

Technical Working Party for Vegetables**TWV/54/5 Add.****Fifty-Fourth Session
Brasilia, Brazil, May 11 to 15, 2020****Original:** English
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**ADDENDUM TO
PARTIAL REVISION OF THE TEST GUIDELINES FOR VEGETABLE MARROW, SQUASH***Document prepared by the Office of the Union**Disclaimer: this document does not represent UPOV policies or guidance*

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*.

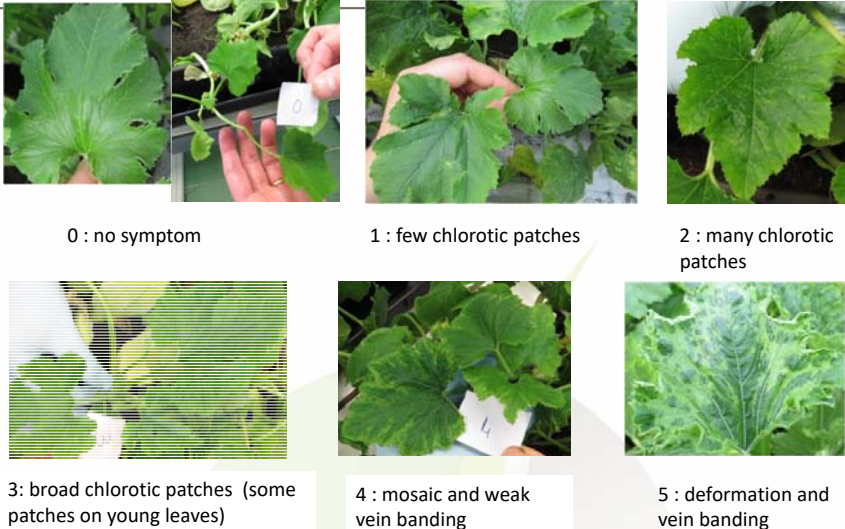
Common traits of these char. 2/2

- **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).

ZYMV Observation scale



The ZYMV Observation scale consists of six photographs showing the progression of symptoms on zucchini leaves:

- 0 : no symptom**: A healthy green leaf with no visible signs of infection.
- 1 : few chlorotic patches**: A leaf with a few small, light-colored chlorotic spots.
- 2 : many chlorotic patches**: A leaf with numerous chlorotic spots of varying sizes.
- 3 : broad chlorotic patches (some patches on young leaves)**: A leaf with large, broad chlorotic patches, some appearing on younger leaves.
- 4 : mosaic and weak vein banding**: A leaf showing a mosaic pattern of green and yellow, along with weak vein banding.
- 5 : deformation and vein banding**: A severely distorted leaf with prominent vein banding and overall deformation.

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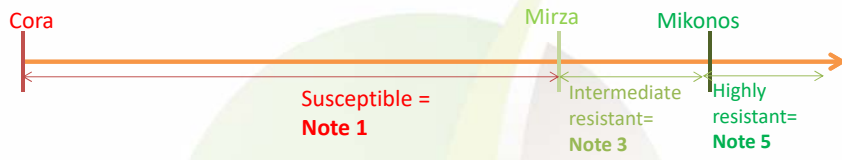
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Zucchini yellow mosaic virus (ZYMV)

➤ Interpretation rules


- $< \text{MIRZA} \rightarrow$ **susceptible**
- $\text{MIRZA} \geq < \text{MIKONOS} \rightarrow$ **intermediate resistant**
- $\geq \text{MIKONOS} \rightarrow$ **highly resistant.**

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



The diagram illustrates the resistance levels for three varieties: Cora, Mirza, and Mikonos. A horizontal axis represents the resistance scale, with an arrow pointing to the right. Cora is marked at the far left. Mirza is marked in the middle, and Mikonos is marked to the right of Mirza. Below the axis, three resistance levels are defined:

- Susceptible = Note 1**: Corresponds to the range from Cora to Mirza.
- Intermediate resistant = Note 3**: Corresponds to the range from Mirza to Mikonos.
- Highly resistant = Note 5**: Corresponds to the range from Mikonos to the right.

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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**.

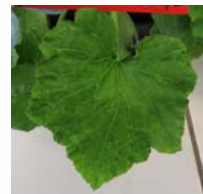
WMV Observation scale



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



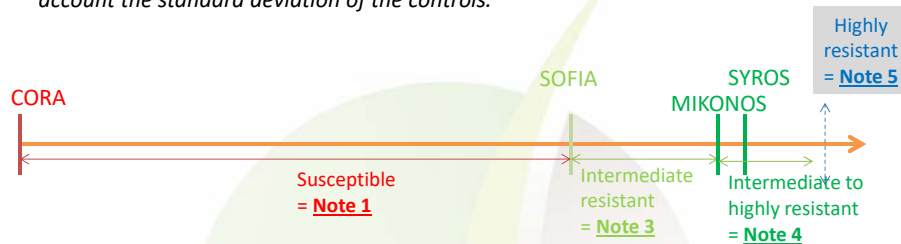
5 : deformation and vein banding

Watermelon mosaic virus WMV

➤ Interpretation rules

- **Less resistant** than SOFIA → **susceptible**
- $SOFIA \geq < MIKONOS$ → **Intermediate resistant**
- $\geq MIKONOS, SYROS$ → **Intermediate to highly resistant (Strong IR)**
- $\geq ***$ (**not yet identified**) → **Highly resistant**

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



TWV/54/5

Thanks a lot
for your attention

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