

**Article Review**

*Effect of Organic and Anorganic Fertilizer Types on Tissue Red Chili Plant  
(Capsicum annum L)*

**Pengaruh Jenis Pupuk Organik dan Anorganik Terhadap Jaringan Tanaman  
Cabai Merah (*Capsicum annum L*)**

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**Abstract**

*Red chili or *Capsicum annum L*, is a superior horticultural plant that many people need for cooking. This plant is one of the largest commodities because it can be consumed domestically or abroad as an export commodity making *C annum L* a major influence on the Indonesian economy. In this research, the author used a literature review research method, specifically research with a series of activities related to methods of collecting data, reading and taking notes, and processing research materials. From the literature results that have been obtained by researchers, the provision of organic and inorganic fertilizers has a great influence on the growth of red chili plants. From the literature that researchers have collected, it is concluded that red chili plants using organic fertilizer are better than using inorganic fertilizer which can damage the soil condition.*

**Keywords:** *Capsicum, Organic, Anorganic.*

**Abstrak**

Cabai merah atau *Capsicum annum L*, merupakan tanaman hortikultura unggulan yang dibutuhkan banyak orang untuk memasak. Tanaman ini merupakan salah satu komoditas terbesar karena dapat dikonsumsi di dalam negeri maupun di luar negeri sebagai komoditas ekspor sehingga membuat *C annum L* berpengaruh besar terhadap perekonomian Indonesia. Dalam penelitian ini, penulis menggunakan metode penelitian studi literatur, yaitu penelitian dengan serangkaian kegiatan yang berkenaan dengan metode pengumpulan data, membaca dan mencatat, serta mengolah bahan penelitian. Dari hasil literatur yang telah didapatkan oleh peneliti, pemberian pupuk organik dan anorganik sangat berpengaruh terhadap pertumbuhan tanaman cabai merah. Dari literatur yang telah peneliti kumpulkan, disimpulkan bahwa tanaman cabai merah dengan menggunakan pupuk organik lebih baik dibandingkan dengan menggunakan pupuk anorganik yang dapat merusak kondisi tanah.

**Kata kunci :** *Cabai Merah, Organik, Anorganik.*

## INTRODUCTION

Red chili or *Capsicum annum L*, is a superior horticultural plant that many people need for cooking. This plant is one of the largest commodities because it can be consumed domestically or abroad as an export commodity, which makes *C annum L* a big influence on the Indonesian economy. *C annum L* is a type of vegetable that has high economic value. Reported from [radarkediri.jawapos.com](http://radarkediri.jawapos.com) in August 2023 the price of red chilies in Keddiry increased from IDR 25,000 to IDR 40,000, the increase in chili prices was influenced by the increasing land for chili planting. narrow but demand in the market is increasing due to population growth, seasonal changes that are difficult to predict, and also increasing fertilizer prices (Achmad & Iriani, 2023).

*C annum L* has fruit that tastes spicy, the spicy taste is obtained from the content in *C annum L* which contains capsaicin. This plant is a plant that is easy to cultivate, but you also have to pay attention to the growing conditions for the red chili plant itself in order to have good results. Because it has good adaptability, *C annum L* can be planted in lowland or highland areas, which have an altitude of 1400 m above sea level. Loose and crumbly soil, containing at least 1.5% organic matter, containing nutrients, water, free of weeds, soil pH for cultivating red chili plants between soil acidity levels of 6-7, soil temperature 24-30 0C, are supporting factors for cultivating Red chili plants influence the flowering factor and fruit ripening process, apart from that, high light intensity can also have an effect (Wati, 2019).

Apart from that, to increase the growth and productivity of red chili plants, fertilizer is also needed. Fertilizer has an important role in the growth of red chili plants, because it contains the ingredients to provide the nutrients needed for plants, develop strong roots, and form quality fruit. However, the choice of organic or inorganic fertilizer must be precise and wise, organic or inorganic fertilizer is usually one of the choices for farmers, chili plants need potassium to help form proteins and carbohydrates, stimulate root growth and development, and improve the quality of the results. Potassium is usually found in inorganic fertilizers, but excessive use of inorganic fertilizers can damage the soil structure. Fertilization by using inorganic fertilizers can only improve the chemical properties of the soil, but not the physical and biological properties of the soil, if the biological and physical properties of the soil are good, then the plants will be more fertile because they are free to take nutrients. Efforts made to improve the soil can be done with the use of organic fertilizers (Vigundari, 2013).

