Analysis of E.U. Rapid Alert System (RASFF) Notifications for pesticides residues in Exported Egypt. Fruits and vegetables Products for 2020–2021

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Abstract: One of the most stringent pesticide regulations is found in the European Union (EU). Regulation (EC) No 396/2005 establishes harmonized maximum residue limits for pesticide residues in food and feed in the European Union as one part of the regulatory framework to guarantee high levels of consumer safety. Pesticide residues that exceed a particular or default maximum limit may occasionally result in the issuing of a warning in the Rapid Alert System for Food and Feed (RASFF). No thorough examination of alerts on pesticide residues over a longer length of time is yet available, despite being a significant food concern in the European Union. As a result, a review of notifications about pesticide residues in food made to the RASFF between 2020 and 2021 was conducted.

A total of 5211 notifications, including 15.8% alert notifications, 36.5% information notifications and 47.8% border rejections, were analyzed with a focus on concerned products, causative pesticides and involved countries of origin. The notifications often concerned vegetables (53.8%) and fruits, tree nuts (24.2%) and reported a total of 7413 residues involving 251 pesticides in products mainly originating from third countries (82.4%), with multiple residues in 22.0% of notifications.

Overall, it appears that the regulatory framework and particular risk management strategies are connected to the notifications on pesticide residues in food. The problem of unapproved pesticide residues in products from EU/EFTA countries and of products not available at the time of publication in the RASFF may necessitate further measures for food safety in the European single market, even though import controls and border rejections appear to be an effective method of safeguarding European consumers from non-compliant and potentially harmful products from third countries.

Keywords: Pesticide residues; Egyptian exports; vegetables; fruits; ASFF.https://webgate.ec.europa.eu/rasff-window/screen/search

1.Introduction:

Fruits and vegetables are crucial parts of a healthy diet for people since they supply vital nutrients needed for the majority of bodily processes **(Attia 2016).** Given their promising potential to increase the nation's foreign currency revenues, agricultural crop exports are crucial to economic growth. The agricultural export crops that supply Egypt with the foreign currency needed to close the trade and agricultural balance deficit are followed by vegetables and fruits. According to data from the General Organization for Export and Import Control in Egypt's Foreign Trade Data Warehouse, Egypt revealed statistics on its yearly shipments of fruits and vegetables to 27 nations in the European Union from 2015 to 2021, totaling (133.428,133.622, 161.134, 164.715, 210.457,245.143 and 290.171tons), respectively **(GOEIC 2022).**

The Rapid Alert System for Food and Feed (RASFF) was established to give food and feed control authorities a useful tool for exchanging information on the actions taken in response to major hazards related to food or feed that were identified. This information sharing enables member nations to respond to health hazards brought on by food or feed more quickly and cooperatively. Its simplicity of structure and clear identification of communication points within the Commission (EFSA and EFTA) and at the national level in member nations, where information is exchanged in a systematic and organized manner using templates, ensures its efficacy. (**RASFF 2016).** Fresh vegetable and fruits exports from Egypt have suffered as a result of the European Union's refusal to recognize the boundaries in recent years. Due to transgressions of the EU quick alert system and EU maximum residue limits (MRLs) for pesticides. Some occurrences of freshly imported veggies from Egypt that were rejected were recorded by the Food and Feed Authority (RASFF) between 2019 and 2015. To

tighten controls, the European Union began allowing Egyptian exports of vegetables like pepper (EC No. 1021/2014). **(Abd-El Rahman, 2020).**

Products for protecting plants PPP, or pesticides as they are more generally known, are routinely employed throughout planting and storage phases to boost production, fend off pests, enhance quality, and lengthen the life of food crops **(Fernndez-Alba and Garca-Reyes 2008).** Pesticide residue is a deciding and influencing element when it comes to importing nations, particularly those in the European Union. Vegetable plants can be severely harmed by a variety of insect infestations. Therefore, the primary strategy in this regard is chemical control; as a result, pesticides have significantly increased agricultural harvests in both quantity and quality. Small levels of such pesticides may be discovered on or in treated crops during harvest even when administered as directed **(Ministry of Agriculture 2021). (Abd-El Rahman 2016).**

Therefore, the purpose of this study, which is based on the RASFF database, is to use statistical analysis to ascertain the level of pesticide residues in Egyptian vegetable and fruits products exported during the period 2020–2021, specifically by the most significant active ingredients of pesticides that pose issues for Egyptian exports, particularly vegetables. It is investigated where these active compounds stand in relation to their registration in Egypt. The primary candidate categories for additional risk categorization, notification categorization, notification reason, action taking, and risk determination.

