

Weed Management through Soil Seed Bank Depletion by Alternate Poly Mulching

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Herbicides are the most effective but least ecofriendly method in weed management. An eco-friendly method of weed control are essential in organic farming and inorganic farming as well. A preliminary study proved that application of a polythene (gauge 150, black colour) mulch for 30 days period controlled the existing-germinated weeds from emerging in the field and after removing the polythene mulch almost all the weed seed lot in soil seed bank germinated once due to breaking of seed dormancy. This allows post-emergence weed control to be more efficient. Based on the results of this preliminary study; a field experiment was conducted in order to see the possibility of weed management through soil seed bank depletion by alternate polythene mulching during *Maha* 2017/18 and *Yala* 2018 seasons at Rice Research and Development Institute, Batalagoda. Three treatments namely; (T₁)= Polymulching for 30 days after 01st ploughing followed by allowing seedling emergence for 10 days, followed by a 2nd ploughing followed by all other practices without herbicides, (T₂)= Polymulching for 30 days without 1st ploughing followed by allowing seedling emergence for 10 days, followed by polymulching for 2 weeks followed by seed sowing followed by all other practices without herbicides and (T₃)= Conventional practice which includes 1st ploughing, 2nd ploughing, puddling and levelling followed by seed sowing followed by all other practices including herbicide application (control) were compared. All crop management practices were done according to the recommendation of the Department of Agriculture. Weed counts, weed biomass and final rice grain yield were recorded. Data was analysed employing ANOVA and GLM procedures using SAS software. Total weed biomass of T₁ was significantly lower (35.88 g/m²) compared to that (41.38 g/m²) of Control during *Maha* and the total weed biomass of T₁ was comparable (56.11 g/m²) compared to that (43.31 g/m²) of Control during *Yala*. Final grain yields of T₁ showed significantly higher (4.78 t/ha) compared to that (4.56 t/ha) of control during *Maha*. Results revealed that polymulching for 30 days after 1st ploughing followed by allowing seedling emergence for 10 days followed by a 2nd ploughing followed by all other practices without herbicides could be effectively practiced to manage weeds in rice as an alternative to conventional herbicide application.

Keywords: Alternate poly-mulching, Conventional practice, Seed bank depletion