

THUNDER



**Phytoprotectant for
Control of *Tuta Absoluta***

INDEX

1. COMPANY

- ▣ Presentation of DAYMSA

2. THUNDER

- ▣ 2.1. Introduction of Thunder
- ▣ 2.2. *Tuta absoluta* Trial Results
- ▣ 2.3. Dosage and Directions for use
- ▣ 2.4. Other trial results
- ▣ 2.5. Conclusions

1. COMPANY



- Europe's leading producer of leonardite
- Daymsa, began manufacturing and marketing operations 31 years old
- Daymsa belongs to a large corporate group called SAMCA.
- The SAMCA Group is a family business located in Spain, whose activities are centred on the mining, agricultural, energy, plastics, textile and construction sectors. In all, it provides employment for more than 4,000 people. It has facilities all over Spain, as well as in other countries, such as France, Italy or Portugal.
- Daymsa reaches its consumers via a professional distribution network covering Spain and 25 countries of Europe, Africa, Asia and South America, where we have three subsidiaries (Ecuador, Colombia and Brazil).

1. COMPANY



THUNDER

FitoProtectores

Daymsa

1. COMPANY

Daymsa
in the world

Daymsa

Daymsa
Daymsa Middle
East

agrilandes

agrilandes
Daymsa de los
Andes

Daymsa do Brasil

Daymsa

We have international vocation and projection

2.1. Thunder[®] Introduction

- ❑ **Thunder[®]** is a natural phytoprotectant for the control of *Tuta absoluta* and other lepidopterae.
- ❑ Mixture of several plant oils.
- ❑ Exempt from residues: It can be applied during harvest.
- ❑ 0 residues: natural product
- ❑ No Pre Harvest Interval (PHI).
- ❑ Compatible with auxiliary fauna (*Amblyseius swirskii*, *Orius laevigatus*, *Nesidiocoris tenuis*, etc.)
- ❑ Certified by CERTICAAE (Product nº Fe-023-0008) for its use in Organic Agriculture according to Reg. (CE) nº834/2007.



2.1. Thunder[®] Introduction

Tuta absoluta on tomato

- *Tuta absoluta*, the Tomato leaf miner is a serious pest of Tomato
- Larvae can feed on all parts of tomato plants and can damage all growth stages. The main host plant is tomato (*Lycopersicon esculentum*) but this insect can also attack potato (*Solanum tuberosum*), aubergine (*Solanum melongena*), cucumber (*Solanum muricatum*).

Tuta absoluta produces losses because of 2 reasons:

- yield reduction due to the leaves and sprouts destruction and
- damage on fruits which reduce its commercial value.





