

PHYTOSOCIOLOGICAL CHARACTERIZATION OF WEEDS AS A FUNCTION OF RESIDUAL HERBICIDES APPLIED TO RICE GROWN UNDER SPRINKLER IRRIGATION

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SUMMARY

We aimed to characterize the weed community in sprinkler irrigated rice, previously applied with residual herbicides for two years, as well as to infer about sustainability of the management applied to the fields based on an ecological approach. The experiment was conducted during the cropping seasons 2013/14 and 2014/15, under sprinkler irrigation. Rice was planted in the second-half of October, using the cultivar PUITA INTA CL. Herbicides were applied in pre- and post-emergence (sequential application) of crop and weeds. Ryegrass (*Lolium multiflorum*) was planted in winter. In May 2015, soil samples were collected for the soil seed bank study. Phytosociological characterization of weeds emerged from the seed bank was conducted from May 2015 to January 2016, until soil seed bank depletion. *Echinochloa crusgalli*, *Fimbristyllis* sp., *Cyperus esculentus* and *Killingia brevifolia* were the weeds to which most concern should be directed when growing rice under sprinkler irrigation in lowland areas of Southern Brazil. Their competition strategies are based on density. Herbicides used should be efficient in controlling at least these four weed species. A selecting action of herbicides on weed species was botanically characterized, as the weed species reported after two cropping seasons depended on the herbicide treatment applied.

INTRODUCTION

Rice is a staple food for nearly half the world's population, being cultivated in 112 countries. The demand for water in paddy rice is considerably high, reaching as much as 8000–10,000 m³ of water per hectare to supplement rainfall, in an irrigation period of 80–100 days (SOSBAI, 2014). Sprinkler irrigation is being tested for rice cultivation in Brazil, claiming for 50% water savings when sprinkler irrigated rice is compared to paddy rice (Parfitt *et al.*, 2011). This water surplus may be used either to increase rice acreage or to irrigate crops on additional fields with great potential to be applied in rice growing areas with low water availability. In the rice fields of Southern Brazil, several plant species may be planted during winter, but ryegrass (*Lolium multiflorum*) is usually adopted. This plant serves as pasture for beef or milk cattle, as well as sheep feeding, allowing crop-livestock succession in lowland areas where only rice is planted in summer (Agostinetto and Vargas, 2014). Thus, traditional rice fields in Southern Brazil usually succeed ryegrass, and the adoption of the sprinkler irrigation in rice would favour the success of the crop (rice)/livestock (cattle/ryegrass) succession.

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