The last recommendation is to take action to lower the levels of those vehicles in light of the findings, which point to suitable options to lessen or restrict the issues with pesticide residues.

2. Material and methods:

2.1. Data collection

The information for this study was located through a search in the EU Rapid Alert System for Food and Feed database pollutants includes biological pollutants like fungus, bacteria, viruses, and aflatoxins as well as chemical pollutants like pesticide residues and heavy metals. **(Abd-El Rahman 2020).**

Data in (Table.1 and Fig.2) show that, the RASFF's database. 71 samples of representing 19 vegetables and 52 fruits received from Egypt were studied and rejected by the RASFF during the period from 2020to 2021. The highest percentage frequencies of samples under study in year 2020 and 2021 recorded16.90% and83.10 %, respectively, (https://webgate.ec.europa.eu/rasffwindow/portal/?event=searchForm&cleanSearch=1). RASFF notifications for Egyptian fruits and vegetables supplied to the European Union were searched for between January 1, 2020, and December 31, 20121. Fruits and vegetables product category, with "Origin and Country Egypt" and "Hazard pesticide residues Country" marked. **(Fig.1) (Luth*er et al.,* 2019). 2.2. Statistical analysis.**

Microsoft Excel 2010 (Microsoft Corp., Redmond, USA) has been used to analyses a subsequent database to create descriptive statistics, including frequency distributions (for the crops being studied as well as pesticide residues). The date (by year), risk category, notification categorization, grounds of notification, measures performed, and risk determination were the primary potential categories for further interpretation of the data on pesticide residues. **(Luth*er al.* 2019)** reported on the location of the active ingredients in pesticide residues in terms of registration in the Egyptian database as well as the categorization of those active ingredients in terms of usage and toxicity.

3. Results and discussion

One of the institutions that decide the direction of exports to the European Union in terms of product quality is the RASFF. It is important to assess pollution levels and the degree of support or opposition for these items. In addition to other pollutants, the diversity of these samples plays an important role in these issues. **3.1. The violated Egyptian exports of samples for the period 2020-2021, based on the RASFF database.**

3.1.1. Evaluation of vegetable commodities during the period 2020-2021:

Data in (Table 1 and Fig.3) show that, the RASFF's database during the year 2020, 8 Egyptian exports of vegetable samples exceeded the maximum limits, and their percentage frequencies was 11.26 % of all samples in the RASFF's database during the period 2020-2021. Representing five vegetable commodities (artichokes, eggplant, spring onions, grape leaves and pickled vine leaves). Grape leaves commodity samples the most contaminated in the studied samples followed eggplant, spring onions and pickled vine leaves, their percentage frequencies were 50%,12.5%,12.5%,12.5% and 12.5%, respectively.

During the year 2021, 11 Egyptian exports of vegetable samples exceeding the maximum limits representing six vegetable commodities (Frozen strawberries, pickled vine leaves, grape leaves, peppers, green chilies and fresh chilies). Grape leaves

