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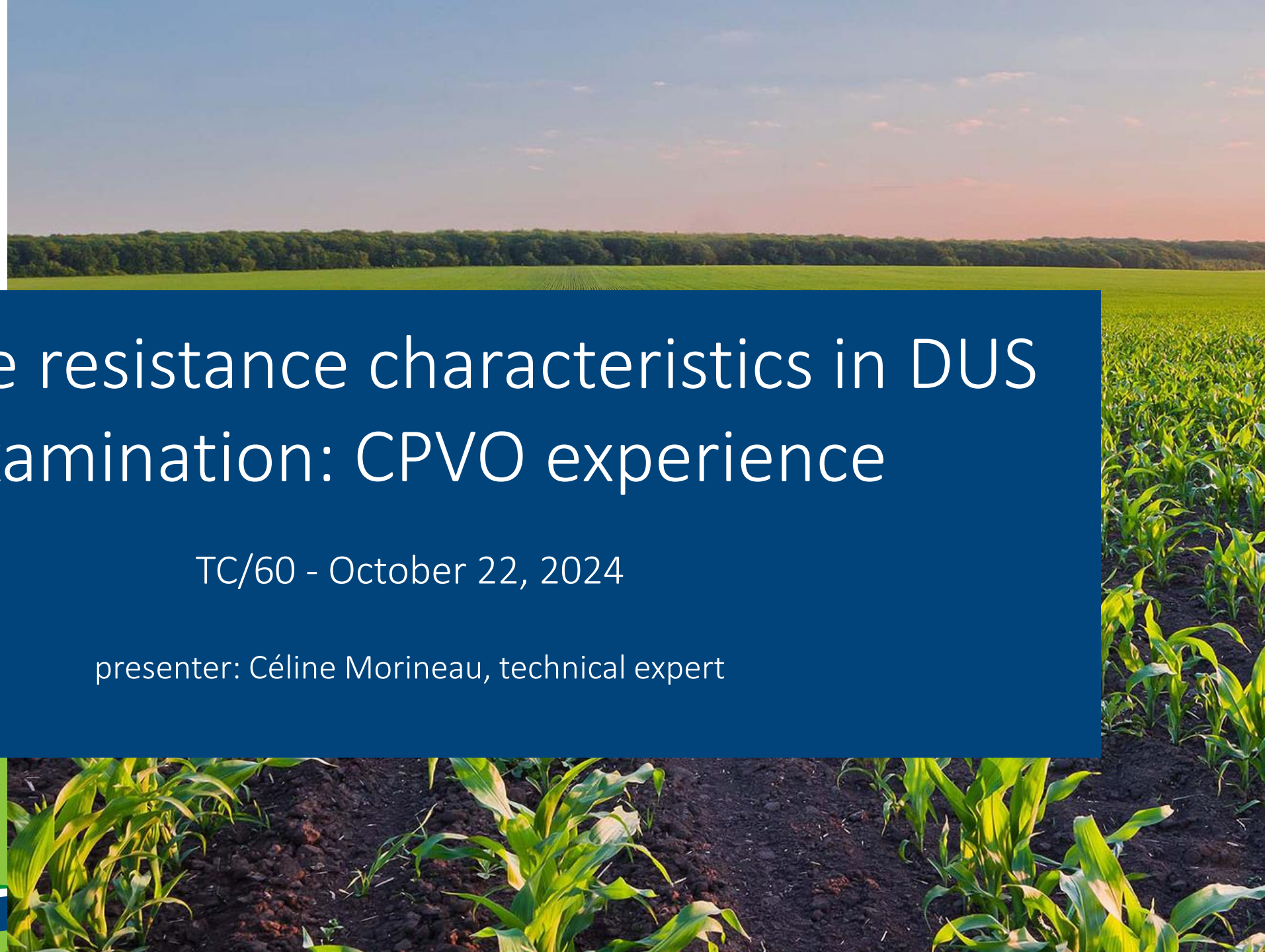
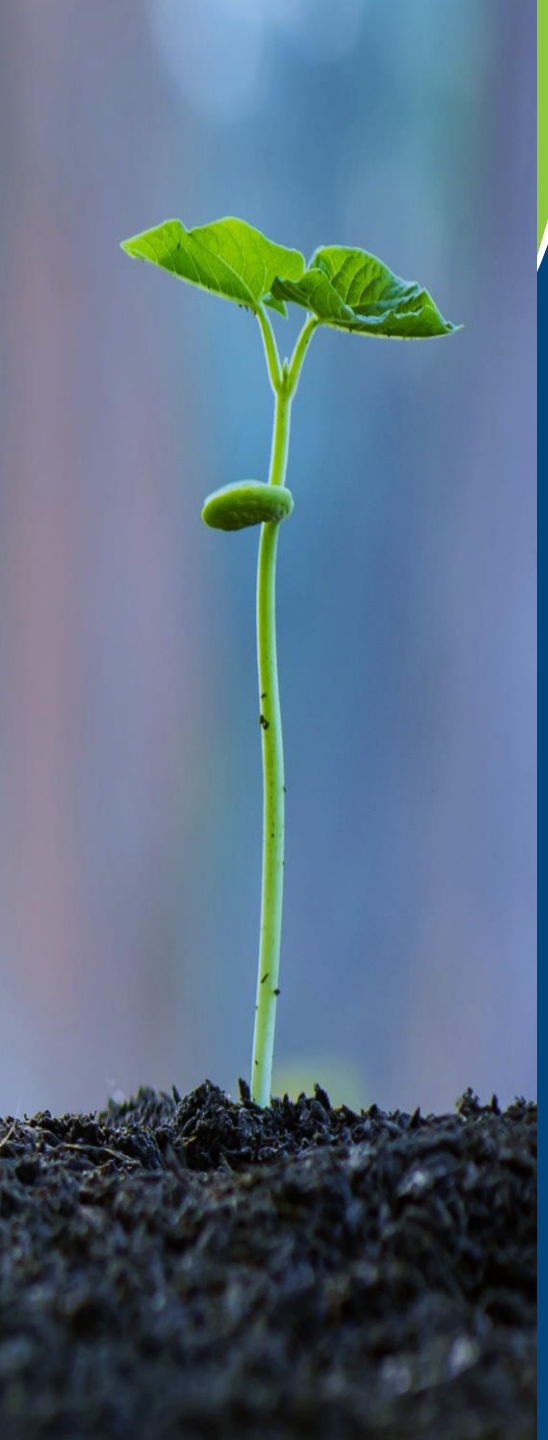


