UPOV
International Union for the Protection of New Varieties of Plants

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Technical Working Party for Vegetables

TWV/54/5 Add.

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ADDENDUM TO
PARTIAL REVISION OF THE TEST GUIDELINES FOR VEGETABLE MARROW, SQUASH

Document prepared by the Office of the Union

The annex to this document contains a copy of a presentation on the “Partial Rev. of TG/119/4 Corr.2 for Vegetable marrow, Squash” by an expert from France, made at the fifty-fourth session of the Technical Working Party for Vegetables (TWV).

Partial Rev. of TG/119/4 Corr.2 for **Vegetable marrow, Squash**

- Addition of a new **Characteristic : Char. 82**

"Resistance to *Zucchini yellow mosaic virus* (ZYMV)"

- Addition of a new **Characteristic : Char. 83**

"Resistance to *Watermelon mosaic virus* (WMV)"

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Common traits of these char. 1/2

- Disease resistance **protocol provided** (Ad. 82, Ad. 83)
- **Quantitative** resistance characteristics
- **Assessment of Uniformity**: as any other QN
- Method of observation: **VS** = *visual assessment by observation of individual plants*
- Format of the test: On **20 plants**, divided in at least **2 rep**.
- Observation scale on **6 classes** (0 to 5), **with an illustration of symptoms**
- Validation of the test (D and U): *Results should be **compared with** results of **all controls** and are depending of the aggressiveness of the test and the **distribution of the plants***
  - *Possible use of the **Pathostat** tool (statistical analysis of the raw data to assist pathologist in proposed conclusions)*
- Critical control points
  - **Recommended *dates of notation*** should be adapted depending on expression of symptoms on controls.
  - **Environmental conditions** can influence the expression of symptoms over time. In this case a *second notation could be necessary*.

Common traits of these char. 2/2

- **Ring tests** performed several years (2013 to 2016) for **ZYMV**, and 2 additional years (2017-2018) for **WMV**), involving breeding companies to **develop and validate the protocols**.

- **Characterization** of the reference collection done by GEVES (**around 160 var**.)

- The **proposed scale** of notes: to allow when the results are «robust enough » , a difference of 2 points allowing **a distinction** on the base of one char. (1 / 3 / 5) - and when it is not possible, only a difference of 1 point (1 / 3 / 4).

- The mentioned *example varieties* are **controls of the test.** The **3 controls** have to be included in each test to validate its aggressiveness. Moreover, they are the **lower bound of the IR, HR levels.**

- **Up to now,** we have chosen to work only with the **mentioned notes** (1/3/5) for ZYMV, (1/3/4) for WMV, to « secure » the description and distinction.

  *With the use of **statistic tools**, it would open the opportunity to use **intermediate notes (2, 4).** We don't have enough experience on this point up to now.*

- We **informed the TWV (2018, 2019)** of the obtained results, inviting the participants to contact us, *in case of interest,* to share experiences.

Specific traits of ZYMV

- Control varieties:
  - Susceptible : **CORA**.....Note 1
  - Intermediate resistant: **MIRZA**.....Note 3
  - Highly resistant: **MIKONOS**.....Note 5

- Interpretation of data in terms of UPOV char. states

*According to our experience, NO doubt about the **distinction** between the note 1 and the note 3, and between the note 3 and the note 5.*

- ✓ If a variety is less resistant than MIRZA, it will be considered susceptible (note 1).
- ✓ If a variety is less resistant than MIKONOS, it will be considered intermediate resistant (note 3).
- ✓ If a variety is at least as resistant as MIKONOS, or more resistant than MIKONOS, it will be considered highly resistant (note 5).

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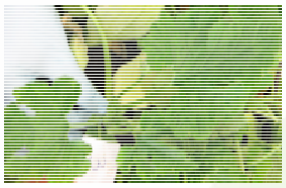
ZYMV Observation scale

0 : no symptom

1 : few chlorotic patches

2 : many chlorotic patches



3: broad chlorotic patches (some patches on young leaves)

4 : mosaic and weak vein banding

5 : deformation and vein banding

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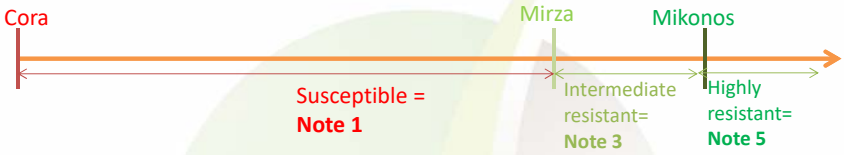
Zucchini yellow mosaic virus (ZYMV)

- Interpretation rules
  - < MIRZA ➔ susceptible
  - MIRZA ≥ < MIKONOS ➔ intermediate resistant
  - ≥ MIKONOS ➔ highly resistant.

Variety analysis will be carried out taking into account the standard deviation of the controls.



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Specific traits of WMV

- Control varieties
  - Susceptible: CORA……Note 1
  - Intermediate resistant: SOFIA……Note 3
    (moderate resistant control of lower level)
  - Intermediate to highly resistant: MIKONOS, SYROS……Note 4
    (moderate resistant controls of higher level)
  - (Highly resistant : ***Not yet identified control*** ……Note 5)
    Note not used up to now.

- Interpretation of data in terms of UPOV char. states

According to our experience, NO doubt about the distinction between the note 1 and the note 3, BUT :

- ***Most of the time*** MIKONOS and SYROS are more resistant than SOFIA, it allows a **difference of 1 point** between these varieties.
- SYROS can be observed more resistant than MIKONOS, but ***regularly, the situation is reversed.*** These varieties are considered to share the **same note**.

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WMV Observation scale

0 : no symptom

1 : few chlorotic patches

2 : many chlorotic patches

3: broad chlorotic patches (some patches on young leaves)

4 : mosaic and weak vein banding

5 : deformation and vein banding

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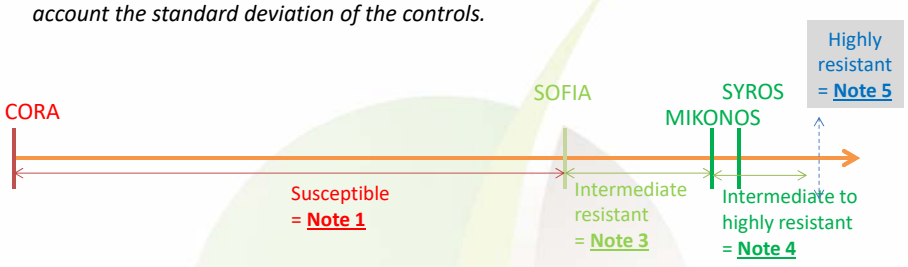
Watermelon mosaic virus WMV

- Interpretation rules
  - Less resistant than SOFIA → susceptible
  - SOFIA ≥ < MIKONOS → Intermediate resistant
  - ≥ MIKONOS, SYROS → Intermediate to highly resistant (Strong IR)
  - ≥ *** (**not yet identified**) → Highly resistant

Variety analysis will be carried out taking into account the standard deviation of the controls.



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Thanks a lot

for your attention

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[End of Annex and of document]