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Measuring of chemical pesticides remnants on agricultural products

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ABSTRACT

Chemical pesticides, generally, are used for preserving agricultural crops from damage of insects. This kind of Toxicities considered as main factors of environmental contaminations, and non – observance of remaining period of toxicity remnants on agricultural crops may be disturbed consumer’s health vastly. Pars Abad City as a part of Moghan plain in Ardabil province on west –north of Iran considered as a main part of agricultural poles of country. This research was done to determine the amount of pesticide residues in tomato and cucumber crops produced in Pars Abad region in the summer of 2009. At harvest time in the August 36 samples of cucumbers and tomatoes from different farms were sampled randomly and weekly basis. Samples was analyzed after transporting to laboratory by using machine of toxicity residues within Optizer Mini –Sp. Results show that toxicity residues amount from determined crops are zero in all farms. This shows that observing currency period (spraying poison and consuming crops) and allowed toxicity rate will be the same in each hectare. Results show that by managing toxicity consuming in respect of time and amount by farmers, can be provided food security of agricultural products by way of agricultural toxicity residues rate.

Key words: Food security, chemical toxicity residue, cucumber, tomato, Pars Abad, Iran

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INTRODUCTION

Studies show that producing cucumber and tomato products came to toxicity residue in upper levels than adduced by European Union and FAO. So, recognizing poisons within water, food material and environment have been considered as a main risks for human health [5].

Iran is such a countries that is increased it is share of toxicity consuming in different kinds published statistics in case of consuming different poisons in Iran at 2009 year shows that total consumption toxicity by 44 percent, 37 percent, 18 percent and 2 percent related to herbicide, insecticide, fungicide and tickicide respectively [16]. Population increases as well as increasing consumption of food material especially agricultural products. Farmers decided to increase their products and used insecticides for preventing plant insects. Creating powerful insects races to chemical insecticides, removing suitable insects and natural enemy of insects, generating new pests, influencing other creatures and these who one in the direct contact and reducing environment variable is the main difficulties of environment may be due to depending common agricultural regulation to chemical pesticides [16, 17]. Most agricultural products that is exposed by pesticides and presented to consumption market after short – time spraying poison, it is consist of some pesticides residue using more of them in producing agricultural crops cause to take place phenomenon called pesticides residue that is considered as a main risks to human being health and environmental pollution.

Therefore, consumers we foods directly that is consist of more density of pesticides [6]. So, farms, trees, vegetables and fruits' exposed to a risk of pests and disease and different weeds frequently that is unavailable using different chemical pesticides within commonly agriculture regulation [7, 8]. At the present remnant insecticides have been known as a main infection of environment in the world [1]. Meanwhile phosphorus insecticides generally used for controlling ware house and products pests and also fighting against cities pests. Since it is residues will be controllable within food, animal and agricultural products [3]. Frequent spraying poison, using more of pesticides lack of attention to currency period of poisons, with drawing early-time of poisoned products and presenting it to market, consuming that products in low- period after spreying poison resulted in more residues of poisons within consumed food material specially fruits and fresh vegetables to human being that is considered a global concern to consumers health [4]. Several studies have been done in field of water pollution environment, garden and Vegetables products in case of chemical poisons such as Malathion, Diazinon, Linden and Tvksafn [10, 11, 14]. WHO has presented MRLS (Maximum residue limits) as a criterion in cause of pesticides residue. That is expressed poison density according to mg/kg within fruit weight and fresh vegetables and if they exceeded to the mentioned measure, they should not consumed by human being [6, 9]. For example, Benomyl pesticide within group of systematic fungicides that used in different stages of fruits and vegetable planting. Fungicide have 14 days currency period and become of consuming more of fungicide and non –observance of it is currency period 14 days, and presenting it markets. Products consist of different levels of fungicide residue. Consuming food material within fungicide can resulted in chronic and acute disease, blood and nervousness disease, cancer and disturbance on internal glands and fertilization. So, knowing farmers in case of person's characteristics and observing their currency period in time of presenting farming products to consuming market.

Considered important, but controlling pesticide application within presenting simple and impact techniques for removing pesticides from fruits and vegetables designed as a sufficient security guidance for consumer health [15]. Evidences show that tomato and cucumber products specially tomato in food regimen of social people considered as an important factor and in respect of non – observance at currency period in poisons, their residues can be entered to food chain at society individuals of consumers by way of consuming products. Many results of the research shows that variety , density of consumed poison, keeping time of fruit after picking and also their mutual effects after picking will be impact poison residues measure with 99 percent possibility [2].

Parsabad township is a northeast city of Ardabil province that is placed on north-west of Iran and it is one of agricultural poles. In the so called area, in the growing period of products for fighting against different products pests, farmers used chemical poisons on tomato and cucumber products so , in case of producing more of tomato and cucumber over the area and food security keeping and environment health and consumers , reviewing of residues poisons considered generated.

