"Influence of two cooking methods of chard on imidacloprid and spinosad residues."

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Introduction

Leafminer flies, thrips, aphids and whiteflies are the most common pests of chard (Beta vulgaris var. cicla). Intense damage not only reduces chard yield, but also the quality of leafy vegetables. The pesticides widely used against them are imidacloprid and spinosad. The ingestion of small traces of these pesticides for prolonged periods of time can affect the health and well-being of the consumer.

The objective of this work was to determine the influence of two cooking methods of chard, microwave and boiling, on the pesticides under study.

Experimental

Imidacloprid OD 20% (90 cm3.hL-1) and spinosad 48 SC (15cm3.hL-1) were applied in a chard crop in a farm located in Rodeo del Medio, Guaymallén, Mendoza. In order to have enough residue to observe the behavior of the pesticides tested, the harvest was carried out on the same day of spraying. Two tests and uncooked control were performed with three replicates each. Boiling test (H), consisted of a pot with boiling water, added 300g of unwashed leaf chard, left to cook for 8 minutes, then drained and processed. Microwave test (M), consisted of microwave cooking of 300g of unwashed leaf chard in polyethylene bags for a 900-watt microwave oven for 5 minutes. Once cold, it was processed.

For the analysis of pesticide residues, the QuEChERS method (EN 15662) was performed. Imidacloprid and spinosad were quantified by UHPLC (ESI +) - MS / MS. To calculate the influence of the treatments carried out, they were compared to the control.

Results

Imidacloprid residues in chard were reduced 80% in treatment H and 12% in treatment M. Spinosad residues increased 33% in treatment H and 6% in treatment M. Imidacloprid assay shown a greater reduction in treatment H compared with treatment M, probably caused by the high-water solubility of this pesticide (610mg. L-1). Regarding spinosad, both treatments revealed that the pesticide concentrated, probably due to the low solubility in water (7.6 mg. L-1). The high level of residues from treatment H could be due to the greater weight loss of chard compared to treatment M.

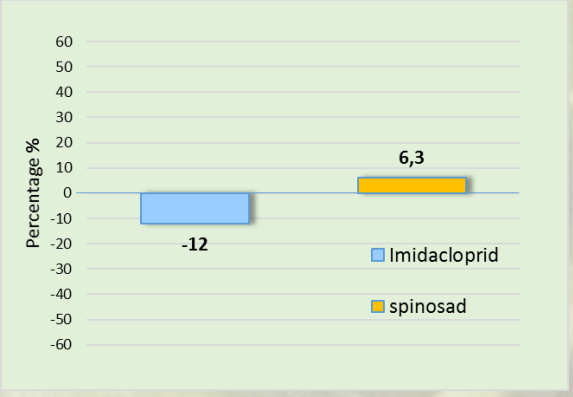

Figure 1: Percentage variation of the active principle compared to the control (Microwave test)

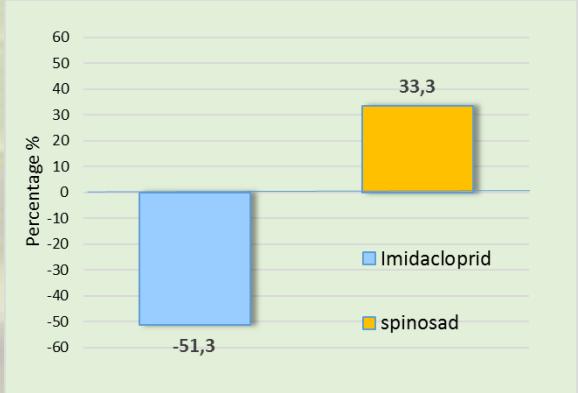

Figure 2: Percentage variation of the active principle compared to the control (Boiled test)

Conclusions

We conclude that the behavior of the pesticides tested depends on the cooking methods used and their solubility.

Acknowledgement

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