

EFFECT OF ORGANIC MULCHING TIME ON THE GROWTH OF CASHEWS (*Anacardium occidentale*)

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Abstract

*Mulching is a soil and water conservation technique widely used in cultivation systems. Mulching functions to suppress groundwater evaporation, inhibit weed growth, and improve soil physical conditions. This study was conducted with the aim of determining the effect of mulching time on the growth of cashew (*Anacardium occidentale*) seedlings. The study was conducted at the Faculty of Military Logistics Vocational, Indonesian Defense University, Belu, East Nusa Tenggara Province, and was conducted in April–May 2026 using a single-factor Completely Randomized Design (CRD) and using three treatments: P0 (control), P1 (mulching 7 days after planting), and P2 (mulching 14 days after planting). The parameters tested in this study were plant height, stem diameter, number of leaves, root length, wet weight of the stover, and dry weight of the stover. The results showed that mulching did not significantly affect the growth of cashew seedlings. Mulching 7 days after planting gave the highest growth results in the parameters of plant height (18 cm), stem diameter (5.87 mm), number of leaves (6 pieces), root length (8.33 cm), wet weight of the stover (6.53 g), and dry weight of the stover (2.67 g).*

Keywords: cashew; mulch; seedling growth

Abstrak

Penggunaan mulsa merupakan salah satu teknik konservasi tanah dan air yang banyak digunakan dalam sistem budidaya. Mulsa memiliki fungsi untuk menekan evaporasi air tanah, menghambat pertumbuhan gulma, dan memperbaiki kondisi fisik tanah. Penelitian ini dilakukan dengan tujuan untuk mengetahui pengaruh waktu pemberian mulsa terhadap pertumbuhan bibit jambu mete (*Anacardium occidentale*). Penelitian dilakukan di Fakultas Vokasi Logistik Militer Universitas Pertahanan Republik Indonesia, Belu, Provinsi Nusa Tenggara Timur yang dilaksanakan pada bulan April – Mei 2026 dengan menggunakan Rancangan Acak Lengkap (RAL) faktor tunggal dan menggunakan tiga perlakuan, yaitu P0 (kontrol), P1 (pemberian mulsa 7 HST), dan P2 (pemberian mulsa 14 HST). Parameter yang diuji pada penelitian ini yaitu tinggi tanaman, diameter batang, jumlah daun, panjang akar, bobot basah brangkas, dan bobot kering brangkas. Hasil penelitian menunjukkan bahwa pemberian mulsa tidak memberikan pengaruh yang nyata pada pertumbuhan bibit jambu mete. Pemberian mulsa 7 HST memberika hasil pertumbuhan tertinggi pada parameter tinggi tanaman (18 cm), diameter batang (5,87 mm), jumlah daun (6 helai), panjang akar (8,33 cm), bobot basah brangkas (6,53 g), dan bobot kering brangkas (2,67 g).

Kata kunci: jambu mete; mulsa; pertumbuhan bibit.

I. INTRODUCTION

Cashew (*Anacardium occidentale*) is one of the plantation commodities that has an important role in the agribusiness sector, especially in tropical and subtropical areas. This plant is known by many people as a producer of cashews which has high economic value, both in the domestic and international markets. In addition to having a function as a food source, cashews also play an ecological role as a conservation crop in dry land, due to the ability of cashews to survive and grow in soil conditions that have low fertility rates (Fadillah *et al.*, 2023). Jambu mete banyak dibudidayakan di beberapa wilayah beriklim kering di Indonesia, seperti Nusa Tenggara Timur, Nusa Tenggara Barat, dan Sulawesi (BPS, 2023). The conditions of some of these areas are in accordance with the growing needs of cashew plants which require high light intensity, moderate rainfall, and good soil drainage. Cashew (*Anacardium occidentale*) is one of the plantation commodities that has an important role in the agribusiness sector, especially in tropical and subtropical areas. This plant is known by many people as a producer of cashews which has high economic value, both in the domestic and international markets. In addition to having a function as a food source, cashews also play an ecological role as a conservation crop in dry land, due to the ability of cashews to survive and grow in soil conditions that have low fertility rates (Fadillah *et al.*, 2023). Cashew production also plays a role as one of the country's sources of foreign exchange through the export of cashews in raw and processed form.

