



## PESTICIDE PRACTICES IN SOME EGYPTIAN EXPORTATION FARMS

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### ABSTRACT

Information related to pesticide practices in green beans and strawberry fields in some selected exportation farms in Egypt was obtained through questionnaire forms. Such forms were randomly distributed among different target exporters at Giza, Ismaellia, Sharkia, Behirah and Alfayoum governorates. Questionnaire outputs indicated that the percent of the rejected export by importers due to high levels of pesticide residues reached 11.11 and 7.69% in green beans and strawberry respectively. The recommended rates of the used pesticides established by the Ministry of Agriculture and/or EU guidelines were followed by 86.67 and 69.23% of these vegetables growers, respectively. Questionnaire outputs indicated that the percent of exporters who were repeating the application of all or each pesticide during the same season of green beans and strawberry reached 48.89 and 42.31%, respectively. Furthermore, 15.56 and 7.69% of growers followed the recommended Pre Harvest interval (PHI) for each pesticide used in green beans and strawberry. On the other hand, no storage period was followed by 40 and 76.92% of the exporters for green beans and strawberry, respectively. Concerning the transportation conditions data showed that 55.56 and 88.46% of the exporters used cooling trucks with green beans and strawberry, respectively.

### INTRODUCTION

Strawberry and green beans crops are going to be among the most profitable vegetables in Egypt. The cultivated area is progressively increasing from year to year, reaching 6427 and 56782 fed-dan in 2005, respectively. The corresponding an-

nual total production during the same year reached 68137 and 227135 tons, with values of 32.59 and 10.1 millions L.E. for green beans and strawberry, respectively, Anonymous (2007).

Egyptian vegetables especially strawberry and green beans are widely marketed in Europe, particularly during winter with higher selling prices. This situation may correct the sizable imbalance in Egypt's trade with the European countries. These vegetables are highly susceptible to infestation by many different key pests that cause severe damage. Therefore, the chemical control represents the major method in this respect. Safety periods between the last application and time of harvest should be prescribed to assure that, at the time of marketing, the pesticide residues are below the Maximum Residue Limits (MRL's) according to the Codex Committee for Pesticide Residues. Many investigations were conducted in concern to residues of pesticides on and in strawberry and green bean crops, amongst are Alary, *et al* (1993); Stevens & Kilmer (1999); Akiyama, *et al* (2002); Nowacka (2003) and Angioni, *et al* (2004). Because of the problems related to the exceeding of pesticides residues, than MRL's, in some exported vegetables lots to EU countries, the present study aimed to clarify the current and real situation of pesticide applications in some selected registered farms for strawberries and green beans exportation through questionnaire analysis.

### MATERIALS AND METHODS

#### Questionnaire design form and data collection

A questionnaire was designed to collect the required current information related to the problems of the pesticide residues on some of the exported vegetable crops. Green beans and strawberry have been selected. Questionnaires were pre-

pared and distributed randomly among different target exporters at Giza (Kafr Gerza and Kafr Ammar), Ismaellia (Aboswaer and Kasaseen), Sharkia (Aboshalabi and Al Salheia al Gadida), Beherah (Kafr Eldawar and Sedi Ghazi) and Fayoum (Al nokrani). Each questionnaire consisted of 27 different questions (two types of questions; close and open) were proposed to achieve the following goals:

- 1- Calculate the percentage of the rejected lots because of the higher and illegal pesticides residues on green beans and strawberry.
- 2- Main pests attacking these vegetables.
- 3- Applied pest control practices.
- 4- Pesticide types, rates and numbers of applications against key pests of these crops.
- 5- Respect Pre Harvest Intervals (PHI) followed for each pesticide.
- 6- Post harvest storage and transportation conditions of green beans and strawberry.

