Standard Measurement Procedure in High Growing Crop trials

Crop parameters recorded in trial reports

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European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes
Application Volume Expression
Basic Formula

\[
\text{water volume (L/10 000m}^2\text{)} = \frac{\text{nozzle flow rate(L/min) \times number of nozzles \times 600}}{\text{working width (m) \times travel speed (km/h)}}
\]

Treated area is the oversprayed plane between working nozzles and targets.
Treated Leaf Wall Area

Basic Formula for orchard, vineyard, or high growing vegetables

\[
tLWA \ (m^2/ha \ ground \ area) = \text{row sides applied} \times \text{Treated Canopy Height (m)} \times \frac{\text{ground area (m}^2\text{)}}{\text{row spacing (m)}}
\]
Treated Leaf Wall Area
Basic Formula for trial plots

\[ \text{tLWA (m}^2/\text{plot}) = 2 \times \text{Treated Canopy Height (m)} \times \text{length of treated rows per plot (m)} \]
For orchard or vineyard characterization:

- Rows per plot
- Plant shape
- Training system, pruning system (Pergola, Goblet, Cordon, Spindel, isolated trees)
- Row spacing
- Spacing within row
- Plant /Row diameter
- Plant height
- Water volume
Important crop parameters additionally to be given for tLWA calculation in trial plots

- Plot length
- Treated canopy height
- Row sides applied (= 2)
- Treated rows per plot
Measurement of **Mid Width of the Canopy**
( Characterization of the crop, e.g. orchard or vineyard)

Average on 10 most representative plants of the trial randomly distributed has to be recorded

- **Vertical canopy, V-shape:**

  ![Vertical Canopy Diagram]

  Average **Plant Diameter** should be taken at mid-height of the canopy height (do not take into account extreme shoots in height and in width which could impact the total canopy height).

- **Globular shape:**

  ![Globular Shape Diagram]

  Average distance between outer leaves of the tree/plant at the middle of the canopy height (minimum + maximum width/ 2).

<table>
<thead>
<tr>
<th>Width at the middle of the foliage height = mid width of the crown</th>
<th>Average maximum distance between outer leaves of the foliage at the middle of the foliage height/crown height.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit: m</td>
<td></td>
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</table>
Definition of **Mid Width of the Canopy**

**Single Row**

**Double Row**

**Multiple Row**

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**Average Plant Diameter** should be taken at mid-height of the canopy height (do not take into account extreme shoots in height and in width which could impact the total canopy height).

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Measurement of the **Row Spacing**

- **Single Row**
- **Double Row**
- **Multiple Row**
Measurement of the Spacing within Row
Definition of **Row sides applied**

- **Single Row**
- **Double Row**
- **Multiple Row**

In all cases: Row sides applied = 2

The number of row sides applied corresponds to the number of sides which are applied.
Definition of the **Treated Canopy Height**  
(Spray Band Height)

Canopy height which is actually sprayed
Treated Canopy Height = Canopy height which is actually sprayed
(can be less than total canopy height, e.g. when only a part of the canopy height is treated)
Measurement of crop parameters
Pome Fruits - Vertical Canopy

\[ H = \text{Treated Canopy Height} \]

Only treated canopy height is relevant should reflect the height of treated area (trunk to be disregarded in most of the cases)

\[ D = \text{Row Spacing} \]

Average on 10 most representative trees of the trial is recorded

\[ W = \text{Plant/Row Diameter} \]
Measurement of crop parameters
Stone Fruits - V-shape

H = Treated Canopy Height

Only treated canopy height is relevant. It should reflect the height of treated area (trunk to be disregarded in most cases)
Average on 10 most representative trees of the trial is recorded

D = Row Spacing
W = Plant/Row Diameter

H = Treated Canopy Height

photo: Agroscope viti 2005/6
Measurement of crop parameter
Stone Fruits - Globular shape

**H** = Treated Canopy Height

Only treated canopy height is relevant. It should reflect the height of treated area (trunk to be disregarded in most cases)
Average on 10 most representative trees of the trial is recorded

**D** = Row Spacing

**W** = Plant Diameter

Should be measured at the middle point of canopy height
Measurement of crop parameter in Grapes “Trellised”

\[ H = \text{Treated Canopy Height} \]

Only sprayed canopy height is relevant, should reflect the height of treated area (trunk to be disregarded in most cases)

Average on 10 most representative grapevines of the trial

\[ D = \text{Row Spacing} \]

\[ W = \text{Plant/Row Diameter} \]
Dos and don‘ts for vertical band spraying

DO!

e.g. Measured Treated Canopy Height = 50 cm
→ Product calculated based on 50 cm
Product applied on 50 cm - correct (large) distance between nozzle and target area – straight movement

BBCH 09-11
Dos and don‘ts

DON’T!
(doesn’t represent usual Practices)

Measured Treated Canopy Height = 20 cm
-> Product calculated based on 20 cm
Product applied on 20 cm
–small distance between nozzle and target area – curved movement
Dos and don‘ts

Recorded Treated Canopy Height = 20 cm

-> Product calculated based on 20 cm

But product applied on 50 cm, because of too large distance between nozzle and target area
Measurement of crop parameter in Grapes “Goblet”

**H** = Treated Canopy Height

Only treated canopy height is relevant should reflect the height of treated area (trunk to be disregarded in most cases)

Average on 10 most representative grapevines of the trial is recorded

**D** = Row Spacing

**W** = Plant Diameter

Photo: DuPont
**Measurement of crop parameter in Grapes “Pergola”**

\[ H_1 + H_2 = \text{Treated Canopy Height} \]

Only treated canopy height is relevant should reflect the height of treated area (trunk to be disregarded in most cases)

\[ D = \text{Row Spacing} \]

Average on 10 most representative grapevines of the trial is recorded.

Photo: M. Troisi