The use of mulch is one of the soil and water conservation techniques that are widely used in cultivation systems. Mulch has the function of suppressing groundwater evaporation, inhibiting weed growth, and improving the physical condition of the soil (Gulo *et al.*, 2025). The effectiveness of mulch is greatly influenced by the time of its application, the application of mulch at the wrong time can potentially reduce the optimization of the expected benefits. According to Sultani *et al.* (2021), mulching too early, i.e. before plants are able to adapt to the environment, or too long after a decrease in soil moisture. This can reduce the efficiency of the mulch function to maintain soil conditions. Based on this description, this study was carried out to determine the influence of mulch application time and to find out the most appropriate mulching time for cashew growth is important to be carried out.

II. LITERATURE REVIEW

Mulch is a material added to agricultural land with the aim of maintaining the physical, chemical, and biological conditions of the soil so that it remains optimal for the growth of a plant. The use of mulch also aims to reduce evaporation, suppress weed growth, and stabilize soil temperature (Adnan *et al.*, 2023). In general, mulch is divided into two types, namely organic and inorganic mulch. The effectiveness of mulching is

determined not only by its type, but also by the time of its application. Mulching at the right time can maximize water absorption and support the initial growth phase of a plant. Late application can lead to reduced mulch effectiveness in retaining soil moisture (Ganda, 2021). The purpose of application is to maintain soil moisture, suppress soil temperature fluctuations, and reduce evaporation.

III. RESEARCH METHODS

This study is an experimental quantitative research with the aim of determining the effect of mulching time on the growth of cashew plant seedlings (*Anacardium occidentale*) with an experimental design, namely the Complete Random Design (RAL) of single factor. This study consisted of three treatments, including no mulch (P0), mulching 7 HST (P1), and mulching 14 HST (P2), each treatment consisted of five replicas with three samples in each replication. Observations are carried out 7 days after planting and are carried out once every 7 days. The parameters observed were plant height, stem diameter, number of leaves, root length, wet weight of prunes, and dry weight of prunas measured in the 1st, 2nd, 3rd, and 4th weeks after planting, while the root length parameters, wet weight of prunes, and dry weight of prunes, were measured at the end of the study. Plant analysis data was obtained by direct observation and followed by tabulation of data using *Microsoft Excel*. Data analysis was carried out using *Analysis of Variance* (ANOVA) to determine the effect of treatment on all observed parameters, if it showed a real effect, it was followed by the *Duncan Multiple Range Test* (DMRT) at a real level of 5% to find out the difference between treatments.

IV. RESEARCH RESULTS

1. Plant Height

The results of the variety analysis test (Table 4.1) showed that the time of mulch application did not have a significant influence on the height parameters of the plant.

Table 4. 1 ANOVA test on plant height parameters

Tabel ANOVA 35 HST							
SK	DB	JK	KT	Fhit	Ftab		Ket
					0.05	0.01	
Detestation	4	28.49	7.12	1.05	3.84	7.01	TN
Treatment	2	6.58	3.29	0.48	4.46	8.65	TN
Errors/Residues	8	54.31	6.79				
Total	14	89.38					

Source: Processed Author (2026)

The application time of organic mulch on the growth of cashew seedlings shows the different plant high values presented in Figure 4.1. The treatment of mulching 7 HST (P1) showed the highest results than other treatments with a value of 18.20 cm. Physiologically, at 7 HST cashew seedlings begin to enter active growth which is characterized by the development of all parts of the plant and increased photosynthesis activity, so that the application of mulch in this phase is suspected to be able to maintain the availability of water in the soil so as to be able to maintain soil temperature and suppress soil evaporation. Optimal water availability can increase cell turgor, so that the process of cell elongation and division can take place more effectively. The results of this study are in line with the results of the Ganda (2021) study which showed that the time of mulching application had no real effect on the tall growth of soybean plants.