## RESULTS AND DISCUSSION

### 1. Analysis of the exporter responses

The obtained information and the frequency of producer response on the investigated questionnaire items are tabulated in **Tables (1&2)** for green beans and strawberry, respectively. The main characteristics of the collected responses of the recipients in exportation farms could be discussed as follows:

#### 1.1. The percentages of the rejected lots by the importers

Data in **Tables (1&2)** showed that, the percent of the rejected lots reached 53.33 and 50% in green beans and strawberry, respectively. The percent of the rejection related to the pesticide residues reached 11.11 and 7.69%, respectively. However, 8.88 and 3.84 % of the rejected lots were due to combined pesticide residues and other quality properties of green beans and strawberry, respectively.

#### 1.2. Factors affecting the pesticide residues levels on the exported green beans and strawberry fruits

##### 1.2.1. Pesticide application rates

Data in **Tables (1&2)** indicated that the recommended rates of the used pesticides described by the Ministry of Agriculture of Egypt or EUREP-GAP guidelines were followed by the majority of

the examined exporters of green beans and strawberry, showing 86.67 and 69.23%, respectively. The application of the recommended rates in strawberry was less than those in green beans because no pesticides were used at all by 15.38% of the strawberry exporters. On the other hand, the percent of applying higher rates than the recommended ones in green beans and strawberry were 13.33 and 11.54%, respectively. In addition, no application rates less than those recommended were followed by the exporters in both crops.

##### 1.2.2. The number and type of pesticides used

Generally, the number of the used pesticides by the green beans exporters was more than those used by strawberry exporters, recording 27 and 16 pesticides, respectively. The percent of the insecticides used in green beans and strawberry reached 44.44 and 25% from the total pesticides used, respectively (**Tables 1&2**). Fungicides applications were 48.14 and 62.5 %, respectively, while acaricides usage representing 7.4 and 12.5%, respectively.

The percent of the exporters who were repeating all or each of used pesticides during the same season of green beans and strawberry reached 48.89 and 42.31%, respectively. In addition to 15.38% of the examined strawberry exporters basically, were not using pesticides in pest control programmes at their farms.

##### 1.2.3. The Pre Harvest Interval (PHI) on green beans and strawberry

Data in **Tables (1&2)** revealed that 15.56 and 7.69% of the exporters were following the recommended PHI for each pesticide used on green beans and strawberry respectively. However, 4.44 and 3.85% of the tested exporters did not follow any PHI value for safe consumption of treated green beans and strawberry. Furthermore, other different intervals; (recommended PHI+1 or 2 days), (from 1 to 6 days), (from 7 to 10 days) and (from 15 to 23 days) were followed by the exporters of green beans showing 6.67, 8.89, 28 and 17.78%, respectively. Also other different intervals; 3days, (7 or 10 days) and 14 days were followed by the exporters of strawberry, showing 11.54, 30.77 and 7.69%, respectively. Moreover, the percent of the exporters who have refused to answer the question relates to the PHI reached 17.78 and 23.08% on green beans and strawberry, respectively.

Table 1. Percent of green beans exporters responding to pest control factors

Target information	Response	Numbers	%
Accepted and rejected lots	Rejected	24	53.33
	Accepted	11	24.44
	No answer	10	22.22
Reasons of rejection	pesticides residues	5	11.11
	Others	15	33.33
	pesticides residues & others	4	8.88
	No answer	10	22.22
Key pests	Insects only	4	8.89
	Fungi only	4	8.89
	Red spider mite only	2	4.44
	Insects & Fungi	1	2.22
	Insects & Red spider mite	3	6.67
	Fungi & Red spider mite	21	46.67
	Insects & Fungi & Red spider mite	10	22.22
Pest control measure	Pesticides only	41	91.11
	Agriculture practices only	0	0
	Pesticides & Agriculture practices	4	8.88
Pesticides application rates	Recommended	39	86.67
	Low	0	0
	High	6	13.33
Types of pesticides used	Insecticides only	1	2.22
	Fungicides only	1	2.22
	Acaricides only	4	8.89
	Insecticides & fungicides	1	2.22
	Insecticides & acaricides	9	20
	Fungicides & acaricides	12	26.67
	Insecticides&fungicides &acaricides	9	20
	No pesticides used	0	0
	No answer	8	17.8
Repeated pesticides	Insecticides	3	6.67
	Fungicides	0	0
	Acaricides	5	11.11
	Insecticides & fungicides	1	2.22
	Insecticides & acaricides	10	22.22
	Fungicides & acaricides	3	6.67
	Insecticides&fungicides&acaricides	0	0
	No pesticides used	0	0
	No answer or sulfur only	14	31.11
No repeated pesticides	9	20	
(PHI) followed	Recommended	7	15.56
	Recommended PHI +1 or 2 days	3	6.67
	1 to 6 days	4	8.89
	7 to 10 days	13	28.90
	15 to 23 days	8	17.78
	No PHI	2	4.44
	No answer	8	17.78
Storage conditions	Room temperature	2	4.44
	Cold storage	23	51.11
	No storage	18	40
	No answer	2	4.44
Crop transportation conditions	No cooling	15	33.33
	Cooling	25	55.56
	No cooling and cooling	2	4.44
	No answer	3	6.67

