**Comparative study of Triafamone 200 sc and other herbicides on weed dynamics of transplanted Rice**

**Abstract**

A two-year field study titled “Bioefficacy of Triafamone 200 SC in transplanted Rice” was carried out during the 2017-18, *Rabi* season and the 2018-19, *Kharif* season at the Agricultural Research Station located at Jangamaheswarapuram, Guntur District, Andhra Pradesh, India. The experimental design comprised 13 treatments arranged in a completely randomized block structure with four replications. Findings from the study revealed that among the various treatments Triafamone 200 SC @ 100 g a.i. ha⁻¹ applied at 2-3 days after transplanting (DAT) (T10) achieved the highest weed control efficiency, recording 68.64% during *Rabi,* 2017-18 and 60.83% in *Kharif,* 2018-19. This result was statistically comparable to the treatment T5 (Triafamone 200 SC @ 100 g a.i. ha⁻¹ applied at the 2-3 leaf stage of weeds), which achieved 63.60% and 59.02% efficiency in the respective seasons, while outperforming all other treatments in both years of the study.

**Key words:** Weed Management, Transplanted Rice, Weed density, Weed dry weight,
 Weed Control Efficiency

**Introduction**

Weeds are among the most severe and widespread biological obstacles to crop production in India, contributing to significant losses in agricultural yields. Research indicates that weeds account for approximately 33% of the total losses caused by various pests (Verma *et al.,* 2015). In rice cultivation, weed-induced yield reductions vary depending on the farming method typically ranging from 18-20% in transplanted rice, 30-35% in direct-sown puddled rice, and exceeding 50% in direct-seeded upland rice. The increasing prevalence of weed infestations has become a major challenge for rice farmers worldwide, with reports suggesting a potential yield decline of 45-55% due to unchecked weed growth (Bouman *et al*., 2005).

Weed management plays a pivotal role in Rice cultivation, particularly in transplanted Rice systems, where unchecked weed growth can lead to significant yield losses and reduced crop quality. Transplanted Rice fields often encounter heavy weed infestations due to favorable growth conditions for weeds, creating intense competition for essential resources such as nutrients, water, and sunlight (Jyothi Basu *et al*., 2021). To address this challenge, chemical herbicides have emerged as one of the most effective solutions for controlling diverse weed species and ensuring optimal crop productivity. Among the range of herbicides available, Triafamone 200 SC stands out as a promising option due to its targeted action against a wide spectrum of weeds and its compatibility with Rice crops. However, the effectiveness of Triafamone 200 SC in comparison to other herbicides remains a critical area of investigation. Understanding the comparative performance of different herbicides is essential for devising effective weed control strategies tailored to specific agronomic conditions (Jyothi basu *et. al.,* 2023a).

This study focuses on evaluating the bioefficacy of Triafamone 200 SC and other herbicides in managing weed dynamics in transplanted Rice fields. By analysing key parameters such as weed control efficiency and crop-weed competition this research aims to provide valuable insights into the strengths and limitations of various herbicides. Such findings are expected to contribute to improved decision-making for farmers and agricultural stakeholders, enabling the adoption of sustainable and economically viable weed management practices. Furthermore, the outcomes of this research will serve as a resource for guiding future studies on herbicide performance (Jyothi basu *et. al.,* 2023b).

**MATERIALS AND METHODS**

A field study was carried out over two consecutive years (2017-18 and 2018-19) at the Agricultural Research Station in Jangamaheswarapuram, Guntur District, Andhra Pradesh, India. The experiment was conducted on clay loam soils and comprised thirteen treatments with four replications, which are detailed below.

List 1: Treatment, doses and corresponding time of application for weed management

