

Control of *Cyperus difformis* biotypes in rice crop and efficacy of florypyrauxifen-benzyl and penoxsulam

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Cyperus difformis is considered to be one of the most troublesome and important weeds for rice crop with an increasing dispersal. It has to be noted that more than 10 cases of herbicide resistance have been already mentioned (Heap, 2019), with the specific C4 weed species being one of the major problems for tropical and subtropical regions of more than 45 different countries (Pedroso *et al.*, 2016). Therefore, the present study was conducted in order to evaluate the efficacy two different herbicides (florpyrauxifen-benzyl and penoxsulam) against different biotypes of *C. difformis* collected in Greece.

METHODS & MATERIALS

Two pot experiments were conducted in 2019 in Agrinio region (western Greece) with five biotypes of *Cyperus difformis* collected from two different typical rice-growing areas of Greece, namely Katochi (G11 and G25) and Chalastra (C1, C6 and C9). At the 2-3 leaves stage, plants were treated with penoxsulam (40 g a.i./ha) and halosulfuron methyl (37.5 g a.i./ha) while some plants remain untreated. Experiments were laid out in completely randomized design with two factors (treatment and biotype) and 10 replicates (pots). At 7 and 14 days after treatment (DAT), height, fresh and dry weight and NDVI were measured. For the statistical analysis, Statgraphics was used.

RESULTS

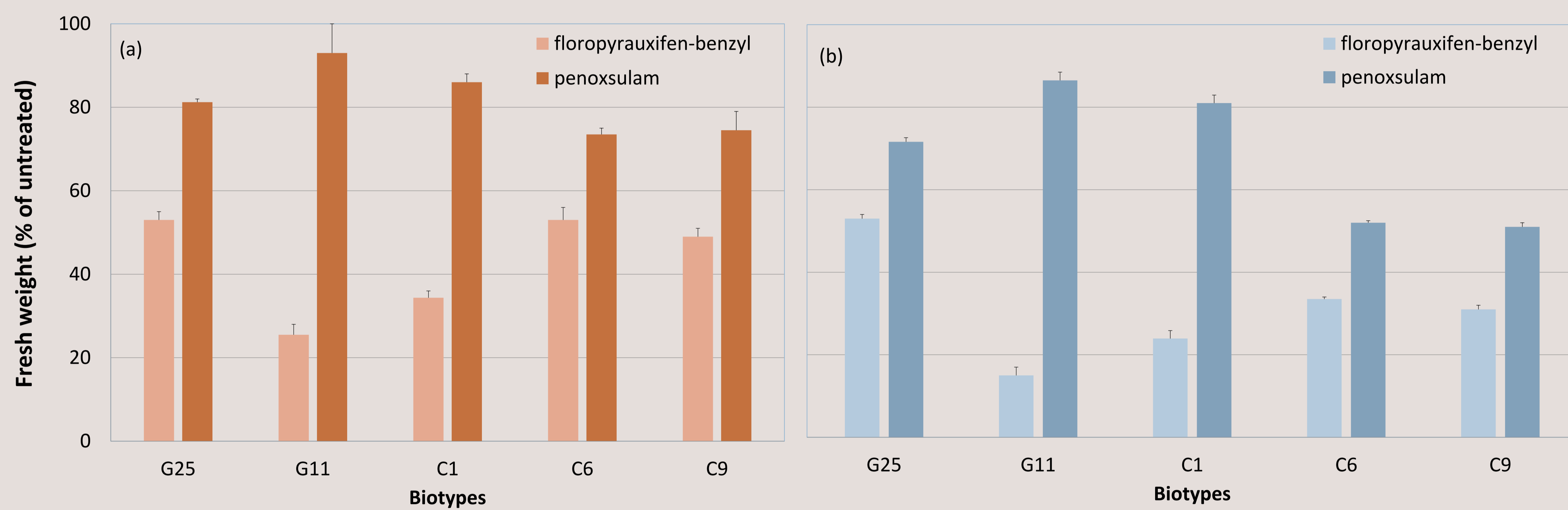


Figure 1. Fresh weight of *Cyperus difformis* at a) 7 and b) 14 DAT. Vertical bars indicate standard errors of the means.

Table 1. MANOVA for the efficacy of the two herbicides against *C. difformis* at 7 and 14 DAT (FW: fresh weight). *** indicate significant difference at $p=0.001$.

Source of variability	Degrees of freedom	<i>Cyperus difformis</i>	
		FW (7 DAT)	FW (14 DAT)
A: Treatment	2	***	***
B: Biotypes	4	***	***
AB	8	***	***



Figure 2. *Cyperus difformis* (biotype G11) at 7 DAT (left: untreated, middle: florpyrauxifen-benzyl, right: penoxsulam)

CONCLUSIONS

- ❑ Efficacy of penoxsulam against the several *C. difformis* biotypes was low and insufficient (15 to 53%)
- ❑ The new herbicide florpyrauxifen-benzyl resulted in the control of the several biotypes ranging between 74 and 93% at 7 DAT
- ❑ Efficacy tends to progressively decrease at 14 DAT
- ❑ The use of florpyrauxifen-benzyl is strongly suggested as a good alternative under the context of integrated weed management

LITERATURE

1. Heap, I. (2019). The International Survey of Herbicide Resistant Weeds. Available www.weedscience.com
2. Pedroso, R. M., Al-Khatib, K., Alarcón-Reverte, R., & Fischer, A. J. (2016). A psbA mutation (Val219 to Ile) causes resistance to propanil and increased susceptibility to bentazon in *Cyperus difformis*. *Pest Management Science* 72(9), 1673-1680.