

physical, chemical, and biological properties, and ultimately supports healthier crop growth and higher yields (Chauhan et al., 2024). Generally, straw, rice husk, crop residues or plastic mulch can be used as artificial mulch in crops (Wilhoit et al., 2019). An effective mulch should be affordable, readily available, simple to apply, and durable enough to resist being washed or blown away (Norman et al., 2011). However, limited studies have been conducted on the effectiveness of different mulching materials under the specific agro-ecological conditions of East Rukum, where environmental constraints differ significantly from the lowland areas of Nepal.

Therefore, the objective of this study was to evaluate the effect of different mulching practices on the growth and yield of okra, and to compare the yield performance under each mulching treatment. The study aimed to identify the most effective mulching method for improving okra yield and to generate useful information that can help farmers select suitable mulching practices for better crop productivity.

2 Materials and Methods

2.1 Experimental site

The experiment was conducted from 10th April to 24th June, 2024, at Dhakalbara, Sisne Rural Municipality-6, East Rukum District. The geographical location of the site is situated at an elevation of 1,568 m above sea level; the latitude is 28.612,803,06 °North, and the longitude is 82.620,663,89 °East. The soil was classified as sandy loam soil with a medium level of nitrogen and has an alkaline pH (Kafle et al., 2025).

2.2 Experimental details

The experiment was conducted using a randomized complete block design with 6 treatments, and each treatment was replicated 4 times. The Arka Anamika variety was selected for experimental purposes. The variety was brought from the local agrovet. Six treatments, i.e., T1-black plastic mulch, T2-control, T3-mustard straw, T4-banmara (*Eupatorium adenophorum*), T5-sawdust, and T6-leaf litter (*Acacia catechu*, *Syzygium cumini*, *Cedrus deodara*) were tested. The thickness of plastic mulch was 25 microns. 600 kilogram/ropani of decomposed farmyard manure were applied (Agriculture and Livestock Diary, 2081). Chemical fertilizers were not used as the site area consists of 100% organic farming practices.

2.3 Experimental unit

Each plot measured 2.1 m in length and 2.1 m in breadth. The R-R distance between crops was 30 cm, and the P-P distance was 30 cm. The individual plot area was 4.41 m² with 7 rows and 7 plants per row, giving a total of 49 plants in each plot. The distance between the blocks of replication was 50 cm, and within the treatments was 50 cm. The outer two rows and the outer two columns were designated as border plants, and data were recorded from the sample plants selected from the remaining inner area of the plot. Out of 7 rows, the outer 2 rows were taken as border plants, and the data were recorded from the sample plants selected within the remaining rows. The outer border was 50 cm from the plot.

2.4 Field preparation and layout

The field was ploughed using a mini tiller. Then the field was divided into 24 plots with each plot size of 2.1 m length and 2.1 m breadth in the appropriate layout of RCBD design. Measuring tape, pegs, and plastic ropes were used to carry out the layout of the field. Soil was treated with the recommended dose of *Metarhizium* biopesticides before sowing. Okra seeds were soaked in water for 24 hours and dried using a clean paper towel before sowing. 3 seeds per hill were sown in the field at a distance of 30 cm R-R distance and 30 cm P-P distance. Thinning of an extra 2 plants was done after satisfactory growth, leaving one behind. The okra seeds were sown on 20th April, 2024.

2.5 Data collection and measurements

Except border plants, 10 plants were chosen at random from the net plot and tagged to record observations on growth and yield metrics. Plant height and number of leaves per plant were recorded as vegetative parameters. Plant height (cm) was measured from the base of the plant to the tip of the apex or flower. The number of fully developed fresh leaves attached to the plants was counted and recorded.