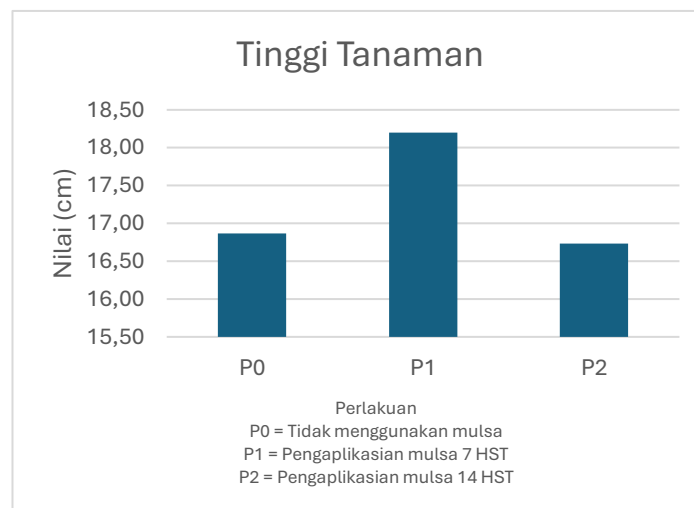


Figure 4. 1 Diagram of the height growth of cashew seedlings 35 HST

2. Diameter Batang

The results of the variety analysis test (Table 4.2) showed that the mulch application time did not have a significant influence on the bar chart parameters.

Table 4. 2 ANOVA test on rod diameter parameters

Tabel ANOVA 35 HST							
SK	DB	JK	KT	Fhit	Ftab		Ket
					0.05	0.01	
Detestation	4	1.32	0.33	0.94	3.84	7.01	TN
Treatment	2	2.31	1.15	3.28	4.46	8.65	TN
Errors/Residues	8	2.81	0.35				
Total	14	6.44					

Source: Processed Author (2026)

The application time of organic mulch on the growth of cashew seedlings shows the values of the different stem diameters presented in Figure 4.2. The mulching treatment of 7 HST (P1) showed the highest results than other treatments with a value of 5.87 mm. It is suspected that the treatment of mulching 7 HST (P1) is the initial phase of the growth of cashew plants which requires sufficient water availability to support the development of stem diameter. In this phase, the application of organic mulching is able to maintain the availability of water in the soil so as to reduce water loss due to evaporation, maintain a stable soil temperature, and allow the absorption of nutrients to take place more optimally so that the cambium formation process becomes more active. This activity results in the addition of xylem and secondary phloem tissues that affect the growth of stem diameter (Siregar *et al.*, 2025).