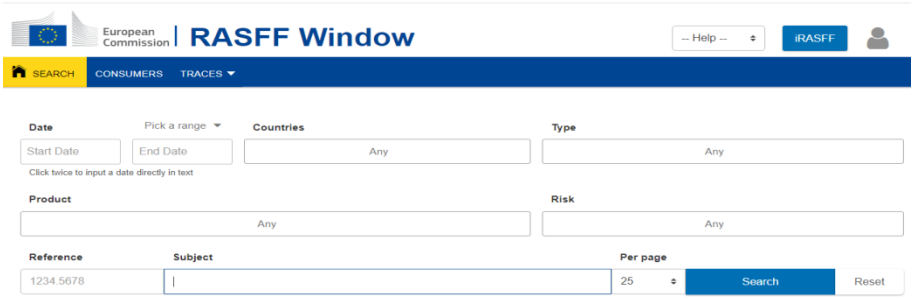

Fig. 1: Website of the European Union RASFF Portal

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commodity samples the most contaminated in the studied samples followed by (Frozen strawberries, pickled vine leaves and peppers, their percentage frequencies were 27.27 %,18.18%,18.18%, and 18.18%, respectively. While the lowest commodities green chilies and fresh chilies were their percentage frequencies 9.09 %.

3.1.2. Evaluation of fruits commodities during the period 2020-2021:

Data in (Table 1 and Fig. 3) indicate that seven Egyptian fruit export samples in the RASFF database for the year 2020 exceeded the maximum limits, and their percentage frequencies were 88.73 % of all samples in the RASFF database during the 2020–2021 timeframe. Representing three fruits commodities (dates, red grapes and oranges)., their percentage frequencies were 33.33%,33.33%, and 33.33%, respectively.

During the year 2021, 48 Egyptian exports of fruits samples exceeding the maximum limits representing seven vegetable commodities (frozen %, black %, and mandarins). Orange commodity samples the most contaminated in the studied samples followed by pomegranates, their percentage frequencies were 85.41 %, and 4.16%, respectively. While the lowest commodities (frozen apricot, sliced black apricot, sliced and mandarins) were their percentage frequencies 2.08 %.

