

Working group: Citrus (Olives/Isolated trees)

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Instituto Valenciano de Investigaciones Agrarias (IVIA)

**EPPO workshop on harmonized dose expression for the zonal
evaluation on plant protection products in high growing crops
Viena, 2016-10-18/20**

- ❑ **DOSE:** amount of active material distributed per unit area.
- ❑ **CONCENTRATION:** amount of product added to a unit of water volume.
- ❑ **SPRAY VOLUME:** amount of water+product distributed per unit area in the field.

$$\text{DOSE} = \text{SPRAY VOLUME} \times \text{CONCENTRATION}$$

Definition of parameters for dosage

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↓ Spain

(g/hl = g/100l, %)

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¿?

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Limitation: L/ha

↓ España
(g/hl = g/100l, %)

CITRUS



Spray volume

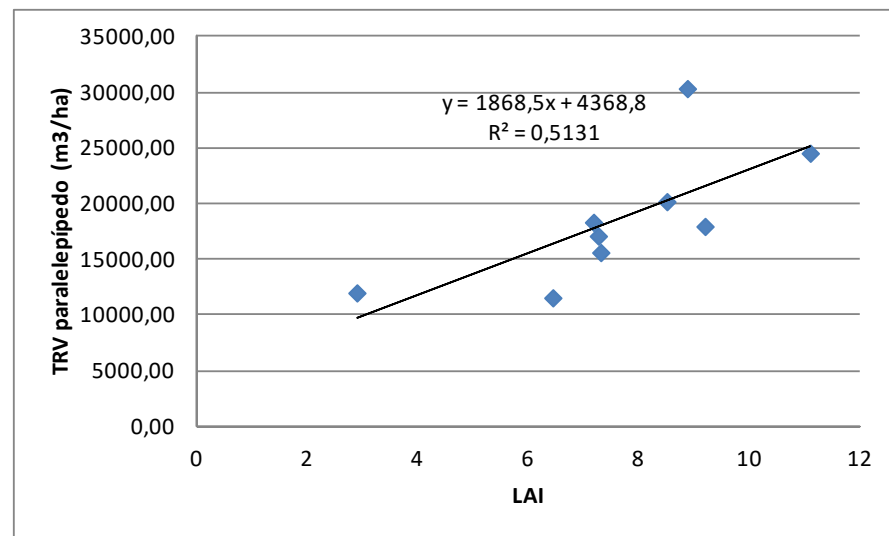
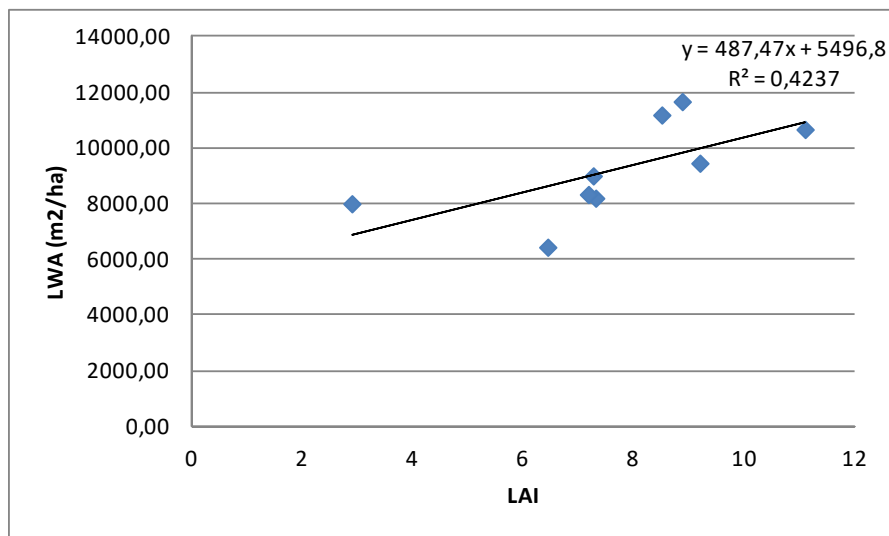
SPRAY VOLUME = Foliar area (cm² leaf/ha) x Min. deposit (μl/cm² leaf)

$SV_r = SV_t / \text{Efficiency}$



1. Foliar density (cm²/m³ veg) x Veg.vol (m³ veg/ha)

2. ??? LAI????



