

Yield-related parameters included average fruit length, average fruit weight, and productivity. The average fruit length (cm) was determined by measuring the length of the fruit (pod), including the pod stalk, at harvest and then averaging the values. The average fruit weight (g) was calculated by dividing the total weight of fruits harvested from 10 tagged plants by the number of fruits produced by those same plants. Productivity (Mt/ha) was estimated by converting the net plot yield, measured from 10 tagged plants, into metric tons per hectare.

2.6 Statistical analysis

The data obtained from the experiment were analyzed using Microsoft Excel 2019 and R-Studio (version 4.5.2). Mean comparisons were performed using Duncan's Multiple Range Test (DMRT) and the Least Significant Difference (LSD) test at 5% level of significance (Gomez and Gomez, 1984).

3 Results and Analysis

3.1 Plant height (cm)

The mulching materials had a significant impact on plant height at 25, 40, and 60 days after sowing (DAS) (Table 1). At 25 DAS, the tallest plants (8.61 cm) were observed in plots mulched with black plastic; the leaf litter had the smallest plant height (5.89 cm). This treatment continued to produce the highest plant height at 40 days (22.37 cm) and 60 days (74.87 cm) after sowing. At 40 DAS, plant heights under mustard straw (20.17 cm) were statistically similar to those under black plastic mulch (22.37 cm). The leaf litter showed the lowest plant heights at 40 days (12.55 cm) and 60 days (53.97 cm). The results showed that black plastic mulch significantly increased plant height at all growth stages (25, 40 and 60 DAS), followed by mustard straw mulch, while leaf litter consistently resulted in the lowest plant heights throughout the growth period.

Table 1 Effect of mulching material on plant height of okra at East Rukum, Nepal, 2024

Treatments	25 DAS	40 DAS	60 DAS
Black plastic mulch	8.61 ^a	22.37 ^a	74.87 ^a
Control	5.79 ^b	15.60 ^{bc}	61.17 ^{bc}
Mustard straw	6.86 ^b	20.17 ^{ab}	68.82 ^{ab}
Banmara	6.57 ^b	16.57 ^{bc}	62.97 ^{bc}
Sawdust	6.08 ^b	15.95 ^{bc}	60.02 ^{bc}
Leaf litter	5.89 ^b	12.55 ^c	53.97 ^c
LSD (0.05)	1.41	5.12	11.06
SEM (±)	0.19	0.70	1.51
F-probability	0.005822**	0.01163*	0.01768*
CV%	14.31	19.98	11.65
Grand Mean	6.63	17.20	63.64

Note: LSD = Least Significant Difference; CV (%) = Coefficient of Variation; DAS = Days after sowing; SEM = Standard Error of the mean; Means followed by the same letter(s) within each column are not significantly different at 5% level of significance by DMRT, ** and * indicate significance at <0.01 level and significance at <0.05 level respectively

3.2 Leaf number

The mulching materials had a significant effect on leaf number at 25, 40, and 60 days after sowing (DAS) (Table 2). At 25 DAS, the highest number of leaves (5.48) was recorded in plots mulched with black plastic, whereas the lowest leaf number (4.51) was observed under banmara mulch. At this stage, all organic mulches and the control plot were statistically similar with respect to leaf number. At 40 DAS, black plastic mulch again produced the maximum leaf number (19.60). The control plot (14.58), mustard straw (13.48), and banmara mulch (14.28) were statistically comparable, while sawdust (9.98) and leaf litter (11.58) recorded the lowest leaf numbers. At 60 DAS, black plastic mulch (27.58) maintained the highest leaf number, while leaf litter resulted in the lowest leaf number (15.88). The control plot (20.58) and banmara mulch (20.78) showed statistically similar leaf numbers. Overall, the results indicated that black plastic mulch significantly increased leaf numbers at all growth stages (25, 40, and 60 DAS), followed by mustard straw and banmara mulches, whereas sawdust and leaf litter mulches consistently produced the lowest leaf numbers throughout the crop growth period.