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Agrochemicals and horticulturists: the invisible risks inserted in food produced in Natuba – Vitoria de Santo Antão/PE

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ABSTRACT

The indiscriminate use and contamination by pesticides are subjects of research that has attracted attention in view of its consequences for human health and the risks of environmental degradation. The study site was the Community of Naturaliste, in the municipality of Vitoria de Santo Antao - PE, one of the largest producers of leafy vegetables state. The objective of this study is to analyze research on the use of pesticides in vegetable production in this community, pointing out the main risks generated during this production chain, from its deployment to consumption. As methodological procedure, the literature and documentary studies of Agricultural Production Process in Naturaliste has been used. The methodologies used in the research material were qualitative and quantitative analysis through questionnaires; Lifting primary and secondary indicators; collection of soil samples, water, some vegetables in the field and blood collections in farmers. The main results show the possibility of various risks of environmental pollution and harmful to human health, not favoring the quality of food consumed by the analyzed production chain and other risks inherent in the production process. It follows that many production practices should be replaced with agroecological models, seeking harmony between the need for food production and the availability of natural resources, with emphasis on the social, cultural, environmental and ethical factors.

Keywords: agrochemicals, consumer health, food safety

INTRODUCTION

In the twentieth century, the period of the Green Revolution, marked by intense agricultural development around the world, fixing in the market using various chemical and physical resources for production control. Associated with this change in

production is thus changing the profile of the consumer over time becoming increasingly critical and demanding (BEZERRA, 2016).

The intensive use of pesticides is associated with health problems of the population, both consumers and workers who deal directly with the products, in addition to food contamination and environmental degradation. It appears that human and environmental exposure to these products grows in importance with the increase in sales and consumption (IBGE, 2010).

Many foods are consumed without the harmful risks are perceived in their production chain.

Allied to these risks, are consumers seeking foods that lend themselves to food security as even more important item that the amount to be paid for this product. Request food quality and that in its production model include the preservation of the environment.

The city of Vitoria de Santo Antao is located in the state of Pernambuco and is considered one of the largest production centers of leafy vegetables North / Northeast.

In this region farm, the natural resources are in high pollution levels, thus causing contamination in soil, water, greenery, on farmers and consumers, being characterized by the abusive use of inputs, particularly fertilizers and pesticides, with damaging consequences for the quality of food and the environment.

Considering the growing demand for healthier foods and need to maintain food security, should emphasize the quality of food produced and the conservation of natural ecosystems, ensuring accessible and the population with quality food.

Thus, the aim of this study was to analyze documentary data about the use of pesticides in vegetable production in the Community of Naturaliste, located in Vitoria de Santo Antao - PE, pointing out the main invisible risks this production chain, its implementation to final costumer.

REVIEW

According to the authors searched by the literature, the studies were conducted at the Agricultural Community of Naturaliste, located in the city of Vitoria de Santo Antao (Figure 1), the Zona da Mata of Pernambuco, where the climate is tropical. According to the 2010 Census conducted by IBGE, the city population is estimated at 129,974 inhabitants. That community is well known in the region as a producer of vegetables, and supplies the main urban centers in the regions.

Natuba (Figure 2) is concentrated in small north areas in Vitoria de Santo Antao, occupying about 2.8% of the basin Tapacura and its population is estimated at 994 inhabitants, representing approximately 7% of the rural population of the municipality.

Figure 1 – Vitoria de Santo Antao City, Pernambuco. Source: IBGE, 2010.

Figure 2 – Community of Natuba. Source: Ribeiro, 2011.

As methodological procedure, we used the literature and documentary studies of Agricultural Production Process searched in Naturaliste, Vitoria de Santo Antao - PE and later data analysis.

The methodologies applied in the material studied were diverse, ranging from qualitative and quantitative analysis, through the formulation and implementation of semi-structured questionnaires for profile identification; Lifting primary and secondary indicators and to identify potential risk factors; collection of soil samples, water and some vegetables in the field to investigate the presence and quantity of pesticide and finally, blood collections in farmers to assess intoxication levels. Such blood tests are defined by decreasing the action of certain enzymes, which are possible indicators of acute and chronic pesticide poisoning, specifically by organophosphates and carbamates in the blood of farmers.

1. Pesticides

Pesticides are defined by Law No. 7.802 / 1989 in its Article 2 as:

> "a) the products and agents of physical, chemical or biological, intended for use in the sectors of production, storage and processing of agricultural products, in the pastures, in the protection of forests, native or deployed, and ecosystems and also urban, water and industrial environments and intended to change the composition of flora and fauna in order to preserve them from harmful action of living beings considered harmful; b) substances and products used as defoliants, desiccants, stimulants and growth inhibitors. "".