MATERIALS AND METHODS

Method

This study is completely random design. In order to obtaining measure of poisons residue within produced cucumber and tomato samples on Parsabad area, sampling was done in summer season of 2009. Sampling has been alone at August month as weekly. 36 samples were taken at three stages of the twelve farms. Selected farms spaced from each other about 3-4 kilometers over the farms. Spraying in the fields of agricultural products was done during the growth period. The sampling time was symmetrical to time of product harvesting. At each sampling time, number of samples of tomatoes and cucumbers from each farm was two.

After transferring the samples to the laboratory using measurements of pesticide residues were analyzed by set with model of Optizen Mini-SP.

The Optizen Mini-SP set are consist of two distinct set such on temperature controller and Optizen Mini-SP set. For measuring poison by way of the set , available poison of sample recognized by Optizen Mini-SP set after extraction with solution in effect of reaction with available enzyme in strip (over temperature controller set). For preparing each of samples, two samples of fruits cleaned and washed with distilled water. And then they are kept in nylon packets and refrigerator in 3-4 degree centigrade. For measuring fruits poisons residue, about 1 gram of each sample measured in scale and transferred to cleaned test tube. For analyzing samples in state of solution from sector of number 1 that is called NBS(N-Bromosuccinimide)that is an oxidant factor and also from sector of number 2 that is called LAS (L-Ascorbic Acid)is a neutralized factor , are used. From sector of number 1 and 2 samples about 1 gram transferred to 100 Milliliters capacitor and indisposed.



Generally, following stages were done for extraction of poisons.

1. About (1 gram) of tomato and cucumber poured separately in to a testing tubes.
2. In order to extracting available poison within samples, about (1 m/l) Methanol added to each tube and allowed to disposing about 2 minutes.
3. 100 micro liter solution of NBS added to each of tubes and allowed to disposing about 3 minutes.
4. 100 micro liter solution of LAS added to each of tubes and again it is allowed to dispose about 2 minutes separately.
5. Extracted poison solutions are powered in to other testing tubes.
6. Then four another testing tubes cleaned and to each one added about (1M/g) phosphate buffer.
7. Two sample of them selected as a proof and to the other add about 100 micro liter extracted solutions.
8. Turn on temperature controller set and set it on cooling mode. Then four strip settled on temperature controller (two proof and two sample) in the white section add 55 micro liter proof solution on two sample and 55 micro liter of extracted sample over another two sample then , the set is placed on heating state.
9. After 6 minute strip covered with a red cover
10. After three minute open the caver and placed it on cooling mode about one minute.

In order to measuring poisons residue by using mini-sp set, final stages followed under stages:

Turn on Optizen Mini-SP and placed on measurement mode. At the first proofs entered to the set and pressure enter button. Then data are stared and documented after pressuring that button

RESULTS AND DISCUSSION

Result show that poison residue rate cucumber and tomato sampling of Parsabad township in 2009 year, it is settled on zero limit in different stations (table 1). This shows inspection of agricultural expert on amount and kind of consumed poisons and farmer's observance in case of applying consumed poisons rate and poisoning period and currency period there fare, the amount of available poison residue within cucumber and tomato and Parsabad township were in limit of FAO/WHO organizations for human being health.

Compliance period, declining to reduce pesticide residues in each toxin is dependent on the type of pesticide. For example, Diazinon poison declined during three week according to produced co. In another word, it must takes about 21 days from last poisoning to harvesting products [12]. Result of studies shows that toxin residue within farm products depend on different factors of applied management over farms. So, if it is exceeded from advised limit, it must considered more time for analyzing poison till reduce it is poison residue sufficiently [12].

So, by considering result , of research, it is recognized that science management of from experts over studying area will be important for increasing farmers knowing in case of reducing poison residue within cucumber and tomato products in time and amount of consuming.

Table 1. The results of measurement commonly used pesticide residues in cucumber and tomato crops produced in Pars-Abad in 2009

Sampling date	Chemical pesticides				
	Svyn	Larvyn	Dyldryn	Mankvzb	Benomyl
First week	ND	ND	ND	ND	ND
Second week	ND	ND	ND	ND	ND
Third week	ND	ND	ND	ND	ND
Forth week	ND	ND	ND	ND	ND
Fifth week	ND	ND	ND	ND	ND
Sixth week	ND	ND	ND	ND	ND

ND: Non Detective

CONCLUSION

In order to obtain poison residue rate on produced tomato and cucumber samples user Parsabad township. Samplings were done weekly and accidentally over different farms in summer and harvesting time in 2009. Results show that poison residue on obtained products were in zero level in all stations this shows observing currency period (poisoning time and consuming products) and allowed poison amount in each hectare.

Another researchers in case of remained density of pesticides in order to reducing posions said that the best time for poisoned products is in the currency period. Really by considering half-time of pesticide poisons and breaking it in biology environment (for example cucumber and tomato) if the keeping time increase , the disturbance due to poison decreases ,and we can design it as a hygienic recommendation in human being healthy [13] so , the result of research indicate observing poison currency period for sending it to market. This study show that managing poison consumption in respect of time and amount by farmers may provide food security product of farms in way of farming poison residue .

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