Introduction

Finger-millet is a small seeded grass, self-pollinated, robust, tufted and tillering annual cereal crop grown as a rainy season crop in mid to high hills of Nepal. The average national productivity is only 1.11 t/ha because it is still dominated as marginal crop and grown under poor management. Diverse planting methods across the country are evident. Therefore, a field experiment was conducted during rainy season of 2016 at Sundar bazar, Lamjung to evaluate the effect of crop establishment methods and varieties tillering habit, growth rate and yield of finger-millet. The experiment was conducted in split-plot design replicated thrice. The main-plot factor comprised 4 varieties (Okhle-1, Dalle-1, Kabrekodo-1 and Kabrekodo-2) and the subplot factor was crop establishment methods (Direct Sowing (DS) @20×10cm, Conventional Transplanting method (CT) @ 10×10cm with 30 days old seedlings and System of Crop Intensification (SCI) @25×25cm with 15 days old seedlings). Growth was significantly affected by crop establishment method where SCI increased growth traits as plant height, tillering habit and growth rates over other planting methods resulting in 82.43% and 24.66% higher yield than DS and CT methods respectively. Similarly, yield of Kabrekodo-2 was more than other varieties in this location. The results show Kabrekodo-2 as a potential finger-millet variety in this agro-climate and SCI method can contribute better grain yield with a slight changes in the existing conventional practices.

Methodology

The research was conducted in agronomy farm of Institute of Agriculture and Animal Science in Sundarbazar, Lamjung Nepal during 29th June to 6th December, 2016. The experiment was laid out in split-plot design replicated thrice. The main-plot factors comprised four finger-millet varieties (Okhle-1, Dalle-1, Kabrekodo-1 and Kabrekodo-2) whereas the subplot factors were crop establishment methods viz. Direct Sowing (DS) (20cm×10cm), Conventional Transplanting (CT) (10cm×10cm with 30 days old seedling) and System of Crop Intensification (SRI) (25cm×25cm with 15 days old seedling). Before transplanting, chemical fertilizer was applied @ 50:30:20kg

Abstract

Finger-millet is self-pollinated, robust, tillering annual cereal crop grown as a rainy season crop in mid to high hills of Nepal. The average national productivity is only 1.11 t/ha because it is still dominated as marginal crop and grown under poor management. Diverse planting methods across the country are evident. Therefore, a field experiment was conducted during rainy season of 2016 at Sundar bazar, Lamjung to evaluate the effect of crop establishment methods and varieties tillering habit, growth rate and yield of finger-millet. The experiment was conducted in split-plot design replicated thrice. The main-plot factor comprised 4 varieties (Okhle-1, Dalle-1, Kabrekodo-1 and Kabrekodo-2) and the subplot factor was crop establishment methods (Direct Sowing (DS) @20×10cm, Conventional Transplanting method (CT) @ 10×10cm with 30 days old seedlings and System of Crop Intensification (SCI) @25×25cm with 15 days old seedlings). Growth was significantly affected by crop establishment method where SCI increased growth traits as plant height, tillering habit and growth rates over other planting methods resulting in 82.43% and 24.66% higher yield than DS and CT methods respectively. Similarly, yield of Kabrekodo-2 was more than other varieties in this location. The results show Kabrekodo-2 as a potential finger-millet variety in this agro-climate and SCI method can contribute better grain yield with a slight changes in the existing conventional practices.

Keywords: Conventional transplanting method; Crop establishment methods; Direct sowing method; System of crop intensification
Results and Discussion
There is higher number of tiller per plant in SCI method than other method because tillering was furnished under wider spacing as compared to closer spacing it also attributed to the fact that transplanting of young seedling (15 days old) under wider spacing preferably square planting exerts less competitive pressure within plants in one hill and among plants in the field as a result tillering was higher under wider spacing. Similar result where maximum number of tiller was observed in wider spacing has been reported by Nayak et al. [5] and Kewat et al. [6].

The significance difference among crop establishment method was also observed where higher crop growth rate was found in System of Crop Intensification (SCI) because of higher dry matter accumulation is more in wider spacing, wider spacing influenced profuse growth. Similar observation was found in Nayak et al. [5].

Finger-millet varieties show non-significant effect on grain yield but there is highly significant effect of crop establishment methods and found to be more under System of Crop Intensification (SCI) methods and which was statistically at par with conventional transplanting (CT). Similarly, higher yield was found in system of crop intensification method in finger-millet Abraham, et al. [2,3]. The highest grain yield of rice was obtained under 25 cm x 25 cm spacing Dahal & Khadka [7] so similar result can happen in other tillering cereal crop [8-10].

Treatment means are separated by Duncan's Multiple Range Test (DMRT) and the columns represented by same letter (s) are not significantly different among each other at 5% level of significance.

Conclusion
Growth characters were more under system of crop intensification methods due to higher spacing results in higher crop growth rate because of more availability and utilization of under and aboveground resources, which leads higher tiller number per plant also increased which results in 82.43% more yield in system of crop intensification than direct sowing and 24.66% more yield than conventional transplanting. It was concluded that system of crop intensification method not only increase the yield, it possess double advantage viz. lower seed and seedling requirement and higher productivity. So it is better to transplant younger seedling (15 days old or at biological stage i.e. 2-3 leaf stage) at wider spacing (25×25) cm or generally at square planting. The yield of KabreKodo-2 was relatively more than other varieties and the result showed that KabreKodo-2 as potential varieties in this agro-climate.

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