

# MATREF: Reference Material of varieties and strains at GEVES, managed in a national network for disease and pest resistance

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## What is MATREF ?

A national network, coordinated by GEVES since 2002, managing REFerence MATerial used for disease resistance tests performed for registration (CTPS), for Plant Breeders’ Rights (CPVO or INOV) or external customers, including:

- Controls : susceptible, intermediate, resistant cultivars
- Differential hosts : for identification of races
- Pests and pathogen isolates (funghi, bacteria, nematodes)

The network comprises 12 partners: GEVES, INRA GAFL Montfavet, and 10 seed companies. MATREF includes about 70 host pathogens or pests combinations for vegetables.



Tomato/Fol:0

## Aim of MATREF

- to make available a validated reference collection used in disease resistance tests for official labs in charge of registration or protection
- to harmonize the controls and the isolates between official labs (SNES & INRA) and breeders to optimize the consistency of results for disease resistance tests
- to exchange information about developments in new disease resistance tests, new resistance genes or new races, harmonization of terminology of pathogens, in collaboration with ISF working group and other UE country authorities.

## Activities of MATREF

Table 2 : Sharing of tasks between network members

Partners	Network tasks	Database	Seed multiplication	Seed storage	Control of resistance	Control of germination	Seed health	Strain maintenance	Distribution
Public partners	GEVES SEV Brion	X seeds		X		X			X seeds
	GEVES-SNES	X strains			X	X	X	X	X strains
	INRA		X		X	X		X	
Private partners	Seed companies *		X			X	(X)	X Duplicate	

\* : ASL, Clause , Gautier, GSN, Monsanto, Orkad, Rijk Zwaan, Sakata, Syngenta, Vilmorin

MATREF provides a collection of reference material, managed by database :

- seed material:
  - ✓ multiplied by seed companies or INRA
  - ✓ validated for resistance/susceptibility behaviour by the pathology lab of GEVES-SNES
  - ✓ stored in an active bank at 4°C and backup bank at -18°C by GEVES Brion.
- isolates
  - ✓ validated for aggressiveness and virulence on controls and differentials by the pathology lab of GEVES-SNES
  - ✓ maintained by the official laboratory (GEVES-SNES or INRA) as an active bank and stored as long term back-up in 2 secure locations.

### Seed health tests: quarantine & quality

To be able to distribute these differentials and controls to breeders and official labs, seeds must be guaranteed free of disease, with at least, the list of quarantine disease.

## Distribution

For MATREF members, the differential seeds and pathogen reference cultures are distributed free of charge ; for non-members, there is a fee and seed quantity is restricted. The MATREF list can be loaded on the Website :

[www.geves.fr](http://www.geves.fr) - Varieties - Bioaggressors MATREF Network (Reference material)