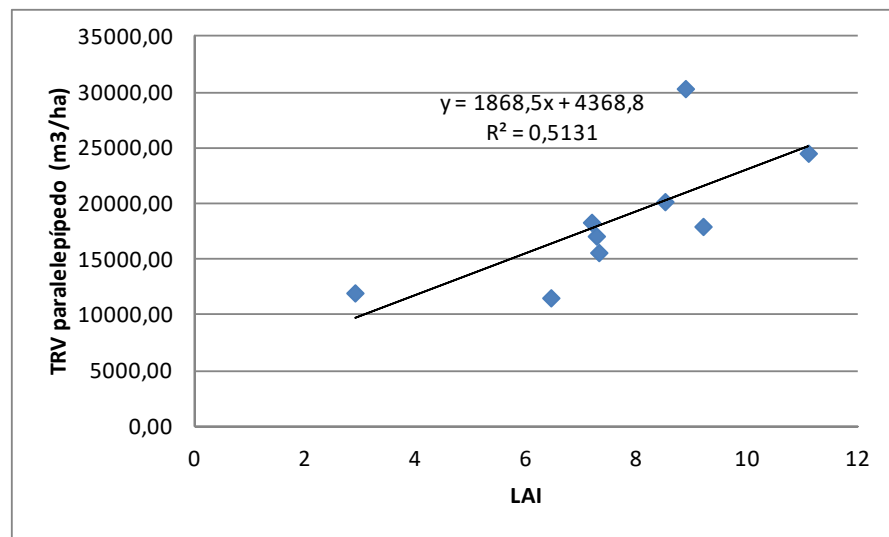
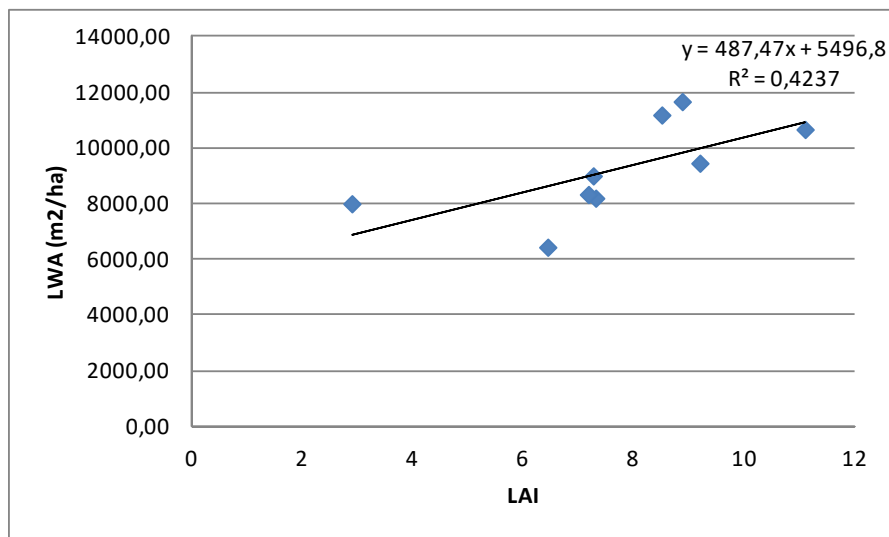
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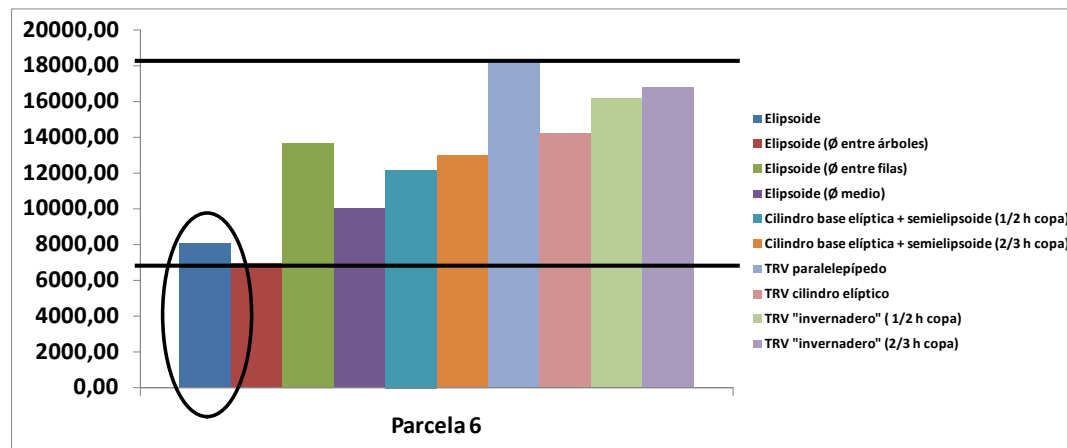
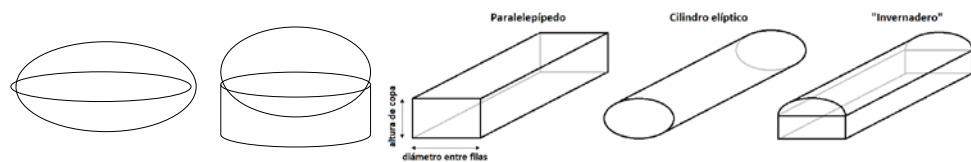
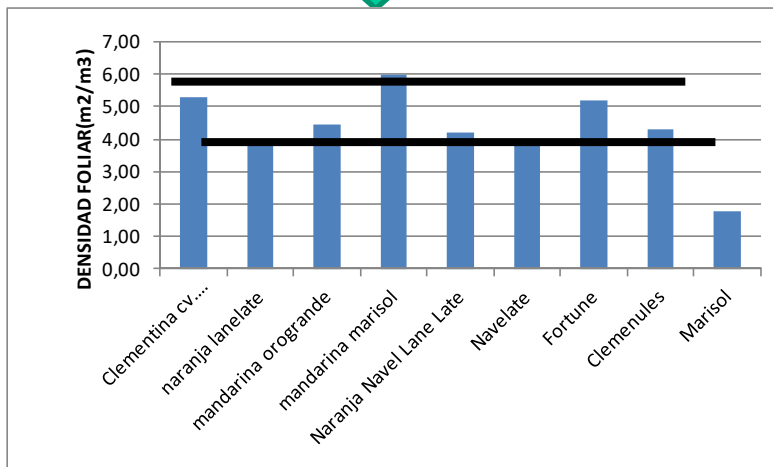