2.2. *Tuta Absoluta* Trial Results

2.2. Tuta absoluta trial 2009

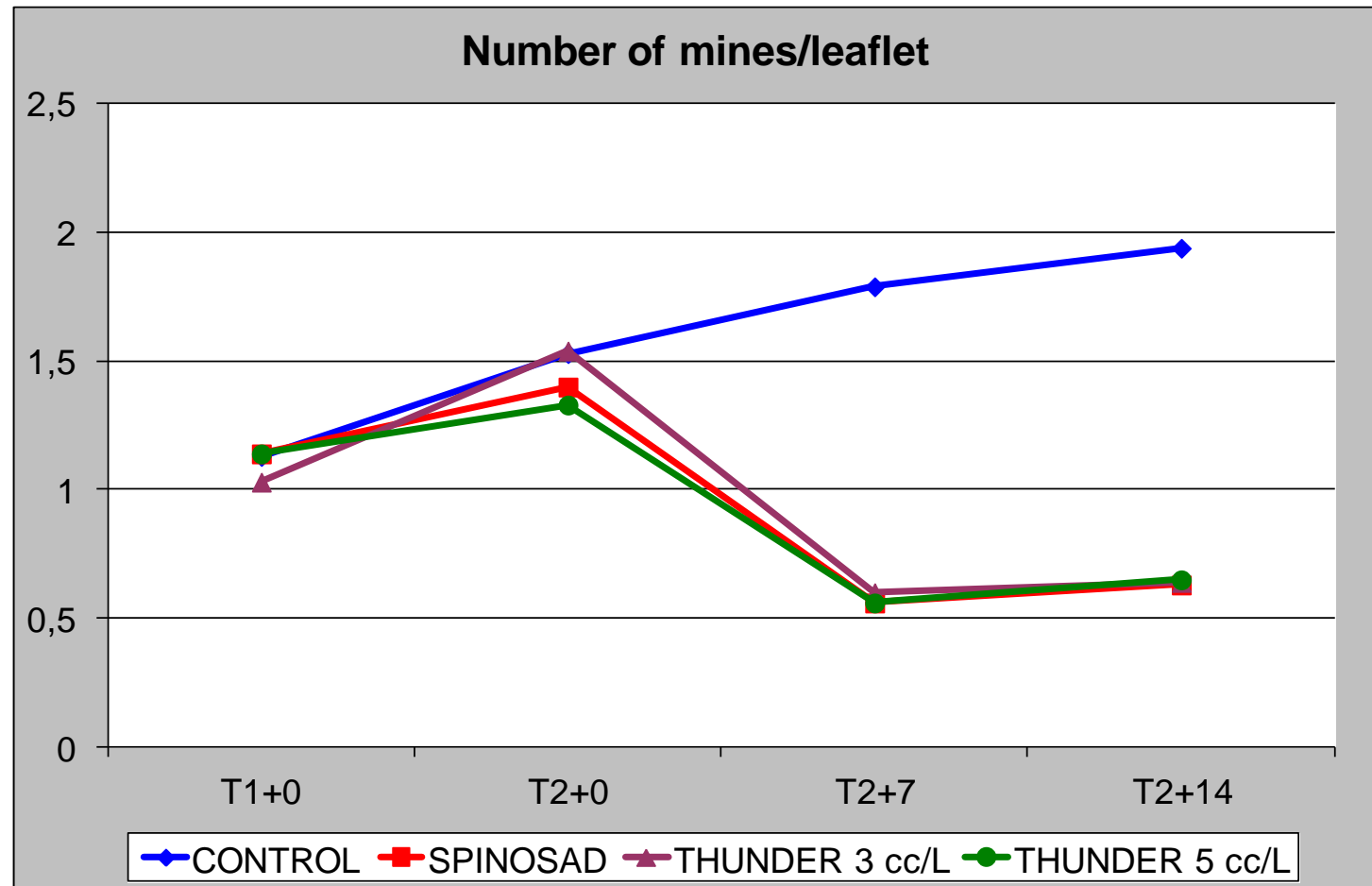
- **Cultivar:** Daniela
- **Location:** Campo de Níjar (Almería)
- **Experimental design**
- **Dispositive** Blocks
- **Number of replicates** 4
- **Size of blocks** 10-15 m².
- **Number of applications:** 2 (T1, T2 = T1+7 days)
- **Moment of application:** Begin of infestation.
- **Evaluations**
 - ▣ T1+0, T2+0, T2+7, T2+14 days
- **Parameters evaluated**
 - ▣ % of leaf surface damaged in 25 leaflets per plot.
 - ▣ Number of Larvae in 25 leaflets per plot.
 - ▣ Number of mines in 25 leaflets per plot.