Inorganic fertilizer is a type of fertilizer that is produced industrially and contains chemical compounds that provide nutrients to plants directly. Chemical fertilizers have a high nutritional content, so plants get the nutrients they need quickly. Apart from that, by using inorganic fertilizers farmers can control the amount and type of nutrients given to plants more precisely. However, inorganic fertilizers have the potential to damage the environment and reduce soil fertility levels in the long term. Organic fertilizer comes from natural materials that decompose naturally, such as drum compost, plant waste and other organic materials. This natural process allows nutrients to be released gradually into the soil. Organic fertilizer has the potential to reduce the risk of soil and water pollution, and can also enrich the soil with beneficial microorganisms, and can increase soil fertility and resistance to erosion. However, organic fertilizer takes longer to produce break down and provide plant nutrients, making it less efficient to provide proper nutrition to plants (D & A, 2015).

## RESEARCH METHODS

In this research, the author used a literature review research method, specifically research with a series of activities related to methods of collecting data, reading and taking notes, and processing research materials. Literature review research is research whose object is sought using a variety of information such as books, scientific journals, magazines, newspapers and documents. This research is different from other research which requires the implementation of observations or interviews to collect data. In this research, the data object that researchers are looking for is literature review research or literature that is relevant to the problem being raised.

## RESULTS AND DISCUSSION

The following research results can be seen in table 1

Table 1. Result

Research Title (Author, Institution of Origin, Year of Writing)	Research purposes	Research methods	Research result
The Effect of Providing Organic and Inorganic Fertilizers on the Growth and Production of the Local Toraja Varieties of Big Katokkon Chilies (Mutmainah and Maluki, Faculty of Agriculture, Cokroaminoto University, Palopo, 2017)	To determine the effect of giving organic and inorganic fertilizers on the growth and production of large chilies ( <i>Capsicum year L.</i> ) local Toraja variety	Experimental method with Randomized Group Design (RAK) treatment, which consists of 6 treatments.	<ol style="list-style-type: none"> <li>1. Plant Height: Organic fertilizer treatment gives taller plants and is significantly different from inorganic fertilizer treatment. The highest height of the plant with organic fertilizer was 30.16 cm and the lowest with treatment without fertilizer was 21.76 cm. Meanwhile, in the inorganic fertilizer treatment, the plant height was between 22.99 cm - 24.86 cm.</li> <li>2. Flowering Age: The treatment of organic and inorganic fertilizers has a very significant effect on the flowering age of plants. The organic fertilizer treatment gave the fastest average flowering age, namely 49.92 days, and the slowest treatment without fertilizer, namely 68.59 days. Meanwhile, inorganic fertilizer treatment gave an average flowering age of between 57.67 - 58.33 days.</li> <li>3. Number of flowers per plant: Treatment of various types of organic and inorganic fertilizers has a significant effect on the number of fruits per plant. The organic fertilizer treatment gave the highest average number of</li> </ol>

			<p>fruit, 25.92, and the lowest in the treatment without fertilizer, namely 17.50. Meanwhile, applying inorganic fertilizer gave an average number of fruit of 22.07 - 23.00.</p> <p>4. Sefar Fruit Weight Per Plant: The treatment of various types of organic fertilizer was not significantly different from the treatment of inorganic fertilizer. Organic fertilizer gave the heaviest average weight of fresh fruit, namely 193.42 g/plant and the lowest in the treatment without fertilizer, namely 138.83 g/plant. Meanwhile for inorganic fertilizer the average plant is between 165.95 - 176.66 g/plant.</p>
<p>The Effect of Providing Three Types of Manure and Urea Doses on the Growth and Yield of Chili Plants(<i>Capsicum year L.</i>) (Mutiar Wiyayanti, M. Syamsoel Hadi, Eko Pramono, Faculty of Agriculture, Lapung University, 2013)</p>	<p>To determine the effect of three types of drum fertilizer on the growth and production of chili plants at each dose of urea fertilizer.</p>	<p>The experimental method used a Randomized Group Design (RAK) treatment, which consisted of 3 treatments giving different types of organic fertilizer.</p>	<p>Based on the research results, it can be concluded that the application of cow manure, goat manure, and chicken manure causes differences in growth and yield of chilies as indicated by the variables of plant height, branching level, fruit length, fruit volume, dry weight of the fruit. Giving different doses of urea causes differences in the growth and yield of chilies, which are indicated by the variables of plant height, branching level, number of flowers, number of fruit, fruit weight, fruit length, fruit volume, and dry weight of the stem. The combination of cow manure, goat manure and chicken manure each with a Urea dose of 200 kg ha<sup>-1</sup> produces higher growth and yield of chilies than the combination of manure with other doses of Urea.</p>
<p>Literature Review: The Effect of Organic Fertilizer on the Growth of Red Chili Plants(<i>Capsicum year L.</i>) (Dwi Junita Zega, Suci Febri Chania, Resti Fevria, FMIPA Padang State University, 2023)</p>	<p>Collect and analyze articles or journals related to the effect of organic fertilizer on the growth of red chili plants(<i>Capsicum year L.</i>)</p>	<p>Literature Review or literature review</p>	<p>Based on the results of articles and journals collected and analyzed by the author, the influence of several types of organic fertilizer on the growth of chili plants was obtained. These influences include the growth and yield of chilies, fruit weight, and time to harvest.</p>

