

# EPPO Workshop on harmonized dose expression for the zonal evaluation of plant protection products in high growing crops



Summary of Questionnaires from the Central Zone

Géza Nagy  
National Food Chain Safety Office  
HUNGARY



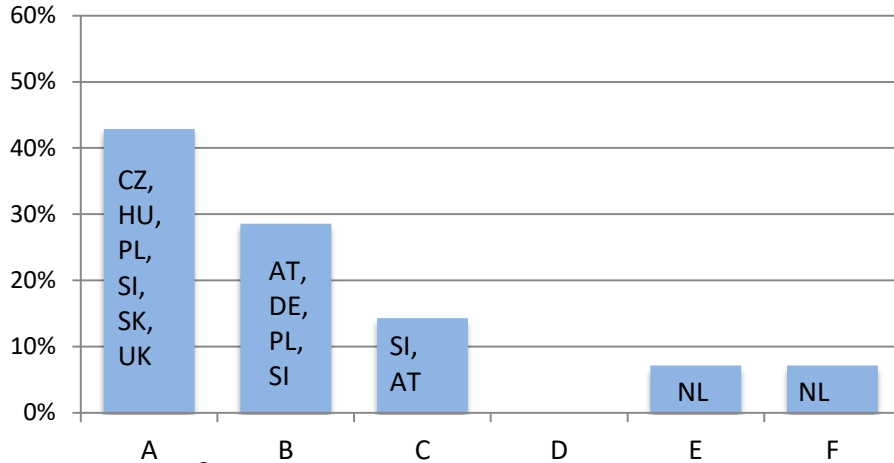
**Q1. Which dose expression is currently used in your country for the following examples of high growing crops (vertical spraying)?**

Dose expressions

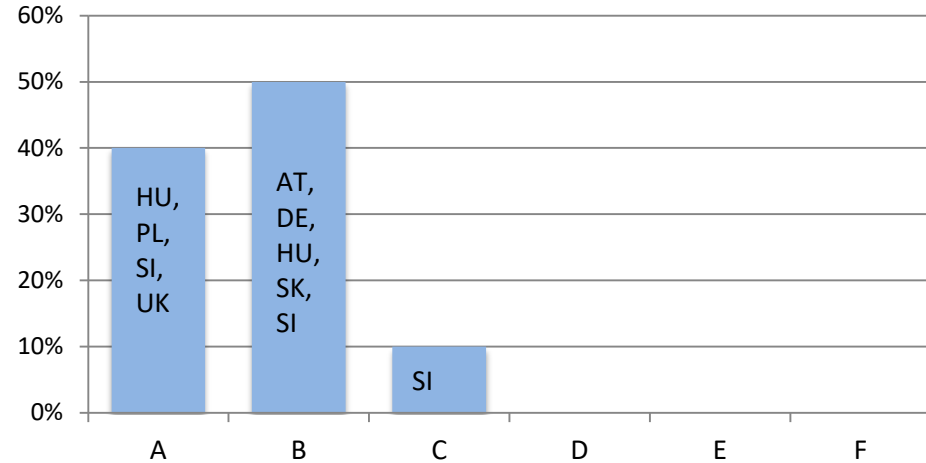
- A L (ml) or kg (g)/ha
- B L (ml) or kg (g)/ha × m crown (plant) height/ha (ground); × LWA; × dose factor (depending on plant size)
- C max. L or kg/ha (with a possibility for using lower doses)
- D %
- E % (max spray volume, max product in L or kg/ha)
- F % (adjusted spray volume depending on plant size)

- Pome fruits

**(I) in the national registration**

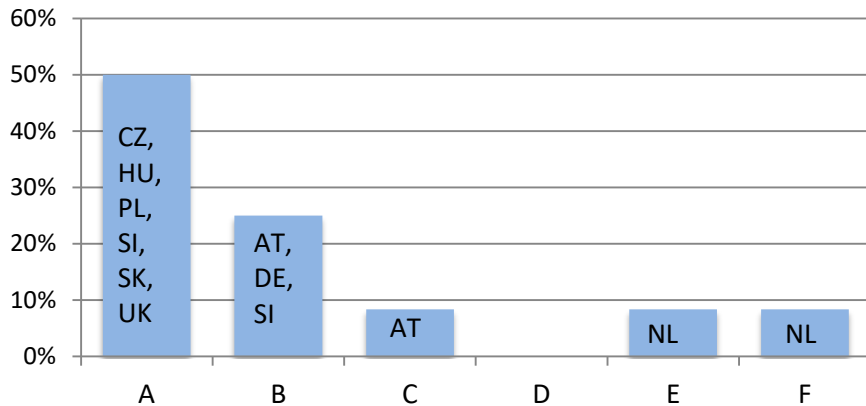


**(II) in the national efficacy assessment**

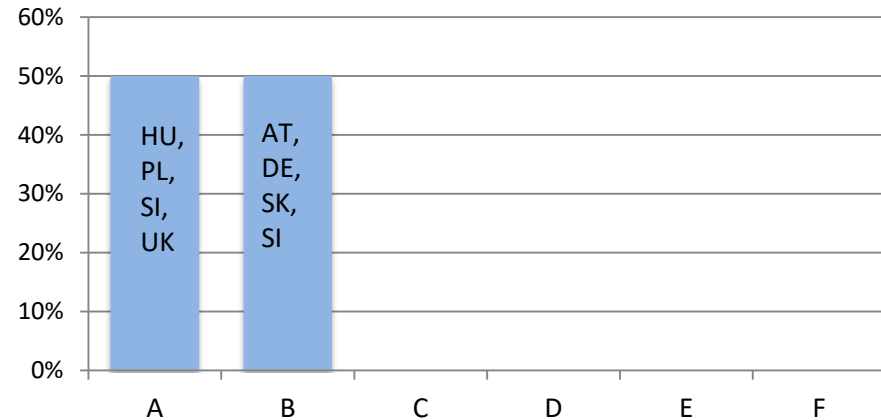


- Stone fruits

**(I) in the national registration**



**(II) in the national efficacy assessment**



A - L (ml) or kg (g)/ha

B - L (ml) or kg (g)/ha × m crown (plant) height/ha (ground); × LWA; × dose factor (depending on plant size)

C - max. L or kg/ha (with a possibility for using lower doses)

