

## **Analysis of Organofosfat Residual Pesticidates on Orange Fruit in Poncokusumo District, Malang District**

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**Abstract:** *Pesticides are the main choice for controlling pests, diseases and weeds because they directly kill the body of the disturber. Pesticides can quickly reduce pest populations so that widespread pests can be prevented. But the use of pesticides in horticultural farming efforts, especially for planting oranges, is not excessive in terms of species, composition, dosage, time and interval. Pesticide residues for organophosphate groups are still allowed in plants in predetermined concentrations, especially for vegetables of horticultural commodities the permissible residual concentration limits are 0.5 mg / kg. This study aims to determine the residual levels of organophosphatepesticides in citrus fruits in Poncokusumo District, Malang Regency. This study uses a descriptive survey method . The activity was conducted by interviewing 5 farmers and 5 orange traders. For each farmer and trader , 5 kg of oranges will be purchased. Citrus fruits obtained from each farmer and trader will be taken 5 kg, then the residual levels of pesticides are measured at the Laboratory of PT. Angler Biochemlab Surabaya. The results of this study indicate that the citrus fruit samples tested in this study residual values of organophosphate (profenofos) pesticides were 0.01 mg / kg but the value was still below the Limit of Detection (LOD) value of 1 mg / kg whereas for grades imidacloripid content is known that the sample in the farmer shows a residual value of 0.04 mg / kg is approaching the maximum threshold of 0.05 mg / kg. Based on interviews with respondents, information was obtained that farmers in the use of pesticides did not pay attention to the dosage / dose in their use, namely farmers using 4-7 types of insecticide pesticides and systemic fungicides in one orange planting period.*

**Keywords:** *Oranges, Organophosphates, Pesticides*

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### **I. Background**

Pesticides are the main choice for controlling pests, diseases and weeds because they directly kill the body of the disturber. The activity of controlling a bully's body is a job that consumes a lot of time, energy and costs. The efficacy of pesticides can be relied upon due to their easy use, high success rate, and easy to obtain and relatively inexpensive costs. The application of pesticides has enormous benefits, so that conditions arise that dependence on pesticides is a factor of production that determines the high production of agricultural crops.

Pesticides can quickly be me n urunkan pest population so that the spread of pests can be prevented. But the use of pesticides in horticultural business is not excessive in terms of species, composition, dose, time and interval. Citrus plants are one of the horticultural commodities that are very popular with the community. This can be seen from the import of oranges, which are increasing every year from the type and quantity aspects. From the 2010 national production data, it was found that in 2010 Indonesia still imported oranges 160 thousand tons and will continue to increase in 2012 to 179 thousand tons. Increasing demand for citrus fruits was followed by the development of increasing consumer orange and increasingly critical of the quality of the fruit, so the health and safety aspects of fruit increased. For this reason, one of the qualities of fruit that must be fulfilled by producers and fruit traders is the level of minimum pesticide residue contained in the fruit must be below the established tolerance limit.

Pesticides found in plants can be absorbed along with the yield of residues that can be consumed by consumers. The pesticide residue not only comes from the material applied, but also comes from the absorption of roots from the soil, especially in plants harvested by the tuber (Matsumura, in Wiralaga, 2004). Based on regulations issued by the Indonesian National Standards Agency (SNI) in 2008, about the maximum residual limit (BMR) of pesticides in plants. Pesticide residues for organophosphate groups are still allowed in plants in predetermined concentrations, especially for vegetables of horticultural commodities the permissible residual concentration limits are

0.5 mg / kg. Pesticide residues are found in all plants such as stems, leaves, fruit and will also be . Especially for fruit, this residue can occur on the surface or the fruit flesh . Although it has been washed, or m asak pesticide residues still te rdapat on foodstuffs (Oginawati, 2003).

In the district of Malang, the district of Poncokusumo is one of the centers of citrus production in Malang Regency. According to Miskiyah (2009) in Malang and Cianjur, pesticide residues were found in horticultural crops, especially cabbage, carrot and tomato. The analysis showed 37.4 ppb endosulfan in cabbage, 10.66 ppb endosulfan in carrots, 7.9 ppb profenofos in tomato plants. In addition, other residues detected include pesticides containing active ingredients chlorpyrifos, metidation, malation, and carbaryl. According to research Narwati et al (2012) reported that there were deltamethrin residues of 0.15 ppm in carrots and 0.01 ppm in celery. In addition, some of the results of the study also showed a number of imazalil and azole thiabend insecticides in the soil, heptachlor, endosulfan, dieldrin and p, p-DDT in zalacca. While the results of analysis of pesticide residues found topad a citrus fruit rbamat ka residue content of 0.09 ppm, above the bat as the tolerances allowed (Hartini., 2014).

Organophosphate is a group of pesticides that farmers like, because it has a strong, fast extermination power, and the results are clearly visible in plants. The Ministry of Agriculture recommends the use of these pesticides because of the organophosphate properties that are easily lost in nature. However, organophosphate pesticide residues in humans can cause acute, or chronic poisoning, this is caused by the accumulative nature of organophosphate pesticide residues (Alegentina, 2005). This study aims to determine the residual levels of organophosphate pesticides in citrus fruits in Poncokusumo District, Malang Regency.

## II. Research Methods

This research was conducted using a descriptive survey method. This research was conducted in March-July 2018. The study was conducted by taking samples of citrus fruits obtained from farmers and traders in Poncokusumo District, Malang Regency. The activity was conducted by interviewing 5 farmers and orange traders. For each farmer and trader, 5 kg of oranges will be bought.