According OLIVEIRA-SON (2013), pesticides can be subdivided into insecticides, herbicides, fungicides, acaricides, rodenticides, molluscicides and the like, not all of which have lethal effect or biocidal for that magnitude of this group of chemicals it is one of the most studied, both from a toxicological point of view of the environment.

According to Carneiro *et al.* (2014), the use of pesticides in Brazil has brought serious consequences, both for the environment and for the health of populations such as worker, especially the peasants and their families.

These consequences are most often conditioned by context and chemical mode of production, the labor relations, the toxicity of the products used as contaminated pesticides and micronutrients, the precariousness of health surveillance mechanisms by improper use or lack of collective and personal protective equipment (ABRASCO, 2015).

According to the author, there are also many cases of environmental contamination resulting from the irresponsibility of manufacturers and formulators of pesticides, as well as agribusiness, which is great user poisons.

The intense and disorderly process of land use associated with inadequate practices in an attempt to solve phytosanitary problems in agricultural production, the use of excessive and indiscriminate way of pesticides has caused contamination in the environment, harming the health of rural workers and consumers of these foods (NASCIMENTO, 2013).

The toxicity is an inherent property that every substance has produced harmful effects to a particular exposed organism over a period of time, certain doses or concentrations (Oliveira-Filho and SISINNO, 2013). Also according to the author, the toxicity of the substances is determined with the aid of laboratory tests where adverse effects are observed, including, often, mortality.

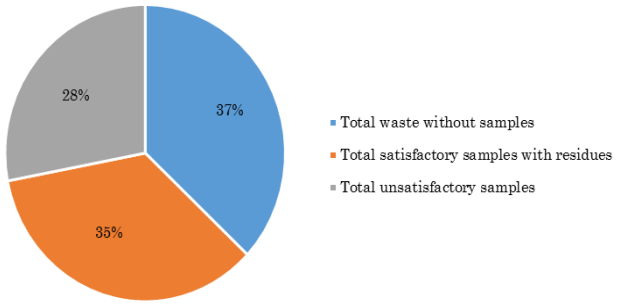
However, new cleaner technologies, such as use of products based on microorganisms, insect pheromones and organic agriculture has been greatly stimulated, with much more simplified requirements than those existing for conventional pesticides (OLIVEIRA-FILHO, 2013).

2. Food security, nutrition and health

The Brazilian agricultural production process is increasingly dependent on pesticides and chemical fertilizers. One third of the food consumed daily by Brazilians is contaminated by pesticides, according to analysis of samples collected in all 26 states of Brazil, conducted by the Pesticide Residue Analysis Program in Food - FOR (ANVISA, 2011).

The picture below shows that 63% of the samples were contaminated by pesticides, and 28% had active ingredients (AIs) unauthorized (NAs) for that crop and / or exceeded the maximum residue limits (MRLs) considered acceptable and 35 others % were contaminated by pesticides, but within these limits (ANVISA, 2011).

Figure 3 - Samples in the presence or absence of residues. Source: ANVISA 2011.



Also noteworthy is that the average levels of contamination of samples are distributed by crop as follows: Chili (91.8%), strawberry (63.4%), cucumber (57.4%), lettuce (54.2 %), carrots (49.6%), pineapple (32.8%), sugar beet (32.6%) and papaya (30.4%), and other cultures analyzed and recorded with pesticide residues (BRAZIL. ANVISA, 2011a).

The use of one or more pesticides in crops for which they are not allowed, especially those in revaluation phase or scheduled discontinuation due to high toxicity has negative consequences on human and environmental health. One is increasing food insecurity for consumers who eat food contaminated with AIs, for this use, being absolutely irregular, was not considered in the calculation of the acceptable daily intake (ADI), and this insecurity worsens to the extent that this pesticide is found in various foods consumed in our daily diet (ABRASCO, 2015).

According Rigotto (2012), part of agrochemicals has the ability to disperse in the environment, and the other part can accumulate in the human body, including the breast milk.

Contaminated milk to be consumed by infants, can cause health problems, e cause hey are more

vulnerable to exposure to chemicals in the environment, for their physiological characteristics and feed almost exclusively with breast milk until six months of age (AUGUSTO, 2013).

3. Agroecology as a health promotion strategy

According to Dossier ABRASCO (2015), alert, through a systemic analysis about pesticides is essential to ensuring full duties established after great struggles guided by researchers and researchers of public health that are now called upon to take the invisibility the question of the impact of these products on human health.

According to ABRASCO (2015), this action to make visible the health-disease from the use of various chemicals in the basic source of life, food, part of a care network that extends from the production of food to table of consumers.

