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Effect of Date of Pinching on Sex Expression, Growth and Yield of Cucumber (*Cucumis sativus* L. cv. Kamini) at Kawasoti, Nepal

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Abstract Farmers continue to struggle with the productivity and production of cucumbers. One of the main causes of the decreased quantity of female flowers is the low number of lateral branches. A field experiment was conducted at Nawalparasi East, Nepal from March to July 2024 to evaluate the effect of the date of pinching on the sex expression, growth, and yield. The experiment was laid out in a Randomized Complete Block Design with five treatments and four replications. *Cucumis sativus* L. cv. Kamini was used as the test crop with evaluation being the plant height, number of lateral branches, number of male and female flowers, sex ratio, fruit weight, fruit circumference, fruit length, yield per plant, yield per hectare. The treatment group included no pinching, pinching at 15 DAT, pinching at 20 DAT, pinching at 25 DAT, and Pinching at 30 DAT. Pinching can change the flowering pattern of cucurbits, favoring the emergence of female flowers. The data obtained was analyzed using R-studio and Duncan's Multiple Range Test (DMRT) was employed to find out the significant difference between the mean values at a 5% level of significance. Among various treatment control results the highest plant height (138.41 cm) and lowest in 15 DAT (90.86 cm). Pinching at 20 DAT exhibited the highest lateral branches (5.09) and lowest at control (2.06). The maximum number of female flowers was observed in pinching at 20 DAT (33.925) and lowest in control (15.125). Sex ratio was minimum in pinching at 20 DAT (1.64) and maximum in control (7.640). Similarly, Highest yield per plant was found in pinching at 20 DAT (5.77 kg/plant) and lowest in control (3.79 kg/plant). Overall, pinching at 20 DAT gives maximum yield so, farmers are recommended to pinch cucumber plant at 20 DAS for better productivity.

Keywords Cucumber (*Cucumis sativus* L.); Pinching; Lateral branches; Apical dominance

1 Introduction

Cucumber (*Cucumis sativus* L., 2n=14) is a creeping annual vine belonging to the family Cucurbitaceae and represents one of the most economically important vegetable crops worldwide. It is valued for its high water content, refreshing flavor, distinctive texture, and medicinal properties, including bioactive compounds such as cucurbitacins (Cts), which are characteristic bitter principles of this species (Mukherjee et al., 2013). Cucumber is largely consumed as a fresh product and is highly perishable, with a narrow tolerance to frost; optimum vegetative growth occurs between 20 °C and 30 °C. In Nepal, cucumber cultivation covers approximately 9,643 ha, yielding a total production of 150,213 Mt at an average productivity of 15.58 Mt/ha (MoALD, 2024/25). Given this considerable area under cultivation, even modest improvements in yield through low-cost agronomic interventions could substantially benefit smallholder farmers.

Yield in cucumber is strongly influenced by sex expression, which determines the proportion of female flowers ultimately available for fruiting. In a typical monoecious cucumber plant, male flowers predominate at the lower nodes, a mixture of male and female flowers occurs at the middle nodes, and female flowers alone appear at the upper nodes (Li et al., 2019). Fruits produced at the base of the plant tend to be smaller than those borne on lateral branches or higher nodes. Although sex expression is primarily under genetic control, it can be modified by environmental conditions, cultural management, and chemical treatments. Notably, long photoperiods and higher temperatures tend to favor male flower production, and the female-to-male flower ratio in cucumber can range widely, from 1:13 to 1:15 (Bhowmick and Jha, 2015). Therefore, agronomic techniques capable of shifting this