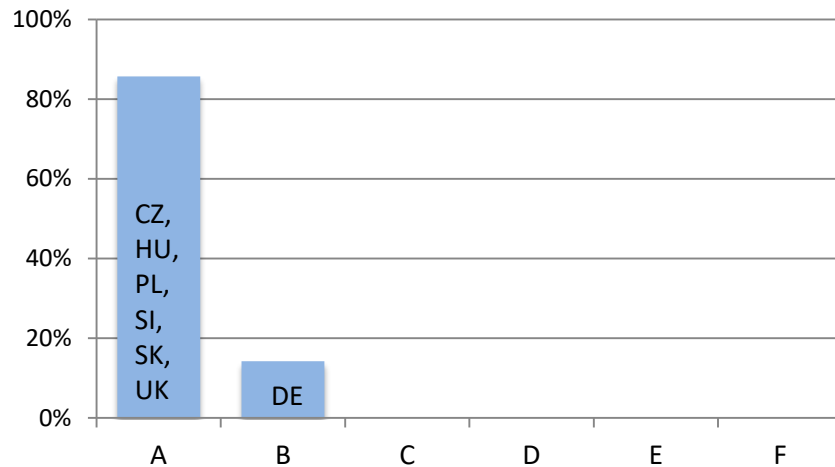
D - %

E - % (max spray volume, max product in L or kg/ha)

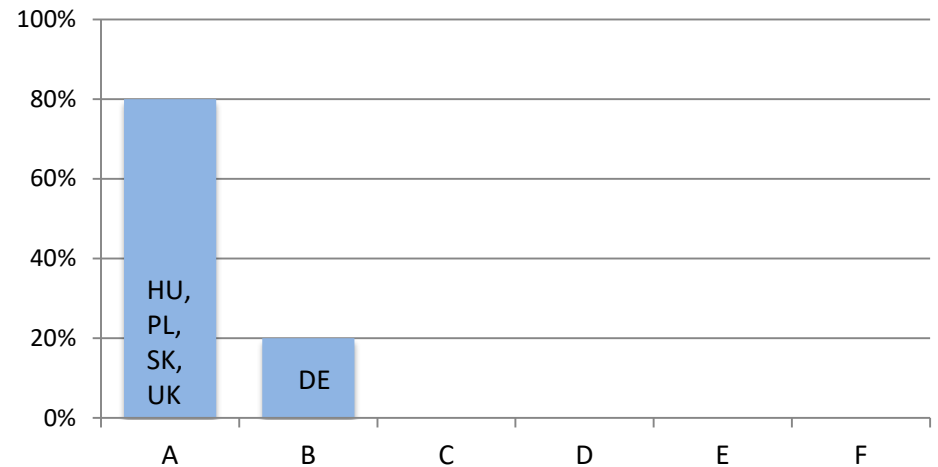
F - % (adjusted spray volume depending on plant size)

- Walnut

**(I) in the national registration**



**(II) in the national efficacy assessment**



A - L (ml) or kg (g)/ha

B - L (ml) or kg (g)/ha × m crown (plant) height/ha (ground); × LWA; × dose factor (depending on plant size)

C - max. L or kg/ha (with a possibility for using lower doses)

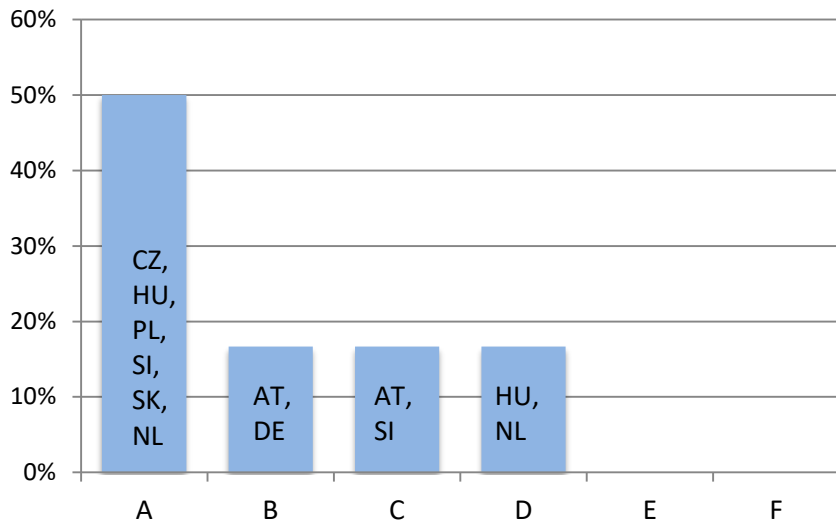
D - %

E - % (max spray volume, max product in L or kg/ha)

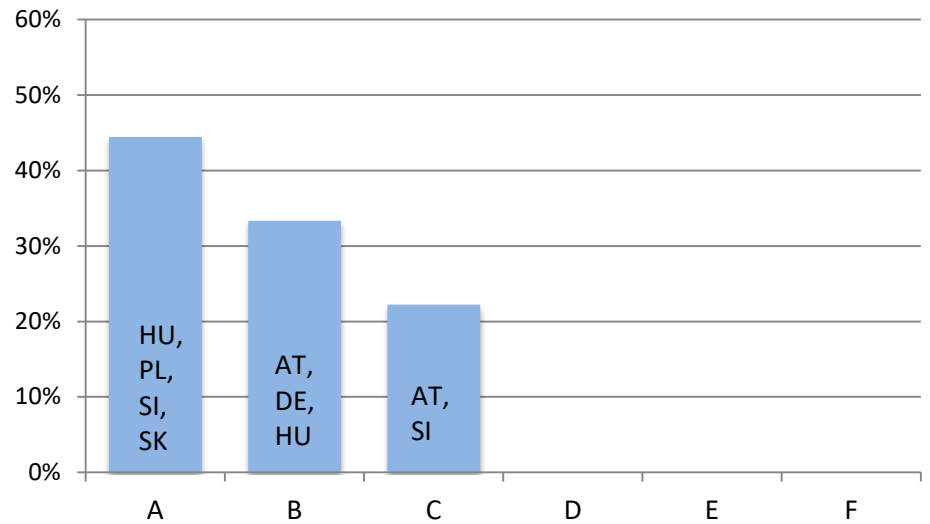
F - % (adjusted spray volume depending on plant size)

- Grapevine

**(I) in the national registration**



**(II) in the national efficacy assessment**



A - L (ml) or kg (g)/ha

B - L (ml) or kg (g)/ha × m crown (plant) height/ha (ground); × LWA; × dose factor (depending on plant size)

C - max. L or kg/ha (with a possibility for using lower doses)