Application: Foliar spray Spray Volume: **800 L/Ha**

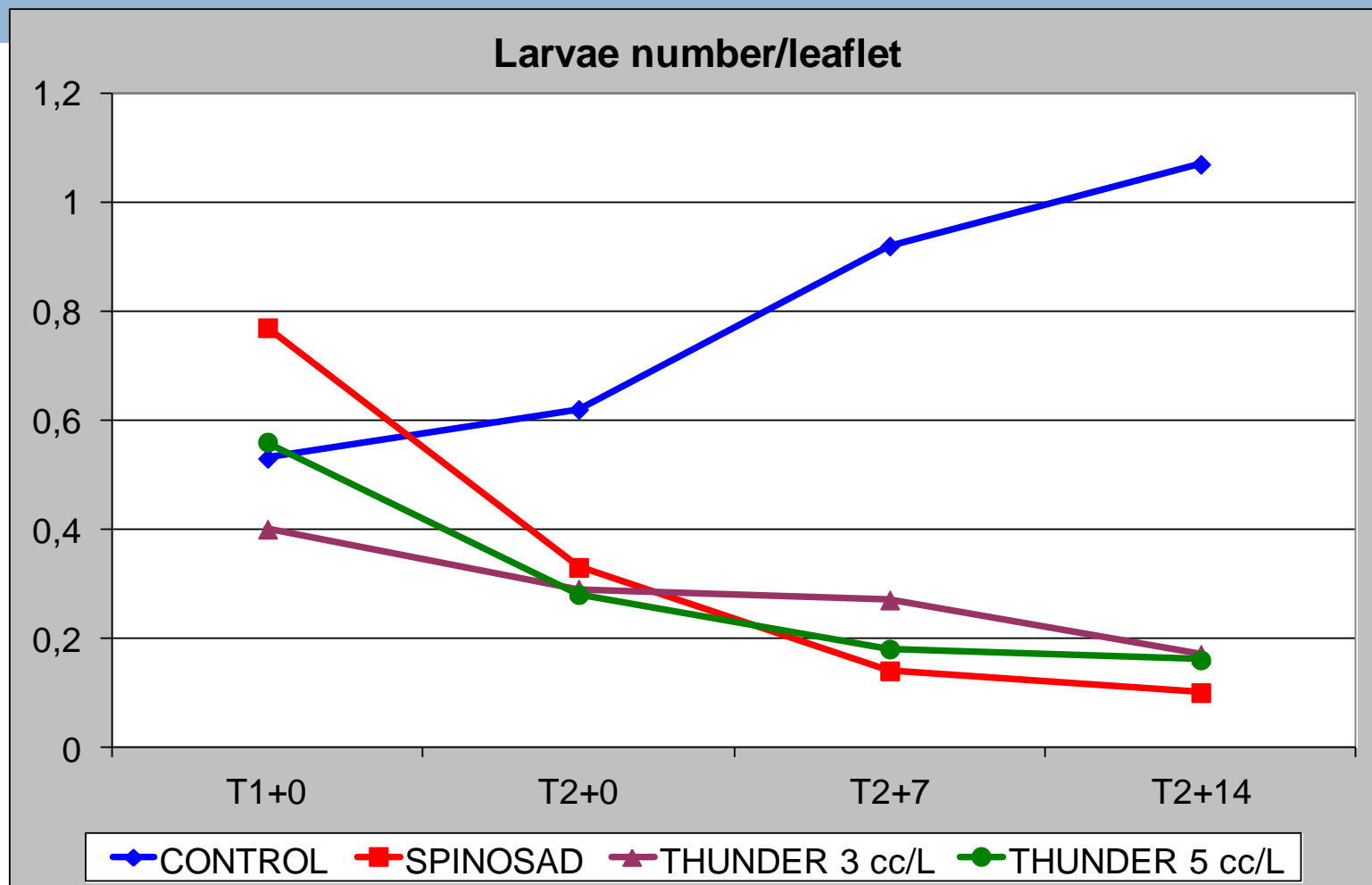
<u>Treat</u>	<u>Product</u>
■ 1	Control (Untreated)
■ 2	(SPINOSAD 48% [SC]) 0.25 cc/L
■ 3	Thunder 3 cc/L
■ 4	Thunder 5 cc/L



