A photograph of a beehive in a field with trees in the background. The beehive is a blue and orange structure with a wooden entrance. The background shows several trees with green leaves under a clear sky.

The effect of sub-lethal doses of imidacloprid on honey bee life span, food consumption, size of hypopharyngeal glands and respiratory rhythm of honeybees

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**The effect of sub-lethal doses
of imidacloprid on
honey bee life span,
food consumption, size
of hypopharyngeal glands and
respiratory rhythm of honeybees**

**Hellenic Institute of Apiculture
Nat. Agr.org. 'DEMETER'
GREECE**





Effects of pesticides

➤ **Lethal**

➤ **Sub-lethal**

Stop of egg laying/

Aggressiveness & Hypothermia

Reduce of orientation ability

Reduce of hygienic behaviour

Reduce of memory ability

Brood intoxication

Reduce function of the heart, glands

Damage in parts of the bee brain

Sub-lethal effects of imidacloprid

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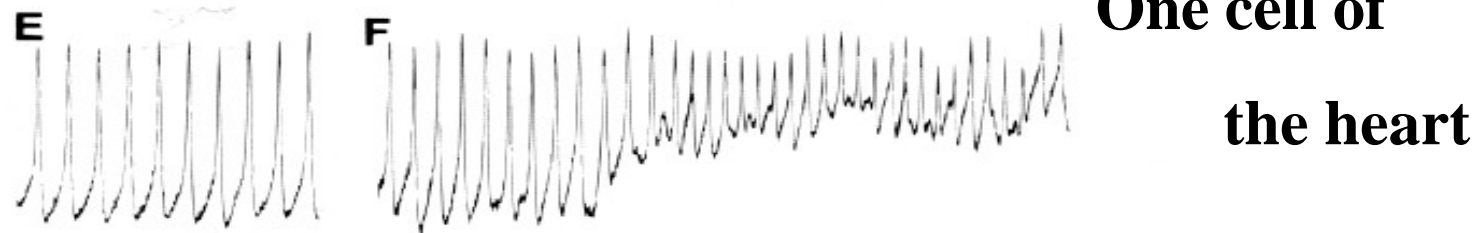
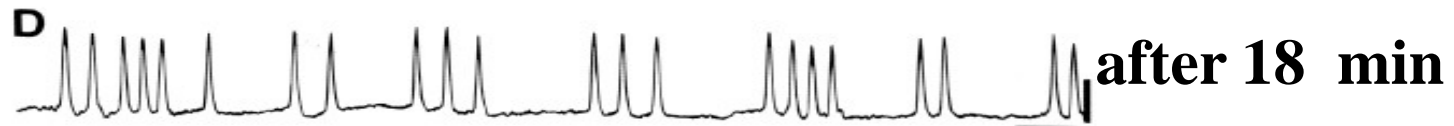
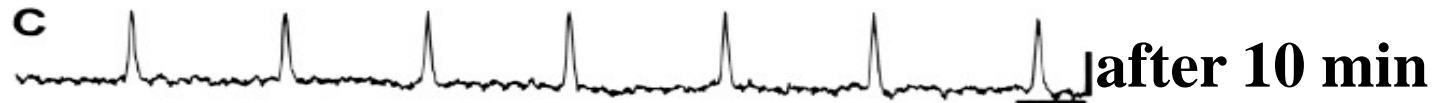
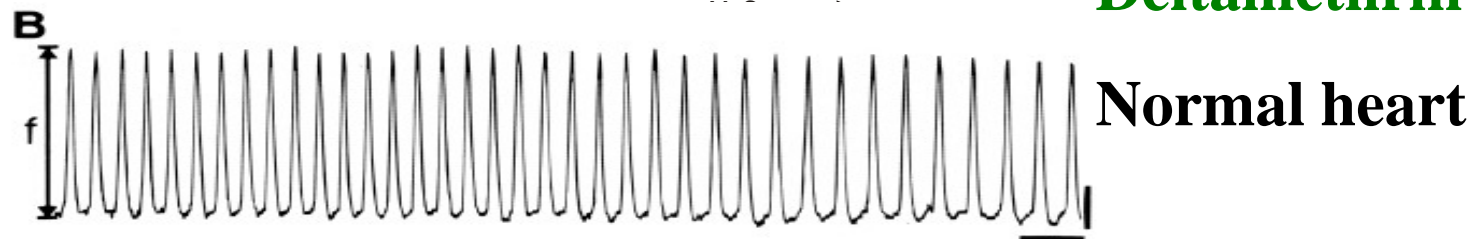


