

Research Report

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Effects of Different Mulching Materials on Growth and Yield of Okra (*Abelmoschus esculentus* L. Moench) cv. Arka Anamika in East Rukum, Nepal

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Abstract A field study was conducted from 10th April to 24th June 2024 to evaluate the effects of different mulching materials on the growth and yield of okra, specifically the Arka Anamika variety, and to compare yield performance across the various mulching treatments. The experiment was carried out at Dhakalbara, Sisne Rural Municipality-6, East Rukum, Nepal, using a Randomized Complete Block Design (RCBD). Six treatments were tested: T1 (black plastic mulch), T2 (control), T3 (mustard straw), T4 (banmara), T5 (sawdust), and T6 (leaf litter), each replicated four times. The results indicated that mulching type had a significant influence on both growth and yield parameters. The highest plant height was recorded from black plastic mulch at 25 days after sowing (DAS) (8.61 cm), 40 DAS (22.37 cm), and 60 DAS (74.87 cm), compared to other treatments. Black plastic mulch consistently produced the tallest plants, followed by mustard straw mulch (20.17 cm and 68.82 cm), which showed moderately improved growth compared to the other treatments. In addition to plant height, black plastic mulch also promoted a higher number of leaves per plant and resulted in superior yield performance. Black plastic mulch produced the highest average fruit weight (245.80 g), which was statistically superior to most organic mulches and comparable to the control plot (193.70 g). The highest productivity (14.897 Mt/ha) was recorded from black plastic mulch, followed by control (11.739 Mt/ha). The findings confirm that mulching, especially black plastic mulch, significantly enhances okra growth and productivity.

Keywords Okra (*Abelmoschus esculentus* L. Moench); Arka Anamika; Yield; Black plastic mulch; Mulching

1 Introduction

Okra production in mid-hill regions such as East Rukum is often constrained by uneven topography, limited irrigation facilities, and moisture stress during dry periods. Farmers in this region largely depend on rainfall, and soil moisture conservation remains a major challenge affecting crop growth and yield stability (Adhikari, 2018). Under such conditions, vegetable production, including okra, is highly affected due to moisture stress and limited soil management options. In addition, the availability and use of mulching materials are not well optimized under local farming conditions (Atreya et al., 2008).

Okra, scientifically known as *Abelmoschus esculentus*, is a renowned species belonging to the family Malvaceae. It holds great economic value as a vegetable crop, primarily cultivated in tropical and subtropical regions across the globe. It serves not only as a valuable source of fiber and nutrients but also plays a significant role in promoting human health. In Nepal, the total production of okra is 13.7 Mt/ha (MoALD, 2024). It is widely cultivated in Jhapa, Morang, Saptari, Bara, Chitwan, Rautahat, Kailali, and Dhanusa (Jha et al., 2018).

Mulching is the agronomic practice of leaving mulch on the surface of the soil for soil and water conservation and to favor plants' growth. Mulch refers to any material, other than soil or living vegetation, that performs the function of permanent or semi-permanent protective cover over the soil surface (Prosdocimi et al., 2016). When mulch is used, the soil becomes less compact and cooler, and its porosity and moisture improve. It also helps increase soil pH, organic matter, and the levels of nutrients like nitrogen, phosphorus, potassium, calcium, and magnesium in both the soil and the plant leaves (Adekiya et al., 2017). Mulching helps reduce weed growth, limits water loss through evaporation, and protects the soil from runoff and erosion, which together slow down soil degradation. As a result, it improves soil moisture retention, moderates soil temperature, enhances the soil's