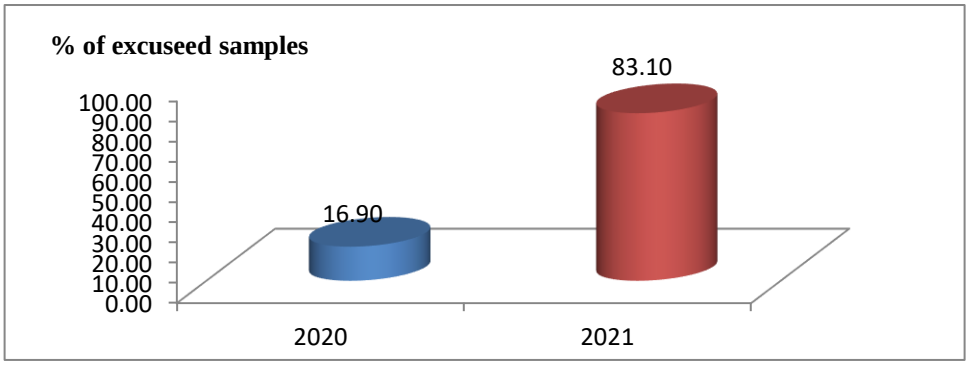


Fig. 2: Percentage of excused samples during the period 2020-2021

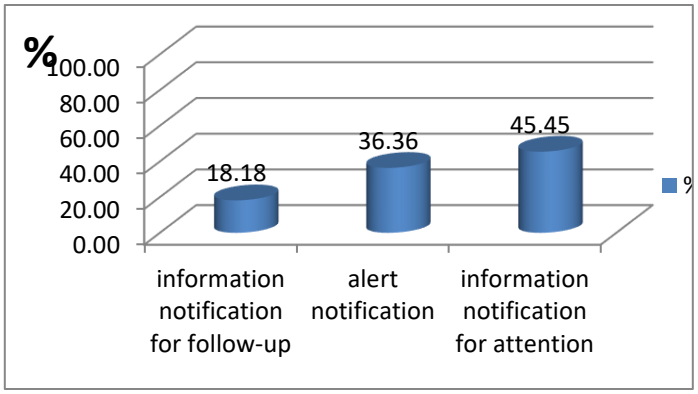


Fig. 3: Percentage of notification type of rejected samples in 2020

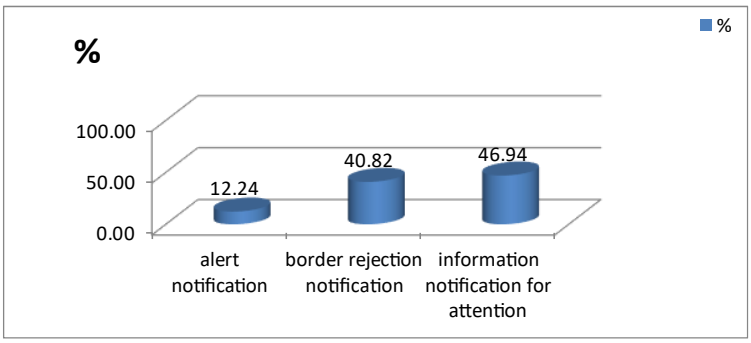


Fig.4: Percentage of notification type of rejected samples in 2021

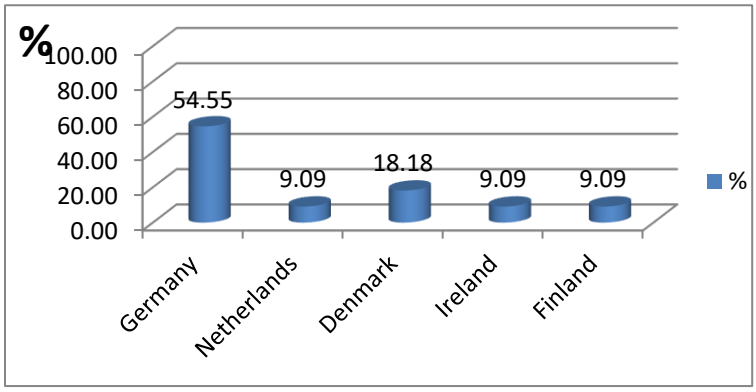
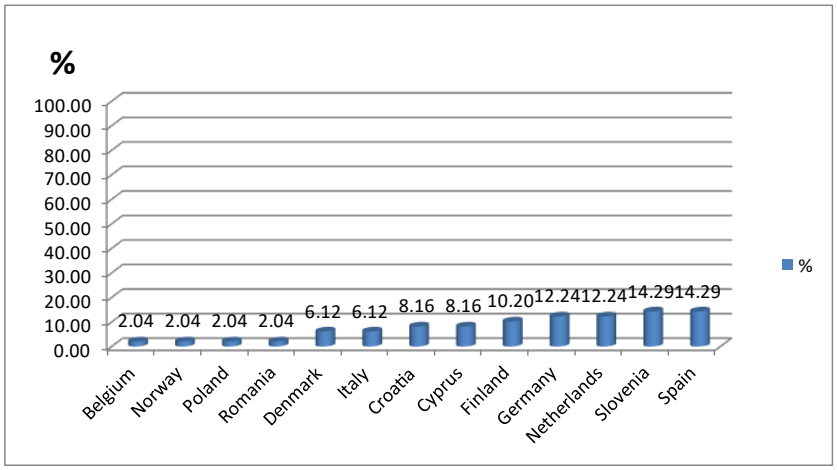


Fig. 5: Percent of rejected samples in EU countries in 2020 Fig.



6: Percent of rejected samples in EU countries in 2021

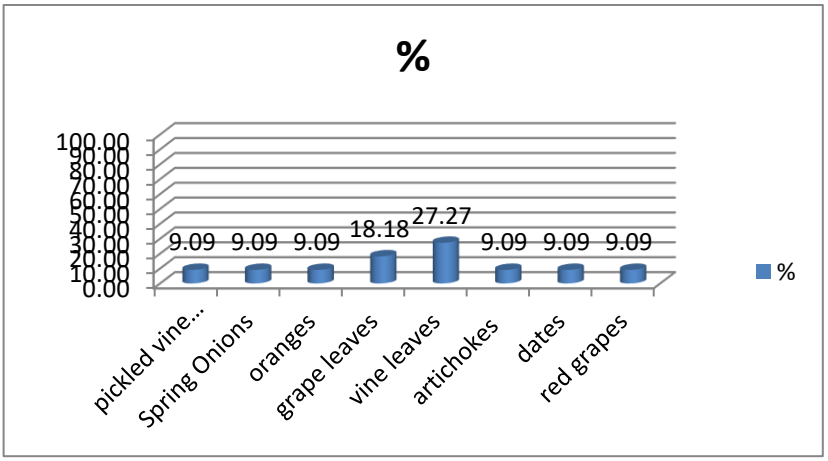


Fig.7: Percentage of each vegetable and fruit contaminated with pesticide residues in 2020