|  |  |  |
| --- | --- | --- |
| **Treatment** | **Dose****(g a.i. ha-1)** | **Time of Application** |
| T1. Untreated control | - | - |
| T2. Triafamone 200 SC at 2-3 leaf stage of weed  | 30 | 2 to 3 leaf stage of weed  |
| T3. Triafamone 200 SC at 2-3 leaf stage of weed | 40 | 2 to 3 leaf stage of weed |
| T4. Triafamone 200 SC at 2-3 leaf stage of weed | 50 | 2 to 3 leaf stage of weed |
| T5. Triafamone 200 SC at 2-3 leaf stage of weed | 100 | 2 to 3 leaf stage of weed |
| T6. Pyrazosulfuron ethyl 10% WP | 15 | 2 to 3 leaf stage of weed |
| T7. Triafamone 200 SC at 0-3 DAT | 30 | 0 to 3 days after transplanting |
| T8. Triafamone 200 SC at 0-3 DAT | 40 | 0 to 3 days after transplanting |
| T9. Triafamone 200 SC at 0-3 DAT | 50 | 0 to 3 days after transplanting |
| T10. Triafamone 200 SC at 0-3 DAT | 100 | 0 to 3 days after transplanting |
| T11. Pretilachlor 50% EC at 0-3 DAT | 750 | 0 to 3 days after transplanting |
| T12. Farmer practice (two hand weedings) | - | 20 DAT and 40 DAT |
| T13. Weed free | - | - |

Triafamone is categorized under keto sulfonanilide herbicides and is absorbed by plants through leaves and roots. Once absorbed, it undergoes rapid conversion to an intermediate form via reduction of the keto group. Unlike Rice, weeds produce a secondary metabolite through N-demethylation, which effectively inhibits acetolactate synthase (ALS) (Jyothi basu *et. al.,* 2023a).

The evaluation of weed control treatments was performed at the crop maturity stage. Random quadrates (0.25 m²) were placed within each plot to measure weed density. Weed population within these quadrates were counted and treatment efficacy was assessed by comparing the density against the untreated control. The weeds were harvested at ground level, the adhered soil was cleaned from weeds with tap water, dried in an oven at 70°C for 48 hours, and weighed to determine biomass. The data on weeds were transformed by square root transformation by adding one before being subjected to ANOVA (Gomez and Gomez 1984).

Weed control efficiency (WCE) indicates percent reduction in weed dry matter due to weed control treatments over unweeded control. Based on dry matter of weeds produced at 42 days after application the WCE was calculated by using the following formula and expressed in percentage (AICRPWC, 1988).

Where,

 DWC = Dry weight of weeds in unweeded control

 DWT = Dry weight of weeds in treated plot

**Results and Discussion**

**Weed Flora in Transplanted Rice**

The experimental field exhibited a diverse range of weed species during the investigation. The dominant grass species included *Echinochloa colonum*, *Echinochloa crusgalli*, *Dinebra retroflexa*, and *Leptochloa chinensis*. Among the sedges, *Cyperus rotundus* and *Cyperus difformis* were observed, while the broad-leaved weed species comprised *Eclipta alba*, *Ammania baccifera* and *Trianthema portulacastrum*. Among these, *Echinochloa colonum* emerged as the most prevalent weed across all three groups during various stages of crop growth in both years of the study.

**Weed Density** **(No. m-2)**

Weed density was notably influenced by the weed management treatments applied. At 28 days after herbicide application (DAA), significant reductions in the density of grasses (*Dinebra retroflexa*), sedges (*Cyperus rotundus* and *Cyperus difformis*) and broad-leaved weeds (*Eclipta alba*, *Ammania baccifera* and *Trianthema portulacastrum*) were observed across all treated plots compared to the untreated control. Among the herbicide management practices, lower weed density was observed in Triafamone 200 SC @ 100 g a.i. ha⁻¹ applied at 2-3 days after transplanting (T10), which performed on par with treatments such as T5, T9, and T4. Conversely, the untreated control (T1) consistently showed the highest weed densities.

At 42 DAA, significant reductions in weed density continued to be evident in all treated plots. The weed-free treatment (T13) resulted in the lowest densities overall. However, among herbicide-treated plots, T10 achieved the most notable reduction, followed closely by T5, T9, and T4, which exhibited similar results. The untreated control (T1) maintained the highest weed density, reinforcing the effectiveness of weed management treatments in reducing weed population and competition during both years of the study. The results of this research correspond closely with the findings of (Jyothi Basu *et al*., 2023a), underscoring analogous trends in herbicide efficacy and crop yield."

**Weed Dry Matter**

Weed dry matter is considered as a more reliable parameter than weed density for evaluating weed competition, as it accurately reflects weed growth and resource depletion. Among all the weed management practices, the weed-free treatment (T13) recorded the lowest weed dry matter at 42 DAA, while the untreated control (T1) showed significantly higher weed dry matter compared to all other treatments during both years.

