

Efficacy of herbicides on the control weeds and productivity of direct seeded rice under minimal water conditions

ABSTRACT

Field experiments have been conducted at the MARDI Seberang Perai Research Station for two seasons: main season 2005/2006 (October - February) and off-season 2006 (March - September) to determine the efficacy of herbicides in controlling weeds and their subsequent effect on rice productivity. Ten herbicides widely used and available in the market have been evaluated singly, as mixtures and as sequential applications in direct seeded rice fields during critical period of weed competition under minimal water conditions of less than 2 cm water depth. In main season the hierarchical position of the four dominant weed species out of 10 species were *Fimbristylis milliacea* > *Lndwiglia hyssopifolia* > *Leptochloa chinensis* > *Echinochloa crus-galli*, this was completely reverse to that of off-season where *Echinochloa crus-galli* > *Leptochloa chinensis* > *Fimbristylis milliacea* > *Limnocharis flava*. Seven of the eighteen treatments over the two cropping seasons showed better broad spectrum weed control, increased grain yields and better yield component indicators. Due to variation of the dominant weed infestation between seasons the potential treatments were pretilachlor followed by bentazon/MCPA (T2), cyhalofop-butyl + bensulfuron followed by bentazon/MCPA (T4), bispyribac-sodium followed by bentazon/MCPA (T6), benthocarb/ propanil followed by bentazon/MCPA (T8), penoxsulam + benthocarb followed by bentazon/MCPA (T10), fenoxaprop-p-ethyl/safener + benthocarb/ propanil followed by bentazon/MCPA (T12) and quinclorac + benthocarb/propanil followed by bentazon/MCPA (T14) in main season and Pretilachlor followed by bentazon/MCPA (T2), bispyribac-sodium followed by bentazon/MCPA (T6) and penoxsulam + benthocarb followed by bentazon/MCPA (T10) in off-season. Rice yield losses due to weed competition in unweeded treatments were 60% in main season and 54% in off-season. This experiment showed that sequential herbicide applications at the critical period of weed competition would give a better result compared to a single herbicide application.

Keyword: Canoco analysis, Herbicides combination, Rice yield, SDR, Weed vegetation