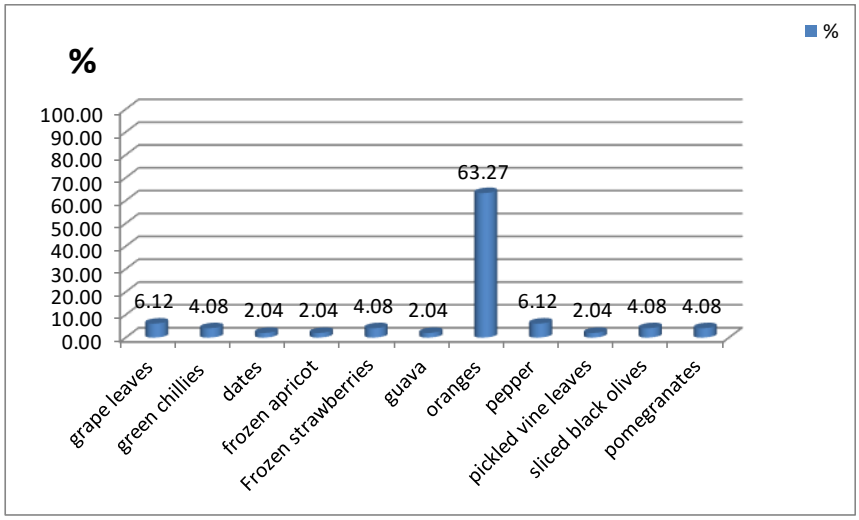


Fig.8: Percentage of each vegetable and fruit contaminated with pesticide residues in 2021

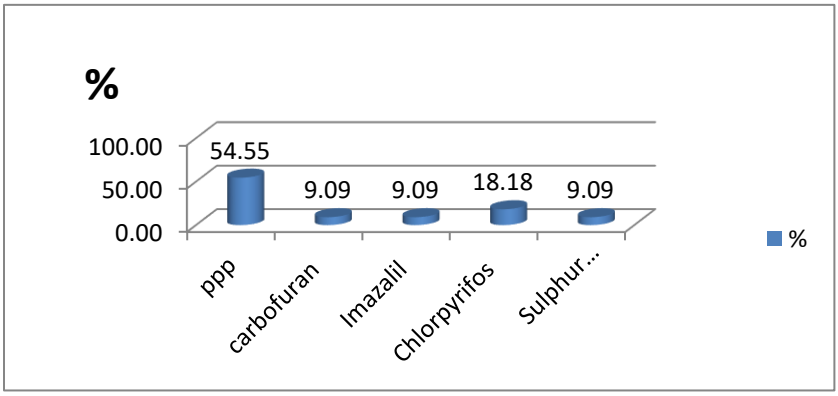


Fig.9: Frequency percentages of most detected pesticide residues in Egyptian exports of vegetable and fruit samples in 2020