Table 2. Percentages of strawberry exporters responding to post control factors

Target information	Response	Numbers	% ..
accepted and rejected lots	Rejected	13	50
	Accepted	12	46.15
	No answer	1	3.84
Reasons of rejection	pesticides residues	2	7.69
	Others	9	34.61
	pesticides residues & others	1	3.84
	No answer	2	7.69
key pests	Insects only	0	0
	Fungi only	5	19.23
	Red spider mite only	4	15.38
	Insects & Fungi	4	15.38
	Insects & Red spider mite	3	11.54
	Fungi & Red spider mite	9	34.62
	Insects & Fungi & Red spider mite	1	3.85
Pest control measure	Pesticides only	22	84.61
	Agriculture practices only	4	15.38
	Pesticides & Agriculture practices	0	0
Pesticides application rates	Recommended	18	69.23
	Low	0	0
	High	3	11.54
	No pesticides used	4	15.38
	No answer	1	3.85
Types of pesticides used	Insecticides only	1	3.85
	Fungicides only	1	3.85
	Acaricides only	4	15.83
	Insecticides & fungicides	3	11.54
	Insecticides & acaricides	4	15.83
	Fungicides & acaricides	7	26.92
	Insecticides&fungicides&acaricides	1	3.85
	No pesticides used	4	15.83
	No answer	1	3.85
Repeated pesticides	Insecticides	1	3.85
	Fungicides	0	0
	Acaricides	3	11.54
	Insecticides& fungicides	0	0
	Insecticides& acaricides	5	19.23
	Fungicides& acaricides	2	7.69
	Insecticides&fungicides&acaricides	0	0
	No pesticides used	4	15.38
	No answer or sulfur only repeated	2	7.69
No repeated pesticides	9	34.62	
(PHI) followed	Recommended PHI	2	7.69
	3days	3	11.54
	7 or 10 days	8	30.77
	Two weeks	2	7.69
	No pesticides used	4	15.38
	No PHI	1	3.85
	No answer	6	23.08
Storage conditions	Room temperature	1	3.84
	Cold storage	5	19.23
	No storage	20	76.92
	No answer	0	0
Crop transportation conditions	No cooling	3	11.54
	Cooling	23	88.46
	No cooling and cooling	0	0
	No answer	0	0

#### 1.2.4. The crop storage and transportation conditions

The storage and transportation conditions of the harvested green beans and strawberry were examined. The percent of the exporters who followed room temperature storage and cold storage conditions were 4.44, 3.84% and 51.11, 19.23% for green beans and strawberry, respectively. On the other hand, no storage period was followed by 40 and 76.92% of the exporters, respectively.

Concerning the transportation conditions, no cooling transportation was followed by 33.33 and 11.54% of the exporters of green beans and strawberry, respectively. However, 55.56 and 88.46% of exporters used cooling trucks in transportation of green beans and strawberry respectively. Furthermore, 4.44 and 0.00 of the exporters were using both types of transportation conditions (no cooling and cooling trucks) for green beans and strawberry respectively.