At 42 DAA, the treatment T10 (Triafamone 200 SC @ 100 g *a*.*i*. ha⁻¹ at 2-3 DAT) achieved the lower values of weed dry matter, and it was significantly lower than treatments *viz*., T9, T4, and T8 but on par with treatment T5. However, none of the treatments matched the performance of the weed-free control (T13) in reducing total weed dry matter. All weed management treatments were, nonetheless, significantly superior to the untreated control (T1) in minimizing weed dry matter. "The observed results corroborate the conclusions of (Jyothi Basu *et al.,* 2023a), emphasizing similar patterns in managing weeds and improving productivity."

**Weed Control Efficiency (%)**

The weed control efficiency (WCE) of various weed management treatments was assessed at 42 days after herbicide application (DAA) during both years of the study, as presented in Table 5.

At 42 DAA, the highest weed control efficiency was observed in treatment T10, recording 68.64% during *Rabi,* 2017-18 and 60.83% during *Kharif,* 2018-19. This treatment performed on par with T5, which achieved 63.60% and 59.02% WCE in the respective seasons. Both treatments significantly outperformed over the remaining weed management practices in reducing weed infestation during the study period. The findings align with those reported by Jyothi Basu *et al*., 2023a, showcasing comparable outcomes in weed control efficiency and crop yield enhancement.

**Conclusions**

Based on the findings of this study, it can be concluded that the weed spectrum in the transplanted Rice crop was predominantly composed of grasses, followed by broad-leaved weeds and sedges. The applied weed management practices demonstrated significant effectiveness in controlling grasses, broad-leaved weeds and sedges, thereby reducing competition for essential growth resources.

Among the herbicide treatments evaluated, Triafamone 200 SC @ 100 g a.i. ha⁻¹ applied at 2-3 days after transplanting (T10) was the most effective in suppressing grasses (*Dinebra retroflexa*), sedges (*Cyperus rotundus* and *Cyperus difformis*), and broad-leaved weeds (*Eclipta alba*, *Ammania baccifera*, and *Trianthema portulacastrum*). This treatment performed comparably to T5 (Triafamone 200 SC @ 100 g a.i. ha-1 at 2-3 leaf stage of weed), T9 (Triafamone 200 SC @ 100 g a.i. ha-1 at 2-3 DAT), and T4 (Triafamone 200 SC @ 50 g a.i. ha-1 at 2-3 leaf stage of weed).

**References:**

AICRPWC, U. (1988). ICAR. *Third annual report of all India Coordinated Research Proect on Weed Control. Sriniketan Center, Viswa Bharati, Sriniketan*, 185-190.

Bouman BAM, Peng S, Castañeda AR and Visperas RM. 2005. Yield and water use of irrigated tropical aerobic rice systems. *Agricultural Water Management.* 74(2): 87–105.

Gomez K. A and Gomez A. A. 1984. Statistical Procedures for Agricultural Research (2 ed.). John wiley and sons, NewYork, 680 p.

Jyothi Basu, B., Prasad, P.V.N., Murthy, V.R.K., Ashoka Rani, Y and Prasad, P.R.K. 2021. Efficacy of sequential application of herbicides on weed management, Rice nutrient uptake and soil nutrient status in dry direct-seeded Rice greengram sequence. *Indian Journal of Weed Science.* 53(4): 398-404.

Jyothi Basu, B., Prasad, P.V.N., Murthy, V.R.K., Ashoka Rani, Y and Prasad, P.R.K. 2020c. Bioefficacy and Phytotoxicity of Herbicides in Rice and Their Residual Effect on Succeeding Greengram. *International Journal of Agriculture Sciences.* 12(11): 9940-9944.

Jyothi Basu, B., Swathi, P., Sambasiva Rao, N and Saida Naik V. 2023b. Efficacy and phytotoxicity of Triafamone 18.52% sc in direct sown Rice and their residual effect on succeeding Blackgram. *International Journal of Plant & Soil Science*.35(20): 1285-1291.

Jyothi Basu, B., Swathi, P., Sambasiva Rao, N and Saida Naik V. 2023a. Efficacy of triafamone18.52% sc on weed control and yield in direct sown Rice. *International Journal of Environment and Climate Change*.13(10): 4414-4422.

Verma, S.K, Singh, S.B, Meena, R.N, Prasad, S.K, Meena, R.S and Gaurav. 2015. A review of weed management in India: The need of new directions for sustainable agriculture. *The Bioscan*. 10(1): 253–263.