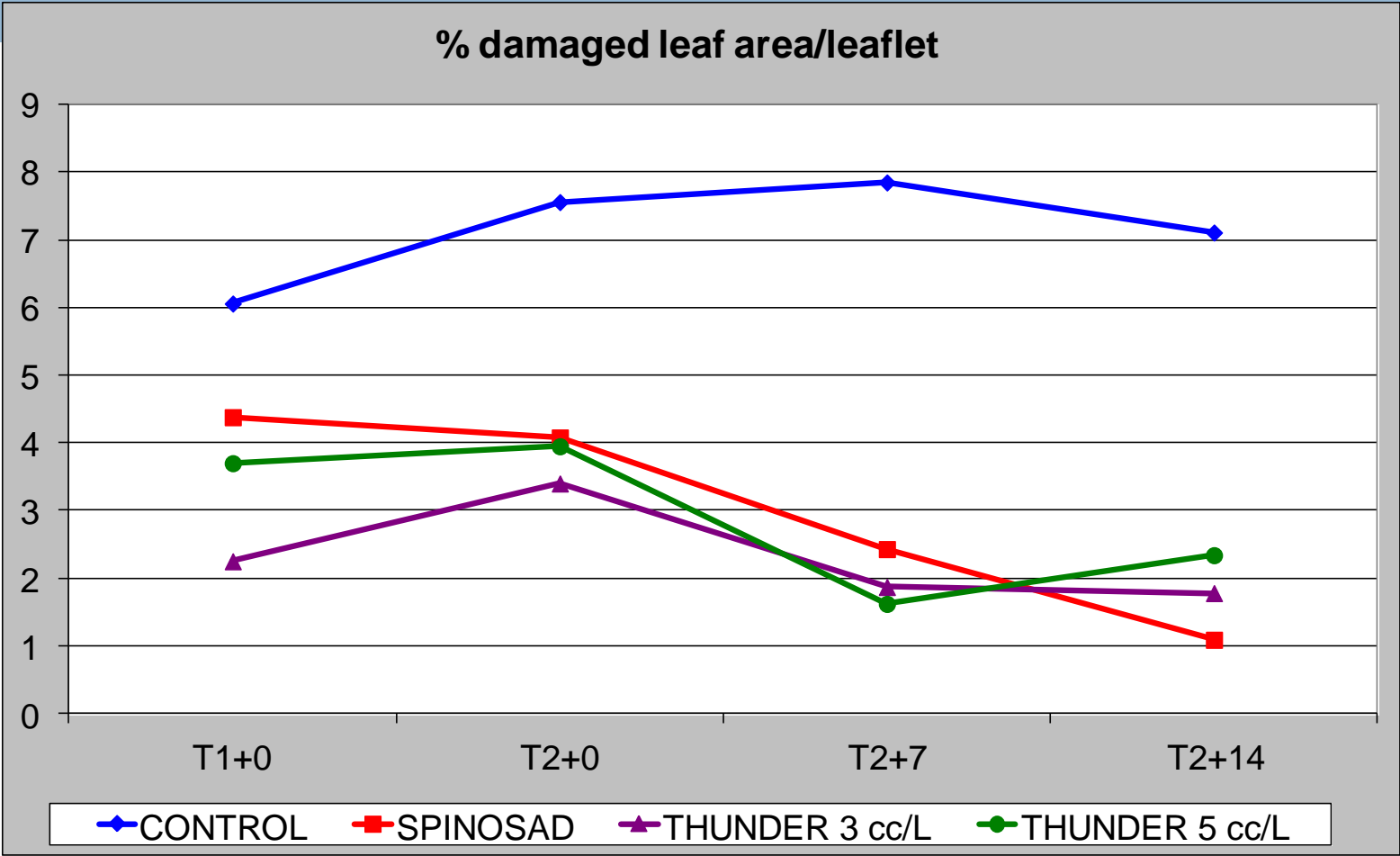
2.2. Tuta absoluta trial 2009: Results



2.2. Tuta absoluta trial 2009 : Results



2.2. Tuta absoluta trial 2009: Results



Spray volume:
800 L/Ha

2.2. Trial conclusions 2009

- Trial started at the beginning of infestation and at the end the pest pressure was very high.
- The Bombus bees activity (were used in the greenhouse during the trial) wasn't reduced, thus Thunder application has been innocuous.
- In a first application, the best shock effect is observed with Thunder application at a dosage of 5 cc/l with a spray volume of 800 l/ha.
- After a second application, a good pest control is reached also with 3 and 5 cc/l.
- At both dosages, a good control persistence is reached, as it's shown in the evaluation 14 days after the second treatment.



2.2. Tuta absoluta trial 2010

- **Cultivar** Flyper
- **Location:** Greenhouse in Almayate, Vélez Málaga (Málaga)
- **Dispositive** Blocks
- **Nº of replicates** 4
- **Size of replicate** 17 m² aprox.
- **Number of applications:** 2 (T1, T2 = T1+7 days)
- **Assessment parameters**
 - T1+0, T2+0, T2+3, T2+7, T2+14 days
 - N° of mines in 25 leaflets per plot.
 - N° of larvae in 25 leaflets per plot.
 - % of foliar damaged surface in 25 leaflets per plot

