RINGKASAN

Padi (*Oryza sativa* L.) merupakan komoditas pangan utama bagi lebih dari separuh penduduk dunia, termasuk Indonesia. Namun, tantangan seperti berkurangnya lahan persawahan, pertumbuhan penduduk, dan perubahan iklim menuntut alternatif budidaya yang lebih adaptif, salah satunya melalui pengembangan padi gogo. Padi gogo memiliki potensi besar untuk dibudidayakan di lahan kering, namun produktivitasnya masih rendah karena keterbatasan air, suhu tanah yang ekstrem, dan rendahnya kandungan bahan organik serta unsur hara. Penelitian ini telah dilaksanakan di lahan Percobaan Fakultas Pertanian Universitas Islam Sumatera Utara, Jln. Karya Wisata, Kelurahan Gedung Johor, Kecamatan Medan Johor, Kota Madya Medan, Provinsi Sumatera Utara Pada Ketinggian tempat ± 25 mdpl, dengan Topografi datar. Penelitian ini dilakasankan Bulan Januari sampai April 2025.

Penelitian ini bertujuan untuk mendapatkan kondisi tanah (Suhu dan Kelembapan) akibat pemberian mulsa Jerami padi. Untuk medapatkan respon pertumbuhan tanaman dengan pemberian pupuk N pada berbagai kondisi suhu dan kelembapan tanah. Penelitian ini menggunakan Rancangan Acak Kelompok (RAK) faktorial yang terdiri dari 2 faktor perlakuan yaitu: Faktor pertama adalah mulsa jerami (M) yang tersusun atas 2 taraf, yaitu: M_0 = Kontrol (Tanpa mulsa jerami); M_1 = mulsa jerami 12 kg/plot. Faktor kedua adalah sumber nitrogen (N) (69 kg N/ha) yang tersusun atas 4 taraf, yaitu: N_0 = Kontrol (Tanpa pupuk N); N_1 = 60 g/plot Urea (N: 46%); N_2 = 131,43 g/plot ZA (21%); N_3 = 184 g/plot KNO_3 (N: 15%). Parameter pengamatan yang terdiri dari suhu tanah, kelembapan tanah, panjang malai, sudut daun bendera, luas daun bendera, bobot gabah hampa per plot, bobot gabah berisi per plot dan curah hujan serta radiasi matahari.

Berdasarkan hasil penelitian menunjukkan bahwa mulsa jerami padi (M_1) terbukti meningkatkan kelembapan tanah dan membantu menstabilkan suhu tanah, dibandingkan perlakuan tanpa mulsa (M_0). Peningkatan kelembapan tanah terjadi secara konsisten di seluruh kedalaman 0–15 cm, meskipun terdapat fluktuasi curah hujan (176 mm di Januari, turun ke 90 mm di Februari, dan naik kembali menjadi 120 mm di Maret) serta peningkatan radiasi matahari (dari 135 Watt/m² di Januari menjadi 172 Watt/m² di Maret). Penggunaan mulsa jerami padi efektif dalam mengurangi evaporasi dan menjaga ketersediaan air tanah, terutama saat curah hujan rendah dan intensitas radiasi tinggi. Pemberian sumber nitrogen (N_1) 60 g/plot (Urea N: 46%) berpengaruh nyata dalam meningkatkan bobot gabah berisi dan menurunkan bobot gabah hampa. Kombinasi antara mulsa jerami padi dan sumber nitrogen memberikan hasil produksi tertinggi, menandakan bahwa pengaruh nitrogen sangat dipengaruhi oleh kondisi lingkungan tanah yang diperbaiki oleh jerami padi.

Kata Kunci : Tanaman Padi, Mulsa jerami Padi, Sumber Nitrogen, Pertumbuhan dan Produksi.

SUMMARY

Rice (Oryza sativa L.) is a staple food commodity for more than half of the world's population, including Indonesia. However, challenges such as decreasing paddy field areas, population growth, and climate change demand more adaptive cultivation alternatives, one of which is the development of upland rice. Upland rice has great potential to be cultivated in drylands, but its productivity remains low due to limited water availability, extreme soil temperatures, and low levels of organic matter and nutrients. This research was conducted at the Experimental Field of the Faculty of Agriculture, Islamic University of North Sumatra, located on Karya Wisata Street, Gedung Johor Subdistrict, Medan Johor District, Medan City, North Sumatra Province. The site is situated at an altitude of approximately 25 meters above sea level with flat topography. The research was carried out from January to April 2025.

This study aims to determine soil conditions (temperature and moisture) resulting from the application of rice straw mulch, and to observe plant growth response to nitrogen fertilization under various soil temperature and moisture conditions. The research employed a factorial Randomized Complete Block Design (RCBD) consisting of two treatment factors. The first factor was rice straw mulch (M) with two levels: M_0 = Control (without rice straw mulch); M_1 = Rice straw mulch at 12 kg/plot. The second factor was the nitrogen source (N) at a rate of 69 kg N/ha with four levels: N_0 = Control (without nitrogen fertilizer); N_1 = 60 g/plot Urea (N: 46%); N_2 = 131.43 g/plot Ammonium Sulfate/ZA (N: 21%); N_3 =184 g/plot Potassium Nitrate/KNO_3 (N: 15%). The observed parameters included soil temperature, soil moisture, panicle length, flag leaf angle, flag leaf area, weight of unfilled grains per plot, weight of filled grains per plot, rainfall, and solar radiation.

Based on the research results, rice straw mulch (M_1) has been proven to increase soil moisture and help stabilize soil temperature compared to the treatment without mulch (M_0). The increase in soil moisture occurred consistently throughout the 0–15 cm soil depth, despite fluctuations in rainfall (176 mm in January, dropping to 90 mm in February, and rising again to 120 mm in March) and an increase in solar radiation (from 135 Watts/m² in January to 172 Watts/m² in March). The use of rice straw mulch was effective in reducing evaporation and maintaining soil water availability, especially during periods of low rainfall and high radiation intensity. The application of nitrogen source (N_1) at 60 g/plot (Urea N: 46%) had a significant effect in increasing the weight of filled grains and reducing the weight of unfilled grains. The combination of rice straw mulch and nitrogen source resulted in the highest yield, indicating that the effect of nitrogen is strongly influenced by the soil environmental conditions improved through the use of rice straw mulch.

Keywords: *Rice Plant, Rice Straw Mulch, Nitrogen Source, Growth and Yield.*