**Table 1. Density of weeds (No. m-2) at different growth stages of transplanted Rice as influenced by weed management practices during *Rabi,* 2017-18 and *Kharif,* 2018-19**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Treatments** | **Dose****(g a.i. ha-1)** | ***Echinochloa colonum*** | ***Echinochloa colonum*** | ***Leptochloa chinensis*** | ***Leptochloa chinensis*** |
| **28 DAA** | **42 DAA** | **28 DAA** | **42 DAA** |
| **2017-18** | **2018-19** | **2017-18** | **2018-19** | **2017-18** | **2018-19** | **2017-18** | **2018-19** |
| T1: Untreated control | - | 6.95 (48.3) | 5.29 (27.8) | 7.77 (60.3) | 6.29 (39.5) | 2.08 (4.0) | 2.32 (5.0) | 2.96 (8.5) | 3.27 (10.3) |
| T2. T2:Triafamone 200 SC at 2-3 leaf stage of weed  | 30 | 3.98 (15.8) | 3.18 (9.8) | 4.94 (24.8) | 4.20 (17.3) | 2.03 (4.0) | 2.39 (5.3) | 2.63 (6.8) | 3.16( 9.5) |
| T3. T3:Triafamone 200 SC at 2-3 leaf stage of weed | 40 | 3.64 (13.0) | 3.11 (9.3) | 4.02 (15.8) | 3.79 (14.0) | 1.92 (3.3) | 2.27 (4.8) | 2.33 (5.0) | 3.10 (9.3) |
| T4. T4:Triafamone 200 SC at 2-3 leaf stage of weed | 50 | 3.04 (9.0) | 2.77 (7.5) | 3.68 (13.3) | 3.58 (12.5) | 2.19 (4.5) | 2.09 (4.0) | 2.62 (6.5) | 2.97 (8.5) |
| T5. T5:Triafamone 200 SC at 2-3 leaf stage of weed | 100 | 2.19 (4.5) | 2.68 (6.8) | 3.05 (9.0) | 3.45 (11.5) | 2.17 (4.3) | 2.05 (3.8) | 2.54 (6.0) | 2.34 (5.0) |
| T6. Pyrazosulfuron ethyl 10% WP | 15 | 4.03 (16.0) | 3.89 (14.8) | 5.25 (27.3) | 4.95 (24.3) | 1.76 (2.8) | 2.48 (5.8) | 2.47 (5.8) | 2.90 (8.0) |
| T7. Triafamone 200 SC) at 0-3 DAT | 30 | 3.89 (15.0) | 3.15 (9.5) | 4.81 (22.8) | 3.69 (13.3) | 2.29 (5.0) | 2.08 (4.0) | 2.83 (7.8) | 2.66 (6.8) |
| T8. Triafamone 200 SC) at 0-3 DAT | 40 | 3.53 (12.3) | 2.92 (8.3) | 4.12 (16.8) | 3.61 (12.8) | 2.19 (4.5) | 2.11 (4.0) | 2.79 (7.5) | 2.64 (6.5) |
| T9. Triafamone 200 SC) at 0-3 DAT | 50 | 2.84 (7.8) | 2.89 (8.0) | 3.85 (14.5) | 3.56 (12.3) | 1.89 (3.3) | 2.03 (3.8) | 2.40 (5.5) | 2.47 (5.8) |
| T10. Triafamone 200 SC) at 0-3 DAT | 100 | 1.87 (3.3) | 2.71 (7.0) | 2.27 (4.8) | 3.55 (12.3) | 2.36 (5.3) | 1.87 (3.3) | 2.62 (6.5) | 2.41 (5.5) |
| T11. Pretilachlor 50% EC at 0-3 DAT | 750 | 4.27 (18.0) | 3.51 (12.0) | 5.02 (25.0) | 4.58 (20.8) | 1.68 (2.5) | 1.98 (3.5) | 2.08 (4.0) | 2.60 (6.5) |
| T12. Farmer practice (two hand weedings) | - | 1.70 (2.5) | 1.98 (3.5) | 1.70 (2.5) | 2.12 (4.3) | 1.31 (1.3) | 1.06 (0.8) | 1.48 (1.8) | 1.18 (1.0) |
| T13. Weed free | - | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71(0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71(0.0) |
| **SEm +** | - | 0.30 | 0.20 | 0.27 | 0.23 | 0.19 | 0.18 | 0.21 | 0.19 |
| **CD (P = 0.05)** | - | 0.86 | 0.57 | 0.77 | 0.66 | 0.55 | 0.50 | 0.60 | 0.54 |
| Note: Data transformed to √x+0.5 transformations. Figures in parenthesis are original values |

