EFFECT OF FORMULATION TYPE AND PRODUCT SOURCE ON THE RESIDUE LEVELS OF SOME PESTICIDES

By

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تأثير نوع المستحضر ومصدر المنتج على مستويات متبقيات بعض المبيدات

رسالة مقدمة من

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للحصول على

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(مبيدات آفات)

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ABSTRACT

Rania Mohammed Abd- El-Hamid- Effect of Formulation Type and Product Source on Residue Levels of Some Pesticides. Unpublished Ph.D. Thesis, Department of Plant Protection, Faculty of Agriculture, Ain Shams University, 2013.

Different solvents with different polarities were tested to determine the most efficient one for extraction of pesticides sprayed on tomato fruit samples. The pesticides used were difenoconazole, fenpyroximate, imidacloprid and profenofos. The results of this study show that the proposed method (quick, easy, cheap, effective, rugged, and safe) QuEChERS methodology has proven successful for extraction of all pesticides used on tomato fruits contrary to other conventional extraction methods, since it is rapid, simple, sensitive and uses small volumes of solvents, making it less hazardous to human health and the environment.

Recommended application was done by spray regime of two pesticides (fenpyroximate and imidacloprid) using different types of formulations on tomato fruits for two consecutive years (2009-2010) at Kalubia governorate. Data indicated the great influence of different formulation types on the residue levels on tomato fruits. Fenpyroximate when used as EC formulation type showed higher persistence compared to another formulation type SC at all intervals during the two studied seasons. The obtained pre-harvest intervals (PHI's) were 14 and 20 days after application in 2009 for SC, EC pesticide formulation type, respectively. While in 2010, the PHI's were 14 days for SC and 22 days for EC. The initial deposits between the four types of imidacloprid formulations (SC, SL, WP and WDG) were attributed to the variation in the physical and chemical properties of the formulations. As expected the degradation rates of SC formulation type was more than that in other

formulation types during the rest of the experiment. This indicated that corresponding and recommended pre-harvest intervals (PHI) of 6 days for SC, 24 days for WDG, 16 days for SL and 22 days for WP formulation type in the season of 2009. On the other hand, in 2010 PHI's were 5, 23, 13 and 21 days for the same formulation types, respectively.

In addition, this work aimed to study the effect of different sources of the same commercial products (profenofos 72% EC) that was recently collected from local market due to evidence of presence of product residues on tomato fruits. Data revealed that the tested commerical profenofos formulation samples incurred some changes in physical and chemical properties. These changes affected the formulations when sprayed on tomato fruits and caused differences in pesticide residues on tomato. This indicated that the three formulation sources for the same active ingredient had different PHI values. Only 8 days were enough to reach the safe level for harvesting tomato fruits after spraying profenofos insecticide (sources 1 and 2) during the two years of the study, while 4 and 2 days were the safe level for harvesting after treatment with source 3 in the years 2009 and 2010, respectively.

On the other hand, three types of difenoconazole formulations 3% were prepared in laboratory (EC, EW and OD) and their residual effect on tomato fruits was studied. The physico-chemical properties revealed that OD had the highest viscosity and the lowest surface tension. There were differences in all the parameters in this study between the three types of formulations. OD formulation type showed the highest residues on tomato fruits at all intervals, on the other hand EW recorded the lowest residue deposit levels, whereas EC showed intermediate residue levels.

Key words: Pesticide formulations, Difenoconazole, Imidacloprid, Fenpyroximate, Profenofos, Physico-chemical properties, Tomato fruits, Residues.

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