

Effect of Hand Frequency Weeding on Crop Growth Parameters and Yield

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Abstract

An effort made to reveal the literatures review about hand weeding frequency attributed on crop yield and crops growth parameters. This review paper has been literature reviewed necessary material that help assesses effect of hand hoeing on crop growth and weed management. Various weed controls methods practiced by small scale farmers of different agro ecology zones in order to compact the injurious effect of weeds on crop yields and growth parameters. Among available farmers practice I used for controlling weeds is hand-hoeing weed control system. Farmer practice of hand- weeding is very time consuming, physically demanding, and not cost efficient for a farmer especially where labour is scarce than other methods While, an advantage of manual control is that it minimizes soil disturbance, and decreases the likelihood of erosion and seed germination. A few farmers have started using herbicides to control weeds. However, herbicides have been found to be less effective than hand-weeding, as they require specific conditions which may be more limiting than other control method. This paper intended to reflect the current state to investigate the effect hand hoeing weeding frequencies on yield and growth parameters is still by far the most widely practiced cultural weed control technique in field crop production throughout the traditional agricultural sector, because of the prohibitive costs of herbicides and fear of toxic residue coupled with the lack of knowledge about their use.

Keywords: crop, growth parameters, weed, Yield

Introduction

Weeds are considered as a major problem in most crop fields and seriously causing reduction on crop yield and productivity. weeds competing with the crop severely for the resources namely nutrients, sunlight and space, soil moisture and reduce the crop yield. In world, due to weeds losses reached (34%), with compared animal pests and diseases caused pathogens 18 and 16% respectively. While loss is 10% in developing countries and 25% in least developing countries [1]. As far as yield is concerned, yield losses due to weeds 33.16, 41.26, 31.88, 40.82, 34.23, and 40.28% in food crops, cereal, pulses, oil seeds, fiber crops and rice crops respectively [2]. In addition, yield loss, weeds cause degradation of land value, reduce product quality, and hampers human- and animal-health. Yield loss due to late weeding occurred in different crops is varied depending on the crop type, agro ecology (soil type, moisture status), and location, yield losses occurred on wheat

26-29, maize 31, sorghum 60, soybean 77.6 -78.50, coffee 62, field pea 15, barely 64 and cotton 73% [3,4 &5].

The strategy complete weed control should be to keep weed populations below the economic threshold level by implementing different need-grounded approaches. Among the most important requirement for effective weed management is not introduction and spread of weeds. This includes preventing weeds from setting seed, strong quarantine to prevent the entry of weed propagules from outside sources, and conducting regular inspections to prevent new weeds. For centuries widely used weeding tool is hand hoe has been the most appropriate practice. It is however, currently hand hoeing is useful implement to obtain results effectively and cheaply.

Annuals and biennials weed growth can be completely destroyed and more effective hoeing is particularly practice. In case of perennials, it destroyed the top growth with little effect on

underground plant parts resulting in re-growth. Hand weeding is the most common weed control method used by small-scale farmers. It usually requires no capital outlay. This is a major advantage when cash is not readily available and labour is provided from the farmer's immediate family or through non-cash exchange. It may be the only feasible method for weeding broadcast crops when herbicides are not available. While, hand weeding is intensive and slow compared to other methods, and may damage crop roots [6]. According to [7], hand pulling weeds is a means of preventing the development and spread of resistant weeds in the field. The practice is effective but is not practical for large crop fields. Advantages and Disadvantages The main disadvantage to hand-weeding is the cost. In a study done by Steven Winter and Allen Wiese, they found that hand-weeding sugar beets was the most expensive method. However, [8] were comparing hand-weeding (hoeing) to chemical uses. The costs for hand-weeding one hectare (2.47 acres) were found to be \$1,077.

In Ethiopia small scale farmers and small private farmers weeds their lands by hand hoeing, in addition to agricultural practices such as increased tillage, delayed sowing, and crop rotation. Hand hoeing along with hand-weeding tools are the easiest methods of hand-weeding because it is less physically demanding. This paper's objectives are to reviewing and reporting the hand hoeing weed management practices utilized in developing countries agriculture because most of poor farmers and small-scale private farm owner are small, marginal and are unable to bear the heavy costs associated in carrying out weed management operations.