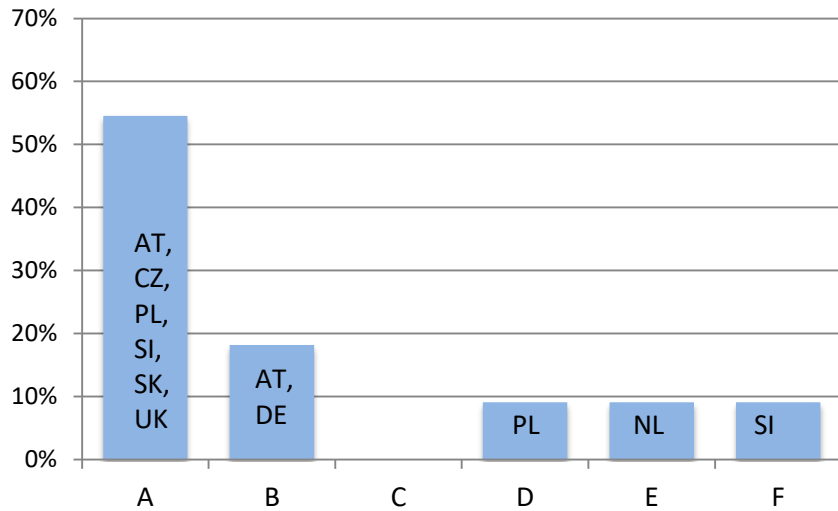
D - %

E - % (max spray volume, max product in L or kg/ha)

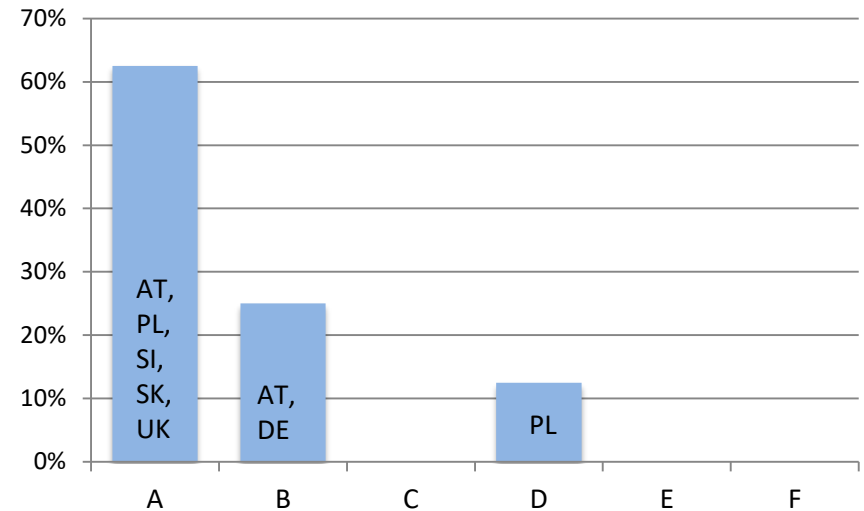
F - % (adjusted spray volume depending on plant size)

- Hop

**(I) in the national registration**



**(II) in te national efficacy assessment**



A - L (ml) or kg (g)/ha

B - L (ml) or kg (g)/ha × m crown (plant) height/ha (ground); × LWA; × dose factor (depending on plant size)

C - max. L or kg/ha (with a possibility for using lower doses)

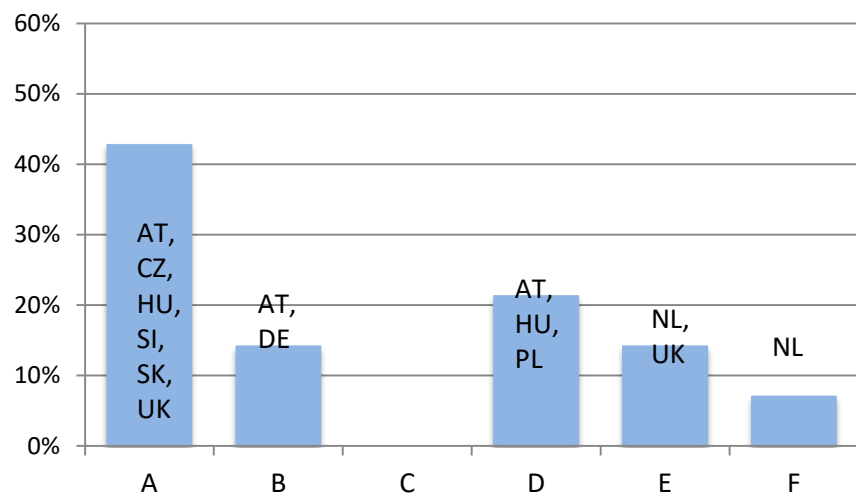
D - %

E - % (max spray volume, max product in L or kg/ha)

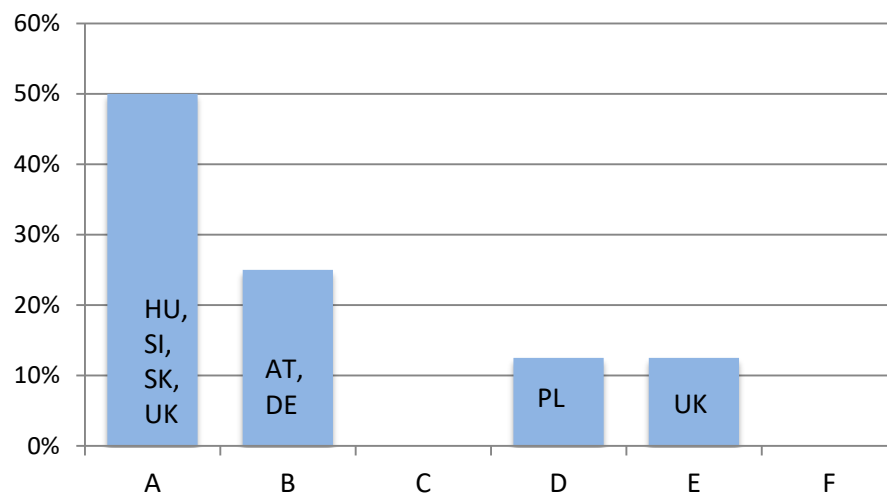
F - % (adjusted spray volume depending on plant size)

- Tomato and cucumber in greenhouse

**(I) in the national registration**



**(II) in the national efficacy assessment**



A - L (ml) or kg (g)/ha

B - L (ml) or kg (g)/ha × m crown (plant) height/ha (ground); × LWA; × dose factor (depending on plant size)

C - max. L or kg/ha (with a possibility for using lower doses)

D - %

E - % (max spray volume, max product in L or kg/ha)

