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Analysis of Contact System for Organic and Inorganic Pesticide Residues on Cayenne Pepper (*Capsicum annuum*)

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Abstract: *The aim of this study is to find out Contact System for Organic and Inorganic Pesticide Residues on Cayenne Pepper. This study used the Factorial Completely Randomized Design (CRD) method with 2 treatment factors. The results of the research on cayenne pepper resulted from the interaction of 0.5 ml / l water (K1) of inorganic pesticides with various levels of organic pesticides having a capsaicin level range between 0.078% to 0.080%. Where the lowest percentage of capsaicin levels was obtained at the interaction with Organic Pesticides at the level of 0 ml / l water (P0) which was significantly different from the interaction of Organic Pesticides at the level of 200 ml / l water (P1). The percentage of capsaicin levels is better obtained at the interaction with organic pesticides at the level of 200 ml / l water (P1) which is significantly different from the interaction of Organic Pesticides at the level of 0 ml / l water (P1) and at the level of 600 ml / l water (P3).*

Keywords: *organic pesticide; inorganic pesticide; cayenne pepper*

I. Introduction

According to Ferdy (2008), in the world of agriculture and in the sub sciences of plant breeding in particular there is something called the castration. Castration is a technique used by breeders to increase the productivity of glorified plants. (Hasibuan, 2019).

Since getting acquainted with farming, people have often experienced disturbances that are inhibiting, damaging, destroying, or thwarting crops. In some locations, pest disturbances have prevented people from cultivating crops. Actually, from the time the seeds are spread until the plants are harvested, they are always exposed to natural disturbances that are both biotic and abiotic. Therefore, in order to obtain crops that are in accordance with their genetic abilities, such as the original parent seed, the community must be able to prevent or overcome the occurrence of pests in plants. There are 2 major groups of plant pests, namely biotic (weeds, plant diseases and pests) and abiotic (weather) (Sinaga, 2009).

Pests are organisms that cause damage to plants. These pests can be in the form of animals such as field molluscs, leafhoppers, rats, caterpillars, mites, ganjur and grasshoppers. Pests can damage crops directly or indirectly. Pests that damage directly can be seen by their marks, such as grinding and biting. Meanwhile, pests that damage plants indirectly through diseases carried by these pests. Plant growth and development from seed, nursery to harvesting are not free from pest disturbances (Pramuhadi, 2012).

According to Djojosumarto (2009), one way of controlling pests is the use of pesticides. Pesticides are poisonous so they are made, sold and used to poison plant pests (OPT). Pesticides are substances or mixtures of substances specifically used to control, prevent, or fend off pest disturbances. Any pesticide poison has the potential to contain dangerous toxins. Chemical or inorganic pesticides contain chemical compounds that are not easily broken down by the environment. Therefore the use of agricultural pesticides indiscretion can have negative impacts on the environment.

The negative impact of chemical pesticides for user safety is that they can directly contaminate users, resulting in poisoning. Chronic poisoning in the long term can cause health problems. Health problems include eye irritation, cancer, and miscarriage, defects in babies, nervous, liver, kidney and respiratory disorders. The impact of pesticides on consumers is

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generally in the form of chronic poisoning that is not immediately felt. However, in the long term it can cause health problems. The impact on environmental sustainability includes environmental pollution, killing of non-target organisms, the accumulation of pesticides in the organism's body tissues through the food chain, killing natural enemies of pests and emerging pests that are resistant to pesticides (Sinaga, 2016).

Agricultural produce often contains chemical pesticide residues which are harmful to health. Since the beginning of planting, as long as the plants are growing, before harvesting, the plants are often given chemicals to protect the plants from pests that can attack the plants and produce high yields. Production results resulting from the use of these chemicals can produce various diseases from chemical residues that are present from plants (Sari et al, 2017). The chemical content contained in pesticides is a general toxic chemical whose ingredients affect not only plant-disturbing organisms, but can have an impact on many organisms including humans so that it can harm human health and death (Sitompul et al, 2014).

