cooperation with the International Seed Federation (ISF) was established to develop a system for distribution of host and pathogen differential sets. This system would help standardize identification of plant pathogen races and strains to enable accurate testing to support claims of resistance. The committee initially focused on four vegetable crop diseases: 1) Pepper bacterial spot, 2) Melon fusarium wilt, 3) Spinach downy mildew, and 4) Tomato tobamovirus. The committee hopes that this system will be adopted by the scientific community and expanded to other crops where differential sets can be effectively utilized to support disease resistance claims.

System Development

- White papers (www.worldseed.org/isf/differential_hosts.html) were written for each of the four diseases documenting differential sets and proper procedures for race or strain testing.
- Seeds of the differential sets were provided to the National Plant Germplasm System (NPGS) by committee cooperators after being tested for the appropriate disease reaction prior to deposit in the Germplasm Resources Information Network (GRIN).
- Distributions of host differential sets are being handled by the appropriate curator and location for each crop. Pathogen races or strains are being obtained from committee cooperators and will be maintained and distributed by the National Center for Genetic Resources Preservation.
- Seed regeneration of all differential sets will be handled by committee cooperators, rather than curators, in order to test for expected disease reaction of each seed inventory.
- The differential sets are only distributed for disease reaction research since these seed inventories have undergone extensive disease testing.

Distributions to date

	<u>Number of orders</u>
Pepper differential host set	12
Tomato differential host set	0
Spinach differential host set	11
Melon differential host set	12

How to Order Seeds of Differential Host Sets

- Seeds of differential host sets may be ordered from the USDA, ARS, GRIN website of the NPGS at www.ars-grin.gov/cgi-bin/npgs/html/desc.pl?279001
- Select the host set you want by clicking on the *Number of Accessions* link beside the ISF code in the list of differential sets (shown below).

Distribution of Values for DIFFERENTIAL HOST SETS

<u>Code</u>	<u>Definition</u>	<u>Number of Accessions</u>
ISF1	Pepper Bacterial Spot (Xcv)	5
ISF2	Tomato Tobamovirus (ToMV)	5
ISF3	Spinach Downy Mildew (Pfs)	9
ISF4	Melon Fusarium Wilt (Fom)	4

- On the page for the specific set, click *Request these accessions* to add them all to an order.
- Click *Complete the germplasm request and order the material* and provide requestor information. Click *Submit Order* to complete ordering of seeds of the differential host set.
A limited supply of 50 pepper, 50 tomato, 100 spinach, and 25 melon seeds/differential may be ordered at no charge, as long as there is adequate seed in supply. (The NPGS may not always have adequate seed to provide a full set of differentials).

How to Order Differential Pathogen Sets

- Differential pathogen sets may be ordered from the Accession Area query page of GRIN at www.ars-grin.gov/npgs/acc/acc_queries.html
- Type in the accession prefix ISFP in the *Text search query* box and hit *Submit*.
Your output would include everything in the GRIN database containing the text ISFP. Pathogens which are part of the differential pathogen set are denoted by the prefix ISFP and accessions which are part of the differential host set are denoted by the prefix ISF. To order the strain, double click on the pathogen name.
- On the page specific to the pathogen strain, click on *Request this germplasm* to add the strain to your order.
- Click *Complete the germplasm request and order the material* and provide the requestor information. Click *Submit Order* to complete ordering of the pathogen strains.
Note that you will need to provide an electronic copy of your APHIS Interstate Movement Permit to obtain a sample of this material and that we will be unable to ship your order until we receive a copy of this Permit. You will also be asked for to provide a courier account number or a pre-paid mailing label to cover over night shipping costs for the samples. If ordering from countries other than the U.S., an import permit is needed with the genus and species of the pathogen listed prior to shipping the samples.