Spray volume

$$\text{SPRAY VOLUME} = \text{Foliar area (cm}^2\text{/ha)} \times \text{Min. deposit } (\mu\text{l/cm}^2 \text{ leaf)}$$



$$1. \text{Foliar density (cm}^2\text{/m}^3 \text{ veg)} \times \text{Veg.vol (m}^3 \text{ veg/ha)}$$

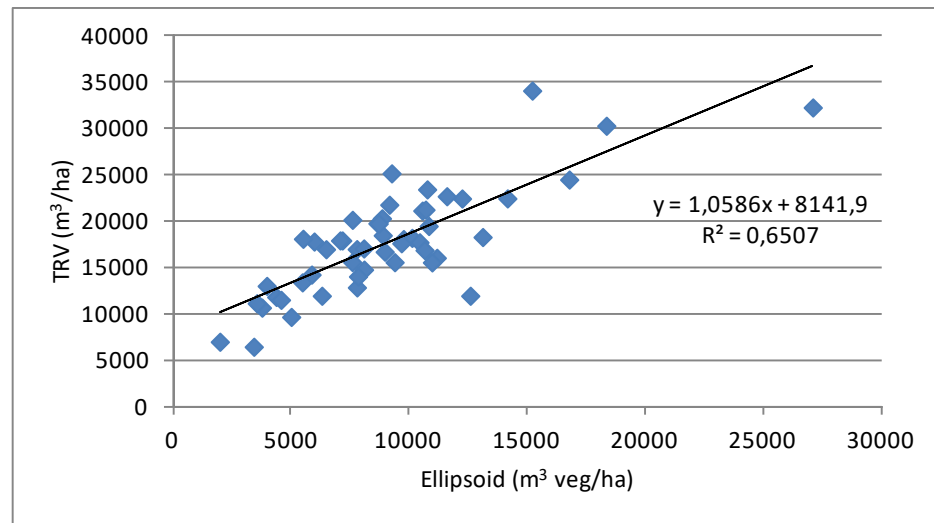
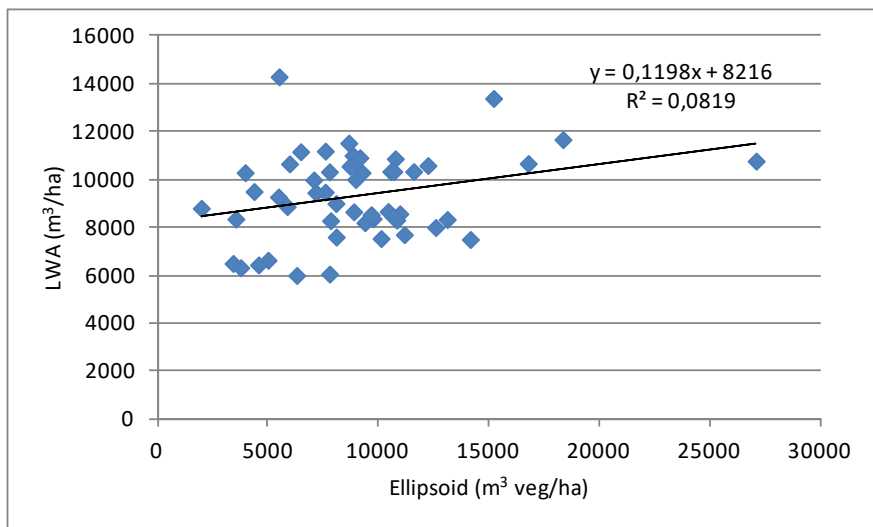