The latter, and not institutionalized, are all vulnerable to exposure and contamination, as highlighted here.

However, it is worth noting that the debate on the exposure differences in the chain of production and consumption involves additional issues, such as those related to gender and access to various rights, such as education in the field and technical advice for healthy cultivation and sustainable (ABRASCO, 2015).

According to Altieri (2012), agroecology is a science that provides the principles for the establishment of an economically sustainable agriculture, environmentally and socially.

Agroecology is presented as an alternative to agricultural modernization aimed at repairing environmental damage and social damage caused by the widespread technology in the green revolution and adopted by the Brazilian government as a development policy based on economic growth (STASIAK, 2013).

4. Analysis of studies Natuba

According to Brandao (2013), the observations and analyzes it was pointed out that agriculture in the Natuba Community, Vitoria de Santo Antao - PE, has been practiced on small farms, whose growing vegetables is predominantly intended for commercialization of production.

According to Brandao (2013), the primary and secondary indicators also show that the multidimensional dynamic, which involves social, environmental, economic, and cultural space in Natuba community, has not been articulated, integrated and planned manner.

Thus, it is clear that the agricultural model in the light of those surveyed benchmarks and results is not done sustainably.

The analysis of community vitality indicators, for example, allows to infer that the high level of dissatisfaction addressed population may be due to the absence of direct intervention of local government through policies that, for example, expand quantitatively and qualitatively the targeted educational services the community, among others (BRANDAO, 2013).

Thus, the risks of environmental pollution in this region are aggravated because the conventional model of production and productive capacity entail a structural change that ecosystem difficult to present resilience.

By consuming foods without knowledge of its origin, several risks are imminent. Intoxication producer by incorrect handling of agrochemicals, following the pollution of the soil, rivers and groundwater caused by the accumulation or

'irreparable damage to the environment, and the end consumer who is driven to consume healthy foods such as fruits, vegetables and vegetables (TORRES, 2007).

In this context, how can we tell if indeed these foods are healthy? Will in its composition there will only be nutrients for the consumer? And how is the question of pesticide accumulation in food? To what extent these residues harmful to human health?

In the studies of Nascimento (2013), four active ingredients have been found in groundwater: Azoxystrobin, Imidacloprid, Tebuconazole Phenthoate and with the concentrations of active ingredients above the maximum allowed, according to the Decree No. 2914/2011 of ANVISA has with respect to nitrate, the limit was much higher than permitted, according to the Ordinance No. 1469/2000 of the Ministry of Health, Ondo 2,4 D presented among the pesticides, the greatest potential risk of contaminating groundwater. On the ground the following active ingredients were found: Cypermethrin (1,2,3,4), Imidacloprid, azoxystrobin and Deltamethrin.

The abamectin active ingredient found in the crops of lettuce and coriander, although not authorized for these crops and residue above the maximum allowed, and toxicological I classification, meaning extremely dangerous product (NASCIMENTO, 2013).

The use of agricultural varieties for which the product is not indicated translates into a violation of the law, which requires extensive monitoring and technical guidance.

Therefore, besides the risk of identification of pesticide residues in crops, often from the contempt of grace period and for each agrochemical often they are applied without being recommended for certain crops or are applied in higher dose and so the waste can also be remnants of previous cultivation or use of contaminated water (ANVISA, 2016).

Similar results were found by Preza (2012), which studies the 29 rural workers growers of vegetables in Conceição de Jacuípe, Bahia, some farmers reported that even knowledgeable of the need of the grace period, it was common to sell the vegetables before this minimum time pressure of intermediate buyers whose usual suppliers were not able to produce that quantity.

Also in this research, it points out that the workers who remain in the area cultivated during the application of the products are directly exposed. In addition to occupational exposure, there is the exposure of the population consumes foods with residues of these pesticides and of those who live around the plantations.

The consumption of vegetables with pesticides is a serious public health problem because both unauthorized products are used, as well as reports of some farmers, it is not subject to the waiting period between application and harvest for sale (Cherishes And AUGUSTO , 2012). If included in Pesticide Residue Analysis Program Anvisa probably these vegetables would be unfit for consumption.

Such damage to public health could not be identified by the final consumer but seeking to know the production process with its steps and knowledge of their origin.

The capitalist market is more concerned about the sale than with the quality of food, and so may be causing cumulative poisoning in humans, may cause immediate evils such as vomiting, intense headaches and severe lack of air to long-term ills with serious problems such as cancer, liver damage,

diseases of the nervous system, hormonal disorders and fetal malformation (ABRASCO, 2015)

Since the effect is not immediate, it is very difficult to identify, generating a debate among researchers as to food quality and safety of producers and consumers. Second Nascimento (2013), it was found that the lack of personal protective equipment use (EPI) among farmers may be indicative of contamination of chemical agents.