II. Review of Literatures

2.1 Cayenne Pepper Plants

The emergence of problems due to the use of chemical pesticides stimulates the use of non-chemical insecticides as an insecticide that is safe for the environment by utilizing toxic compounds from plants, microbes, or entomopathogenic fungi. Entomopathogenic fungi are one of the potential biological agents to control plant pests. Some entomopathogenic fungi that have been used to control plant pests and vegetables are Metarhizium anisopliae, Beauveria bassiana, Paecilomyces sp., Verticillium sp., And Spicaria sp (Mulyono in Halawah, 2019).

The use of chemicals for insect pest control has been started for a long time by using inorganic chemicals such as sulfur and asphalt in the centuries BC and then the nature of arsenic poison was discovered in the first century BC. (Hotang, 2020).

The quality of cayenne pepper plants that use chemical pesticide spraying will reduce the quality of cayenne pepper due to the residue contained in the cayenne pepper plant. The chemical residue is not good for health. A good pesticide spray is to use organic materials that contain organic ingredients. This can be seen in organic cayenne pepper plants which are avoided from spraying inorganic pesticides, so that the price is higher than that of cayenne pepper sprayed with inorganic pesticides (Santosa, 2011).

Agricultural produce often contains chemical pesticide residues which are harmful to health. Since the beginning of planting, as long as the plants are growing, before harvesting, the plants are often given chemicals to protect the plants from pests that can attack the plants and produce high yields. Production results resulting from the use of these chemicals can produce various diseases from chemical residues found from plants (Santosa, 2011).

The production of crop products using inorganic pesticides can often cause problems in plants, such as crop production that contains toxic residues, so observers conclude that the use of natural and non-chemical pesticides can be an alternative for crop cultivation. The most appropriate way to overcome it is the use of organic pesticides. Organic pesticides are the result of weathering plant remains or organic waste which is used to become pesticides (Musnamar, 2003).

Cayenne pepper is a seasonal vegetable that is included in the eggplant (Solanaceae) plant. Cayenne pepper comes from the American continent, in the Peru area, and spreads to other areas. In Indonesia, it is estimated that red chili peppers were brought by traders from Persia. These traders stopped by in Aceh with red chilies, bird's eye chilies, curly red chilies, and peppers (Harpenas and Dermawan, 2010). Cayenne pepper is used not only for household consumption, but also as a spice in cooking, and a mixture of food production produced by the food industry. Cayenne pepper is also used as an ingredient in cosmetics and medicines. In addition, cayenne pepper contains nutrients that are beneficial to the body such as protein, fat, calcium (Ca), phosphorus (P), iron (Fe), vitamins, and alkaloid compounds such as flavonoids, capsolain, and essential oils (Santika, 2006).

2.2 Agricultural Products Using Organic Pesticides

Organic pesticides derived from Siamese weeds are used on black soybean plants, able to affect leaf area for 11 weeks after planting. Siamese weed organic pesticides with a level of 1% are able to expand the leaves of black soybean plants by 120.65% compared to using inorganic pesticides (Sakung, 2004). The results showed that rice using organic pesticides was more efficient than rice using inorganic pesticides. The level of technical efficiency achieved by farmers is between 0.47-0.96 with an average of 0.70 so that the opportunity for farmers to increase rice production is up to 30% compared to rice using inorganic pesticides (Sembodo, 2010).

Cabbage sprayed with an organic pesticide made from pamphlets leaves turned out to be favored by the Plutella Xylostella caterpillar. The caterpillar approached the cabbage plant because it really liked sprayed pesticides compared to other organic pesticides. This is because the flavonoids contained in this pesticide material can absorb ultraviolet light so that the caterpillars can see this, so that the caterpillars are attracted to approach it (Sudewa et al, 2008).