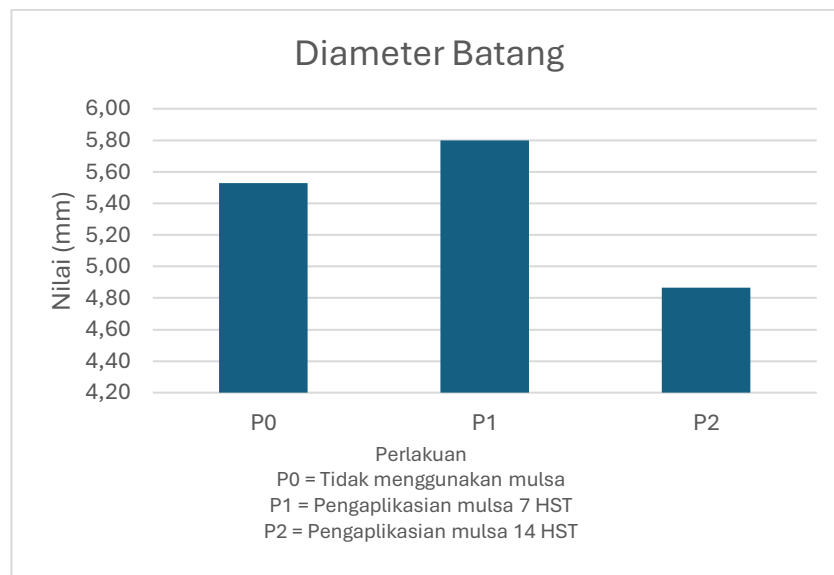


Figure 4. 2 Growth diagram of the stem diameter of cashew seedlings 35 HST

3. Number of Leaves

Table 4.3 shows that the time of mulch application does not have a significant influence on the leaf count parameter.

Table 4. 3 ANOVA test on the number of leaves parameter

Tabel ANOVA 35 HST							
SK	DB	JK	KT	Fhit	Ftab		Ket
					0.05	0.01	
Detestation	4	3.60	0.90	2.03	3.84	7.01	TN
Treatment	2	1.11	0.56	1.25	4.46	8.65	TN
Errors/Residues	8	3.56	0.44				

Total	14	8.27
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Source: Processed Author (2026)

The application time of organic mulch on the growth of cashew seedlings shows the values of the different number of leaves presented in Figure 4.3. The mulching treatment of 7 HST (P1) showed a higher number of leaves than other treatments with a value of 6 leaves. The greater number of leaves in the 7 HST (P1) mulching treatment is related to the mulch's ability to maintain soil moisture and suppress water loss through the soil evaporation process. Water availability also affects the formation of new tissues, including leaves. Water functions to maintain turgor pressure so that it supports cell development and elongation which affects the formation of new leaves. The more leaves in cashew seedlings, the greater the ability of cashew seedlings to capture sunlight and produce photosynthates to support plant growth (Damaiyanti *et al.*, 2013).

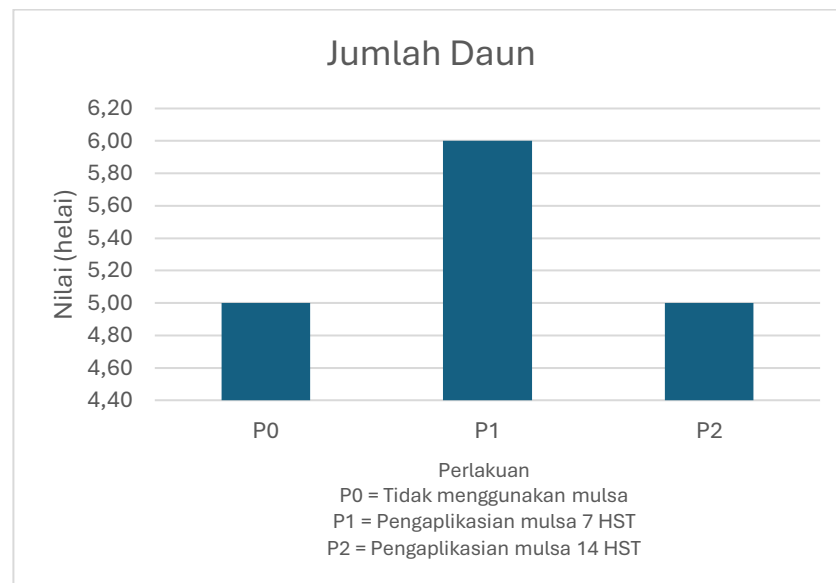


Figure 4. 3 Growth diagram of the number of leaves of cashew plants 35 HST

4. Root Length

Variety-fingerprint analysis (Table 4.4) showed that the application time of organic mulch did not have a significant influence on the root length parameters.