F - % (adjusted spray volume depending on plant size)

## (III) in the zonal efficacy assessment

- Majority: Dependent on zRMS
- Some cases
  - Pomefruits and stonefruits: A (SI), B (SI, AT), C (SI)
  - Grapevine: A (SI), B (AT)
  - Hop: A (SI, AT, NL)
  - Tomato and cucumber in greenhouses: A (SI, AT)

A - L (ml) or kg (g)/ha

B - L (ml) or kg (g)/ha × m crown (plant) height/ha (ground); × LWA; × dose factor (depending on plant size)

C - max. L or kg/ha (with a possibility for using lower doses)

D - %

E - % (max spray volume, max product in L or kg/ha)

F - % (adjusted spray volume depending on plant size)



## Q.2 Are different crop structures or individual parameters characterizing crop structure considered

(I) National registration		(II) National efficacy assessment		(III) Zonal efficacy assessment	
Yes	No	Yes	No	Yes	No
8	1	7	1	9	0
Growth stage Height and growth stage Canopy density		Height and growth stage Canopy density		Height and growth stage Dependent on MS requirements	

### Comments on (I)

- United Kingdom: UK growers use the PACE (Pesticide dose Adjustment to the Crop Environment) system to ensure the appropriate rate is used in relation to the crop canopy.
- Hungary: Dose ranges are commonly used. Decision should be made by a plant protection expert.
- Netherlands: Fixed spray concentration with a variable water volume. The user can adjust the spray volume using the fixed concentration, depending on cropping system, leaf density etc. (up to a maximum rate or volume).

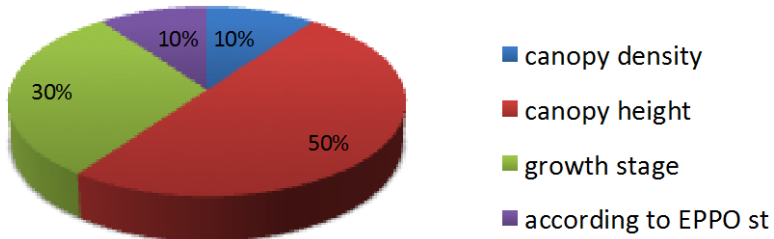
### Comments on (III)

- Germany: No calculation for other dose expressions than used nationally. It is expected that applicants should make recalculation in the dossier (national addendum of dRR)