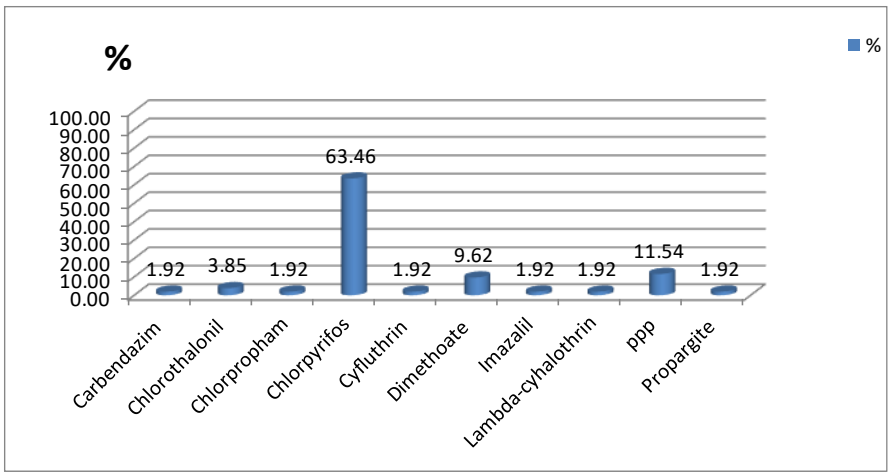


Fig.10: Frequency percentages of most detected pesticide residues in Egyptian exports of vegetable and fruit samples in 2021