Table 4. 4 ANOVA test on root length parameters

Tabel ANOVA 35 HSS							
SK	DB	JK	KT	Fhit	Ftab		Ket
					0.05	0.01	
Detestation	4	0.40	0.10	0.06	3.84	7.01	TN
Treatment	2	0.84	0.42	0.27	4.46	8.65	TN

Errors/Residues	8	12.71	1.59
Total	14	13.96	

Source: Processed Author (2026))

The application time of organic mulch on the growth of cashew seedlings shows the values of different root lengths presented in Figure 4.4. The mulching treatment of 7 HST (P1) showed the highest results than other treatments with a value of 8.33 cm. The high value of mulching treatment 7 HST (P1) on the root length parameter is suspected to be because organic mulching can retain soil moisture and reduce evaporation in the soil. Moist soil conditions greatly affect root growth because roots need enough water for the process of cell division and elongation. Sufficient water availability can encourage roots to grow more actively in search of nutrients in the soil (Damaiyanti *et al.*, 2013).

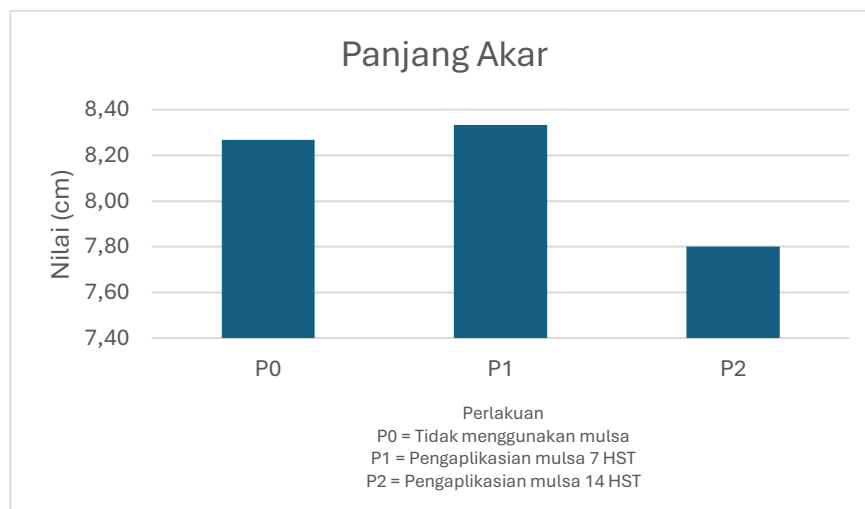


Figure 4. 4 Root length growth diagram 35 HST

5. Wet Weight Trimming

The ANOVA table (Table 4.5) shows that the application time of organic mulch does not have a significant influence on the wet weight parameters of the prunes.

Table 4. 5 ANOVA test on the wet weight parameters of the pruning

Tabel ANOVA 35 HST							
SK	DB	JK	KT	Fhit	Ftab		Ket
					0.05	0.01	
Detestation	4	1.81	0.45	0.40	3.84	7.01	TN
Treatment	2	3.66	1.83	1.61	4.46	8.65	TN
Errors/Residues	8	9.08	1.14				

Total 14 14.55

Source: Processed Author (2026))

The application time of organic mulch on the growth of cashew seedlings shows the different wet weight values of the cuttings presented in Figure 4.5. The mulching treatment of 7 HST (P1) showed the highest results than other treatments with a value of 6.53 g. The high wet weight of the prunes in the treatment of mulching 7 HST (P1) is suspected to be due to the ability of organic mulch to maintain the availability of water in the soil, so that the water needs of plants can be met optimally. Water is the main component as a constituent of plant tissues that are highly influential in various physiological processes, such as nutrient absorption, photosynthesis, translocation of photosynthetic results, and cell enlargement and division. Sufficient water availability supports the growth of plant tissues more optimally, which ultimately contributes to increasing the wet weight of cashew seedlings (Hartono *et al.*, 2018).

