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Title: TILLAGE AND WEED MANAGEMENT IN RICE – WHEAT SYSTEM

Publisher: Birsa Agricultural University, Kanke, Ranchi, Jharkhand

Language: en\_US

Type: Thesis

Pages: 210

Agrotags: null

Keywords: TILLAGE AND WEED MANAGEMENT IN RICE – WHEAT SYSTEM

**Abstract:** A field experiment on the topic “Tillage and Weed Management in Rice-Wheat System” was conducted during 2009-11 to study the effect of zero and conventional tillage as well as weed control practices on productivity, energetic and economics of rice-wheat system at the university farm, Ranchi on sandy loam soil. The soil was acidic in reaction (pH 5.43), low in, available nitrogen (242.23kg/ha), potassium (123kg/ha) and medium in organic carbon (0.52) available phosphorus (14.85kg/ha). Treatment consisted tillage practices viz. (i) Zero till rice and zero till wheat (ii) Zero till rice and conventional till wheat (iii) Conventional till rice and zero till wheat (iv) Conventional till rice and conventional till wheat in main plot and weed control practices viz. (i) weedy check (ii) recommended herbicides Butachlor @ 1.5 kg/ha PE +2,4-D @ 0.5 kg/ha post emergence for rice and Isoproturon @ 0.75kg/ha + 2,4-D @ 0.5 kg/ha post emergence for wheat (iii) Two hand weeding (20 and 40 DAS for rice and 25 and 50 DAS for wheat) in sub plot laid out in split plot design and replicated 4 times. Results revealed that the dominant weed flora associated with direct seeded rice were *Cyperus rotundus*, *C.difformis*, *C.iria* and *Fimbristylis miliacea* in sedges, *Commalina benghalensis*, *C.diffusa*, *Ageretum conyzoides*, *Polygola chenensis* and *Phyllanthus niruri* in broad leaf weeds and *Echinochloa colonum*, *Sorghum halepense*, *Setaria glauca*, *Digitaria sanguinalis* in grassy weeds. Among the weed flora 59.20% was broad leaf weeds, 17.72% sedges and 23.08% grassy weeds. Similarly dominant weed flora associated with wheat were *Coronopus didymus*, *Vicia hirsuta*, *Vicia sativa*, *Anagalis arvensis*, *Medicago denticulate* and *Chenopodium album* in broad leaf weeds while *Cynodon dactylon*, *Avena fatua* and *Phalaris minor* in grassy weeds. Among weed flora, 94.3% was broad leaf weeds and 5.7% grassy weeds. Weed density was maximum in conventionally tilled ricewheat system and minimum in zero tilled rice-wheat system. However reverse was true in weed dry matter. Direct seeded rice-wheat sequence with conventional tillage produced higher rice equivalent yield 74.40 q/ha (for 31.2 q/ha rice and 36.0 q/ha wheat), net return (Rs. 58206/ha), net energy output (62144 MJ/ha grain and 142012 MJ/ha biomass) having maximum energy-use efficiency (7.16 grain and 14.83 biomass) and minimum specific energy (9656 MJ/t) than the system with other tillage practices. Among weed control, rice-wheat either with butachlor @ 1.5 kg/ha pre-emergence + 2,4-D 0.5 kg/ha post emergence in rice and isoproturon @ 0.75kg/ha + 2,4-D @ 0.5 kg/ha post emergence in wheat or, with two hand weeding in both crops produced higher rice equivalent yield (74.3 q/ha and 78.1 q/ha), net return (Rs. 62258/ha and Rs. 60498/ha) net grain energy output (63198 MJ/ha and 67802 MJ/ha), grain energy-use efficiency (7.53 and 7.94) with lower specific energy (8978 MJ/t and 8624 MJ/t) than system with weedy check.

**Description:** TILLAGE AND WEED MANAGEMENT IN RICE – WHEAT SYSTEM

**Subject:** Agronomy

**Theme:** TILLAGE AND WEED MANAGEMENT IN RICE – WHEAT SYSTEM

**These Type:** Ph.D

**Issue Date:** 2013

**Appears in** Thesis (/handle/1/93550)

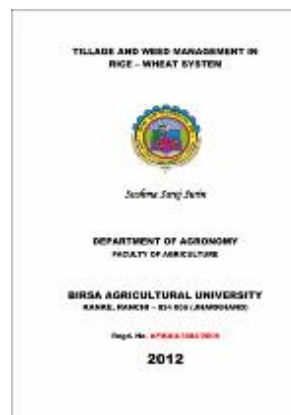
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