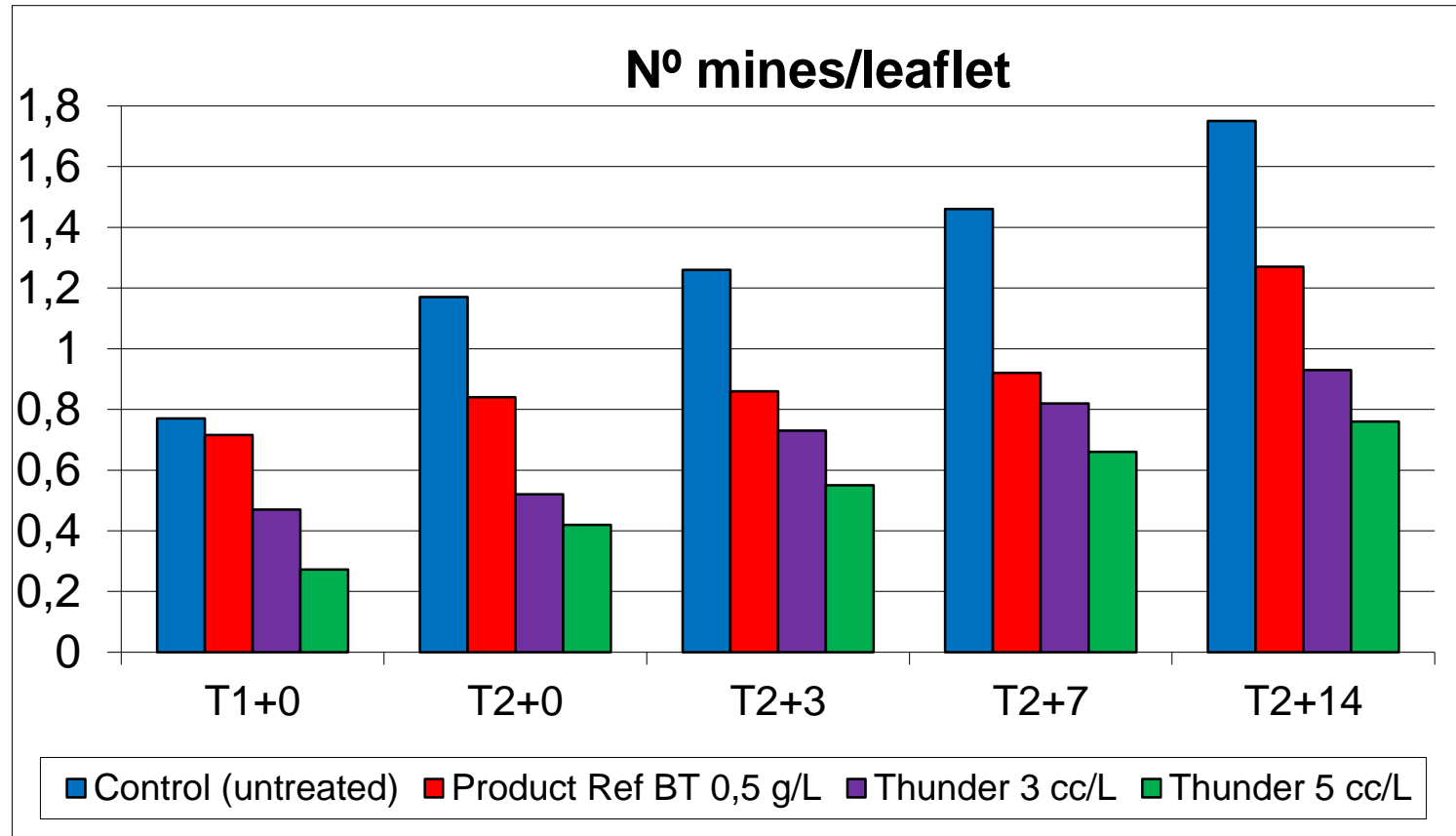


Spray volume: **800-1000 L/Ha**

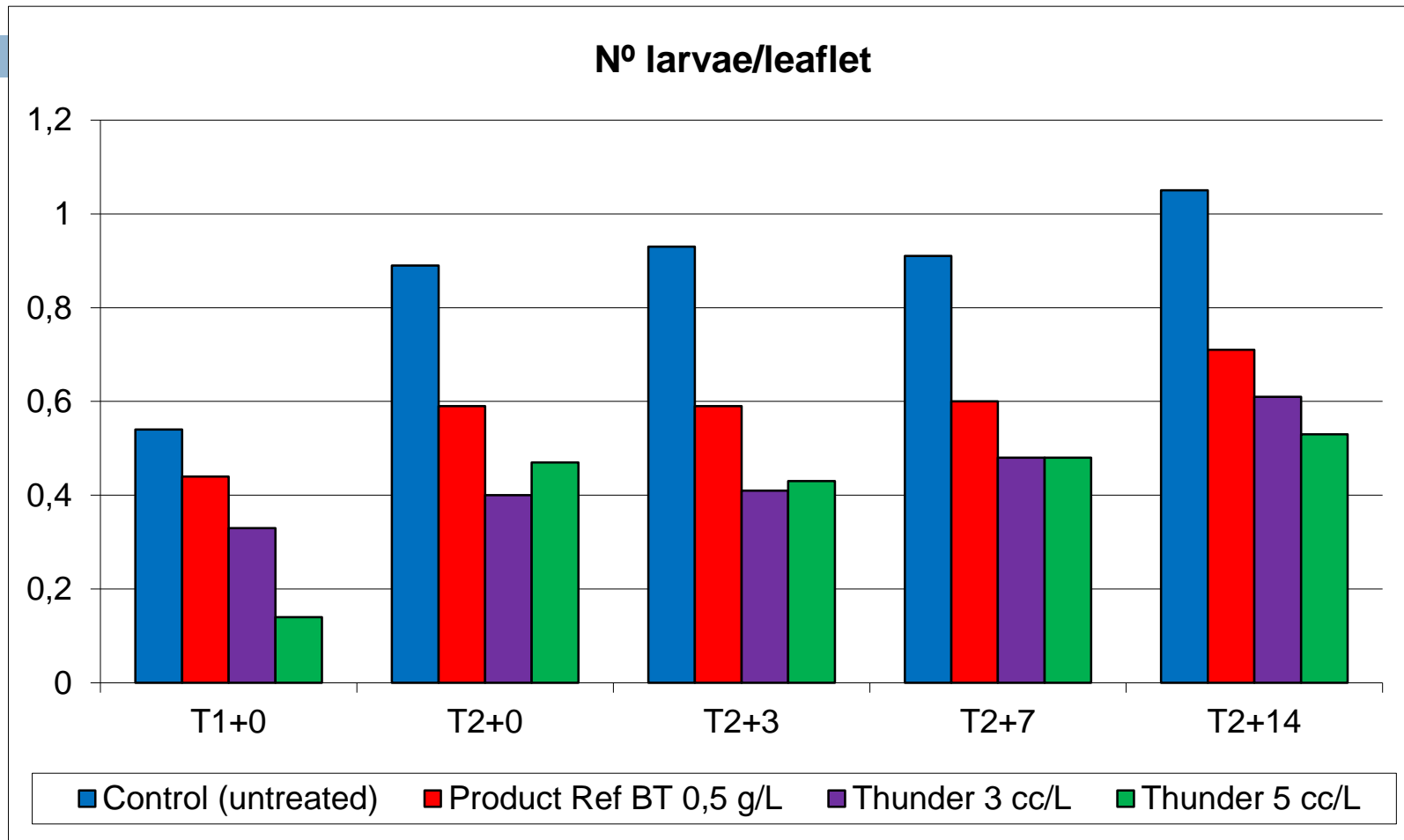
Treat Product

- | | |
|---|--|
| 1 | Control (untreated) |
| 2 | Bacillus Thuringiensis Kurstaki (Ref BT) 0,5 g/L |
| 3 | Thunder 3 cc/L |
| 4 | Thunder 5 cc/L |