The results of the blood samples indicated that 33% of men had levels of enzyme cholinesterase below normal and women with respect to the levels were even more alarming because 67% signaled that lower enzyme. Thus, this study can be seen that the total number of analyzed producers, 53% had an index of some enzymes below normal.

This study shows that improper handling of pesticides, without complying with the safety advice, is harmful to the health of farmers, resulting in acute poisoning, chronic diseases, reproductive problems and environmental damage, which can often be irreversible.

The results presented by Brandao (2013) are not different, and can be seen in the table below, where 71.6% of respondents apply fertilizers, 50% use pesticides and only 24.4% of respondents make use of EPI's.

It is remarkable the importance in making a seizure of work in this community (Table 1), because the workers even knowing the risks of the practices of their work, do not fail to perform their daily activities in the cultivation of their agricultural products, and not to use the due safety criteria in day-to-day, still in need of technical assistance and more active monitoring and didactic.

Table 1 – - Frequency distribution of agricultural indicators of the Community Environmental Dimension Natuba (Ribeiro, 2011)

Characteristics		Frequency	% Valid
Farmers use fertilizers?	Yes	116	71,6
	No	46	28,4
	Total	162	100,0
	No answer	123	-
Farmers use pesticides?	Yes	80	50,0
	No	80	50,0
	Total	160	100,0
	No answer	125	-
Farmers use EPI?	Yes	39	24,4
	No	121	75,6
	Total	160	100,0
	No answer	125	
Local where EPI is washed	At home	7	20,0
	In the river	18	51,4
	Other sites	10	28,6
	Total	35	100,0
	No answer	250	-
Destination of residues of the pesticides	Hold for the next day	43	65,2
	Throw away	22	33,3
	Apply a certain amount	1	1,5
	Total	66	100,0
	No answer	219	-

According to Ribeiro (2011), the chemical deterioration of Natuba soil occurs primarily by overuse of pesticides or fertilizers, as there is the need to protect the plants against pests and sustain the supply of nutrients in the ground to maintain productivity.

The accelerated wear of the soil of the area is the vertical washing nutrients that percolate, as well as its removal by crops and surface washing (laminar) of rainwater and excessive irrigation.

The main effects of pesticides on ecosystems are already well known by the community scientific and include loss of biodiversity, the elimination of pollinating insects, the development of resistant

species and the emergence of secondary pests (PREZA and AUGUSTO, 2012). However, it is necessary to recognize that high biodiversity and complexity of the tropical soil biochemical reactions generate varying degrees of uncertainty in the application of environmental hazard classification (PREZA, 2012).

The pesticide poisoning, manifested by decreased immune defenses, anemia, male impotence, headache, insomnia, blood pressure changes, distimias (form of chronic depression) and behavioral disorders (psychotic outbreaks) are described as frequent among farmers, determining, sometimes the medical prohibition of work in the fields and orientation to another type of professional activity (MOURA, 2014).

Pontes (2011) conducted an assessment of the monitoring of pesticide residues in horticultural products marketed in Pernambuco from 2008 to 2010. The production Natuba was approached and studied in relation to the analysis of the presence of pesticides in lettuce, with a view to community have great representation in the production and marketing of vegetables in the state.

The level of pesticide residues in Lettuce culture, including the production of Naturaliste, among others in the state of Pernambuco, had a percentage of 33% of the detection of unauthorized active ingredients.

This result tends to is associated with lack of satisfactory levels of education for the majority of farmers who used pesticides, in this sense, organic farming may be the best form of production that ensures the health and environmental protection (NETO *et al.*, 2010).

However, this type of production has some obstacles, such as lack of applied financial resources and lack of expertise that makes it impossible to practice this production mode (MELO *et al.*, 2012). Another alternative to be presented would be an agroecological production, which seeks an interaction between production and environment.

CONCLUSION

It may be noted that the food to reach the end consumer, brings various stages of their production, making invisible all eminent risks, including: farmer's intoxication; soil and water pollution; high pesticide content in food to be consumed;

The nutritional value and safety from the point of view of food microbiological quality and chemical contaminants, being decisive to consumer health, deserves a highlight when you purchase food.

It is noticed that many of the production practices of the current production model should be replaced by agroecological practices.

These practices consider greater interaction between production processes and natural processes, seeking harmony between the needs of food production and the availability of natural resources, taking into account various social, economic, cultural, environmental and ethical.

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