Review of hand hoeing weeding frequency on crop growth parameters and yield

2nd and 7th weeding times after week germination are often adequate for maize crop weed control depending on the agro eco zone. It is recommended that first weeding (2-3 weeks) and second weeding (6-7) weeks after emergence [9]. Trial conducted at Nigeria by [10] in 2000 and 2001 to study the frequency of weeding conducive to optimum growth and yield of jute crop showed that, weeding once as early as 2, 3 or 4 weeks after sowing (WAS) was not as beneficial to the growth and yield of jut crop. While, weeding at once every week throughout the growth season boosted all growth parameters and yield over most of the treatments. Research conducted at North Kordofan state, Sudan, on naturally infested fields within the same area, using three similar fields during 2008/2009 [11]. Result indicated that weeding three

times at 2, 4 and 6 weeks after sowing was optimal for plant height, leaf area index, number of branches, number of calyces per plant, calyx diameter and. calyces yield per unit area.

Other trial conducted to determine optimal weeding frequency for weeding management in two widely used cultivated varieties of Hibiscus sabdariffa L, (*Elrahad and Elfashir*) indicted that the weeding three times at 15, 30 and 45 days after sowing are effective to control weeds and recommended to improved yield of Roselle crop [12] at North Kordofan state, Sudan, on naturally infested fields within the same area, using three similar fields during 2007/2008 rainy season. The practice of weeding twice improved teff [*Eragrostis tef* (Zucc.) Trotter variety (Quncho)] recommended for higher yield and profitability in the study area and other similar environments [13].

Research conducted Elephant foot yam (*Amorphophallus paeoniifolius*) (Dennst.) Nicolson) to determine the effect of the weeding frequency on the yield of elephant foot yams grown, the results showed that the weeding frequency affected the growth and yield of elephant foot yams. The number of leaves was larger and the life span of the leaves was longer for the weeding at two and four months after planting (W2) and weeding every month (W6) treatments than for the no weeding, control (W0) and weeding at two months after planting (W1) treatments [14]. Field trial conducted under the title of and Hoeing Weeding Frequency on Growth of Tobacco under the Ecological Conditions of Shewa Robit and Bilatte Tobacco Farms, Ethiopia. The experimental result revealed that frequency of different hand hoeing levels has an effect on yield and growth characteristics of tobacco. Weeding of tobacco four or five times, especially at 15, 30, 45, 60 and 90 DAT gave relatively better yield and found recommendable under Bilatte and Shewa Robit conditions [15].

[16] reported that weeding the crop by hand-hoeing twice at two and five weeks after crop emergence resulted in optimum growth and grain yield of the crop for study was conducted in 2012 main cropping season at Haramaya and Hirna research fields, eastern Ethiopia, to determine the effect of plant spacing and weeding frequency on weeds, yield components and yield of common bean. Effect of Weed frequency and plant density on maize grain yield studied by [17] result indicated that twice hand weeding would be some more suitable practices for attaining optimum grain yield for the hybrid maize BH 546 in the study area. The study was conducted to evaluate the effect of canopy structure, plant density and weeding frequency on weed infestation and tuber

yield of sweet potato during 2002 and 2003 by [18] result revealed that weeded twice to reduce weed infestation and increase crop yield.

Research trial conducted by [19] to study effect of weeding Frequency on Yield and yield components of food Barley (*Hordeum vulgare* L.) Varieties at Amuru District, Horo Guduru Wollega Zone of Oromia, Ethiopia in 2016 main cropping season, the result suggested that three times weeding of barley is the optimal weeding frequency increases grain yield in the area. Research conducted [20] to determine of weeding Frequency to Increase Production and Productivity of Sorghum revealed that, weeding in sorghum production at North Gondar zone data showed that weed free treatments gave the highest yield (3314 kg/ha) followed by two times and three times hand weeding in this experiment the highest grain yield was recorded two times hand weeding is recommended for Gondar Zuria and similar agro ecological areas.

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Conclusion

Weeds are serious concerns for the ecosystem stability and socio-economic development of small-scale farmers. Hand hoeing weeding has become impractical due to labour shortages and escalating costs. This review summarizes hand hoe weeding the improvements made so far in weed management strategies.

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