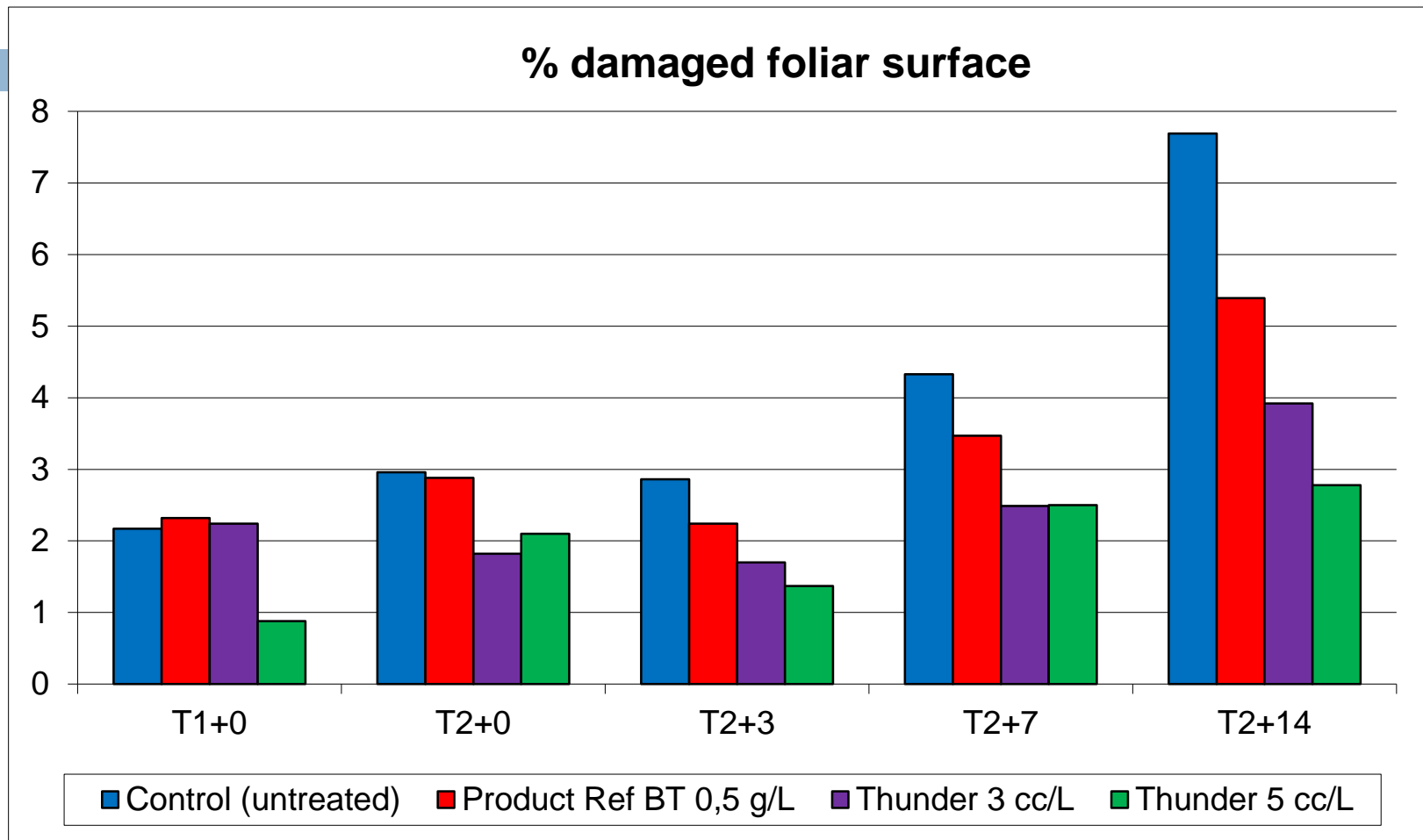
2.2. *Tuta absoluta* trial Results 2010



2.2. *Tuta absoluta* trial Results 2010



2.2. *Tuta absoluta* trial Results 2010



2.2. *Tuta absoluta* trial 2010: Conclusions

- It is shown the efficacy of Thunder for the control of *Tuta Absoluta*.
- With respect to number of mines, larvae and damaged foliar surface, at every evaluation date, it is observed the higher efficacy of Thunder vs Ref BT.
- At T2+14 days in all parameters assessed, it is clear the dosage effect in Thunder. It is checked the higher persistence with the dosage of 5 cc/L with respect to the dosage of 3 cc/L.

2.3. Dosage and Directions for use

- First application: Make the first application at a dosage of 5 cc/L, with a spray volume of 800-1.000 L/ha.
- Second application and subsequent: Apply at a dosage of 3-5 cc/L, depending on the level of pest infestation, with a spray volume of 800-1.000 L/ha.



2.3. Dosage and Directions for use

- Start the treatment as soon as the pest is noticed.
- In case of high pest pressure, apply a second treatment 7 days after.
- It is very important to cover the vegetal surfaces, considering both leaf sides.
- Do not need any adjuvants (spreader-stickers, etc) into the spray tank.



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2.4. Other trials *Spodoptera Exigua*

2.4. *Spodoptera Exigua* in strawberry

- **Variety** Camarosa
- **Location:** Rociana del Condado (Huelva, España)
- **Nº of replicates** 4
- **Size of plot** 40 plants
- **Number of applications:** 2 (T1, T2 = T1+10 days)
- **Evaluation dates**
 - ▣ T1+0, T2+0=T1+7, T1+14 days
 - ▣ Nº of total larvae in 10 plants per plot.