Example of previous work

➤ The heart of the honey bee

(Team of G.Theophilidis, Greece)

Deltamethrin



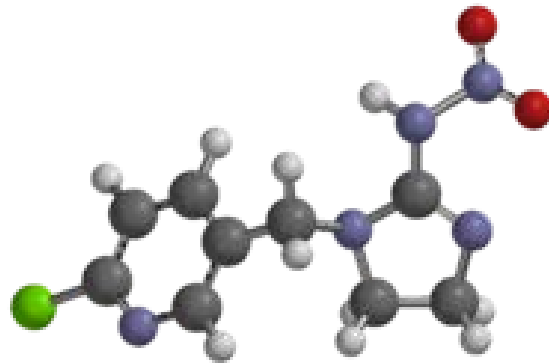
Sub-lethal effects of imidacloprid

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Effects of pesticides

New generation of pesticides +
their metabolites- neonicotinoids



Sub-lethal effects of imidacloprid

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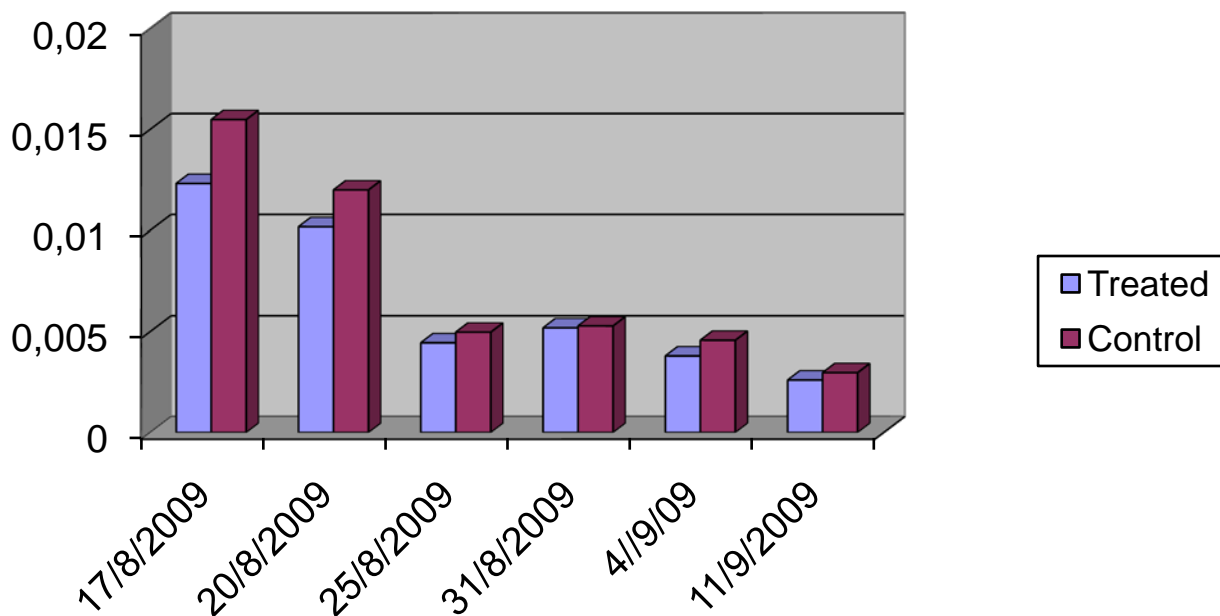


Laboratory experiments:

- Life span of workers
- Food consumption



Quantity of pollen (g) consumed per bee

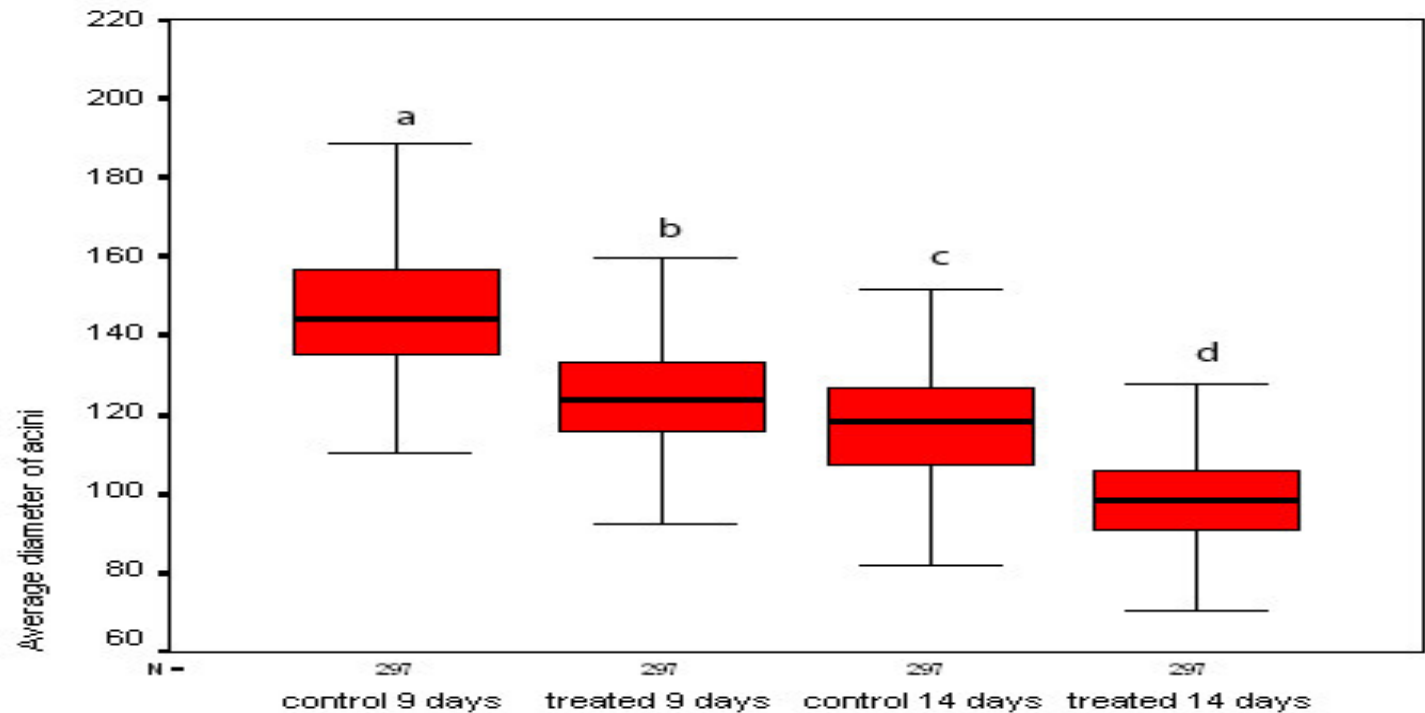


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Laboratory experiments: ➤ Size of Hypoph. glands



