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No till, minimum till and weed management practices on weed species dynamics in the Rice- Rice cropping system of Cauvery Delta Zone in Tamil Nadu

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To work out the effective weed management strategies under conservation tillage in Rice (Oryza sativa L.) - Rice (Oryza sativa L.) cropping system, field experiments were conducted with three tillage systems, viz. Conventional-tillage (CT), No tillage (NT) and Reduced tillage (RT) and two cultivars (ADT 43 and CORH 3) continuously for three years (Six seasons). Results indicated that total weed density and biomass was highest in zero and minimum tillages during the second season of first year, which declined gradually in subsequent seasons. During the first year, NT had the highest weed density and weed biomass followed by RT. However, in the second season of third year, no significant difference was observed among the different tillage methods for weed density and weed biomass. Though lowest weed density and biomass of Cyperus difformis was found in NT, increase in the density of Panicum repens was observed under NT during the third year of study (Sixth season) , which indicated the shift of weeds in No tillage (NT). Though significantly highest grain yield was observed with CT during first two seasons, no significant difference was observed among the different tillage treatments from the third season onwards. The results of the study further indicated that though the grain yield was highest with conventional tillage, the net return and BCR was highest with reduced and no tillages. The cultivars also did not differ themselves in suppressing the weed growth during all the seasons of study. Tillage x cultivar interaction did not occur for weed density and grain yield. Perennial weeds were problems in all tillage systems and there is a general dependence on glyphosate for perennial weed control, which was observed in the present study also. On a long run, the possible build-up of resistance to glyphosate and pre-emergence herbicides may pose a threat for weed management in the conservation tillage. These results suggest that conventional till based rice–rice cropping system could be replaced with either reduced till or no till based crop establishment methods for resource conservation without any yield penalty.

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