2.3 Agricultural Products Using Inorganic Pesticides

The broccoli vegetables sprayed with inorganic pesticides in Sumberejo Village, Ngablak District, Magelang District, turned out to produce a residue of 0.0216 ppm, so this is an obstacle to health if consumed. The habit of farmers in Sumberejo Village, who always use pesticides on plants in their village, is not only bad for the plants they plant, but also has a negative impact on the environment (Wahyuni, 2009). Farmers who sprayed tomato plants in Sumberejo Village, Ngablak District, Magelang Regency, after conducting research on the tomatoes, it turned out that the tomatoes contained a residue of 0.58066 ppm which was not good for human health. This is obtained from the habit of farmers who always spray the tomato plants they plant (Wahyuni, 2009).

III. Research Method

This research was conducted from July 2019 to November 2019 in Paro Lhong Village Aceh Besar, Baristand Laboratory, Chemistry Laboratory of MIPA Unsyiah.

Gas Chromatography GC-MS *(Gas Chromatography Spectrofotometry Massa QP2010S Simadzu, kolom kromatografi Rxi-1MS 30m 0,25mm ID (0,25 µmdf),* chromatography column, hoe, cayenne pepper seeds F1 Top Super variety, vegetable pesticides from neem leaves, Demolish inorganic pesticides 18 EC (5 ml - 7.5 ml / plant), NPK pesticides (2.5 ml / plant), house pesticides (10 ml / plant), water, polybags, analytical scales, raw husk, husk charcoal, water.

This study used the Factorial Completely Randomized Design (CRD) method with 2 treatment factors as shown in the table below:

Table 1. Factorial Complete Randomized Design of Organic Pesticides and Inorganic Pesticides

Code	Treatment
P0 x K0	Treatment with organic pesticides (P0) and inorganic pesticides (K0)
P0 x K1	Treatment with organic pesticides (P0) and inorganic pesticides (K1)
P0 x K2	Treatment with organic pesticides (P0) and inorganic pesticides (K2)

P0 x K3	Treatment with organic pesticides (P0) and inorganic pesticides (K3)
P1 x K0	Treatment with organic pesticides (P1) and inorganic pesticides (K0)
P1 x K1	Treatment with organic pesticides (P1) and inorganic pesticides (K1)
P1 x K2	Treatment with organic pesticides (P1) and inorganic pesticides (K2)
P1 x K3	Treatment with organic pesticides (P1) and inorganic pesticides (K3)
P2 x K0	Treatment with organic pesticides (P2) and inorganic pesticides (K0)
P2 x K1	Treatment with organic pesticides (P2) and inorganic pesticides (K1)
P2 x K2	Treatment with organic pesticides (P2) and inorganic pesticides (K2)
P2 x K3	Treatment with organic pesticides (P2) and inorganic pesticides (K3)
P3 x K0	Treatment with organic pesticides (P3) and inorganic pesticides (K0)
P3 x K1	Treatment with organic pesticides (P3) and inorganic pesticides (K1)
P3 x K2	Treatment with organic pesticides (P3) and inorganic pesticides (K2)
P3 x K3	Treatment with organic pesticides (P3) and inorganic pesticides (K3)

Source: Primary Data, 2020

From table 1 it is found that the study had 16 treatments with 2 repetitions. The first factor is organic pesticides (P) with 4 levels, namely:

– P0 (kontrol) = 0 ml/l Water
– P1 = 200 ml/l Water
– P2 = 400 ml/l Water
– P3 = 600 ml/l Water

The second factor is inorganic pesticides (K) with 4 levels, namely:

– K0 = 0 ml/l Water
– K1= 0,5 ml/l Water
– K2= 1 ml/l Water
– K3 = 1,5 ml/l Water

Variables observed / measured during the study were moisture content (%), protein content (%), protein content (%), ash content (%), carbohydrate content (%), capsaicin content (%), organoleptic test, and levels of residue (%).