Disease resistance characteristics in DUS examination: CPVO experience

TC/60 - October 22, 2024

presenter: Céline Morineau, technical expert



ORGANISATION OF THE PVP SYSTEM IN EU

CPVO: European agency located in France (Angers)

23 DUS examination offices (EOs) in the EU:

- Cooperation with national authorities located in different countries over the EU
- The EOs are entrusted by the CPVO for a defined list of species from the ornamental, agricultural, vegetable and/or fruit sector

The EOs perform the technical examinations:

- on behalf of the CPVO

- or on behalf of their national authorities for national protection or marketing authorisation (the CPVO can then purchase the DUS report)

Examination offices entrusted by the CPVO

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GUIDANCE FOR DUS TESTING

UPOV

CPVO

Examination offices

2 Test guidelines (TWP)

At least UPOV (*) characteristics are kept

1 Technical protocols (experts' meetings)

all char. from CPVO TP + national characteristics

3 National guidelines

6.1.2	Asterisked Characteristics (*)	UPOV Technical guidelines

Asterisked characteristics (denoted by *) are those included in the Test Guidelines which are important for the international harmonization of variety descriptions and should always be examined for DUS and included in the variety description by all members of the Union, except when the state of expression of a preceding characteristic or regional environmental conditions render this inappropriate.

SPECIFICITY OF THE DISEASE CHARACTERISTICS IN THE CPVO TPs

3 types of disease characteristics:

- Compulsory (*must be tested by the EOs*)
- In phasing period (*transitional period before becoming obligatory*)
- Optional

CPVO TP

Compulsory

38. **(+)** **(*)**	**48.**	**VG**	**Resistance to *Bremia lactucae* (Bl) isolate Bl: 29EU**		
QL			absent	Argelès	1
G			present	Balesta	9

Phasing period

46. **(+)**		**VG**	**Resistance to *Bremia lactucae* (Bl) isolate Bl: 40EU**		
[*]			absent	Bartoli, RYZ2164	1
QL			present	Kibrille	9

Optional

39. **(+)**	**49.**	**VG**	**Resistance to *Bremia lactucae* (Bl) isolate Bl: 30EU**		
QL			absent	Argelès, Colorado	1
			present	Balesta	9

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QL			absent	Argelès, Colorado	1
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CPVO TQ (in section 5)