Spray volume

SPRAY VOLUME = Foliar area (cm² leaf/ha) x Min. deposit (μl/cm² leaf)



1. Foliar density (cm²/m³ veg) x Veg.vol (m³ veg/ha)



Spray volume

$$\text{SPRAY VOLUME}_t = \text{Foliar area (cm}^2\text{ leaf/ha)} \times \text{Min. deposit (}\mu\text{l/cm}^2\text{ leaf)}$$

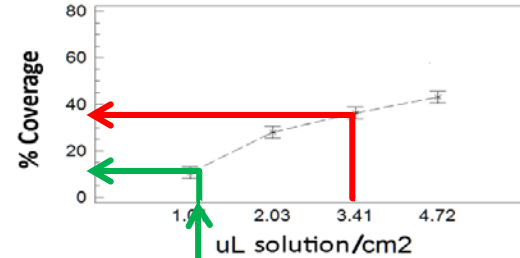
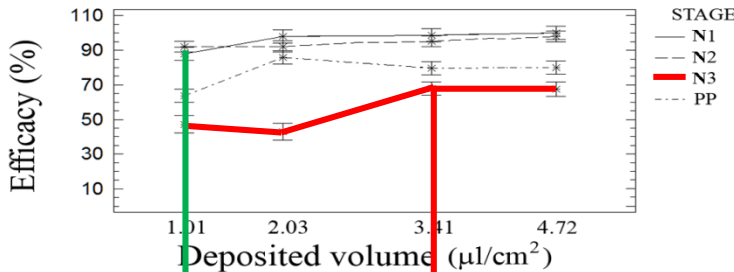
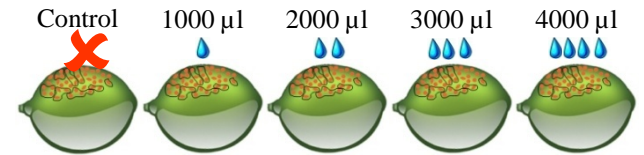
$$\text{SV}_r = \text{SV}_t / \text{Efficiency}$$



Deposition



Efficacy



Minimum deposit of chlorpyrifos mixture for young stages and adult females

Factors:
-Product
-Pest

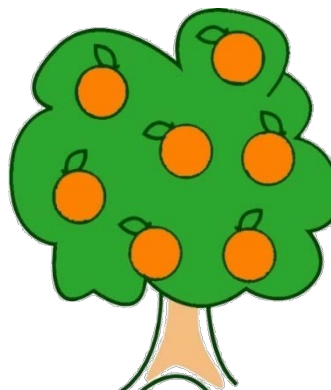
Determinación L/m³ vegetación

Minimum deposit ($\mu\text{l}/\text{cm}^2$)

Leaf Area Density (m^2/m^3) + Volumen vegetación m^3/ha (Canopy volume + Trees/ha)



spray application volume (L/m³ vegetación - ha)



CASE OF STUDY

□ Citrus orchard characteristics:

Report	Crop	Spacing (m x m)	Canopy height (m)	Diam-cross (m)	Diam-length (m)	Shape tree * (m ³ veg/ha)	TRV (m ³ /ha)	LWA (m ² /ha)
1	Washington orange	5x4	1.5	4	4	6300	12000	6000
2	Washington orange	4x2	1.3	2	2	3400	6500	6500

*The tree shape was consider a ellipsoid

□ Treatment characteristics:

Report	Treatment	Product	Conc (g/hl)	Spray vol (L/ha)	Dose (kg/ha)	Dose (kg/1000 LWA ha)	Dose (kg/1000 TRV ha)	Dose (kg/10000 m ³ veg ha)
1	1	1	20	1200	2400	4000	2000	3800
1	2	1	30	1200	3600	6000	3000	5700
1	3	1	60	1200	7200	12000	6000	11500
2	4	1	20	1300	2600	4000	4000	7600
2	5	1	30	1300	3900	6000	6000	11500
2	6	1	60	1300	7800	12000	12000	22900