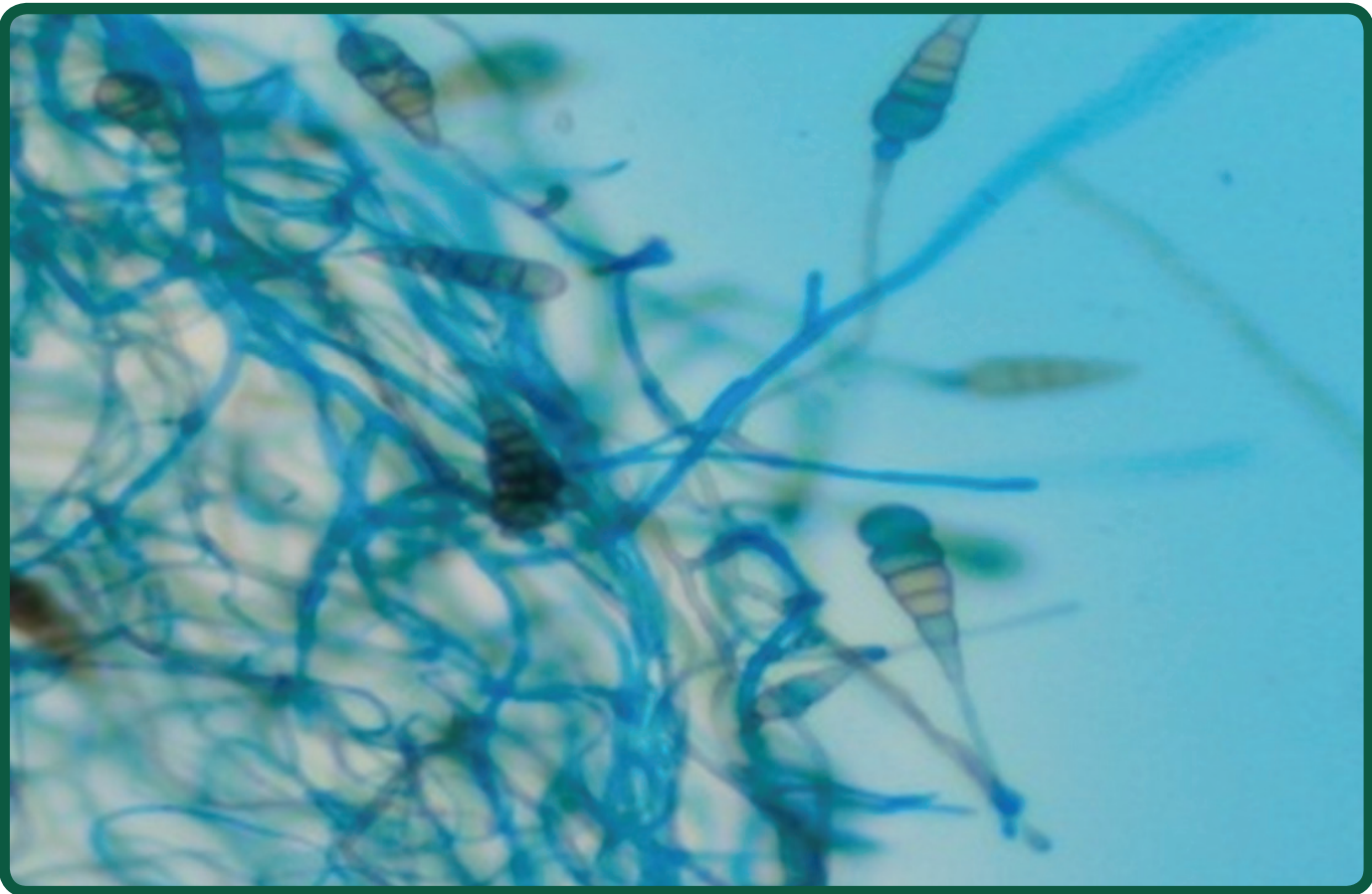
## Conclusion

These collections are now being used on a national level by official French laboratories (SNES, INRA Avignon) and breeders and on international level, by non-members of the network: GEVES counterparts, research laboratories, seed companies,... Development of comparable system for some field crops, as crucifers, and notably rapeseeds , may be expected.

Table 1 : Extract of the MATREF list

Species	Pathogens	Code	Pathotype	Controls	Differentials
MELON <i>Cucumis melo</i> L.	<i>Fusarium oxysporum</i> f.sp. <i>melonis</i>	Fom	0	S: Charentais T R: Védrentais, Charentais Fom-2	Charentais T, Védrentais, Charentais Fom-2
			1	S: Charentais T, Védrentais R: Charentais Fom-2	
			2	S: Charentais T, Charentais Fom-2 R: Védrentais	
			1.2	S: Virgos IR : Lunasol, Manta IRh: Isabelle	