Analysis of water content was tested using an oven. The water content is calculated using the weight percent unit, which means how many grams of weight is the difference in weight from the sample that has not been evaporated and the sample that has been dried. So the moisture content can be obtained by calculating the weight loss of the heated sample. The percentage of water content can be calculated as follows, namely:

$$\text{Water content} = \frac{(B - C)}{(B - A)} \times 100\ \%$$

Where:
A = dry weight of the cup (grams)
B = dry weight of the plates and initial sample (grams)
C = dry weight of the plates and samples after drying (grams)

Determination of the fat content in the sample was carried out using a soletation extraction tool. The extraction flask which contains several grains of boiling stone should be pre-dried in an oven at 105◦C to 100◦C for 1 hour. Then cooled in a *desiccator* and weighed. The sample to be extracted weighed approximately 5 grams, then put filter paper blinded from the bag and covered with cotton that is not fat. The filter paper containing the sample is put in a *soklety* and extracted with petroleum ether or with other fatty solvents such as ethyl ether, *chlorophome*, and tetra chloride, over a water heater for 24-48 hours. The solvent can be separated from the oil by evaporating the solvent by distillation. Furthermore, the flask is dried with a compressor pump to remove any remaining petroleum ether. Then dried in an oven at 100◦C for 1 hour, then cooled in desiccators and weighed. Drying and weighing were repeated until a fixed weight was obtained (Ketaren, 1989). The protein content can be calculated as follows:

$$\text{Protein content} = \frac{\textbf{Grease Weight}}{\textbf{Sample weight}} \times 100\%$$

Protein content analysis was carried out at the Banda Aceh Food Crops Research Agency laboratory. Protein content was measured by means of a Shimadzu 1800 UV-VIS Spectrophotometer, centrifuge, analytical balance, micropipette, blender, and a set of glass mats. The unit of protein content is percent (%).

Ash content analysis was carried out at the Banda Aceh Food Crops Research Agency laboratory. Determination of the ash content begins by heating the porcelain crucible in the oven at temperature 105°C for 5 minutes and cooling it in desiccators for 10 minutes, then weighing the empty weight of the porcelain crucible. Next, put the sample into a porcelain crucible and weigh it out. Then, the sample was put into a furnace at 400◦C for 15 minutes and then put into desiccators for 10 minutes. After that, the crucible is removed and cooled on an iron plate. Furthermore, the weight of the crucible and the sample of the biscuits were weighed and the ash content was determined.

Analysis of carbohydrate levels was carried out at the Laboratory of the Banda Aceh Food Crops Research Agency. The process of preparing 1 gram of mashed sample is weighed and put into a round flask equipped with a cooler. Then, put 50 ml of 4 mol hydrochloric acid solution into the flask, heating it for 1-2 hours until the sample in the flask is completely dissolved. Cooled to room temperature, then neutralized with sodium hydroxide until it reaches neutral pH (tested with litmus paper). 2-4 grams of activated carbon are added to the neutralized solution and heated to a boil, cool and filter the solution, then turn it into a solution volume of 250 ml with a measuring flask. Pipettes from each 1 ml standard solution were put in a test tube. Add 1 ml of 5% phenol solution, 5 ml of concentrated sucfic acid, mix the solution until it is homogeneous then the solution is heated at 60°C for 10 minutes in a water bath (Chandra, 1995).

$$\text{Carbohydrate levels (\%)} \quad \frac{\textbf{Carbohydrate Weight}}{\textbf{Sample weight}} \times 100\ \%$$

Freshly harvested cayenne pepper was analyzed quantitatively by the TLC (Thin Layer Chromatography) method. Determination of capsaicin levels was carried out by drying the ripe cayenne pepper at 45◦C for 4 hours. Then the cayenne pepper sample was ground in a pollinator blender, then filtered with a 60 mesh sieve. The test sample was weighed and added

2 ml of ethanol, gojog with vortex, and harmonized for 24 hours. Then evaporated the ethanol phase, added to 1 ml with methanol. Spoting was done on the silicate plate 60 F254, including the capsaicin standard. Put in a chamber which contains saturated mobile phase of *toluenechloroformaceton* (45-25-30), evaluated to warm limit and dried. Then the densito was carried out at a wavelength of 228 nm. Rf. 061.