CASE OF STUDY

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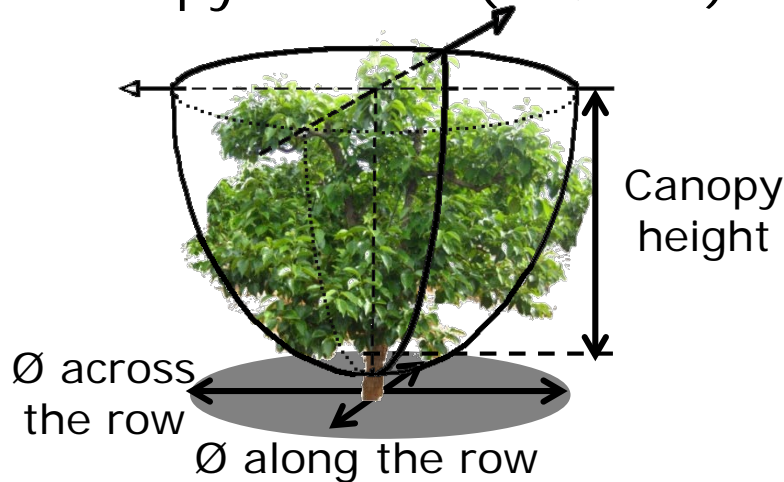
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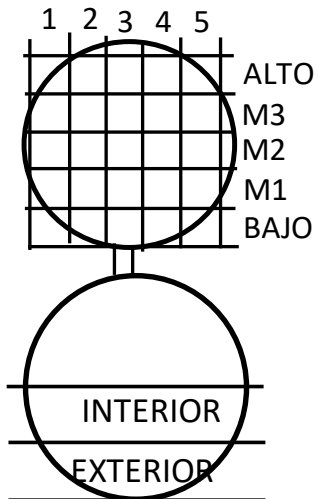
Persimmon-Canopy Characterization along the season

Canopy volume (m³/tree)



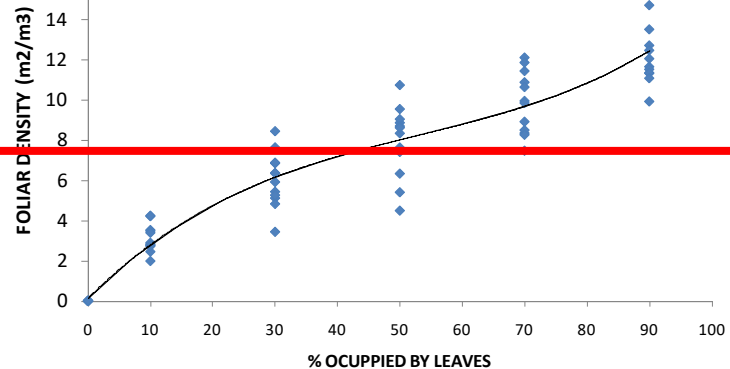
Canopy volume = Half ellipsoid

Foliar density (m² leaves/m³ canopy)



% OCCUPIED BY LEAVES

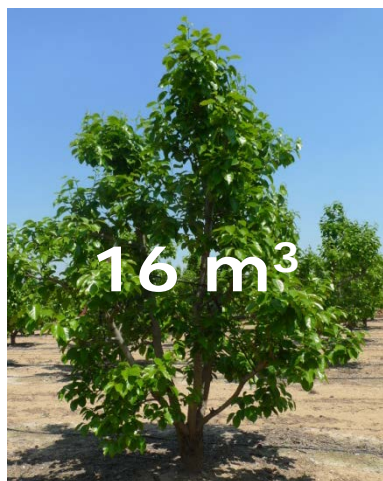
m² leaves/m³ canopy = f(% occupied by leaves)



CANOPY FOLIAR DENSITY

Persimmon-Canopy Characterization along the season

ORCHARD 1



APRIL

SEPTEMBER

ORCHARD 2



Table of dose expressions op Plant Protection Products in high growing crops mentioned in EPPO Standard PP 1/239(2)

Concentration of the formulated product in the spray volume	g or L per hL or %
Dose per ha ground	kg or L/ha
Dose per ha leaf wall area (LWA)	kg or L per 10.000 m ² leaf wall area
Tree Row Volume (TRV)	Kg or L per 10 000 m ³ tree row volume (TRV)
Tree-area density	Dose per ha ground for every m canopy height
	kg or L per m crown height and hectare

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