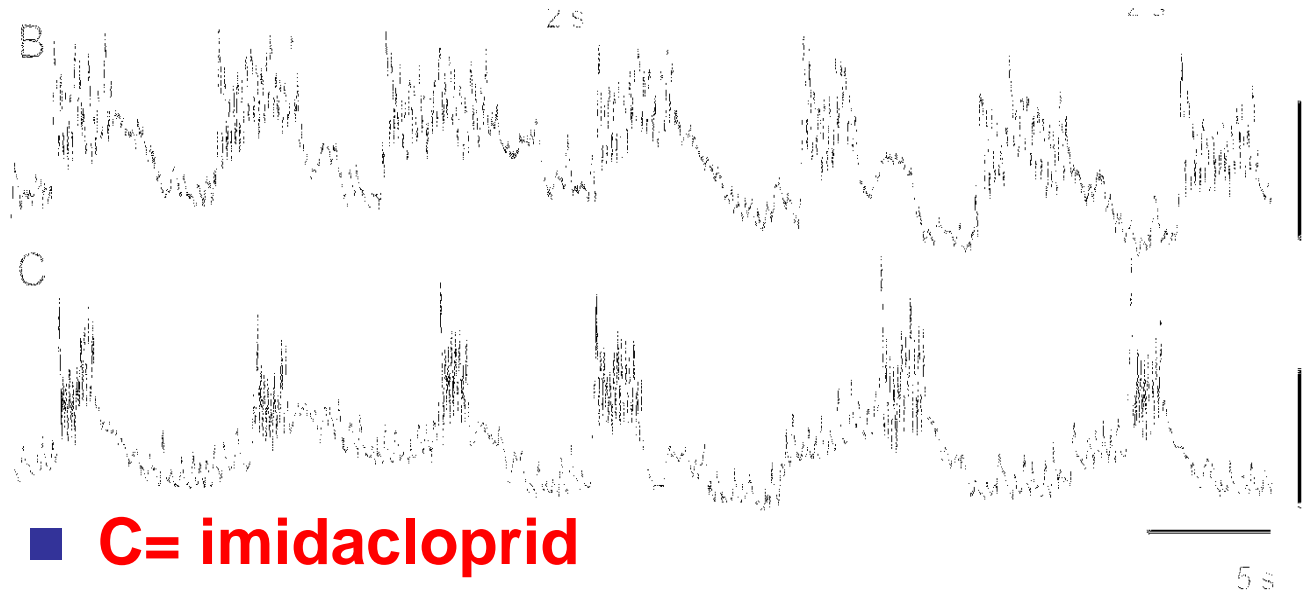
Hatjina et al., Apidologie 2013



Laboratory experiments:

➤ Respiration rhythm

■ B= control



Hatjina et al., Apidologie 2013

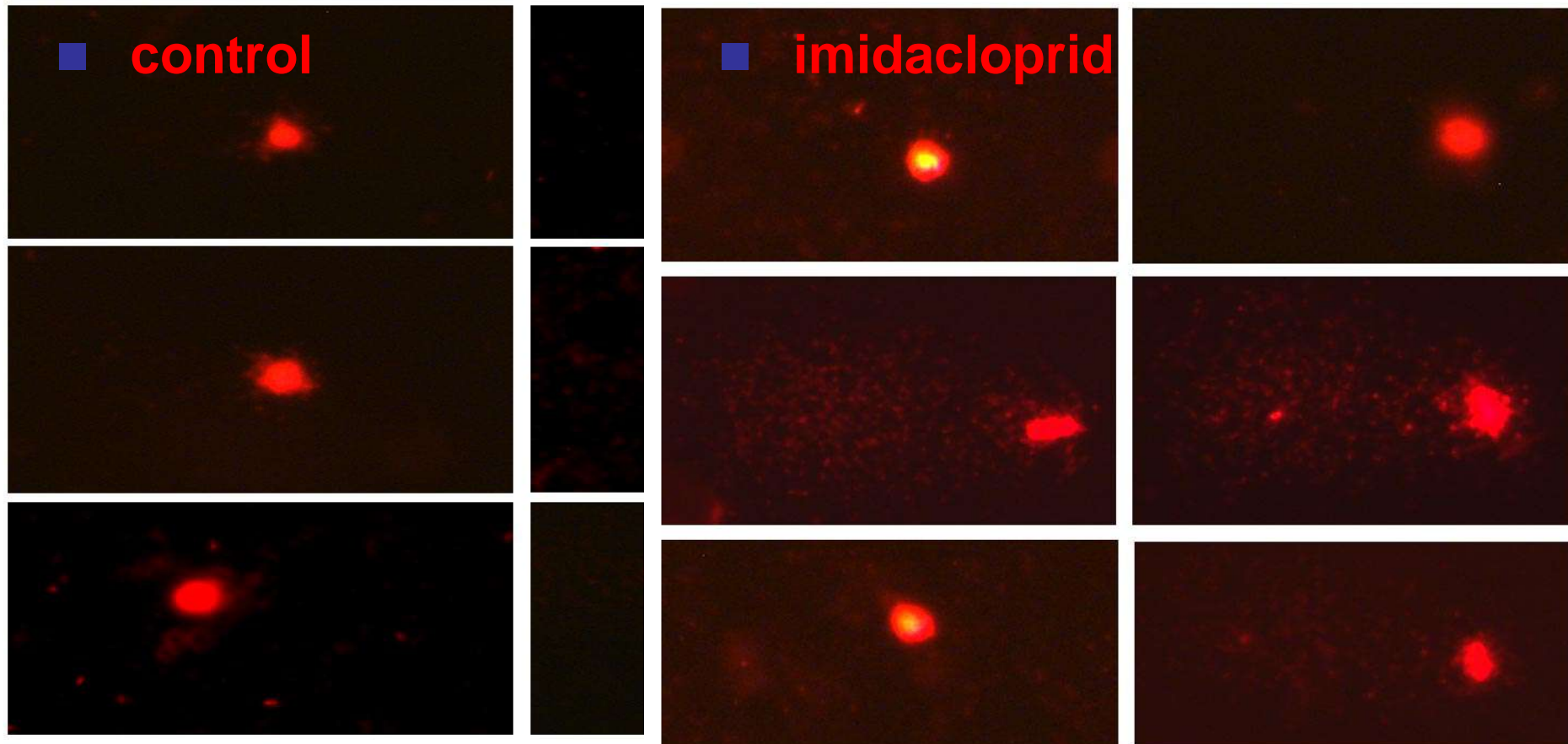
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Laboratory experiments:

➤ DNA damage



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Semi-field experiments:

No of missing foragers

3000

2500

2000

1500

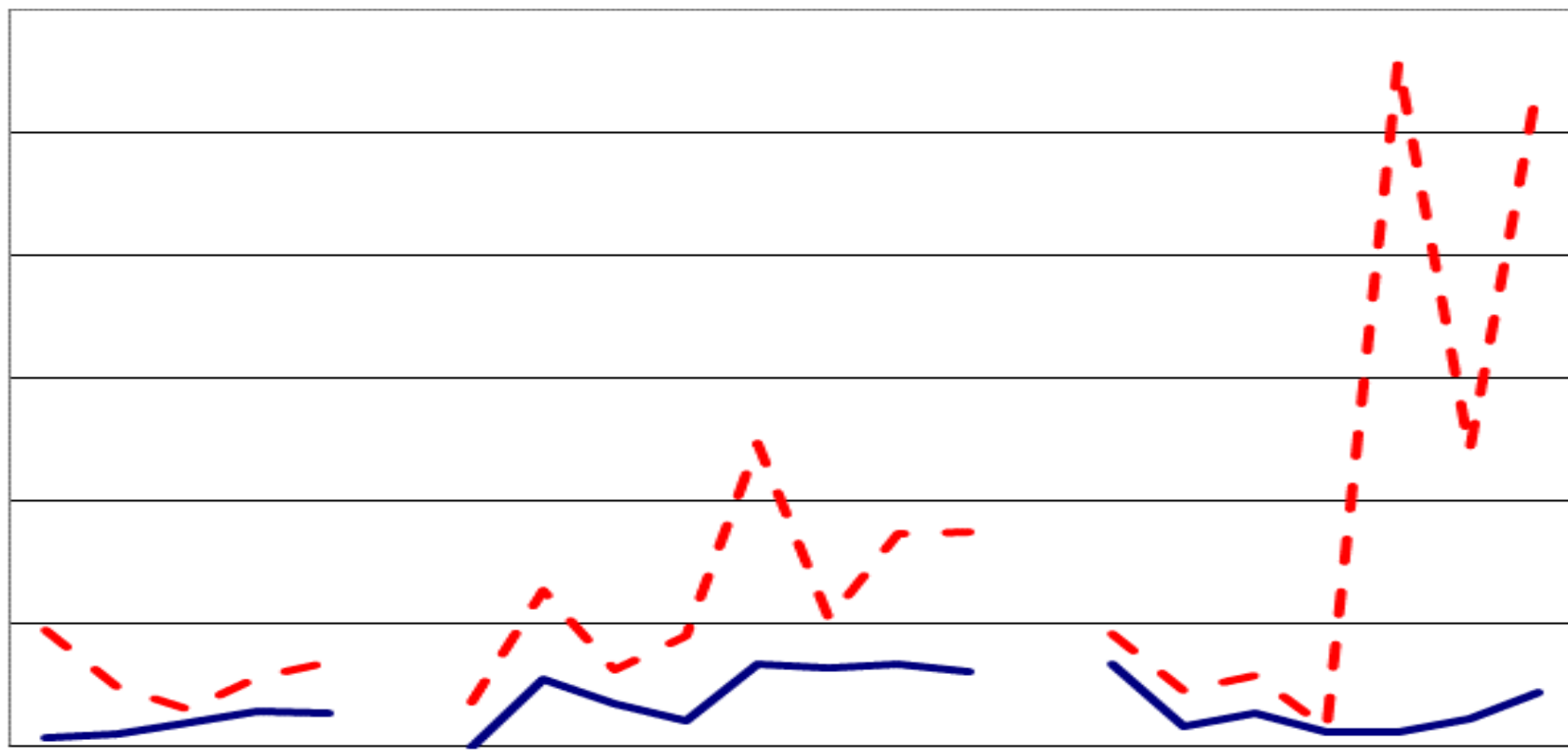
1000

500

0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

— Control - - Imidacloprid



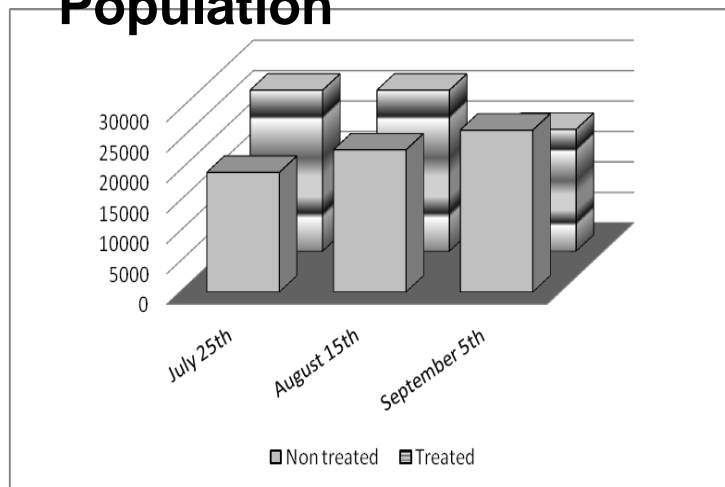
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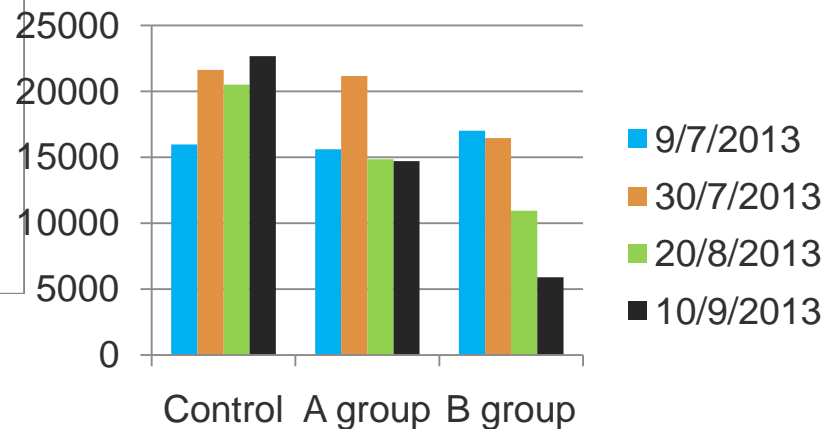