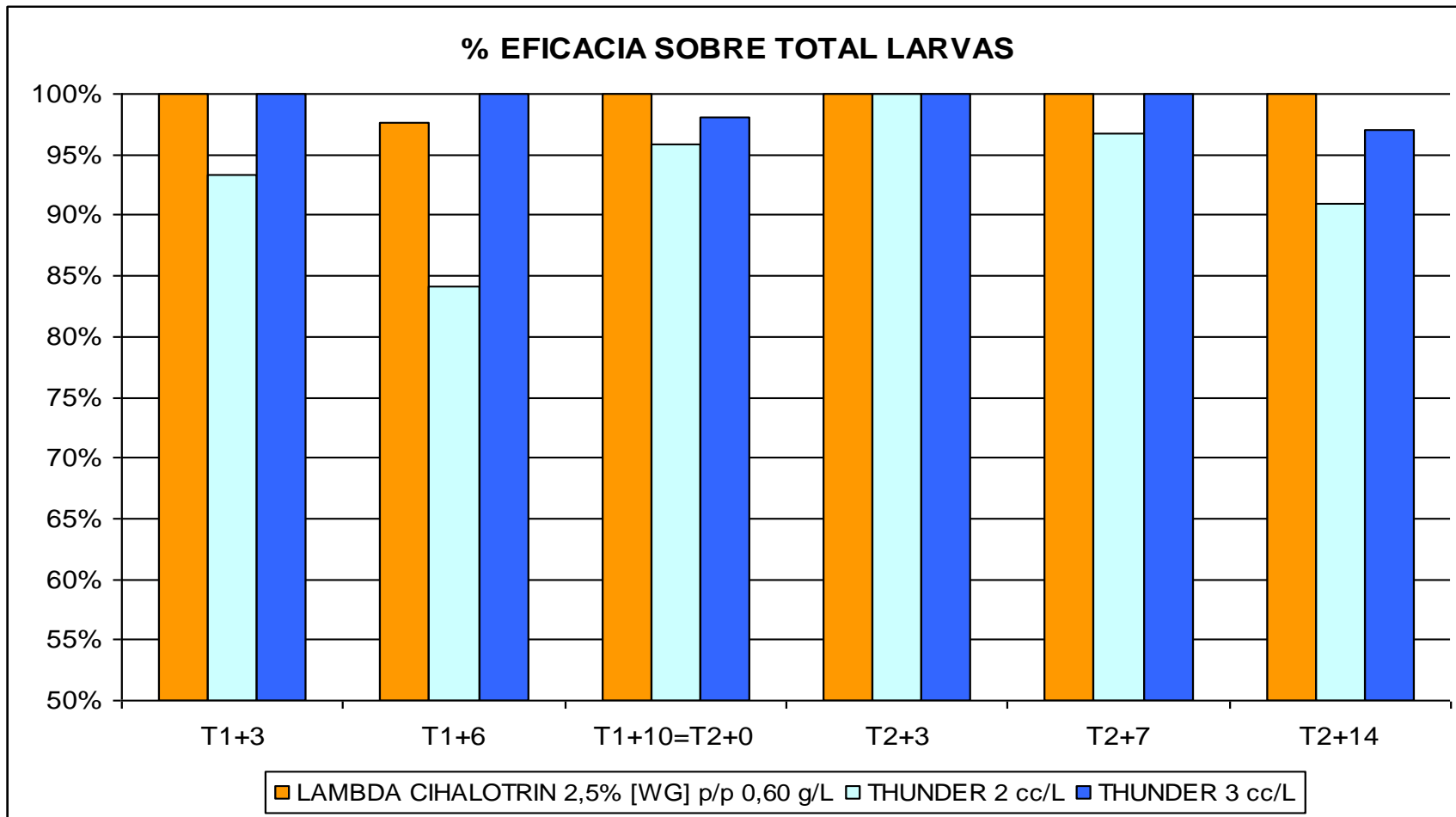
Application: Foliar spraying
Spray Volume: 1000 L/Ha

Trat Producto

- 1 Control (untreated)
- 2 Lambda Cihalotrin 2,5% [WG] at 0,60 g/L
- 3 Thunder at 2 cc/L
- 4 Thunder at 3 cc/L



2.4. *Spodoptera Exigua* in strawberry



- Efficacy of **Thunder** at 3 cc/L is similar to the obtained with standard Lambda Cihalotrin. It is observed a clear effect of dosage of **Thunder** in all evaluation dates.

2.4. Evaluation of selectivity of Thunder over *Orius Laevigatus* & *Amblyseius Swirskii*



Pepper variety Palermo

- Untreated
- Thunder 3 cc/L 2 applications separated 7 days
- Thunder 5 cc/L 2 applications separated 7 days

Thunder is **inocuous** to *Orius Laevigatus* and inocuous to *Amblyseius Swirskii*

2.5. Conclusions

- THUNDER is effective in *Tuta absoluta* control in tomato.
- THUNDER contains only natural ingredients totally free of substances that give place to residues in harvesting.
- Thunder can be applied during the whole cycle, including on harvesting period.
- Certified by CERTICAAE for its use on Organic Agriculture, according to Reg. (CE) nº 834/2007.

THUNDER



Natural Efficacy

**Merci beaucoup par
votre attention!!!**