Classification of Red Chilies, Deviation : Magnoliophyta, Class : Magnoliopsida, Order : Solanales, Family: Capsicum, Species : *Capsicum year 5*

From the results of the literature that researchers have obtained, the provision of organic and inorganic fertilizers has a great influence on the growth of red chili plants. Based on research conducted by (Mutmaninnah & Masluki, 2017) the results showed that giving organic fertilizer resulted in higher plant height compared to

inorganic fertilizer. With organic fertilizer, the highest plant height is 30.16 cm. The application of organic fertilizer has an effect on the flowers, the average flower age is 49.92 days. Apart from influencing the height of the plant and the age of the flowers, the application of fertilizer also influences the number of fruit, the red chili plants are given organic fertilizer, the average number of fruit was 25.92. Based on the results of the research (Wijayanti, Hadi, & Pramono, 2013) that the chili growth yield was higher with a combination of goat drum fertilizer and chicken manure, with a Urea dose of 200kg ha<sup>-1</sup> than the combination of the drum fertilizer with other urea doses. This can be determined by the variables of plant height, branching level, number of flowers, fruit weight, application of cow drum fertilizer, goat manure, and chicken manure can cause differences in the growth and yield of chilies. Then for those who used inorganic fertilizer, the height was between 22.99 cm - 24.86 cm. When applying inorganic fertilizer, the average flower life was 57.67 - 58.22 days. and for plants that were given inorganic fertilizer, they had fruit with an average number of fruit of 22.07 - 23.00. Providing organic and inorganic fertilizers also affected fruit weight, plants given organic fertilizer had the heaviest weight of 193.42 kg/ plant, while plants given inorganic fertilizer were between 165.95 - 176.66 g/ plant. (Mutmaninnah & Masluki, 2017). The research results obtained from (Zega, Chania, & Fevria, 2023) Based on the results of articles and journals collected and analyzed by the author, the influence of several types of organic fertilizer on the growth and yield of chilies and harvest time was obtained.

Organic fertilizer produced from animal waste contains nitrogen which plays an important role in the formation of the following percentages of nutrient content in several types of manure.

Table 2. Nutrient content in several types of manure

Animal Source	Nutrient Content (%)		
	N.total	P2O5	K2O
Cow	0,067	0,63	0,89
Goat	1,23	0,71	1,83
Chicken	1,27	2,49	2,1

Based on the table above, we can see that animal waste contains nitrogen which plays an important role in the formation and growth of vegetative parts of plants such as roots, stems, leaves, apart from that, nitrogen also plays a role in cell formation. Phosphorus plays a role in the process of stimulating flowering, while the potassium content can be used to increase plant resistance from pest and disease attacks (Kusumadewi, Suyanto, & Suwerda, 2019).

The use of inorganic fertilizers can increase plant productivity, but if used continuously and in large quantities it will damage the soil structure and reduce soil fertility levels. The use of inorganic fertilizers has a fast effect on plant control

because it already has the right dosage according to what is needed. plant. In contrast to inorganic fertilizer, organic fertilizer comes from natural ingredients which can make the soil more fertile, can be used to improve the structure of infertile soil to make it fertile, however, this organic fertilizer does not have a dosage and takes quite a long time to provide nutrients to the soil. If there are enough nutrients, physiological and metabolic processes run well.

Fertilizer has an effect on the soil and also on plant tissue, so that applying fertilizer has a big effect on the stems, leaves, flowers and fruit. Because plants absorb food using roots in the soil, soil that has few nutrients cannot meet the needs of plants, causing plants not to grow well and some may even die. Using organic materials as nutrients can reduce the level of pest attacks. Meanwhile, with inorganic fertilizer, more pests are attacked, although the presentation is still relatively small.

### CONCLUSION

The use of fertilizer can affect red chili plant tissue, which affects stem height, number of branches, leaves, flowers and number of red chili fruit. Everything can be obtained from drum fertilizer. From the literature that researchers have collected, it is concluded that red chili plants using organic fertilizer are better than using inorganic fertilizer which can damage the condition of the soil.

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