Statistical analysis by Chi-Square test of the exporter responses revealed that there was no correlation between the percent of the lots rejection of these vegetables and the pesticide residues levels. Also there was no correlation between pesticide residues levels and the applications rates followed by the exporters in green beans and strawberry. Finally, the statistical analysis of the obtained data clearly indicated that the majority of the examined exporters were following Good Agriculture Practices (GAP). Whereas, the percent of rejection reasons related to the pesticide residues were very low, i.e. 11.11 and 7.69% in green beans and strawberry, respectively.

In addition, 86.67 and 69.23% of the exporters of these vegetables were applying pesticides at the recommended rates.

#### REFERENCES

- Akiyama, Y.; N. Yoshioka and M. Tsuji (2002). Pesticide residues in agricultural products monitored in Hyogo Prefecture, Japan, FYs 1995-1999. *Journal of AOAC International*. 85(3): 692-703.
- Alary, J.; J.L. Benoit-Guyod; F.H. Nasfi; K. Masmoudi; S. Hedidar; F.De. Volder and A. Chebil (1993). Residues of pesticides in Tunisian vegetables. *Fresenius Environmental Bulletin*. 2 (5): 281-286.
- Angioni, A.; M. Schirra; V.L. Garau; M. Melis; C.I.G. Tuberoso and P. Cabras (2004). Residues of azoxystrobin, fenhexamid and pyrimethanil in strawberry following field treatments and the effect of domestic washing. *Food Additives and Contaminants*. 21(11): 1065-1070.
- Anonymous (2007). *Statistics Egyptian Ministry of Agriculture and Land Reclamation, Ministry of Agric., Cairo, Egypt.*
- Nowacka, A. (2003). Polish monitoring of pesticide residues in crops. *Zbornik predavanj in referatov 6-Slovenskega Posvetovanje o-Varstvu Rastlin, Zrece, Slovenije*, 34-41.
- Stevens, T.J. and R.L. Kilmer (1999). Pesticide residues on fresh tomatoes and strawberries. *Choices The Magazine of Food, Farm and Resources Issues* 1: 44-45.



## الممارسات المتعلقة بالمبيدات في بعض المزارع التصديرية المصرية

[٢٢]

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### الملخص العربي

على الجانب الآخر وصلت نسبة تكرار كل أو بعض المبيدات المستخدمة في نفس الموسم إلى ٤٨,٨٩ و ٤٢,٣١ % لكل من الفاصوليا الخضراء والفراولة على الترتيب. كذلك أتضح أن ١٥,٥٦ و ٧,٦٩ % من عدد المصدرين في المجموعة المختبرة يتبعون فترة الأمان الموصى بها للمبيدات المستخدمة في الفاصوليا الخضراء والفراولة على الترتيب.

بلغت نسبة المصدرين الذين لا يقومون بتخزين المحصول على الإطلاق إلى ٤٠ و ٧٦,٩٢ % في الفاصوليا الخضراء والفراولة على الترتيب. أما بخصوص ظروف النقل فقد وجد أن ٥٥,٥٦ و ٨٨,٤٦ % من مصدري الفاصوليا الخضراء والفراولة على الترتيب يستخدمون شاحنات مبردة في نقل المحصول.

أجرى هذا البحث بغرض دراسة الممارسات المتعلقة بالمبيدات والمتبعة بالمزارع التصديرية لكل من محصول الفاصوليا الخضراء والفراولة. تم جمع المعلومات المطلوبة من خلال استمارات استبيان تم توزيعها عشوائيا بين المصدرين في محافظات الجيزة، الإسماعيلية، الشرقية، البحيرة والفيوم. أوضحت الإجابات المتحصل عليها من المصدرين أن نسب اللوطات المرفوضة من المستوردين لأسباب متعلقة بمتبقيات المبيدات كانت ١١,١١ و ٧,٦٩ % في الفاصوليا الخضراء والفراولة على الترتيب.

أظهرت المعلومات المتحصل عليها أن نسبة المصدرين الذين يستخدمون المبيدات بالمعدلات الموصى بها من قبل وزارة الزراعة المصرية أو توصيات الاتحاد الأوروبي قد بلغت ٨٦,٦٧ و ٦٩,٢٣ % لكل من الفاصوليا الخضراء والفراولة على الترتيب.