**Table 2. Density of weeds (No. m-2) at different growth stages of transplanted Rice as influenced by weed management practices during *Rabi,* 2017-18 and *Kharif,* 2018-19**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Treatments** | **Dose****(g a.i. ha-1)** | ***Dinebra retroflexa*** | ***Dinebra retroflexa*** | ***Cyperus rotundus*** | ***Cyperus rotundus*** |
| **28 DAA** | **42 DAA** | **28 DAA** | **42 DAA** |
| **2017-18** | **2018-19** | **2017-18** | **2018-19** | **2017-18** | **2018-19** | **2017-18** | **2018-19** |
| T1. Untreated control | - | 1.56 (2.0) | 1.92 (3.3) | 2.22 (4.5) | 2.49 (6.0) | 2.68 (6.8) | 2.30 (5.0) | 3.44 (11.5) | 3.11 (9.3) |
| T2. Triafamone 200 SC at 2-3 leaf stage of weed  | 30 | 1.18 (1.0) | 1.70 (2.5) | 1.56 (2.0) | 2.16 (4.3) | 1.92 (3.3) | 2.10 (4.0) | 2.44 (5.5) | 2.60 (6.5) |
| T3. Triafamone 200 SC at 2-3 leaf stage of weed | 40 | 0.71 (0.0) | 1.48 (1.8) | 1.18 (1.0) | 1.98 (3.5) | 1.77 (2.8) | 1.98 (3.5) | 2.42 (5.5) | 2.44 (5.5) |
| T4. Triafamone 200 SC at 2-3 leaf stage of weed | 50 | 0.71 (0.0) | 1.13 (1.0) | 1.27 (1.3) | 1.46 (2.0) | 1.54 (2.0) | 2.00 (3.5) | 2.05 (3.8) | 2.33 (5.0) |
| T5. Triafamone 200 SC at 2-3 leaf stage of weed | 100 | 0.71 (0.0) | 1.06 (0.8) | 0.71 (0.0) | 1.13 (1.0) | 1.49 (1.8) | 1.86 (3.0) | 1.92 (3.3) | 2.39 (5.3) |
| T6. Pyrazosulfuron ethyl 10% WP | 15 | 1.48 (1.8) | 1.63 (2.3) | 1.99 (3.5) | 2.10 (4.0) | 1.70 (2.5) | 2.12 (4.3) | 2.25 (4.8) | 2.65 (6.8) |
| T7. Triafamone 200 SC) at 0-3 DAT | 30 | 1.70 (2.5) | 1.40 (1.5) | 2.15 (4.3) | 1.64 (2.3) | 1.70 (2.5) | 2.17 (4.3) | 2.22 (4.5) | 2.72 (7.0) |
| T8. Triafamone 200 SC) at 0-3 DAT | 40 | 1.56 (2.0) | 1.27(1.3) | 1.79 (2.8) | 1.48 (1.8) | 1.73 (2.5) | 1.92 (3.3) | 2.17 (4.3) | 2.44 (5.5) |
| T9. Triafamone 200 SC) at 0-3 DAT | 50 | 0.71 (0.0) | 1.18 (1.0) | 0.71 (0.0) | 1.36 (1.5) | 1.54 (2.0) | 1.73 (2.5) | 2.15 (4.3) | 2.18 (4.3) |
| T10. Triafamone 200 SC) at 0-3 DAT | 100 | 0.71 (0.0) | 0.84 (0.3) | 0.71 (0.0) | 1.10 (0.8) | 1.48 (1.8) | 1.64 (2.3) | 1.84 (3.0) | 2.00 (3.5) |
| T11. Pretilachlor 50% EC at 0-3 DAT | 750 | 1.40 (1.5) | 1.92 (3.3) | 1.79 (2.8) | 2.43 (5.5) | 2.32 (5.0) | 2.27 (4.8) | 3.00 (8.8) | 2.68 (6.8) |
| T12. Farmer practice (two hand weedings) | - | 0.97 (0.5) | 0.71 (0.0) | 1.18 (1.0) | 1.10 (0.8) | 1.10 (0.8) | 1.06 (0.8) | 1.35 (1.5) | 1.22 (1.3) |
| T13. Weed free | - | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) |
| **SEm +** | - | 0.11 | 0.17 | 0.14 | 0.21 | 0.17 | 0.17 | 0.19 | 0.17 |
| **CD (P = 0.05)** | - | 0.32 | 0.49 | 0.39 | 0.60 | 0.48 | 0.48 | 0.56 | 0.50 |
| Note: Data transformed to √x+0.5 transformations. Figures in parenthesis are original values |