(38) (G) 05.10. Resistance to *Bremia lactucae* (Bl) isolate Bl: 29EU

○ 1 - absent	Argelès
○ 9 - present	Balesta

(46) 05.18. Resistance to *Bremia lactucae* (Bl) isolate Bl: 40EU

○ 1 - absent	Bartoli, RYZ2164
○ 9 - present	Kibrille
○ not tested	

(39) 05.11. Resistance to *Bremia lactucae* (Bl) isolate Bl: 30EU

○ 1 - absent	Argelès, Colorado
○ 9 - present	Balesta
○ not tested	

- the applicant shall declare the resistance when it is compulsory
- option “not tested” for resistances that are not compulsory

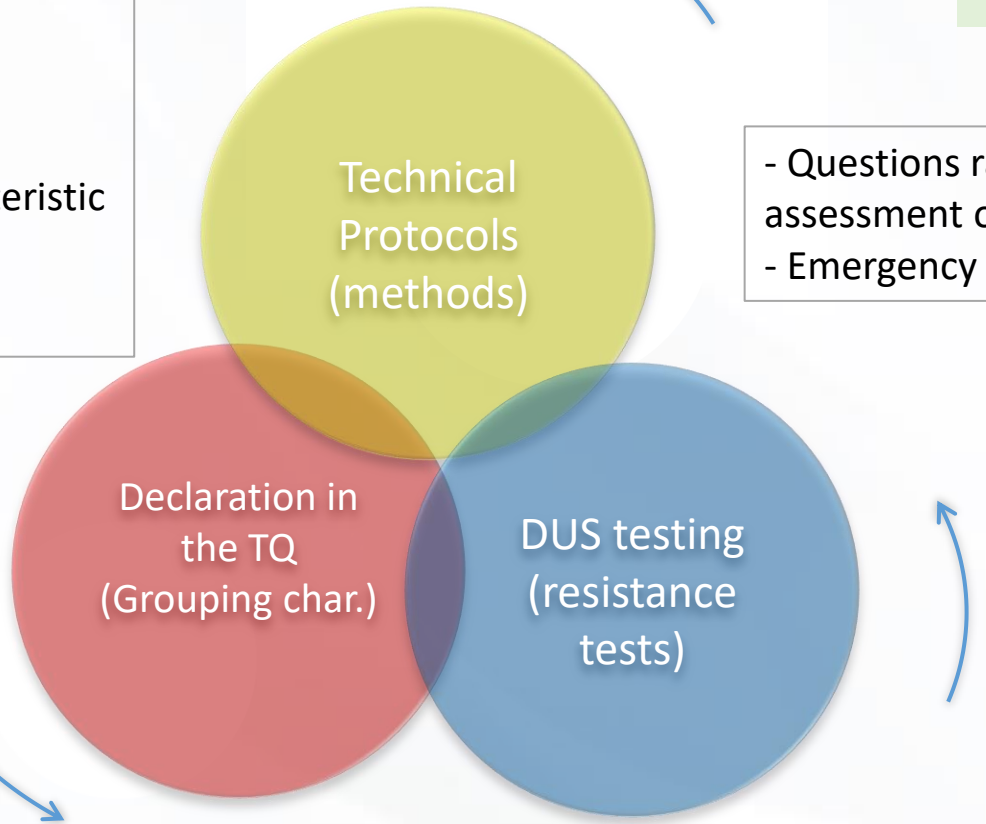
ASSESSMENT OF DISEASE RESISTANCE CHARACTERISTICS

Close cooperation between CPVO, EOs and breeders at every steps

Discussion at the experts' meetings:
- deletion or introduction of new resistances
- methodology (improvement or development of protocols, how to assess the char? etc.)
- Compulsory status of the characteristic

↕

discussions at UPOV TWP



- Questions raised during the assessment of the resistances
- Emergency of new resistances

(optional) Phasing in period after introduction of a new char. in the TP (~3 years)

Exchanges between all parties during the application process and the duration of the DUS testing

