Proceedings of the Joint Meeting AGI-SIBV-SIGA
Assisi, Italy – 19/22 September, 2011
ISBN **978-88-904570-2-9**

Poster Communication Abstract – 9.07

EVIDENCE OF HERBICIDE TOLERANCE GENE FLOW FROM CULTIVATED CLEARFIELD RICE (*ORYZA SATIVA* L.) TO RED RICE (*ORYZA SATIVA* F. *SPONTANEA*)

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Herbicide tolerance, clearfield rice, AHAS-inhibiting herbicides, gene flow, red rice

The weedy relative of cultivated rice, red rice, can invade and severely infest rice fields, both lowering yields and reducing the selling price of the harvested grain. Infestations caused by this weed have been reported by rice farmers throughout the world. Because of its close genetic relationship to commercial rice, red rice has proved difficult to control. No herbicide yet developed can adequately control red rice without also injuring or killing conventional rice. Clearfield rice, which is resistant to the chemical group of AHAS-inhibiting herbicides called imidazolinones, has been developed by treating seeds of cultivated rice with the chemical mutagen ethyl methanesulfonate (EMS) and selecting for the resulting herbicide tolerant plants. Clearfield rice provide an high efficient opportunity to control red rice infestations and in order to reduce the risk of herbicide resistance spreading from cultivated rice to red rice Stewardship Guidelines are regularly released. Five years ago (2006) Italy started the cultivation of the Clearfield cultivar Libero. During the year 2010 a surveillance of the possible escape of herbicide resistance has been carried out. Red rice plants have been sampled at the edges of fields actually cultivated or previously cultivated with Libero. The collected plants have been analyzed for the presence of herbicide resistance by herbicide treatment and by molecular analysis of the region of the AHAS gene in search for the nucleotide variation determining the tolerant phenotype. The results showed clearly that in field are already present herbicide tolerant red rice plants, moreover the finding of plants homozygote for the mutation suggested that the cross event is happened minimum two years ago and that these plants are in the F2 generation or further.