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Neonicotinoid insecticides and its alternatives against soil pests from sunflower crops

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Introduction: For several years at the European Commission level it is closely monitored the possible interaction between bees health and pesticides and in 2013, the use of plant protection products and treated seeds containing clothianidin, imidacloprid and thiamethoxam were severely restricted in order to protect honeybees by Regulation (EU) No 485/2013. Due to the restrictions imposed, Romanian agriculture is facing an alarming increase in the population density of some soil pests, the most dangerous being *Tanymecus dilaticollis* and *Agriotes* spp., no insecticides being available for sunflower seed treatment.

Keywords: sunflower, neonicotinoids, alternative means, residues, *Tanymecus dilaticollis*, *Agriotes* spp.

Aim: Our study aims to identify alternative methods and means to control pest populations of *Tanymecus dilaticollis*, *Opatrum sabulosum* and *Agriotes* spp. in sunflower crop and also to monitor level of residues of neonicotinoid substances present in soil and sunflower plants in various stages of development.

Material and methods:
Experimental areas : Moldova, South of Romania and Sub-Carpathian hills.
Experimental model:
- **Agrotechnical measures :**

- Crop rotation, soil amendament , physical measures : chopping and grinding plants residues
- **Chemical treatments :**

- Seed : Langis + Microfert insenticide;
- Vegetation: Mospilan 20SP, Faster Delta
- **Biocogical treatments : *Beauveria bassiana* (150 kg/ha; 300 kg/ha), Biosem**

Results: Sunflower crop has been affected by *Agriotes* spp. larvae and adults of *Tanymecus dilaticollis* and *Opatrum sabulosum*, the most intense attack of *Agriotes* spp. was registered to the seed in emergence. To keep pests below EDT, 2 treatments were also applied in vegetation, one with Faster Delta and one with Mospilan 20 SP.
The best results were registered in the variants of seed treatments with Langis + Microfert, followed by vegetation treatments either with Mospilan 20 SP or Faster Delta. Biological control with *Beauveria bassiana* and Biosem did not ensure protection of sunflower from the attack of targeted pests.

Conclusions: In the absence of seed treatment with systemic active substances, until now there are no equally effective alternatives for protecting the sunflower, in the early stages of vegetation, thus seed treatment with a contact insecticide provides protection only to the seeds.

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