# Q.2a Which parameters are considered

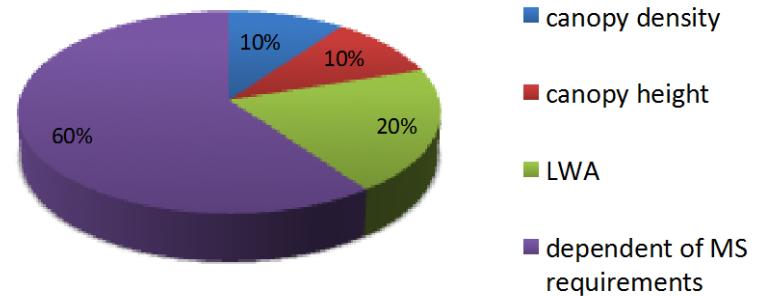
- Pome fruits

(I) National registration

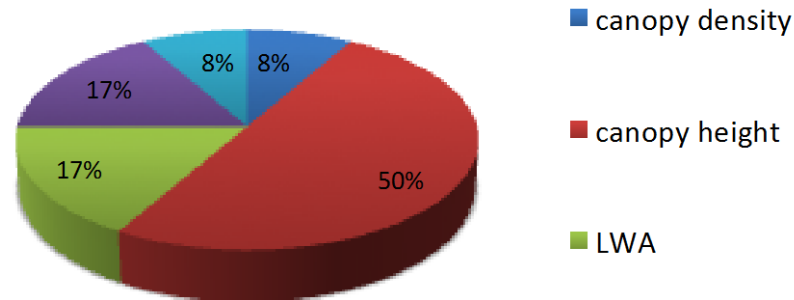


MS considering parameters 78%  
MS not considering parameters 22%

(III) Zonal efficacy assessment



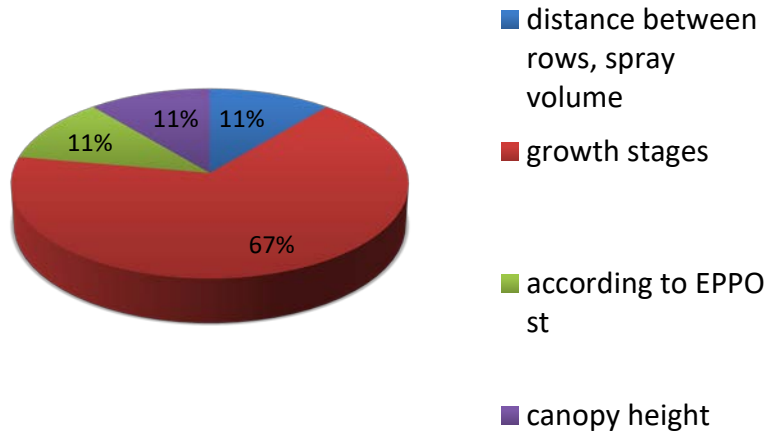
(II) National efficacy assessment



MS considering parameters 88%  
MS not considering parameters 13%

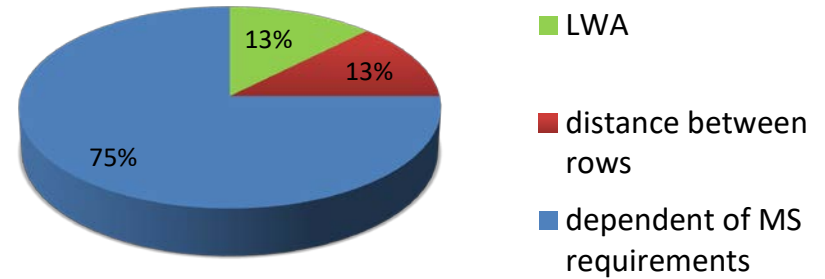
- Grapevine

**(I) National registration**

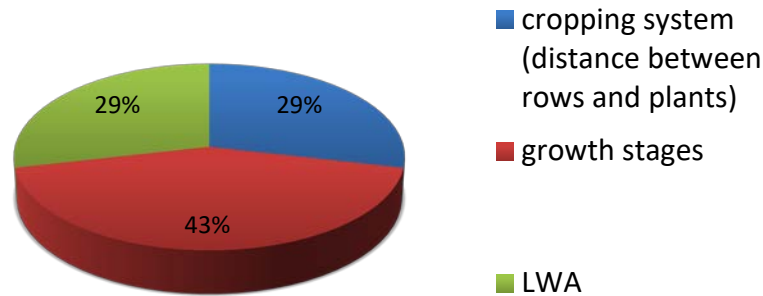


MS considering parameters 88%  
MS not considering parameters 13%

**(III) Zonal efficacy assessment**



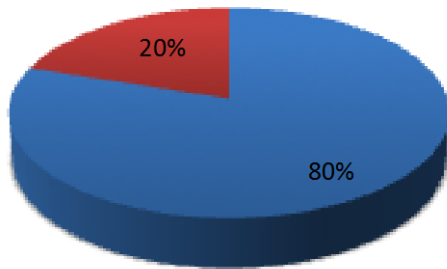
**(II) National efficacy assessment**



MS considering parameters 86%  
MS not considering parameters 14%

# • Hop

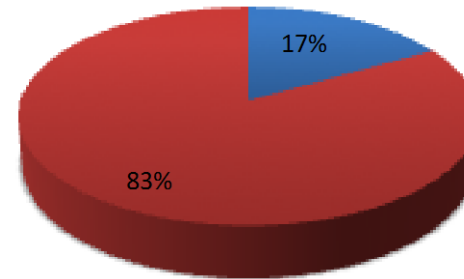
## (I) National registration



- growth stages, spray volume
- according to EPPO st

MS considering parameters 63%  
MS not considering parameters 38%

## (III) Zonal efficacy assessment



- not yet carried out (LWA)
- dependent of MS requirements

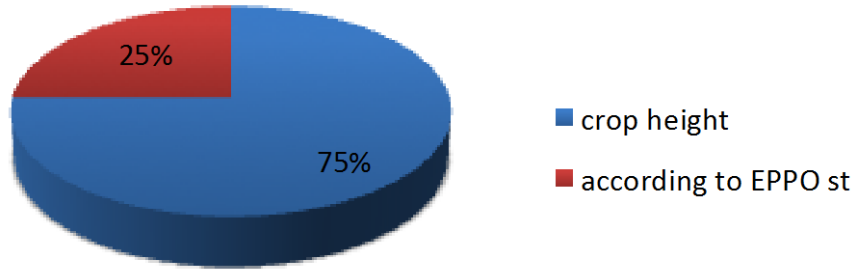
## (II) National efficacy assessment

**100%: growth stages, spray volumes**

MS considering parameters 57%  
MS not considering parameters 43%

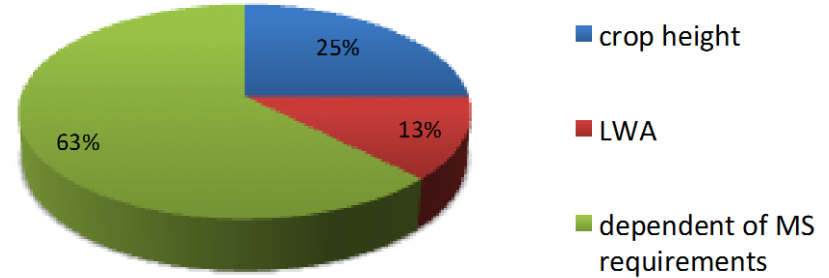
- Tomato and cucumber in greenhouse

**(I) National registration**

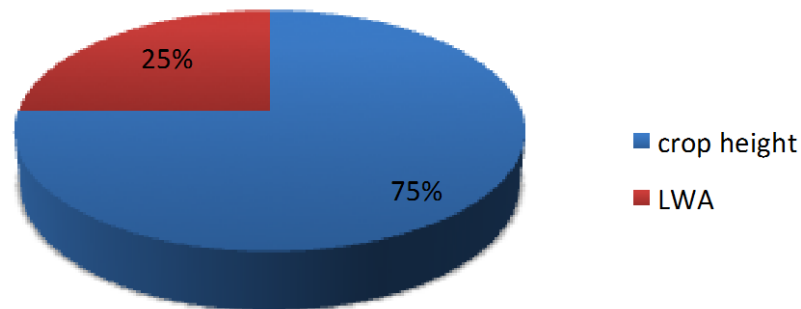


MS considering parameters 44%  
MS not considering parameters 56%

**(III) Zonal efficacy assessment**



**(II) National efficacy assessment**

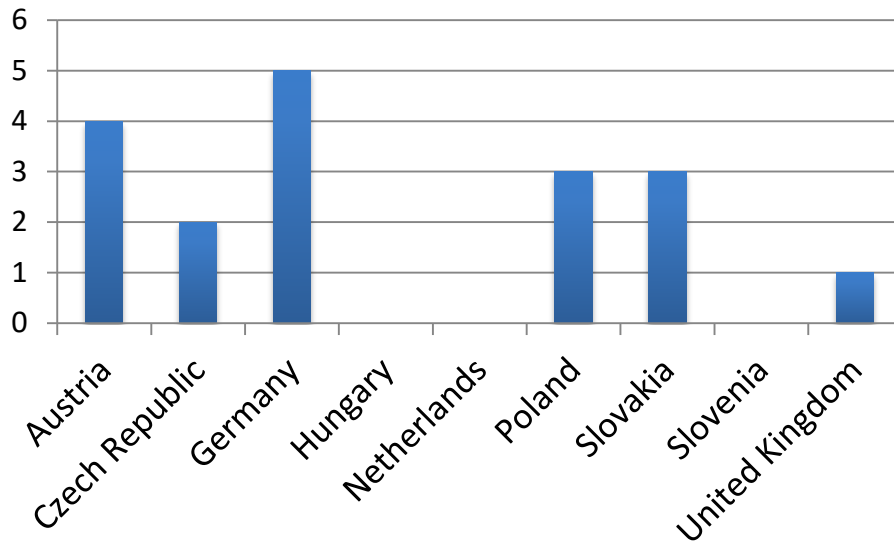


MS considering parameters 57%  
MS not considering parameters 43%

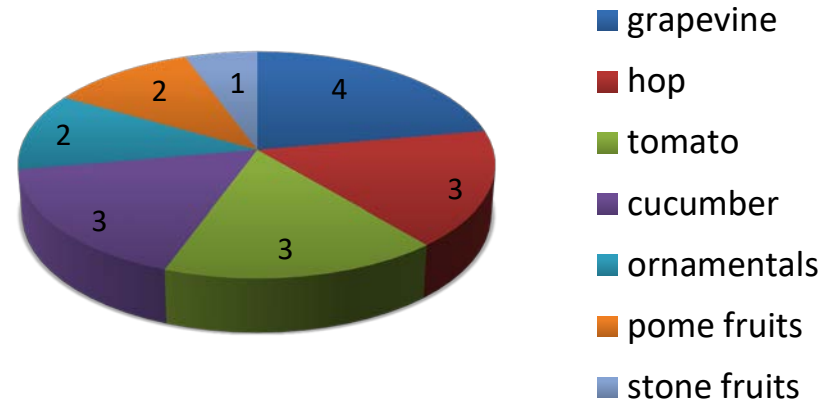
# Q.3 Are changes of crop structure during the growing period (seasonal development) considered