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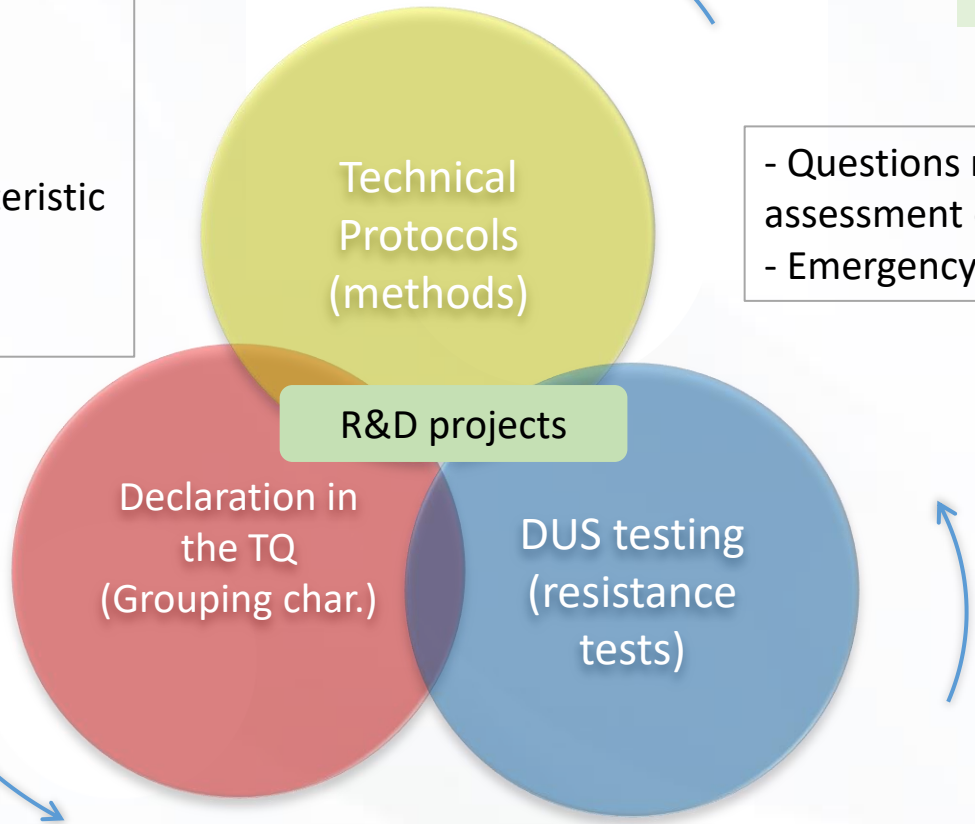

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ASSESSMENT OF DISEASE RESISTANCE CHARACTERISTICS

CPVO in support of :

- Harmonisation of protocols (isolates, differentials, controls)
- Maintainer networks (isolates, differentials, controls)
- Development of new protocols (biotests/marker test)

CO-FUNDED R&D PROJECTS

Harmores I, II and III

Harmonization of resistance test to diseases for DUS testing

GEVES (FR)[1,2,3], Naktuinbouw (NL)[1,2,3], INIA (SP)[1,2,3], Central Institute for Supervising and Testing in Agriculture (CZ)[2,3], Bundessortenamt (DE)[2,3], National Food Chain Safety Office (HU)[2,3], CREA (IT)[3], Science and Advice for Scottish Agriculture (UK)[2,3], Palacky University (CZ)[2], Julius Kühn-Institut (DE)[2], French Technical Institute for Fruits and Vegetable (CTIFL)[3], Seed companies belonging to Euroseeds (UE)[2,3]

Harmorescoll

Setting up an EU system for harmonized collections of reference isolates, controls and differentials to facilitate disease resistance testing

Naktuinbouw (NL), GEVES (FR), INIA (SP), CREA (IT), SASA Science and Advice for Scottish Agriculture (UK), Eursoseeds (EU), Seed companies belonging to Euroseeds.

ToBRAG

Updating DUS resistance tests according to pests' evolution:

- *Setting up resistance test for ToBRFV for tomato and pepper*
- *Improvement of resistance test for melon/Aphis gossypii*

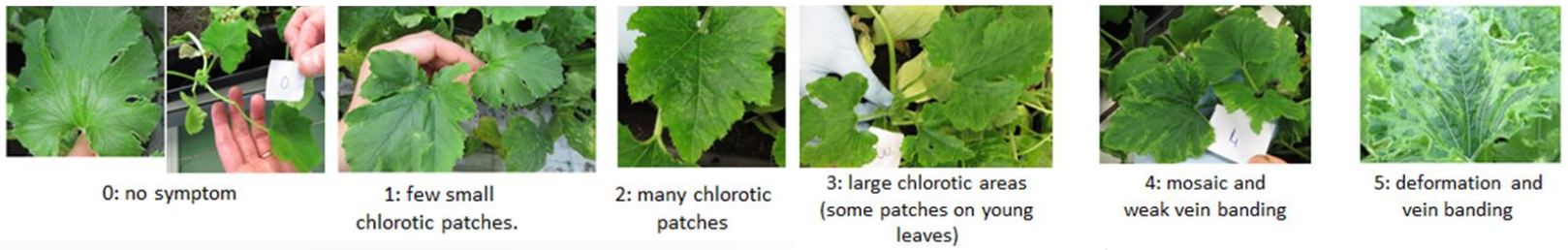
GEVES (FR), Naktuinbouw (NL), CSIC, CREA (IT), Eursoseeds (EU), Seed companies belonging to Euroseeds, INRAE (FR).