Preparation of the standard solution is carried out as follows: A number of reference standards whose purity is known to be weighed carefully, then put into the appropriate volumetric flask, then dissolved with the appropriate amount of solvent and squeezed until the mark so that the concentration of the solution contains ± 1000 ppm or 1 ng / µL, for testing the residual concentration of the solution used is 1 ng / µL, obtained by diluting the formula:

V1.N1 = V2.N2

Where:
V1 = volume of solution available = mL
N1 = concentration of available solution = ng / µL
V2 = volume of solution to be made = mL
N2 = concentration of the solution to be made = ng / Ml

IV. Result and Discussion

4.1 Carbohydrate Levels

The results of the F test of variance analysis showed that the application of various levels of organic pesticides with various levels of inorganic pesticides had no significant effect on carbohydrate levels in cayenne pepper. The average carbohydrate content in cayenne pepper can be seen in Table 2.

Table 2. Average Value of Carbohydrate Content in Cayenne Pepper on the Interaction of Organic Pesticides and Inorganic Pesticides.

Organic Pesticides	Inorganic Pesticides				Rataan	$BNJ_{0,05}$
	0 ml/l Water (K0)	0,5 ml/l Water (K1)	1 ml/l Water (K2)	1,5 ml/l Water (K3)		
0 ml/l Water (P0)	0,835 cd	0,840 d	0,855 e	0,855 e	0,846	
200 ml/l Water (P1)	0,825 b	0,835 cd	0,835 cd	0,855 e	0,838	0,0091
400 ml/l Water (P2)	0,815 a	0,811 a	0,825 b	0,835 cd	0,822	
600 ml/l Water (P3)	0,825 b	0,827 bc	0,836 cd	0,855 e	0,836	
Average	0,825	0,828	0,838	0,850		

Note: Numbers Followed by the Same Letters in the Same Row and Column are not significantly different at BNJ 0.05

4.2 Water Content

The results of the F test of variance analysis showed that the application of various levels of organic pesticides with various levels of inorganic pesticides did not significantly affect the moisture content of cayenne pepper plants. The average water content in cayenne pepper can be seen in Table 3.

Table 3. Average Value of Water Content in Cayenne Pepper in the Interaction of Organic Pesticides and Inorganic Pesticides.

Organic Pesticides	Inorganic Pesticides				Average	$BNJ_{0,05}$
	0 ml/l Water (K0)	0,5 ml/l Water (K1)	1 ml/l Water (K2)	1,5 ml/l Water (K3)		
0 ml/l Water (P0)	80,91 c	80,87 b	80,43 a	81,20 de	80,853	0,285
200 ml/l Water (P1)	81,10 cd	81,34 de	81,34 de	81,41 e	81,298	
400 ml/l Water (P2)	81,21 de	81,24 de	81,40 e	81,40 e	81,313	
600 ml/l Water (P3)	81,32 de	81,36 de	81,36 de	81,40 e	81,360	
Average	81,135	81,203	81,133	81,353		

Note: Numbers Followed by the Same Letters in the Same Row and Column are not significantly different at BNJ 0.05

Based on the results of the research in the table above, it shows that the cayenne pepper plants resulted from the interaction of 0 ml / l water (K0) inorganic pesticides (K0) with various levels of organic pesticides having a water content range between 80.91% to 81.32%. Where the lowest percentage of water content was obtained at the interaction with Organic Pesticides at the level of 0 ml / l water (P0) which was significantly different from the interaction of Organic Pesticides at the level of 400 ml / l water (P2) and the level of 600 ml / l water (P3). The percentage of water content is better obtained at the interaction with organic pesticides at the level of 600 ml / l water (P3) which is significantly different from the interaction of Organic Pesticides at the level of 0 ml / l water (P0) and the level of 200 ml / l water (P1).

The results of the research on cayenne pepper resulted from the interaction of 0.5 ml / l water (K1) of inorganic pesticides with various levels of organic pesticides having a water content range between 80.87% to 81.36%. Where the lowest percentage of water content was obtained at the interaction with Organic Pesticides at the level of 0 ml / l water (P0) which was significantly different from the interaction of Organic Pesticides at the level of 200 ml / l water (P1), the level of 400 ml / l water (P2) and the level of 600 ml / l water (P3). The percentage of water content is better obtained at the interaction with organic pesticides at the level of 600 ml / l water (P3) which is significantly different from the interaction of Organic Pesticides at the level of 0 ml / l water (P0).