Citrus fruits obtained from each farmer and trader will be taken 5 kg, then the residual levels of pesticides are measured at the Laboratory of PT. Angler Biochemlab Surabaya. The residual level of pesticides is measured by the *Gas* method *Chromatography* for 2 citrus fruit residue samples obtained from ex farmers and ex traders.

Data on the use of pesticides by citrus farmers are presented descriptively and the residual levels of pesticides in citrus fruits are compared with the SNI 7313: 2008 quality standard regarding the Maximum Residue Limit on agricultural products. Further discussion and analysis of the relationship between the use of pesticides and levels of pesticide residues in citrus fruits were made.

## III. Results And Discussion

### Test Results of Pesticide Residue Content

Based on the results of testing the levels of pesticide residues obtained from the laboratory of PT. The Angler Biochemlab Surabaya for testing citrus fruits obtained from the Poncokusumo District in Malang Regency is shown in table 1.

**Table 1.** Organophosphat and Carbamate Pesticide Residues in Citrus Fruits

Pesticide Residues	Poncokusumo District, Malang Regency		LOD Ppm (mg / kg)
	Farmer Samples Ppm (mg / kg)	Sample Trader Ppm (mg / kg)	
Acephate	0.010	0.010	5
Carbofuran	0.010	0.010	0.1
Carbosulfan	0.010	0.010	2
Diazinon	0.010	0.010	0.7
Dimethomorp	0.010	0.010	2
Fenobucarb	0.010	0.010	0.5
Profenofos	0.010	0.010	1
Imidacloprid	0.040	0.010	0.05

Source: primary data

Based on table 1 above, it can be seen that the levels of organophosphat (profenofos) group pesticide residues are all still below the Limit of Detection (LOD), meaning that the measured levels of pesticide residues are not readable by the tool. This contains two possibilities, namely in the citrus fruit, there is no organophosphate group pesticide residue or possibly pesticide residue but below the LOD value of the testing tool. This result may also be caused by the use of pesticide formulations by citrus farmers who mixed several types of pesticides, resulting in no detection of pesticide residues in the gas chromatography tool because the device was unable to detect some mixed pesticide formulations.

Organophosphate pesticides are among the most toxic of pesticides and often cause poisoning in humans. If consumed, even in small amounts, it can cause death. Most of the active ingredients of the organophosphate group have been banned in Indonesia, such as diazinon, fention, fenitroteion, fentoat, chlorpyrifos, quinephos, and malation, while other active ingredients are still permitted. The active ingredients of this group are quite widely used in several types .

Decrease in pesticide residue levels can be done with some approaches namely physically and chemistry. Pesticide residues on the product agriculture can be reduced in a way wash the product with water which flows for several times, then soaked in water for one hour. Some research results report that detergent can be used to release residue fruit pesticides (Indraningsih, 2008). But for fruit This orange thing needs to be proven first first because oranges have normal skin is consumed in a fresh way .

### Characteristics of Respondents

Of the 10 respondents surveyed including 5 farmers and traders, information about the types of pesticides used and the frequency of application of pesticides was shown in table 2.

**Table 2.** Types of Pesticides and Frequency of Application During the Orange Planting Period

Orange	Dose	Frequency	Category
A	4-7 types of pesticides, not according to the dosage	Every 2 days during the planting period	High
B	4-6 types of pesticides, Not according to dose	Every 2-3 days during the planting period	Is being
C	1-4 types of pesticides, Not according to dose	Every 2 days, from the 3rd week the oranges have not been sprayed with pesticides because they are exposed to the disease so that the farmers feel they have failed	Low

Citrus farmers in Poncokusumo Village, Malang Regency use the "Klopindo" insecticide, starting from the 14th day to the 50th day, with a frequency of every 2 days it is possible to cause the active ingredient Imidaklorpid to seep into the citrus parts. "Ambas" and "Curacron" are types of contact and stomach poison insecticides. Contact toxins will work well if exposed or in direct contact with the target pest. This type of contact insecticide is not very effective for controlling pests that move around or can fly, but if there are plants that still retain pesticide residues

So that contact between insects and pesticides can take place. The stomach poison found in "Ambas" and "Curacron" insecticides works if the part of the plant that has been sprayed is eaten by pests. The part of the plant that is eaten is what will reach the stomach of the pest. It is on this stomach that the work of poisons begins to react. The types of trademarks fungicides used by farmers are very diverse, among others, Belvo, Acrobat, Nativo, Antracol, and Hexa. The number of types of fungicides used is due to the fact that citrus plants are very susceptible to fungi, so farmers will try to protect their citrus plants maximally by washing the plants with various trademark fungicide solutions, even though the label is not written on citrus plants.

### IV. Conclusion

The results of the research data showed that citrus fruit samples tested in this study in the form of organophosphate pesticide residues value (profenofos) of 0.01 mg / kg but the value is still below the Limit of Detection (LOD) value of 1 mg / kg whereas for the imidaclorpid content it is known that the sample in the farmer shows a residual value of 0.04 mg / kg nearing the threshold maximum limit of 0.05 mg / kg. Based on interviews with respondents, information was obtained that farmers in the use of pesticides did not pay attention to the dosage / dose in their use, namely farmers using 4-7 types of insecticide pesticides and systemic fungicides in one orange planting period.

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