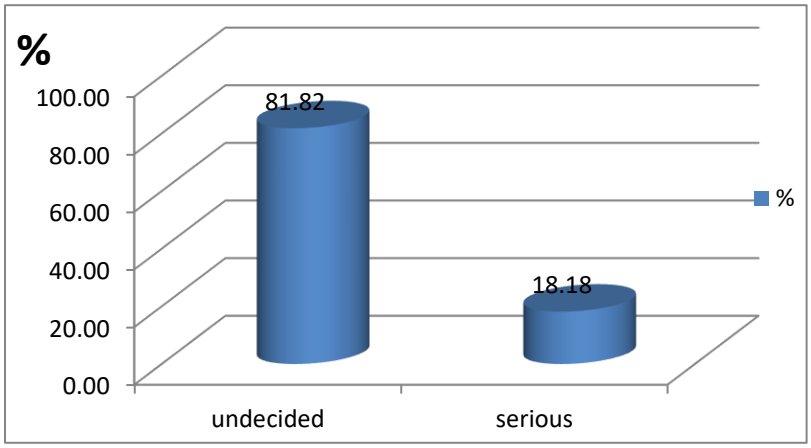


Fig. 11: Percent of rejected samples in 2020

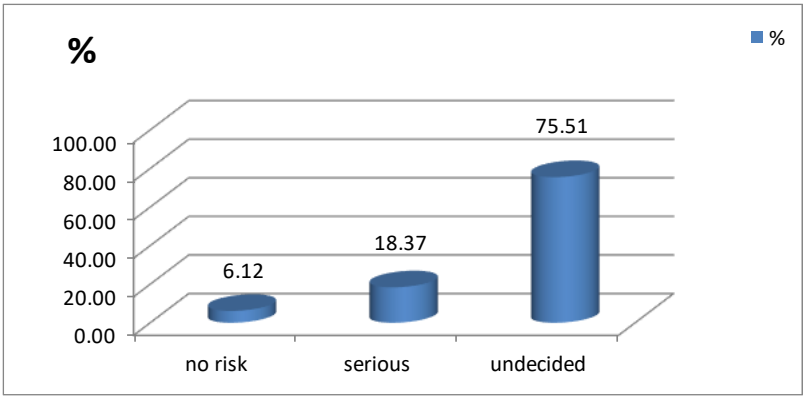


Fig. 12: Percent of rejected samples in 2021

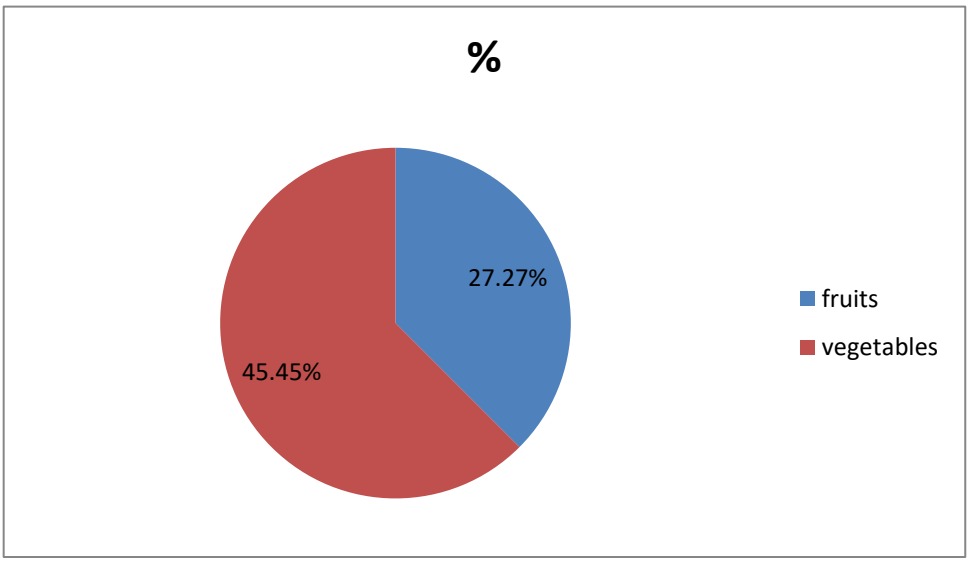


Fig. 13: Percent of vegetables and fruits in rejected samples in 2020

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تحليل الاتحاد الأوروبي.وإخطارات نظام الإنذار السريع (RASFF) لمخلفات المبيدات في منتجات الفواكه والخضروات التى تصدرها. مصر لعامى 2020-2021

طارق عبد العليم عبد الرحمن و أيمن السيد محفوظ

المعمل المركزى للمبيدات بمركزالبحوث الزراعية ، شارع نادى الصيد بالدقى ، الجيزة ، مصر

الملخص العربى:

: توجد واحدة من أكثر لوائح مبيدات الآفات صرامة في الاتحاد الأوروبي (EU). تحدد اللائحة (EC) رقم 2005/396 الحدود القصوى المنسقة لمخلفات مبيدات الآفات في الأغذية والأعلاف في الاتحاد الأوروبي كجزء من الإطار التنظيمي لضمان مستويات عالية من سلامة المستهلك. قد تؤدي مخلفات المبيدات التي تتجاوز حدًا أقصى معينًا أو افتراضيًا في بعض الأحيان إلى إصدار تحذير في نظام الإنذار السريع للأغذية والأعلاف (RASFF). لا يوجد فحص شامل للتنبيهات الخاصة بمخلفات المبيدات الحشرية على مدى فترة زمنية أطول ، على الرغم من كونها مصدر قلق كبير للغذاء في الاتحاد الأوروبي. ونتيجة لذلك ، تم إجراء مراجعة للإخطارات الخاصة بمخلفات المبيدات في الأغذية المقدمة إلى RASFF بين عامي 2020 و 2021.

تم تحليل ما مجموعه 5211 إخطارًا ، بما في ذلك 15.8٪ إخطارات التنبيه و 36.5٪ إخطارات المعلومات و 47.8٪ من حالات الرفض على الحدود ، مع التركيز على المنتجات المعنية ومبيدات الآفات المسببة ودول المنشأ المعنية. غالبًا ما كانت الإخطارات تتعلق بالخضروات (53.8٪) والفواكه وجوز الأشجار (24.2٪) وأبلغت عن إجمالي 7413 بقايا تشتمل على 251 مبيدًا في منتجات مصدرها أساسًا بلدان ثالثة (82.4٪) ، مع وجود مخلفات متعددة في 22.0٪ من الإخطارات.

بشكل عام ، يبدو أن الإطار التنظيمي واستراتيجيات إدارة المخاطر الخاصة مرتبطة بالإخطارات الخاصة بمخلفات المبيدات في الأغذية. قد تتطلب مشكلة بقايا مبيدات الآفات غير المعتمدة في المنتجات من دول الاتحاد الأوروبي / الرابطة الأوروبية للتجارة الحرة والمنتجات غير المتوفرة وقت النشر في RASFF مزيدًا من التدابير لسلامة الأغذية في السوق الأوروبية الموحدة ، على الرغم من أن ضوابط الاستيراد ورفض الحدود يبدو أنهما يمثلان مشكلة. طريقة فعالة لحماية المستهلكين الأوروبيين من المنتجات غير المتوافقة والتي يحتمل أن تكون ضارة من دول ثالثة.