**Table 3. Density of weeds (No. m-2) at different growth stages of transplanted Rice as influenced by weed management practices during *Rabi,* 2017-18 and *Kharif,* 2018-19**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Treatments** | **Dose****(g a.i. ha-1)** | ***Cyperus difformis*** | ***Cyperus difformis*** | ***Eclipta alba*** | ***Eclipta alba*** |
| **28 DAA** | **42 DAA** | **28 DAA** | **42 DAA** |
| **2017-18** | **2018-19** | **2017-18** | **2018-19** | **2017-18** | **2018-19** | **2017-18** | **2018-19** |
| T1. Untreated control | - | 1.76 (2.8) | 1.84 (3.0) | 2.29 (5.0) | 2.44 (5.5) | 2.46 (5.8) | 2.53 (6.0) | 3.28 (10.5) | 3.45 (11.5) |
| T2. Triafamone 200 SC at 2-3 leaf stage of weed  | 30 | 1.63 (2.3) | 1.70 (2.5) | 2.08 (4.0) | 2.04 (3.8) | 2.38 (5.3) | 2.27 (4.8) | 2.95 (8.3) | 2.86 (7.8) |
| T3. Triafamone 200 SC at 2-3 leaf stage of weed | 40 | 1.70 (2.5) | 1.70 (2.5) | 2.17 (4.3) | 2.09 (4.0) | 2.22 (4.5) | 2.22 (4.5) | 2.82 (7.5) | 2.57 (6.3) |
| T4. Triafamone 200 SC at 2-3 leaf stage of weed | 50 | 1.55 (2.0) | 1.48 (1.8) | 2.11 (4.0) | 1.79 (2.8) | 2.15 (4.3) | 1.99 (3.8) | 2.68 (6.8) | 2.39 (5.5) |
| T5. Triafamone 200 SC at 2-3 leaf stage of weed | 100 | 1.31 (1.3) | 1.40 (1.5) | 1.86 (3.0) | 1.79 (2.8) | 1.76 (2.8) | 1.92 (3.3) | 2.38 (5.3) | 2.38 (5.3) |
| T6. Pyrazosulfuron ethyl 10% WP | 15 | 1.18 (1.0) | 1.70 (2.5) | 1.70 (2.5) | 2.10 (4.0) | 1.82 (3.0) | 2.24 (4.8) | 2.47 (5.8) | 2.74 (7.3) |
| T7. Triafamone 200 SC) at 0-3 DAT | 30 | 1.56 (2.0) | 1.56 (2.0) | 1.98 (3.5) | 1.98 (3.5) | 2.03 (3.8) | 1.98 (3.5) | 2.60 (6.5) | 2.58 (6.3) |
| T8. Triafamone 200 SC) at 0-3 DAT | 40 | 1.63 (2.3) | 1.48 (1.8) | 1.96 (3.5) | 1.84 (3.0) | 1.82 (3.0) | 1.86 (3.0) | 2.45 (5.8) | 2.15 (5.0) |
| T9. Triafamone 200 SC) at 0-3 DAT | 50 | 1.54 (2.0) | 1.40 (1.5) | 1.92 (3.3) | 1.84 (2.5) | 1.70 (2.5) | 1.71 (2.5) | 2.31 (5.0) | 2.15 (4.3) |
| T10. Triafamone 200 SC) at 0-3 DAT | 100 | 1.06 (0.8) | 1.31 (1.3) | 1.35 (1.5) | 1.65 (2.3) | 0.71 (0.0) | 1.64 (2.3) | 1.18 (1.0) | 1.99 (3.5) |
| T11. Pretilachlor 50% EC at 0-3 DAT | 750 | 1.70 (2.5) | 1.98 (3.5) | 2.22 (4.5) | 2.39 (5.3) | 2.27 (4.8) | 2.39 (5.3) | 2.79 (7.5) | 2.99 (8.5) |
| T12. Farmer practice (two hand weedings) | - | 0.71 (0.0) | 0.71 (0.0) | 0.97 (0.5) | 0.97 (0.5) | 0.71 (0.0) | 0.97 (0.5) | 0.97 (0.5) | 1.10 (0.8) |
| T13. Weed free | - | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) |
| **SEm +** | - | 0.16 | 0.13 | 0.16 | 0.15 | 0.19 | 0.18 | 0.21 | 0.18 |
| **CD (P = 0.05)** | - | 0.47 | 0.38 | 0.47 | 0.43 | 0.54 | 0.52 | 0.61 | 0.51 |
| Note: Data transformed to √x+0.5 transformations. Figures in parenthesis are original values |

