

The effects of flooding period duration on the efficiency of some herbicides in the paddy field

farzaneh asadollahi sharifi*,bijan yaghoobi,

Abstract: Water resources shortage threatens the sustainability of continuous flooding rice culture. A field experiment was conducted at Rice Research Institute of Iran-Rasht, northern Iran in 2015 to investigate the effect of initial flooding duration on herbicide efficacy and rice yield loss. The experiment was arranged in a factorial arrangement based on a randomized complete block design with three replicates. Factors were rice cultivars (Hashemi and Gilaneh) and initial flooding duration (flooding for 2, 4, 6, 8 and 12 weeks after transplanting and then applying intermittent irrigation). Consistent with the paddy fields irrigation method in northern Iran, 12-week flooding duration was considered as continuous flooding irrigation. Results showed that there was no significant difference in herbicide efficacy between Hashemi (87.9%) and Gilaneh (85.6%) cultivars. No significant reduction in herbicide efficacy was observed when initial flooding duration reduced 12 to 6 weeks, but with further reduction in initial flooding duration to 4- and 2-week, herbicide efficacy was significantly reduced. The highest paddy yield (3989.2 kg ha⁻¹) was observed at permanent flooding irrigation (flooding for 12 weeks) and the paddy yield was reduced by 10% as initial flooding duration was reduced to 6 weeks which was not statistically significant. With further decrease in initial flooding duration to 4- and 2- week, rice paddy yields reduced significantly by 16% and 31%, respectively. In conclusion, results of this experiment revealed that under water shortage condition, it is necessary to apply initial flooding duration at least for 6 weeks after transplanting for obtaining optimum herbicide efficacy ($\leq 90\%$), Although paddy yield was reduced by 10% in this treatment compared to continuous flooding treatment.

Keywords: Herbicide efficacy, irrigation method, paddy fields, yield loss

Keywords : Keywords: Herbicide efficacy, irrigation method, paddy fields, yield loss