The results of the research on cayenne pepper resulted from the interaction of giving inorganic pesticides 1 ml / l water (K2) with various levels of organic pesticides having a water content range between 80.43% to 81.40%. Where the lowest percentage of water content was obtained at the interaction with Organic Pesticides at the level of 0 ml / l water (P0) which was significantly different from the interaction of Organic Pesticides at the level of 200 ml / l water (P1), the level of 400 ml / l water (P2) and the level of 600 ml / l water (P3). The percentage of water content is better obtained at the interaction with organic pesticides at the level of 400 ml / l water (P2) which is significantly different from the interaction of Organic Pesticides at the level of 0 ml / l water (P0).

The results of the research on cayenne pepper resulted from the interaction of 1.5 ml / l water (K2) of inorganic pesticides with various levels of organic pesticides having a water content range between 81.20% to 81.41%. Where the lowest percentage of water content was obtained at the interaction with Organic Pesticides at the level of 0 ml / l water (P0) and was not significantly different from the interaction of Organic Pesticides at various levels. The percentage of water content was better obtained at the interaction with organic pesticides at the level of 200 ml / l water (P2) and was not significantly different from the interaction of organic pesticides at various levels.

4.3 Grease Level

. The results of the F test of variance analysis showed that the application of various levels of organic pesticides with various levels of inorganic pesticides did not significantly affect the fat content of cayenne pepper plants. The average fat content in cayenne pepper can be seen in Table 4.

Table 4. Average Fat Content Value of Cayenne Pepper on the Interaction of Organic Pesticides and Inorganic Pesticides

Organic Pesticides	Inorganic Pesticides				Average	$BNJ_{0,05}$
	0 ml/l Water (K0)	0,5 ml/l Water (K1)	1 ml/l Water (K2)	1,5 ml/l Water (K3)		
0 ml/l Water (P0)	1,435 bc	1,475 d	1,410 ab	1,460 cd	1,445	0,038
200 ml/l Water (P1)	1,405 ab	1,430 bc	1,415 ab	1,415 ab	1,416	
400 ml/l Water (P2)	1,415 ab	1,425 abc	1,405 ab	1,415 ab	1,415	
600 ml/l Water (P3)	1,405 ab	1,405 ab	1,390 a	1,390 a	1,398	
Average	1,415	1,434	1,405	1,420		

Note: Numbers Followed by the Same Letters in the Same Row and Column are not significantly different at BNJ 0.05

4.4 Protein Content

The results of the F test of variance analysis showed that the application of various levels of organic pesticides with various levels of inorganic pesticides did not significantly affect protein levels in cayenne pepper plants. The average protein content in cayenne pepper can be seen in Table 5.

Table 5.Average Protein Levels in Cayenne Pepper on the Interaction of Organic Pesticides and Inorganic Pesticides

Organic Pesticides	Inorganic Pesticides				Average	$BNJ_{0,05}$
	0 ml/l Water (K0)	0,5 ml/l Water (K1)	1 ml/l Water (K2)	1,5 ml/l Water (K3)		

0 ml/l Water (P0)	3,025 a	3,050 bcde	3,045 abcd	3,070 efg	3,048	0,0236
200 ml/l Water (P1)	3,030 ab	3,030 ab	3,035 abc	3,055 cde	3,038	
400 ml/l Water (P2)	3,025 a	3,050 bcde	3,065 def	3,090 g	3,058	
600 ml/l Water (P3)	3,050 bcde	3,125 h	3,090 g	3,085 fg	3,088	
Average	3,033	3,064	3,059	3,075		

Note: Numbers Followed by the Same Letters in the Same Row and Column are not significantly different at BNJ 0.05

4.5 Ash Content

The results of the F test of variance analysis showed that the application of various levels of organic pesticides with various levels of inorganic pesticides did not significantly affect the ash content of cayenne pepper plants. The average ash content in cayenne pepper can be seen in Table 6.