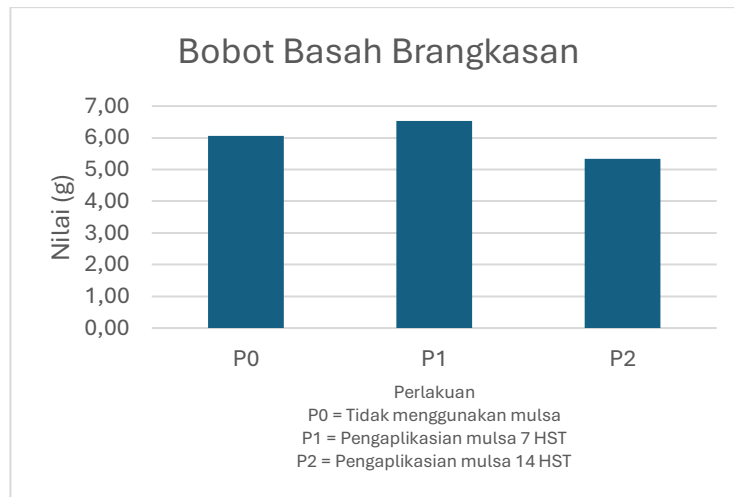


Figure 4. 5 Diagram of wet weight of cashew seedlings 35 HST

6. Dry Weight Pruning

Based on the results of the ANOVA analysis (Table 4.6), the mulch application time does not have a significant influence on the dry weight parameters of the prunes.

Table 4. 6 ANOVA test on the dry weight parameters of the brayos

SK	DB	JK	KT	Fhit	Ftab		Ket
					0.05	0.01	
Detestation	4	0.52	0.13	1.09	3.84	7.01	TN
Treatment	2	0.90	0.45	3.81	4.46	8.65	TN
Errors/Residues	8	0.95	0.12				

Total	14	2.37
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Source: Processed Author (2026))

The application of organic mulch on cashew seed growth shows the different dry weight values of cuttings presented in Figure 4.6. The treatment of mulching 7 HST (P1) showed the highest results than other treatments with a value of 2.67 g. The high dry weight of the prunes in the mulching treatment of 7 HST (P1) is suspected to be related to the application of organic mulch in the early stages of growth that can maintain soil moisture, as well as increase the efficiency of water and nutrient absorption by the root system. The availability of sufficient water and nutrients can support the sustainability of photosynthesis so that photosynthetic production increases. The resulting photosynthate is then used for the formation and development of plant tissues, such as stems, leaves, and other vegetative organs (Nisa *et al.*, 2023).

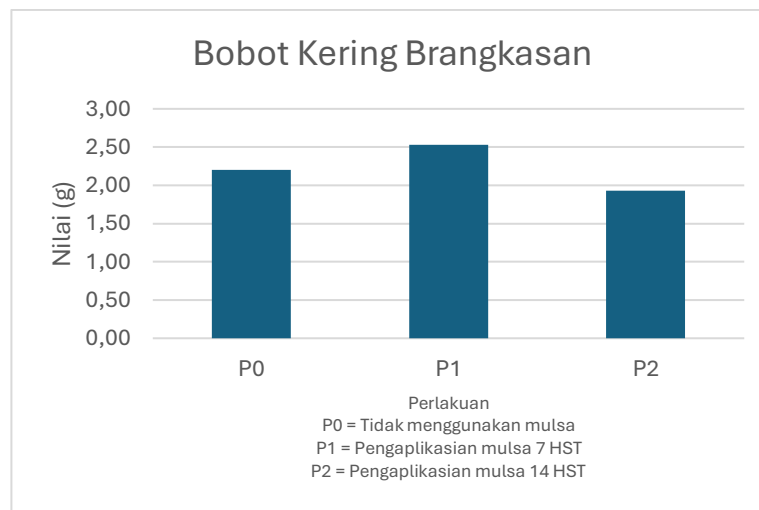


Figure 4. 6 Dry weight diagram of cashew plant cuttings

V. CONCLUSION

Mulching at different times has been proven to have no real effect on the growth of cashew plants. This is because the difference in mulching time has not been able to create significantly different plant growing conditions, so that the process of absorbing water and nutrients in the soil is relatively the same in each treatment. Mulching 7 HST (P1) gave the highest growth results in the parameters of plant height (18.20 cm), stem diameter (5.87 mm), number of leaves (6 leaves), root length (8.33 cm), wet weight of prunes (6.53 g), and dry weight of prunes (2.67 g).

