FACTORS INFLUENCING PESTICIDE RESIDUES IN SOME EXPORTED VEGETABLE CROPS AND MEANS OF THEIR ELIMINATION

BY

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A thesis submitted in partial fulfillment

of

the requirements for the degree of

DOCTOR OF PHILOSOPHY

In

Agricultural Science

(Pesticides)

Department of Plant Protection

Faculty of Agriculture

Ain Shams University

2007

Approval Sheet

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ABSTRACT

Ahmad Hanafi Hussein. Factors Influencing Pesticide Residues in Some Exported Vegetable Crops and Means of Their Elimination . Unpublished Ph.D. Dissertation, Ain Shams University, Faculty of Agriculture, Department of Plant Protection, 2007.

The information related to pesticide practices followed on green beans and strawberry in some exportation farms of Egypt was obtained using questionnaires forms. Monitoring of pesticide residues on the Egyptian exported strawberry, lettuce and rocket was carried out in Norway. Also the degradation patterns of azoxystrobin, cyprodinil, fludioxonil, fenhexamid, and myclobutanil were studied on strawberry fruits under field trial conditions during December 2005 till January 2006 at a farm following EUREPGAP guidelines.

Furthermore, elimination of azoxystrobin, cyprodinil, fludioxonil residues on/in strawberry, lettuce and rocket was determined in two lots pretreated by the recommended rates of the investigated fungicides. Also, the effect of cooking of strawberry fruits on reduction of the residues of the tested fungicides was investigated. Finally the effect of cold storage conditions on azoxystrobin, cyprodinil, fludioxonil residues on/in strawberry, lettuce and rocket was evaluated on the two lots of the tested vegetables after arrival to Norway.

All samples at the present study have been analysed using GC-NPD/ECD and GC/MS at Bioforsk accredited Lab, Ås, Norway.

The obtained data from the designed questionnaire indicated that the percentages of the rejection related to the pesticide residues were 11.11 and 7.69% in green beans and strawberry respectively. The recommended rates of the used pesticides established by the Ministry of Agriculture or EU guidelines were followed by 86.67 and 69.23% of growers in green beans and strawberry, respectively. The percentages of the exporters who were repeating the all or each of pesticides during the same season of green beans and strawberry reached 48.89 and 42.31% respectively. Furthermore, 15.56 and 7.69% of growers were following the

recommended PHI for each pesticides used in green beans and strawberry, respectively.

On the other hand, no storage period was followed by 40 and 76.92% of the exporters on green beans and strawberry, respectively. Considering the transportation conditions, 55.56 and 88.46% of the exporters were following cooling trucks in transportation of green beans and strawberry, respectively.

Examination of the obtained data revealed that strawberry samples were relatively the most contaminated samples with pesticides compared with lettuce and rocket samples. On the other hand, no pesticide residues were detected in all lettuce samples during the investigated period. In rocket samples, the only detected pesticide was azoxystrobin at the concentration of 0.19 mg/kg in December. No pesticides residues were detected in the other months.

All the contaminated samples of strawberry, and rocket with pesticide residues did not exceed the legitimated MRL; with one exception in strawberry whereas only one sample (January sample) was exceeding MRL of cyprodinil (0.5 mg/kg).

The half-life values ($t_{0.5}$) were 1.92, 4.99, 3.68, 6.02 and 5.17 days for azoxystrobin, cyprodinil, fludioxonil, fenhexamid and myclobutanil, respectively.

The obtained data showed that glycerol 5% was the most effective washing solution in reducing azoxystrobin residues where the highest reduction percentages of residues were recorded in strawberry samples, reached 40.9% at the 1st lot while the highest reduction percentages obtained in lettuce and rocket i.e. 68.07% and 78.33% at the 2nd lot, respectively.

However**,** Citric acid was the best washing treatments in eliminating cyprodinil and fludioxonil residues in all tested fungicides. The reduction rates of cyprodinil and fludioxonil at the 1st lot of strawberry reached 76.09 and 82.93% , and 67.39 and 79.84 at the 2nd lot of lettuce samples, respectively. Also, the reduction rates of cyprodinil

and fludioxonil residues at the 1st lot of rocket samples, reached 42.50 and 63.23%, respectively.

On the other hand, the reduction percentages of the residues of the investigated fungicides after heating treatment at the 1st and the 2nd lot of strawberry samples reached 80.43, 78.05% and 78.05, 80% and 96.3, 98.25% for cyprodinil, fludioxonil and azoxystrobin, respectively.

The obtained data indicated that the losses percentages of the initial residues because of the cold storage at 4°C on strawberry, lettuce and rocket samples reached 2.7, 0.0 and 11.11% and 5.46, 13.55 and 32.48% and 17.58, 13.91 and 34.81% for cyprodinil, fludioxonil and azoxystrobin, respectively.

Key words: Questionnaire, Pesticide practices, Monitoring, Pesticide Residues, Degradation, Azoxystrobin, Cyprodinil, Fludioxonil, Fenhexamid, Myclobutanil, Washing, Elimination, Removal, Cooking Strawberry, Lettuce, Rocket, Cold storage, GC/MS and GC-NPD/ECD.

ACKNOWLEDGEMENT

I would like to express my deepest appreciation and gratitude to **Prof. Dr. Mohamed Ibraheam Abd El Megeed.** Prof. of Pesticides, Plant Protection Dept., Faculty of Agriculture, Ain Shams University, for his supervision, reading the manuscript, helpful suggestions and offering facilities of the work.

My deep gratitude is extended to **Prof. Dr. Amged Kamel Sobeiha** Prof. of Pesticides., Plant Protection Dept., Faculty of Agriculture, Ain Shams University, for his supervision, revising the manuscript, helpful suggestions and constructive criticism.

The author also extends his deep thanks to **Prof. Dr. Sayed Mohamed Abd El Latif Dahroug** Prof. of Pesticides, Plant Protection Dept., Faculty of Agriculture, Ain shams University, for his supervision.

My deep gratitude to **Prof. Dr Ole-Martin Eklo** Prof. of Pesticides, Weed Science and Ecotoxicology Dept., Plant Health and Plant Protection Division, Bioforsk, Norway., for receiving me in Norway, helpful advices, facilities and support during my stay in Norway and after I back to Egypt.

Also I would like to express my deepest appreciation and gratitude for **Borge Holan** the Manager of Bioforsk accredited Lab. for giving me the chance to work at Bioforsk Lab. during my stay in Norway. My deepest appreciation and gratitude is extended to all **staff at Bioforsk accredited Lab**. for supportive information, helpful guidelines and great cooperation in analysis of samples.

My grateful acknowledge for the **Norwegian Research Council** for awarding the grant for 12 months in Norway and covering all research costs during the grant period.

Many thanks for **Dag Thomassen**, Quality manager of BAMA company and **Trond Roald**, Buying Manager of COOP company for offering samples of the exported Egyptian crops during my stay in Norway.

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