## (I) National registration

Number of crops

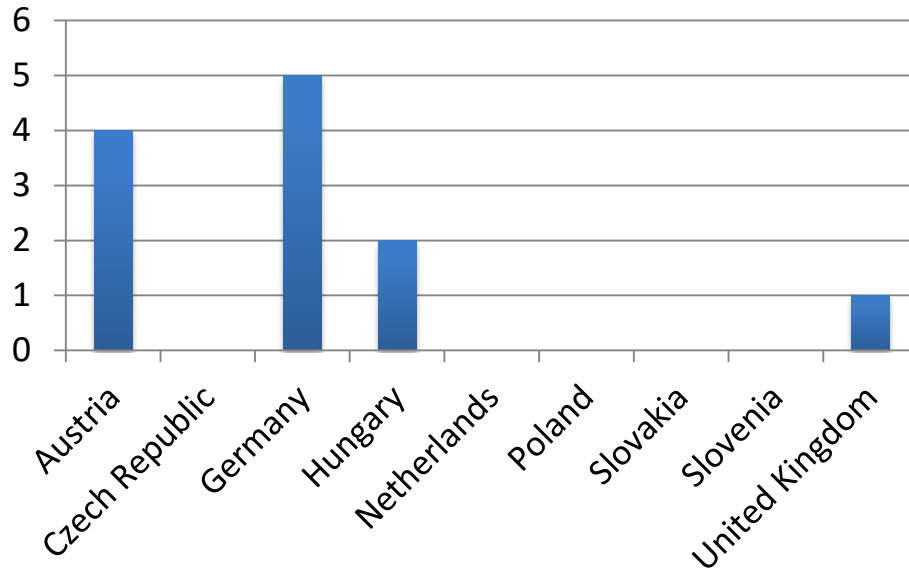


Number of crops

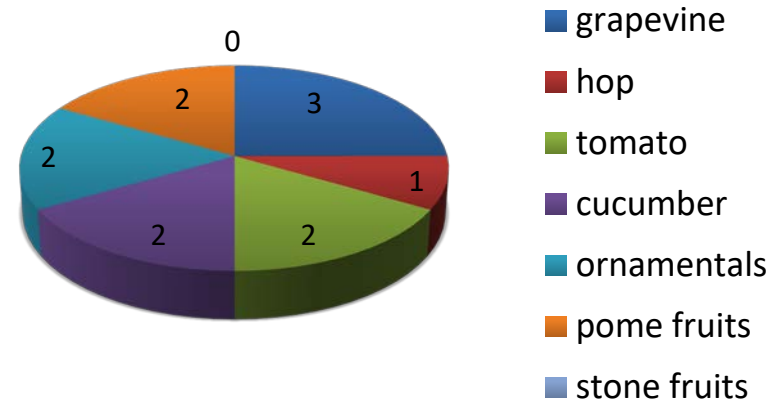


## (II) National efficacy assessment

Number of crops



Number of crops



## (III) Zonal efficacy assessment

- Majority: Dependent on zRMS

# How changes are considered

<i>grapevine</i>	<i>pome fruits</i>	<i>stone fruits</i>	<i>hop</i>	<i>tomato</i>	<i>cucumber</i>	<i>ornamentals</i>
growth stage dependent dose factor DE	changes of crop structure PL	changes of crop structure PL	rate dependent on plant height DE, PL	rate dependent on plant height DE, AT	rate dependent on plant height DE, AT	rate dependent on plant height DE, AT
rate dependent on growth stage CZ, HU, AT	rate dependent on growth stage HU	fixed concentration (water volumes dependent on plant size) NL	water volumes dependent on plant height CZ	water volumes dependent on plant height SK	water volumes dependent on plant height SK	
water volumes dependent on growth stage SK, AT	dose factor dependent on canopy structure UK*		fixed concentration (water volumes dependent on plant size) NL	fixed concentration (water volumes dependent on plant size) NL	fixed concentration (water volumes dependent on plant size) NL	
rate dependent on distance between rows AT	fixed concentration (water volumes dependent on plant size) NL					



# Does your country intend to change the procedures addressed in questions 1 to 3?

	YES	NO
Austria	×	
Czech Republic		×
Germany	×	
Hungary	×	
Netherlands	×	
Poland	×	
Slovakia		×
Slovenia		×
United Kingdom		×
<b>SUM</b>	<b>5</b>	<b>4</b>

## Comments (some)

- **Netherlands:** The current system has disadvantages and advantages, and changing the system will be complex. Preferred is a system that takes in consideration the current agricultural practice.
- **United Kingdom:** The current approach is what the users are familiar with and it is also how the risk assessments by other specialists have been undertaken to date

## 5a. Please, give a rough estimation of LWA ranges for high growing crops in your country

Crop	Mode LWA (est. range) m2	Min-max LWA (given data) m2	Category	MS (order by mode LWA)
Pome fruits	10000-13999	8000-13000	low	CZ, HU
	14000<	2000-26700	high	SK, DE, NL, UK, AT, PL
Stone fruits*	10000-14999	6700-16700	low	HU, CZ
	15000-19999	10000-20000	middle	DE, AT, NL
	20000<	3300-40000	high	PL, SK, UK
Walnut	13000-15999	11500-16700	low	HU, PL
	16000<	5000-33000	high	SK, AT
Grapevine	9000-10999	3000-20000	low	HU, CZ, PL
	11000-14999	5300-25000	middle	AT, SK
	15000<	3000-30700	high	DE, UK

\* LWA highly dependent on stone fruit crop type (e.g. cherry vs plum)