REFERENCE

Adnan, Sondakh, R. C., & Alfin, M. (2023). Pengaruh Kombinasi Mulsa dan Jenis Pupuk Kandang Terhadap Pertumbuhan dan Hasil Tanaman Bawang Merah (*Allium Ascalonium* L.). *Jornal of Multi Disciplinary Sciences*, 2(2), 61-71.

- Badan Pusat Statistik (BPS). (2023). Statistik Perkebunan Indonesia: Jambu Mete 2022. BPS Republik Indonesia.
- Damaiyanti, D. R. R., Aini, N., & Koesriharti. (2013). Kajian Penggunaan Macam Mulsa Organik Pada Pertumbuhan Dan Hasil Tanaman Cabai Besar (*Capsicum annuum* L.). *Jurnal Produksi Tanaman*, 1(2), 25-31.
- Fadillah, R., Sugelar, D. H., Kusnendi, F. S., & Zuliati, S. (2023). Identifikasi Keragaman dan Dominasi Gulma Jambu Mete (*Anacardium occidentale*) Telah Menghasilkan. *Jurnal Agroteknologi dan Ilmu Pertanian*, 41-52.
- Faisal, M & Yelni, G. (2021). Pengaruh Berbagai Macam Mulsa Terhadap Pertumbuhan dan Hasil Bawang Merah di Ultisol Kabupaten Bungo. *Jurnal Sains Agro*, 6(1), 43-51.
- Ganda, R. M., (2021). *Pengaruh Jenis Mulsa dan Waktu Pengaplikasian Terhadap Pertumbuhan dan Hasil Tanaman Kedelai (Glycine Max L.) Dengan Teknologi Terasering*, Universitas Borneo Tarakan. <https://repository.ubt.ac.id/repository/UBT10-08-2022-11163>.
- Gulo, A., Harefa, L., & Gea, F. J. (2025). Efektivitas Penggunaan Mulsa Plastik dalam Meningkatkan Produktivitas Tanaman Cabai (*Capsicum annuum* L.). *Jurnal Kajian Ilmu Pertanian dan Perkebunan*, 2(1), 152-159.
- Hartono, S., Pembengo, W., & Rahim, Y. (2018). Pengaruh Jenis Mulsa Organik dan Sistem Tanam Jajar Legowo Terhadap Pertumbuhan dan Hasil Tanaman Nilam (*Pogostemon cablin Benth*). *Jurnal Agroteknologi Tropika*, 7(3), 327-334.
- Nisa, C., Redjeki, E. S., & Lailiyah, W. N. (2023). Pengaruh Pemberian Mulsa Jerami Padi Dan Pupuk Npk Phonska Terhadap Pertumbuhan Dan Hasil Tanaman Kacang Panjang (*Vigna Sinensis* L.). *Journal of Agro Plantation*, 2(1), 157-168.
- Sultani, S., Hasanuddin, H., & Hafsah, S. (2021). Pengaruh Dosis dan Waktu Aplikasi Mulsa Organik *Chromolaena odorata* terhadap Hasil Tanaman Kedelai (*Glycine max* L.). *Jurnal Agrista*, 22(2), 70-76.
- Siregar, S., Yuniasih, B., & Mawandha, H. G. (2025). Pengaruh Ketebalan Mulsa dan Volume Penyiraman terhadap Pertumbuhan Bibit Kelapa Sawit Main Nursery. *Jurnal Agroforetech*, 3(1), 177-185.