Field experiments:

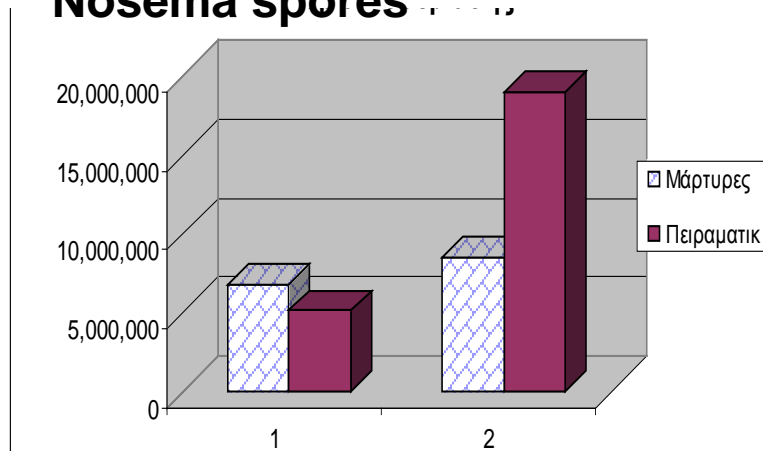
Population



No of Brood cells



Nosema spores



Sub-lethal effects of imidacloprid

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Thank you for your attention



Sub-lethal effects of imidacloprid

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Proboscis Extention Reflex