Crop	Mode LWA (est. range)	Min-max LWA (given data)	Category	MS (order by mode LWA)
Hop	21000-32999	22400-24000	low	CZ
	33000-46999	13400-48000	middle	UK, DE, PL
	47000<	-	high	AT
Tomato in greenhouse	35000-44999	6700-67000	low	PL, UK, DE, CZ, HU
	45000-64999	50000-60000	middle	AT
	65000<	70000-92000	high	NL
Cucumber in greenhouse	28000-34999	26000-45000	low	NL, DE
	35000-49999	5000-67000	middle	PL, UK, HU
	45000<	50000-60000	high	CZ, AT

## 5b. If feasible give some description of training systems

### Most common training types

- Pome fruits
  - Hedgerow (e.g. AT, PL)
  - Slender spindle, super spindle (e.g. HU, PL, SI)
- Stone fruits
  - Free hedge (e.g. PL, AT)
  - Slender spindle, spindle bush (e.g. SI, CZ)
  - Open vase (e.g. HU, SI)
- Grapevine
  - Very different: (bilateral low cordon, single curtain high cordon, guyot *etc.*)



- Hop
  - Trellis, hedgerow
- Walnut
  - High single trees (modified central leader) (e.g. AT, DE, HU, PL)
  - Open vase, spindle (SI)
- Tomato
  - Trellis, supported on high wires. Generally in double row beds
- Cucumber
  - Trellis, supported on high wires. Single or double row beds



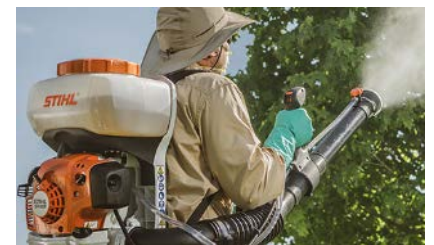
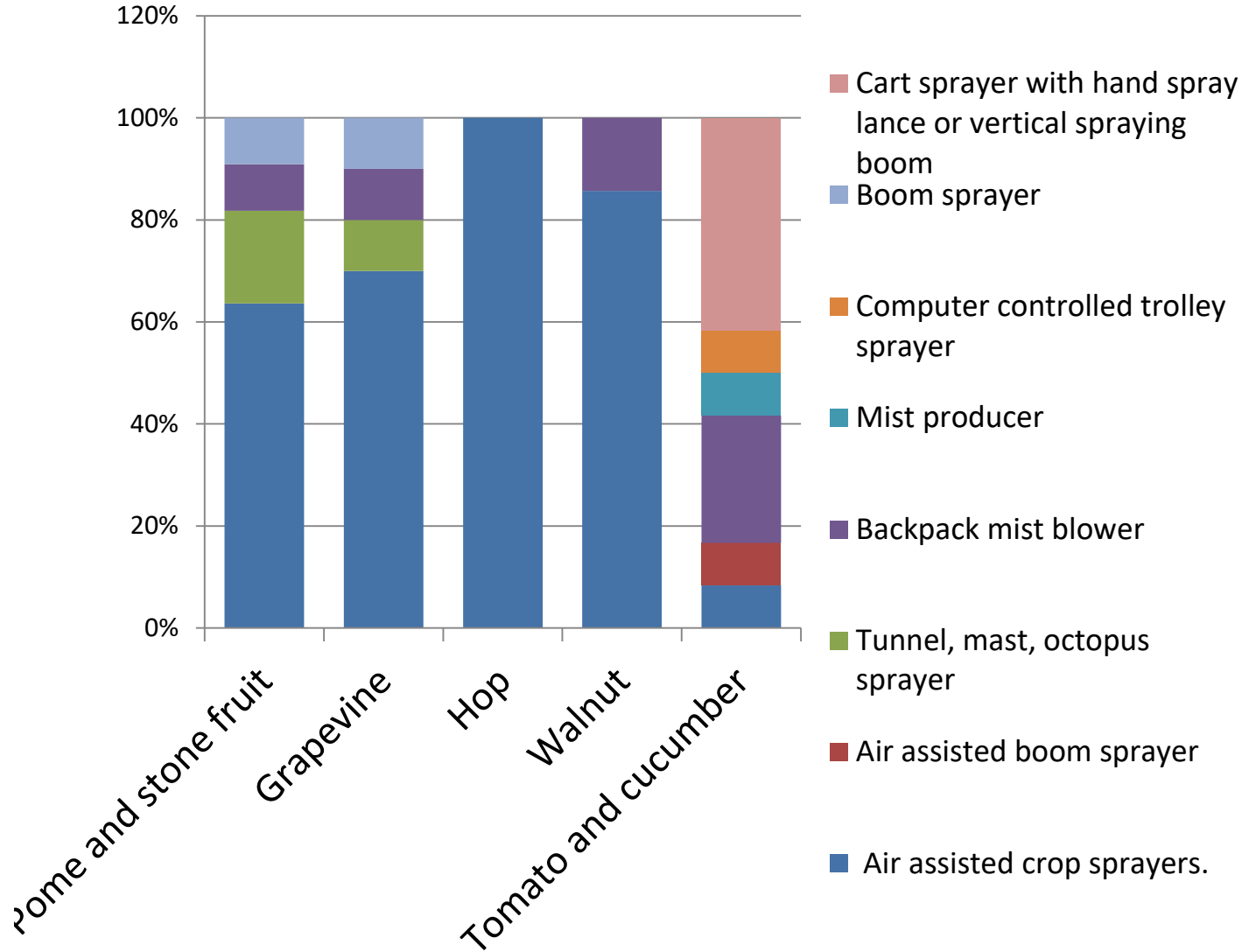
## **5c. Add some information for orchards with isolated (large) trees**

- Data can not be evaluated due to some misunderstandings (e.g. isolated trees?)

## **5d. Give an estimate of the proportion of the orchard's land with isolated trees in relation to the total land surface of high growing crops**

*See above*

# Q6. If feasible give some information on the main application techniques for each crop below used in your country



WZ290101491

## Q7. Are parameters to calculate the LWA sufficiently included in single trial reports and are they clearly described

Crop	No. of answers	
	Yes	No
Pome fruit	4	3
<b>Stone fruit</b>	<b>2</b>	<b>4</b>
Grapevine	3	2
<b>Hop</b>	<b>2</b>	<b>3</b>
<b>Almond</b>	<b>0</b>	<b>1</b>
<b>Walnut</b>	<b>1</b>	<b>3</b>
<b>Tomato gl.</b>	<b>0</b>	<b>5</b>
<b>Cucumber gl.</b>	<b>0</b>	<b>5</b>
<b>Ornamentals</b>	<b>0</b>	<b>1</b>
<b>Sweet peper</b>	<b>0</b>	<b>1</b>
Soft fruit (bushes)	1	0
<b>SUM</b>	<b>13</b>	<b>28</b>

### *Most frequently missing data:*

Treated canopy /plant height; distance between rows

### *Comments:*

- (SI) **LWA should be a part of trial reports** offered by the trial conductor and by applicant in submitted documentation since some data are sometimes missing
- (UK) To date we have found that the full **details required to enable a proper calculation of LWA have been missing** from reports and that these have not always been provided. Our view is that **this is more of an issue with regard to the applicant not obtaining this information when conducting the trials** rather than an issue specific to the type of crop



## Q.8. Which parameters to calculate the LWA are frequently missing in current zonal dossiers and draft evaluation reports (BAD and dRR)?