OVERVIEW OF CPVO TPs FOR VEGETABLE CROPS WITH DISEASE CHARACTERISTICS

species	No. diseases	total no. resistance characteristics	No. of resistance characteristics with...					HARMORES I, II, III (disease/species)
			(*)	[*]	G	QN	test both by biotest and marker test	
Lettuce	4	12	1	3	1	1	1	1
Tomato	16	25	5		6	1	2	4
Tomato rootstocks	11	20	6		5	1	2	
pea	3	3			2			3
french bean	4	5	2		2			3
cabbage	1	1						
spinach	2	19	2	1	3			
Cucumber	8	8			5	2		
cornsalad	1	2						
melon	8	16	3		3	2		2
pepper	7	10	4		5			3
watermelon	2	4						
total	67	125	23	4	32	7	5	16

Challenge :
Constant need to adapt
to new diseases
and develop new protocols

conversion of plants distribution in symptoms classes and notation scales



Challenge :
How to ensure constant alignment
between CPVO TP
and UPOV guidance
(CPVO--> UPOV
or UPOV --> CPVO)

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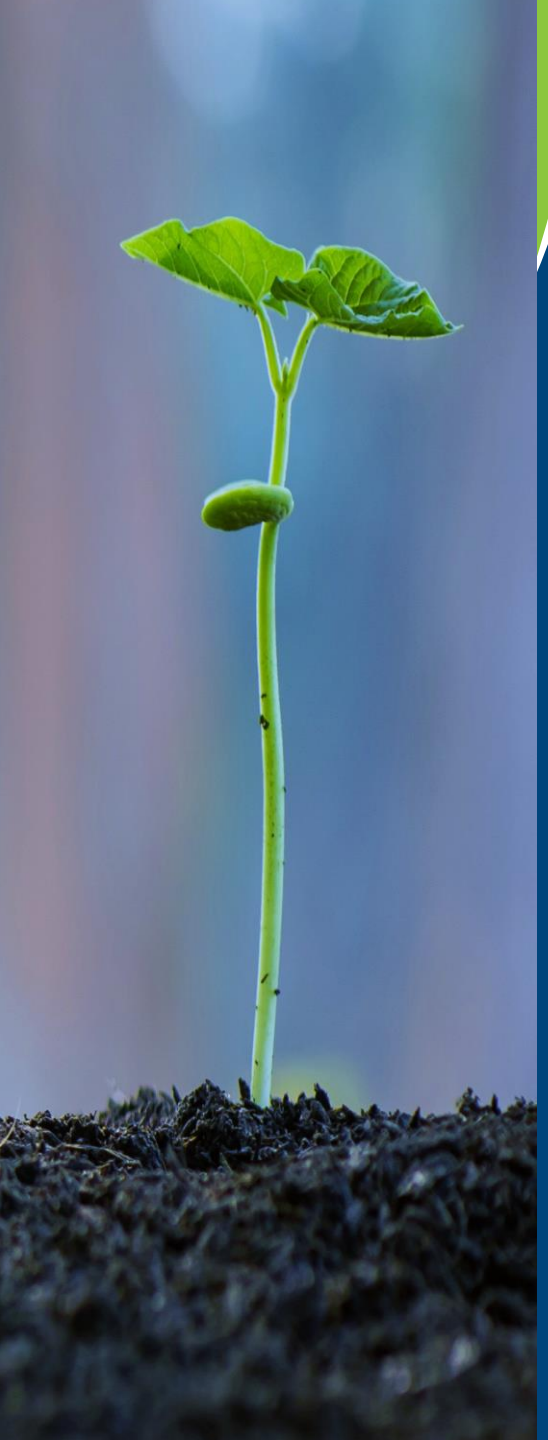

DISEASE RESISTANCE CHARACTERISTICS
CHALLENGES

- disease resistances are key breeding objectives: new diseases or strains appear continuously.

- disease resistances can serve to efficiently group varieties for DUS trials.
  --> Need to take them into account as much as possible.

- disease resistances result from complex interactions between pathogens and their hosts.
  --> Need to define precisely the characteristics reporting the phenotype of the varieties (expression types, states of expressions etc.)

Challenges :

Need for highly technical discussions, involving DUS experts and pathologists
--> proposal to keep such discussions at CPVO level (expert meetings and R&D projects) to prepare common EU proposals

Need for frequent revisions of protocols, administrative burden
--> proposal to modify CPVO protocols first,
exchange with experts from other countries when relevant,
inform UPOV TWPs of ongoing discussions,
and make proposals for revisions when consensus reached (at min at EU level).

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