ESTABLISHMENT OF N_2-FIXING LEGUMES FOR IMPROVING THE PRODUCTIVITY OF RICE-WHEAT SYSTEM

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ABSTRACT

A field experiment was conducted using three green manure legumes (GMLs): Sesbania aculeata, Sesbania rostrata and Crotolaria juncea during 1995-97. The legumes were established with three methods as relay cropping with wheat (in March), zero-tillage after wheat harvest and line sowing in finely prepared seedbed. S. aculeata and S. rostrata were proved as the most promising GMLs in the paddy soils, the latter contributed dry biomass and N upto 5.12 t ha^{-1} and 109 kg ha^{-1}, respectively. Crotolaria juncea did not perform well in the paddy soils. Use of Sesbania GM increased the paddy yield by 124 percent over the untreated plots and 2 percent over the crop receiving 90 kg N ha^{-1} as urea fertilizer. After three years, Sesbania spp. had significant residual effect on wheat yield. Green manuring improved soil physiochemical properties. The results concluded that establishment of Sesbania spp. through relay cropping or zero-tillage were the most effective and economical methods and saved Rs. 1960 ha^{-1} over the line sowing method (conventional method) and produced the same level of paddy yield.