Table 6. Average value of ash content in cayenne pepper on the interaction of organic pesticides and inorganic pesticides

Organic Pesticides	Inorganic Pesticides				Average	$BNJ_{0,05}$
	0 ml/l Water (K0)	0,5 ml/l Water (K1)	1 ml/l Water (K2)	1,5 ml/l Water (K3)		
0 ml/l Water (P0)	0,845 de	0,830 ab	0,860 gh	0,875 i	0,853	0,0074
200 ml/l Water (P1)	0,835 bc	0,825 a	0,850 ef	0,855 fg	0,841	
400 ml/l Water (P2)	0,840 cd	0,850 ef	0,865 h	0,860 gh	0,854	
600 ml/l Water (P3)	0,835 bc	0,840 cd	0,850 ef	0,855 fg	0,845	
Average	0,839	0,836	0,856	0,861		

Note: Numbers Followed by the Same Letters in the Same Row and Column are not significantly different at BNJ 0.05

Based on the results of the research in the table above, it shows that the cayenne pepper plants resulting from the interaction of 0 ml / l water (K0) inorganic pesticides with various levels of organic pesticides have a range of ash content between 0.835% to 0.845%. Where the lowest percentage of ash content was obtained at the interaction with Organic Pesticides at the level of 200 ml / l water (P1) which was significantly different from the interaction of Organic Pesticides at the level of 0 ml / l water (P0). The percentage of ash content was better obtained at the interaction with organic pesticides at the level of 0 ml / l water (P0) and significantly different from the interaction of organic pesticides at the level of 200 ml / l water (P1) and 600 ml / l water (P3).

The results of the research on cayenne pepper resulted from the interaction of 0.5 ml / l water (K1) of inorganic pesticides with various levels of organic pesticides having a range of ash content between 0.825% to 0.850%. Where the lowest percentage of ash content was obtained at the interaction with Organic Pesticides at the level of 200 ml / l water (P1) which was significantly different from the interaction of Organic Pesticides at the level of 400 ml / l water (P2) and the level of 600 ml / l water (P3). The percentage of ash content is better obtained at the interaction with organic pesticides at the level of 400 ml / l water (P2) which is significantly different from the interaction of Organic Pesticides at the level of 0 ml / l water (P1), the level of 200 ml / l water (P1). And at the level of 600 ml / l water (P3).

4.6 Residue Level

The results of the F test of variance analysis showed that the application of various levels of organic pesticides with various levels of inorganic pesticides had no significant effect on residual levels in cayenne pepper plants. The average residual content in cayenne pepper can be seen in Table 7.

Table 7. Average Residue Levels on Cayenne Pepper on the Interaction of Organic Pesticides and Inorganic Pesticides

Organic Pesticides	Inorganic Pesticides				Average	$BNJ_{0,05}$
	0 ml/l Water (K0)	0,5 ml/l Water (K1)	1 ml/l Water (K2)	1,5 ml/l Water (K3)		
0 ml/l Water (P0)	0 a	0,125 bc	0,167 f	0,235 h	0,132	0,00286
200 ml/l Water (P1)	0 a	0,125 b	0,157 e	0,237 h	0,130	
400 ml/l Water (P2)	0 a	0,128 c	0,149 d	0,214 g	0,123	
600 ml/l Water (P3)	0 a	0,124 b	0,155 e	0,240 i	0,130	
Average	0	0,126	0,157	0,232		

Note: Numbers Followed by the Same Letters in the Same Row and Column are not significantly different at BNJ 0.05

4.7 Capsaicin Levels

The results of the F test of variance analysis showed that the application of various levels of organic pesticides with various levels of inorganic pesticides did not significantly affect capsaicin levels in cayenne pepper plants. The average capsaicin levels in cayenne pepper can be seen in Table 8.