**Table 4. Density of weeds (No. m-2) at different growth stages of transplanted Rice as influenced by weed management practices during *Rabi,* 2017-18 and *Kharif,* 2018-19**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Treatments** | **Dose****(g a.i. ha-1)** | ***Ammannia baccifera*** | ***Ammannia baccifera*** | ***Trianthema portulacastrum*** | ***Trianthema portulacastrum*** |
| **28 DAA** | **42 DAA** | **28 DAA** | **42 DAA** |
| **2017-18** | **2018-19** | **2017-18** | **2018-19** | **2017-18** | **2018-19** | **2017-18** | **2018-19** |
| T1. Untreated control | - | 1.98 (3.5) | 1.86 (3.0) | 2.48 (5.8) | 2.23 (4.5) | 2.32 (5.0) | 2.51 (6.0) | 2.75 (7.3) | 3.19 (10.0) |
| T2. Triafamone 200 SC at 2-3 leaf stage of weed  | 30 | 1.48 (1.8) | 1.31 (1.3) | 1.92 (3.3) | 1.73 (2.5) | 1.92 (3.3) | 2.06 (3.8) | 2.39 (5.3) | 2.54 (6.0) |
| T3. Triafamone 200 SC at 2-3 leaf stage of weed | 40 | 1.48 (1.8) | 1.31 (1.3) | 1.86 (3.0) | 1.56 (2.0) | 1.70 (2.5) | 1.93 (3.3) | 2.32 (5.0) | 2.49 (5.8) |
| T4. Triafamone 200 SC at 2-3 leaf stage of weed | 50 | 1.48 (1.8) | 1.31 (1.3) | 1.79 (2.8) | 1.64 (2.3) | 1.70 (2.5) | 1.76 (2.8) | 2.22 (4.5) | 2.31 (5.0) |
| T5. Triafamone 200 SC at 2-3 leaf stage of weed | 100 | 1.22 (1.0) | 1.10 (0.8) | 1.56 (2.0) | 1.31 (1.3) | 1.48 (1.8) | 1.55 (2.0) | 1.98 (3.5) | 2.09 (4.0) |
| T6. Pyrazosulfuron ethyl 10% WP | 15 | 1.64 (2.3) | 1.70 (2.5) | 2.22 (4.5) | 2.11 (4.0) | 2.05 (3.8) | 2.21 (4.5) | 2.44 (5.5) | 2.68 (6.8) |
| T7. Triafamone 200 SC) at 0-3 DAT | 30 | 1.56 (2.0) | 1.31 (1.3) | 2.04 (3.8) | 1.56 (2.0) | 1.70 (2.5) | 1.85 (3.0) | 2.10 (4.0) | 2.21 (4.5) |
| T8. Triafamone 200 SC) at 0-3 DAT | 40 | 1.40 (1.5) | 1.22 (1.0) | 1.86 (3.0) | 1.48 (1.8) | 1.73 (2.5) | 1.80 (2.8) | 2.05 (3.8) | 2.17 (4.3) |
| T9. Triafamone 200 SC) at 0-3 DAT | 50 | 1.48 (1.8) | 1.18 (1.0) | 1.73 (2.5) | 1.27 (1.3) | 1.79 (2.8) | 1.73 (2.5) | 2.11 (4.0) | 2.06 (3.8) |
| T10. Triafamone 200 SC) at 0-3 DAT | 100 | 0.71 (0.0) | 0.71 (0.0) | 1.06 (0.8) | 1.18 (1.0) | 1.49 (1.8) | 1.40 (1.5) | 2.05 (3.8) | 1.87 (3.0) |
| T11. Pretilachlor 50% EC at 0-3 DAT | 750 | 1.63 (2.3) | 1.48 (1.8) | 2.15 (4.3) | 1.92 (3.3) | 2.00 (3.5) | 2.21 (4.5) | 2.23 (4.5) | 2.49 (6.0) |
| T12. Farmer practice (two hand weedings) | - | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 1.18 (1.0) | 1.10 (0.8) | 1.35 (1.5) | 1.18 (1.0) |
| T13. Weed free | - | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) | 0.71 (0.0) |
| **SEm +** | - | 0.13 | 0.11 | 0.14 | 0.12 | 0.14 | 0.15 | 0.15 | 0.19 |
| **CD (P = 0.05)** | - | 0.38 | 0.30 | 0.41 | 0.35 | 0.39 | 0.44 | 0.42 | 0.54 |
| Note: Data transformed to √x+0.5 transformations. Figures in parenthesis are original values |