Crop	Parameters and comments
Pome fruit	Distance between rows and canopy height often missing
Stone fruit	Parameters are rarely given
Grapevine	Canopy height
Hop	Canopy height, sometimes distance between rows
Almond	Canopy height
Walnut	Canopy height
Tomato gl.	Parameters are rarely given
Cucumber gl.	Parameters are rarely given

### Comments (some)

- (PL) The draft evaluation reports differ significantly depending on the applicant
- (SI, HU) Dose expression in LWA is not useful due to the training systems used in Slovenia (and in Hungary) in the orchards of stone fruits.
- (UK) missing parameters were varied and were not consistent

**Q 9. Do efficacy dossiers and draft evaluation reports (BAD and dRR) provided by the applicant always include a discussion of results implementing the LWA approach?**

- **Almost all given answer were NO** irrespective to crop type; however some mention that the draft evaluation reports differ significantly depending on the applicant. In some cases discussion implementing LWA is added to the reports recently (mainly pome fruit and grapevine)

## Q 9a. If not, do you ask for it

No. of answers		Comments
YES	NO	
(I) for the national efficacy assessment		
2	5	<p><b>Yes</b> (AT) For fruit and grapevines</p> <p><b>No</b> (SI) Dose rate per ha is used in SI since that we did not ask for LWA dose rate expression (UK) We would only ask for information if a specific request for use in terms of LWA was sought.</p>
(II) for the zonal efficacy assessment?		
5	1	<p><b>Yes</b> (AT) For tree fruits, grapevine and vegetables (DE) Only for orchards (NL) We ask for LWA, or for information that will allow us and CMS Member States to easily translate to LWA and other dose rate systems from the presented data.</p>

## Q.10 Do you consider the current EPPO standard PP 1/239(2) Dose expression for plant protection products useful or do you recommend (major) modifications?

MS	No. of answers	
	YES	NO
Austria	×	
Czech Republic	×	
Germany	×	
Hungary	×	
Netherlands	×	
Poland	×	
Slovakia		
Slovenia	×	×
United Kingdom	×	
<b>SUM</b>	<b>8</b>	<b>1</b>

### Comments:

- (AT) We consider the current standard useful; (however, a **glossary of terms would be helpful, as well as an instruction how to measure parameters in the field**)
- (DE) We recommend stricter modifications, **LWA area** as harmonized approach for dose expression **should be forced**
- (HU) The use of the application rate **dose per hL or % in orchards is suggested for reconsideration**
- (SK) We consider that it is useful since **it covers wide range of dose rate expression** including dose rate which is expressed for most high growing crops in our country.
- (UK) We believe it is useful but **that it needs to be made clearer, simpler and easier to follow\*** (detailed suggestion can be found in the questionnaire)

## Q.11 Is it feasible to do all evaluations (of high growing crops) in the EU with a harmonized dose expression (e.g. LWA)?

*Comments* (some):

MS	No. of answers	
	YES	NO
Austria	×	
Czech Republic		×
Germany	×	
Hungary		×
Netherlands	×	
Poland	×	
Slovakia		
Slovenia	×	
United Kingdom		×
<b>SUM</b>	<b>5</b>	<b>3</b>

- (DE) For some crops **additional arrangements are necessary**. Horizontal and vertical spraying – dose should be expressed always on the real treated area
- (HU) Big **differences of canopy structures** among the different crops can be observed. In case of the **different pests different parameters should also be considered**. Furthermore, at **the beginning of the growing season often higher infection pressure is observed**, at the same time the LWA is still low (e.g. apple scab). For this reason relative higher application rates should often be maintained in the beginning of the vegetation period.
- (UK) We believe that **it should be up to member states to use LWA or g a.s./ha or other approaches** depending on how their growers use the products and what they are familiar with. We believe the point on **flexibility is key** so that those MSs who want dose expression in LWA can have it but for those who do not use this system and for which growers already are trained in an alternative method can continue to use the system that best suits them practically.

## Q.12 Do you consider LWA as the only method to be adopted regardless of the variability in crop structures in the EU?

MS	No. of answers	
	YES	NO
Austria	×	
Czech Republic		×
Germany	×	
Hungary		×
Netherlands		×
Poland		×
Slovakia		
Slovenia		×
United Kingdom		×
<b>SUM</b>	<b>2</b>	<b>6</b>

### Comments (some):

- (HU) For orchards (e.g. stone fruits, walnut) the **use of TRV** (Tree row volume) is suggested for further consideration, the **reconsideration of the use of dose per hL or %** is suggested as well.
- (PL) The crop structures with a considerable canopy mid-width may need **the TRV method** or a coefficient reflecting (taking into account) the 3rd canopy dimension
- (SI) No, but **it will be useful from the different part of view** (not only from efficacy point of view but also for risk assessment). Only in Belgium dose rate is expressed as LWA (data from 2012).
- (UK) We believe **it is possible for other options to be used** and indeed these are given in EPPO PP1/239. So we do not believe it is appropriate for a single approach i.e. LWA to be imposed. The current EPPO guidance makes it clear that different approaches are possible and legitimate.

## Q14. What are your expectations for this Workshop?



- **Austria:** Hope that the outcome of the workshop is the implementation of a harmonised dose expression, preferably LWA, which all MS follow in future assessments, and that clear guidance is published by EPPO
- **Germany:** Harmonisation as fast as possible
- **Hungary:** We hope to reach a common point of view on the bases of which a guideline modification could be established in the future
- **Netherlands:** To have an open discussion on dose expression in high growing crops and hopefully come to an harmonized approach
- **Poland:** Handful of robust arguments supporting the actions for harmonization
- **United Kingdom:** A flexible system of dose expression. Clarity on how to calculate and use LWA and what parameters are needed. Clarity on conversion between LWA and other methods of dose expression. Clear and transparent guidance and worked examples on using all the different methods of dose expression. A better understanding of how the grower is actually using the product in the 'field'

