EVALUATION OF THE HERBICIDAL EFFICACY OF SIX COMMONLY USED HERBICIDES AND THEIR EFFECT ON PHOTOSYNTHESIS, CHLOROPHYLL CONTENT AND YIELD OF RICE (*Oryza sativa*)

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Rice is the staple food of Sri Lankans, and thus it is imperative that yields are optimized. It has been reported that 20-40% of rice yields are generally lost due to weed competition, which shows the urgent need for sustainable weed management. For many countries, use of herbicides is the easiest and most effective option for this purpose. Therefore, this study was conducted as a field trial to evaluate: 1) the efficacy in controlling rice weeds among the currently used popular herbicides bispyribac sodium, propanil 360g/l, thiobencarb 400g/l + propanil 230g/l, oxadiazon 80g/l + propanil 230g/l, quinclorac, and fenoxa prop-p-ethyl, and 2) their effect on photosynthesis, chlorophyll content and yield of rice plant. Though bispyribac-sodium is considered as a total killer, it does not have the capability of controlling *Isachne globosa* even at high dosage levels. Therefore, a laboratory trial was undertaken to determine the time of application and ideal dosage to control this problematic perennial grass weed.

Six herbicides (at recommended doses) and a control (no chemicals) were used to study the herbicidal efficacy on controlling rice weeds in the maha season 2000/2001 in direct seeded rice fields at Hingurakgoda. Bispyribac sodium, propanil 360g/l, thiobencarb 400g/l + propanil 200g/l, oxadiazon 80g/l + propanil 230g/l were applied at the 1st time of application (7-8 DAS) whereas quinclorac and fenoxa prop-p-ethyl were applied at 2nd time of application (13-14DAS). For the laboratory trial, eleven days after the establishment of *Isachne globosa* cuttings, seventeen treatments of the above chemicals were carried out including the control to study the efficiency of controlling *Isachne globosa*. Photosynthesis and chlorophyll contents of rice flag leaf were measured at 10 weeks after sowing by means of a photosynthetic meter and spadmeter, respectively. Also yield of each plot was collected. Weed species counts at 6 weeks after sowing and weed dry biomass per stand count (g/m^2) were measured. Controlling efficacy of treatments for the *Isachne globosa* was assessed visually as a count at 14 days after the application.

It was seen that efficacy of weed controlling increased according to quinclorac < fenoxa prop-p-ethyl < propanil 360g/l < thiobencarb 400g/l + propanil 200g/l thiobencarb 400g/l + propanil 200g/l < oxadiazon 80g/l + propanil 230g/l < bispyribac sodium. There was no significant effect among chemicals over the physiology of the rice plant, but there was a significant negative effect from the control plot. Application of bispyribac-sodium on the experimental plot resulted in a relatively high yield of 6250 Kg/ha compared to other treatments. According to the laboratory trial, propanil was the major constituent of the herbicide capable of controlling *Isachne globosa* when applied at the stage of 10-11 days after planting at recommended dosage levels. This study revealed that bispyribac sodium [Acetolactate synthase inhibitor] has the potential to control other rice weeds available in paddy fields where control of *Isachne globosa* is not targeted. Application of the herbicide has to be made at an early growth stage of the weed to control *Isachne globosa* effectively.