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Title: EFFECT OF RICE ESTABLISHMENT AND WEED CONTROL METHODS ON PRODUCTIVITY OF RICE UNDER MEDIUM LAND CONDITION

Publisher: Birsa Agricultural University, Kanke, Ranchi, Jharkhand

Language: en_US

Type: Thesis

Pages: 120

Keywords: EFFECT OF RICE ESTABLISHMENT AND WEED CONTROL METHODS ON PRODUCTIVITY OF RICE UNDER MEDIUM LAND CONDITION

Abstract: University, Ranchi during rainy season of 2009 with objective to find out the effect of establishment and weed control method on weed dynamics, growth, development, productivity and profitability of rice under wet land situation. The experimental soil was acidic with pH 5.68, sandy loam in texture, low in organic carbon (0.37%) and nitrogen (242.23 kg ha⁻¹) and medium in phosphorus (14.43 kg ha⁻¹) and low in potassium (123 kg ha⁻¹). The treatment comprised of 4 methods of rice establishment i.e. transplant, SRI, drum seeded and broadcast in main plot and 4 methods of weed control – application of pyrazosulfuron 0.02kg ha⁻¹ PE + mechanical weeding at 25 DAS/T, weeding by cono weeder at 25 DAS/T, hand weeding at 25& 40 DAS/T, and weedy check in sub plot. The experiment was laid out in split plot design with 3 replications. Rice variety “Lalat” was sowed on 10-07-10 under drum seeded, broad cast as well as seedling raising for SRI, and transplant methods of establishment. Transplanted rice registered 100, 43.93 and 44.96% and 100, 68.85 and 48.06% reduced weed population and 100, 41.60 and 11.59% and 100, 31.39 and 25.64% reduced weed dry matter compared to drum seeded and broadcasted rice at 30, 50 and 70 DAS respectively registering maximum weed control efficiency (71.18% at 50 DAS) . Transplant method of rice establishment being at par with SRI method expressed significantly higher total tillers m⁻² 466,362 and 326 m⁻² at 70, 90 and at maturity respectively, higher number of effective tillers m⁻² (309), filled grains (68 panicle-1) and 1000 grain weight (28.02g) compared to drum seeded and broadcast methods, thereby recorded maximum grain (3925 kg ha⁻¹) and straw yield (6454 kg ha⁻¹), higher net return (Rs33056 ha⁻¹) and B:C ratio (1.73), net energy output by grain (39540 MJ ha⁻¹) and biomass (108114 MJ ha⁻¹), energy use efficiency by grain (4.51) and biomass(10.60 MJ ha⁻¹) and reduced specific energy (2863 MJ t⁻¹) and weed index(15.08%). Application of pyrazosulfuron 0.02kg ha⁻¹ PE + mechanical weeding at 25 DAS/T registered 76.48, 82.23 and 51.14% reduced weed population and 61.14, 39.83 and 19.74% reduced weed dry matter at 30, 50 and 70 DAS respectively compared to two hand weeding at 25 and 40 DAS registering maximum weed control efficiency (87.72% at 50 DAS). Application of pyrazosulfuron 0.02kg ha⁻¹ PE + mechanical weeding at 25 DAS being at par with weeding by cono weeder at 25 DAS recorded significantly higher panicle m⁻² (293), filled grains (60 Panicle-1) and 1000 grain weight (27.14g) compared to hand weeding and weedy check weedy check thereby recorded significantly higher grain (4377 kg ha⁻¹) and straw (7279 kg ha⁻¹) yield, net return (Rs 44953 ha⁻¹). B: C ratio (3.51), net energy output by grain (45968 MJ ha⁻¹) and biomass (123305 MJ ha⁻¹), energy use efficiency by grain (5.32) and biomass (12.57MJ ha⁻¹) and minimum specific energy (2433 MJ t⁻¹). Transplant method of establishment along with application of pyrazosulfuron 0.20kg ha⁻¹ + one mechanical weeding at 25 DAS/T being similar to SRI, drum seeded and broadcast methods supplemented with same weed control, registered significantly higher grain (4626 kg ha⁻¹) and net return (Rs44579 ha⁻¹) as compared to combination of drum seeded and broadcasted rice along with weeding by cono weeder or two hand weeding at 20 & 40 DAS. Microbial population in soil was not affected by establishment and weed control methods, however, an increase in organic carbon from 0.37% to 0.77% was noticed under drum seeded and broadcasted rice. Thus it can be concluded that among establishment and weed control methods transplant and application of pyrazosulfuron 0.20kg ha⁻¹ + one mechanical weeding at 25 DAS/T were most productive and profitable. Application of pyrazosulfuron 0.20kg ha⁻¹ + one mechanical weeding at 25 DAS/ T in transplanted or drum seeded or broadcasted rice was most effective in suppressing weed population and weed dry matter accumulation thereby producing higher rice grain yield and net return compared to weed control performed by cono weeder at 25 & 40 DAS/T and hand weeding at 25 & 40 DAS/T.

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Subject: Animal Biochemistry

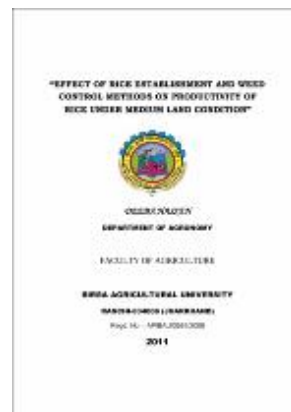
These Type: M.SC

Issue Date: 2011

Appears in Collections: Thesis (/handle/1/93550)


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