**Table 5. Dry weight of total weeds (g m-2) and weed control efficiency (%) at 42 days after herbicide application of transplanted Rice as influenced by weed management practices during *Rabi,* 2017-18 and *Kharif,* 2018-19**

|  |  |  |  |
| --- | --- | --- | --- |
| **Treatments** | **Dose****(g a.i. ha-1)** | **\*Dry weight of total weeds** | **\*\*Weed control efficiency**  |
| **42 DAA** | **42 DAA** |
| **2017-18** | **2018-19** | **2017-18** | **2018-19** |
| T1. Untreated control | - | 15.35 (235.4) | 13.98(195.9) | 0.00 (0.0) | 0.00 (0.0) |
| T2. Triafamone 200 SC at 2-3 leaf stage of weed  | 30 | 9.87 (98.5) | 9.67 (93.1) | 49.54 (57.7) | 46.05 (51.8) |
| T3. Triafamone 200 SC at 2-3 leaf stage of weed | 40 | 8.51 (72.0) | 8.72 (75.7) | 56.34 (69.3) | 50.88 (60.0) |
| T4. Triafamone 200 SC at 2-3 leaf stage of weed | 50 | 8.01 (64.1) | 7.98 (63.3) | 58.54 (72.7) | 54.98 (66.9) |
| T5. Triafamone 200 SC at 2-3 leaf stage of weed | 100 | 6.83 (46.5) | 7.19 (51.2) | 63.60 (80.1) | 59.02 (73.4) |
| T6. Pyrazosulfuron ethyl 10% WP | 15 | 9.96 (99.2) | 10.28 (105.8) | 49.32 (57.4) | 42.53 (45.7) |
| T7. Triafamone 200 SC) at 0-3 DAT | 30 | 9.53 (90.6) | 8.46 (71.2) | 51.58 (61.3) | 52.77 (63.4) |
| T8. Triafamone 200 SC) at 0-3 DAT | 40 | 8.58 (73.4) | 7.84 (61.2) | 56.01 (68.7) | 55.65 (68.0) |
| T9. Triafamone 200 SC) at 0-3 DAT | 50 | 7.59 (57.1) | 7.19 (51.2) | 60.35 (75.4) | 59.06 (73.5) |
| T10. Triafamone 200 SC) at 0-3 DAT | 100 | 5.61 (31.1) | 6.79(45.8) | 68.64 (86.7) | 60.83 (76.1) |
| T11. Pretilachlor 50% EC at 0-3 DAT | 750 | 10.13 (102.7) | 10.14(103.1) | 48.32 (55.7) | 43.37 (47.2) |
| T12. Farmer practice (two hand weedings) | - | 3.63 (13.2) | 3.71 (13.3) | 76.56 (94.4) | 74.78 (93.0) |
| T13. Weed free | - | 0.71 (0.0) | 0.71 (0.0) | 90.00 (100.0) | 90.00 (100.0) |
| **SEm +** | - | 0.35 | 0.29 | 1.70 | 1.47 |
| **CD (P = 0.05)** | - | 1.01 | 0.84 | 4.87 | 4.23 |

Note: \*Data transformed to √x+0.5 transformations. Figures in parenthesis are original values

 \*\* Data transformed to arc sine transformations. Figures in parenthesis are original values