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Title: INTEGRATED WEED MANAGEMENT IN ELEPHANT FOOT YAM [*Amorphophallus paeoniifolius* (Dennst.) Nicolson] cv. Gajendra

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Abstract: *Amorphophallus paeoniifolius* (Dennst. Nicolson) [Elephant foot yam] is largely cultivated in the Philippines, Java, Indonesia, Sumatra, Malaysia, Bangladesh, India and China. In India, it is cultivated in Andhra Pradesh, West Bengal, Gujarat, Kerala, Tamil Nadu, Maharashtra, Uttar Pradesh, and Jharkhand. Gajendra, Bidhan Kusum and Sree Padma are some of the high yielding *Amorphophallus* varieties released for cultivation in India. The production potential of this crop is 50-80 t ha⁻¹ and net economic return is over 1.5 lakh rupees ha⁻¹. In India, grown over an area of 29 (000' ha) with an average production of 748 (000' MT) and productivity 26 MT ha⁻¹. Keeping this factor in view the present investigation was carried out in the experimental farm of Department of Horticulture, Ranchi Agriculture College, Birsa Agricultural University during during kharif season of 2017 with objective to identify the different weed flora, to evaluate the response of different herbicides and cultural method of weed control, growth, yield and the attributing traits of elephant foot yam and to determine the economics of different weed control method in Elephant foot yam. The treatments consisted of 9 different weed control methods, viz. T1 (Pre-emergence herbicide pendimethalin @1kg a.i. ha⁻¹ at 1DAP + Post emergence herbicide glyphosate 1kg a.i./ha at 45 and 90 DAP), T2 (Pre emergence herbicide pendimethalin @ 1kg a.i./ha at 1DAP + hand weeding 45 and 90 DAP), T3 (Raising green manure cow pea in interspaces along with planting and incorporation 45-60 DAP + post emergence herbicide glyphosate @ 1kg a.i ha⁻¹ at 90 DAP), T4 (Hand weeding 45 DAP + post emergence herbicide glyphosate @ 1kg a.i ha⁻¹ at 90 DAP), T5 (Post emergence herbicide glyphosate @ 1kg a.i. ha⁻¹ at 30, 60 and 90 DAP), T6 (Weed control ground cover @ 50 kg ha⁻¹), T7 (Black plastic mulch), T8 (Hand weeding at 30, 60 and 90 DAP), T9 (weedy check) were laid out in Randomized Block Design with replicated thrice. Results revealed that among all the categories, broad leaved dominated followed by grassy and sedges weeds. Weed density and dry weight were significantly reduced by weed management methods. The lowest weed density (0.00 m⁻² at 90 and 120 DAP and 26.67 m⁻² at 150 DAP) and lowest weed dry matter (0.00 m⁻² at 90 and 120 DAP and 13.56 m⁻² at 150 DAP) were recorded under black plastic mulch (T7). Maximum weed control efficiency (100 percent, 100 percent, 95.52 percent at 90, 120 and 150 DAP respectively) were recorded under black plastic mulch (T7). All weed management practices significantly improved the yield of tuber over control (no weeding) [T9]. Maximum height of pseudostem, girth of pseudostem, leaf area, canopy spread, volume of corms and no. of branches were recorded under black plastic mulch (T7) which was statically at par with 3 hand weedings at 30, 60 and 90 DAP (T8) and Glyphosate 1 kg a.i. ha⁻¹ at 30, 60 and 90 DAP (T5) While dry matter percentage of corms and diameter of corms were not significantly influenced by weed competition; however, some treatments increased the value of these parameter compared to control (no weeding). Maximum dry matter percentage (24.08 percent) was also recorded under black plastic mulch (T7) which was statically par with all treatment except control (no weeding). Maximum diameter (horizontal-22.36 cm and vertical-19.37 cm) was also recorded under black plastic mulch (T7) which was statically par with all treatment except T1, T4, T6 and T9. The maximum tuber yield (58.64 t ha⁻¹) were recorded under black plastic mulch (T7) which was statically at par with 3 hand weeding at 30, 60 and 90 DAP (T8) [52.48 t ha⁻¹] and Glyphosate 1 kg a.i. ha⁻¹ at 30, 60 and 90 DAP (T5) [49.12 t ha⁻¹]. Highest TSS (6.4 □brix) recorded under weedy check (no weeding) (T9) while highest ascorbic acid (17.4 mg per 100 gm) recorded under hand weeding at 45 DAP + glyphosate 1kg a.i. ha⁻¹ at 50 DAP (T4). Significant highest net return (` 557906 ha⁻¹) highest B:C ratio (2.15) were recorded by black plastic mulch (T7). However, the lowest B:C ratio (1.11) was recorded in the weedy check (no weeding). Highest weed population, weed dry matter and lowest tuber yield, net return and B:C ratio were recorded under control (no weeding) [T9]. Thus, on the basis of results obtained in one year investigation (2017-18) it can be inferred that mulches, herbicides and hand weeding have potential for reduction in weed density for effective weed management in *Amorphophallus* under Jharkhand conditions and thereby promoting high yield of elephant foot yam. After analyzing the data it is inferred that the best treatment was black plastic mulch followed by hand weeding at 30, 60 and 90 DAP and application of glyphosate 1 kg a.i. ha⁻¹ at 30, 60 and 90 DAP. Hence, black plastic mulch was found as the most promising treatment in order to get better vegetative growth, higher productivity and profitability of elephant foot yam owing to better weed control. However, as these result are based on one year data, it needs verification for at least one more year for making definite recommendation to the growers.

Description: INTEGRATED WEED MANAGEMENT IN ELEPHANT FOOT YAM [*Amorphophallus paeoniifolius* (Dennst.) Nicolson] cv. Gajendra

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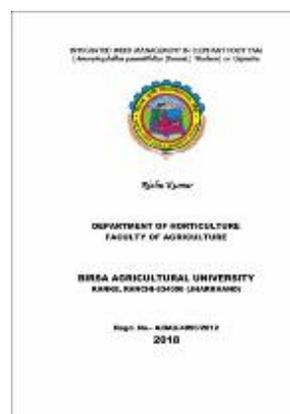
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