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Carrot/*Alternaria dauci*

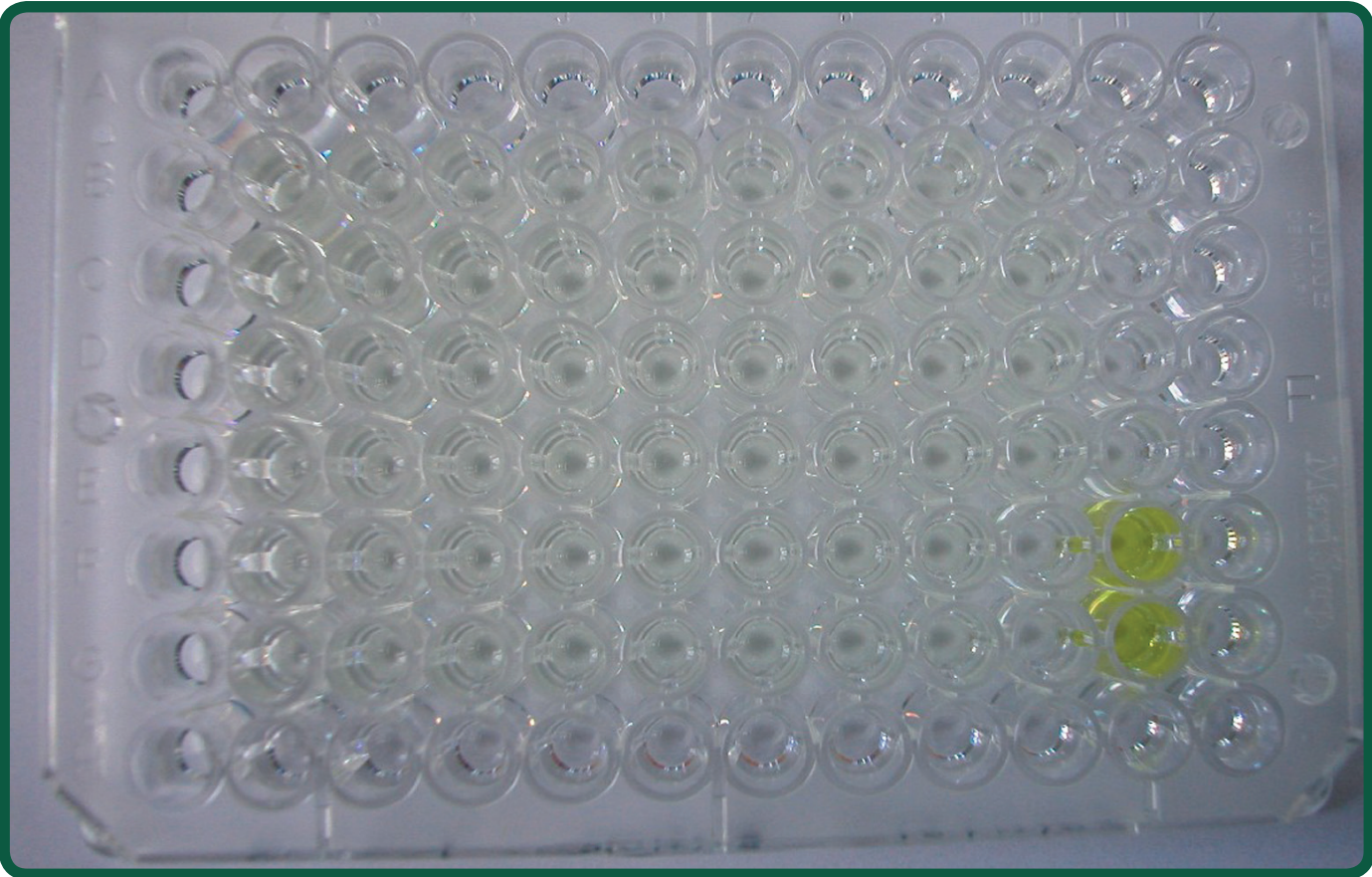


Melon/Powder mildew

Species	Seed health tests: 16 pathogens
Carrot	<i>Xanthomonas hortorum</i> pv. <i>carotae</i>
Bean	<i>Pseudomonas savastanoi</i> pv. <i>phaseolica</i> <i>Pseudomonas syringae</i> pv. <i>syringae</i> <i>Xanthomonas axonopodis</i> pv. <i>phaseoli</i> (quarantine)
Lettuce	LMV (except for Bremia)
Melon*	<i>Acidovorax avenae</i> subsp <i>citrulii</i> Squash mosaïc virus
Pepper	TMV PMMoV <i>Xanthomonas vesicatoria</i> & <i>X. axonopodis</i> pv. <i>vesicatoria</i> (quarantine)
Pea	<i>Pseudomonas syringae</i> pv. <i>pisi</i> Pea seed-borne mosaic virus **
Tomato	<i>Clavibacter michiganensis</i> subp <i>michiganensis</i> (quarantine) Pepino Mosaic Virus (quarantine) ToMV <i>Xanthomonas vesicatoria</i> & <i>X. axonopodis</i> pv <i>vesicatoria</i> (quarantine)

\* if regenerated out of France

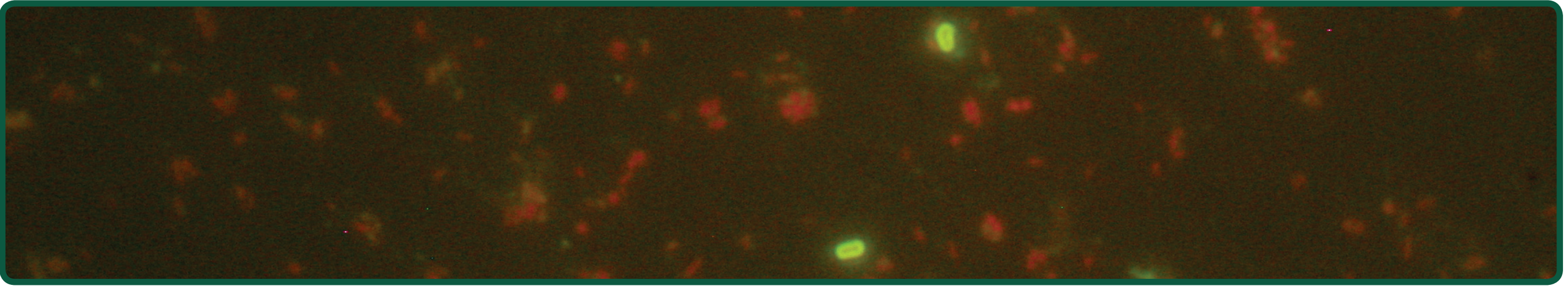
\*\* not compulsory



Elisa carried out to detect LMV



MATREF storage and distribution



Immunofluorescence carried out to detect *Clavibacter michiganensis* subp *michiganensis*