Table 8. Average Value of Capsaicin Levels in Cayenne Pepper on the Interaction of Organic Pesticides and Inorganic Pesticides

Organic Pesticides	Inorganic Pesticides				Average	$BNJ_{0,05}$
	0 ml/l Water (K0)	0,5 ml/l Water (K1)	1 ml/l Water (K2)	1,5 ml/l Water (K3)		

0 ml/l Water (P0)	0,078 ab	0,078 b	0,078 b	0,078 b	0,078	
200 ml/l Water (P1)	0,078 b	0,080 c	0,079 c	0,077 a	0,079	
400 ml/l Water (P2)	0,079 c	0,079 bc	0,079 c	0,078 b	0,079	0,00031
600 ml/l Water (P3)	0,080 c	0,078 b	0,078 b	0,079 c	0,079	
Average	0,079	0,079	0,079	0,078		

Note: Numbers Followed by the Same Letters in the Same Row and Column are not significantly different at BNJ 0.05

Based on the results of the research in the table above, it shows that the cayenne pepper plant resulted from the interaction of 0 ml / l water (K0) inorganic pesticides with various levels of organic pesticides has a capsaicin level range between 0.078% to 0.080%. Where the lowest percentage of capsaicin levels was obtained at the interaction with Organic Pesticides at the level of 0 ml / l water (P0) which was significantly different from the interaction of Organic Pesticides at the level of 400 ml / l water (P2) and the level of 600 ml / l water (P3). The percentage of capsaicin levels was better obtained at the interaction with organic pesticides at the level of 600 ml / l water (P3) and significantly different from the interaction with Organic Pesticides at the level of 0 ml / l water (P0) and 200 ml / l water (P1).

The results of the research on cayenne pepper resulted from the interaction of 0.5 ml / l water (K1) of inorganic pesticides with various levels of organic pesticides having a capsaicin level range between 0.078% to 0.080%. Where the lowest percentage of capsaicin levels was obtained at the interaction with Organic Pesticides at the level of 0 ml / l water (P0) which was significantly different from the interaction of Organic Pesticides at the level of 200 ml / l water (P1). The percentage of capsaicin levels is better obtained at the interaction with organic pesticides at the level of 200 ml / l water (P1) which is significantly different from the interaction of Organic Pesticides at the level of 0 ml / l water (P1) and at the level of 600 ml / l water (P3).

V. Conclusion

Chemical parameters of cayenne pepper on the interaction of various levels of inorganic pesticides with various levels of organic pesticides for the best carbohydrate content is the interaction of inorganic pesticides at 1.5 ml / l of water with organic pesticides at 0 ml / l of water.

Chemical parameters of cayenne pepper on the interaction of various levels of inorganic pesticides with various levels of organic pesticides for the best moisture content is the interaction of inorganic pesticides at 1.5 ml / l of water with organic pesticides at 600 ml / l of water.

Chemical parameters of cayenne pepper on the interaction of various levels of inorganic pesticides with various levels of organic pesticides for the best fat content is the interaction of inorganic pesticides at 0.5 ml / l of water with organic pesticides at 0 ml / l of water.

Chemical parameters of cayenne pepper on the interaction of various levels of inorganic pesticides with various levels of organic pesticides for the best protein content is the interaction of inorganic pesticides at 1.5 ml / l of water with organic pesticides at 600 ml / l of water.

Chemical parameters of cayenne pepper on the interaction of various levels of inorganic pesticides with various levels of organic pesticides for the best ash content is the interaction of inorganic pesticides at 1.5 ml / l of water with organic pesticides at 400 ml / l of water.

Chemical parameters of cayenne pepper on the interaction of various levels of inorganic pesticides with various levels of organic pesticides for the best residual levels is the interaction of inorganic pesticides at 0 ml / l of water with organic pesticides at 400 ml / l of water.

Chemical parameters of cayenne pepper on the interaction of various levels of inorganic pesticides with various levels of organic pesticides for the best capsaicin levels is the interaction of inorganic pesticides at 0 ml / l of water with organic pesticides at 200 ml / l of water.

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