

# EFFECT OF THE APPLICATION OF BIOCHAR ORGANIC AMENDMENT ON THE HERBICIDE EFFICACY IN RICE CULTIVATION

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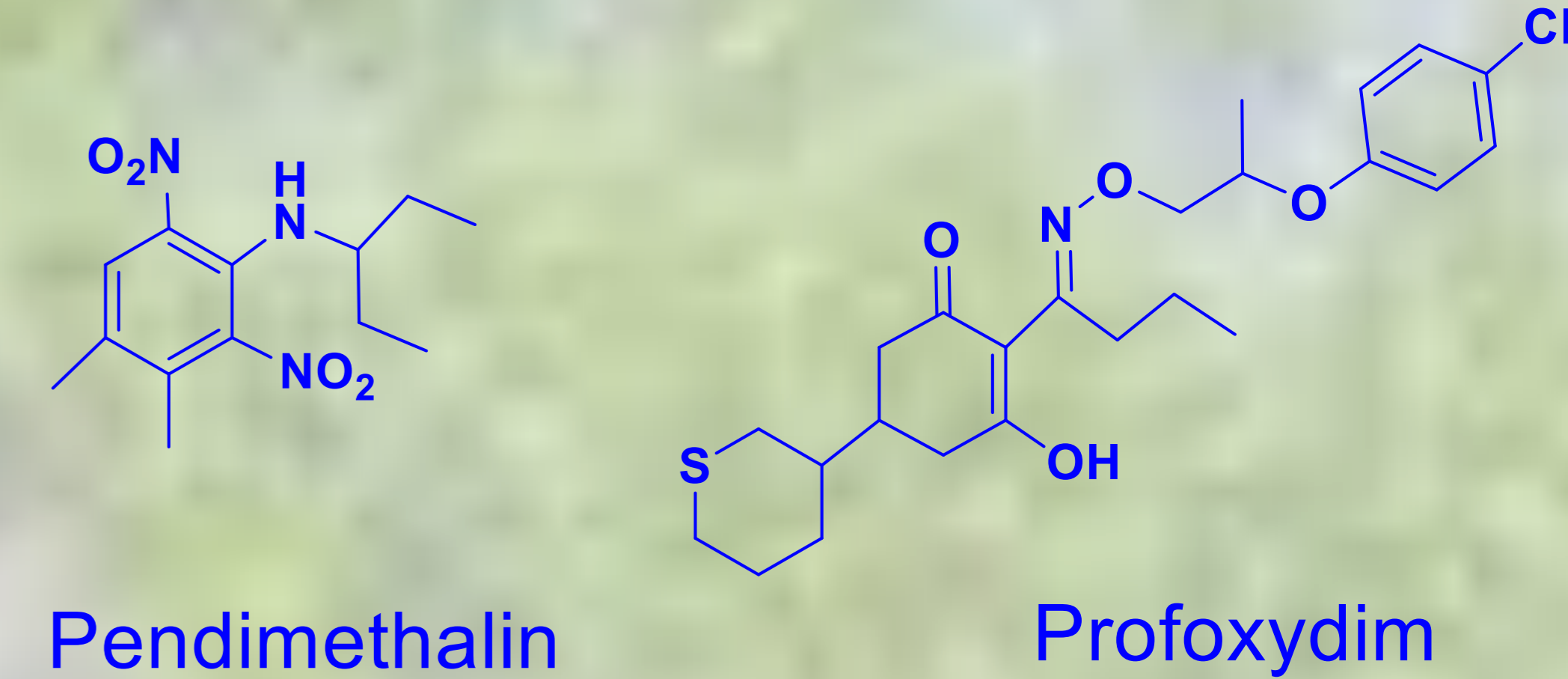
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## INTRODUCTION

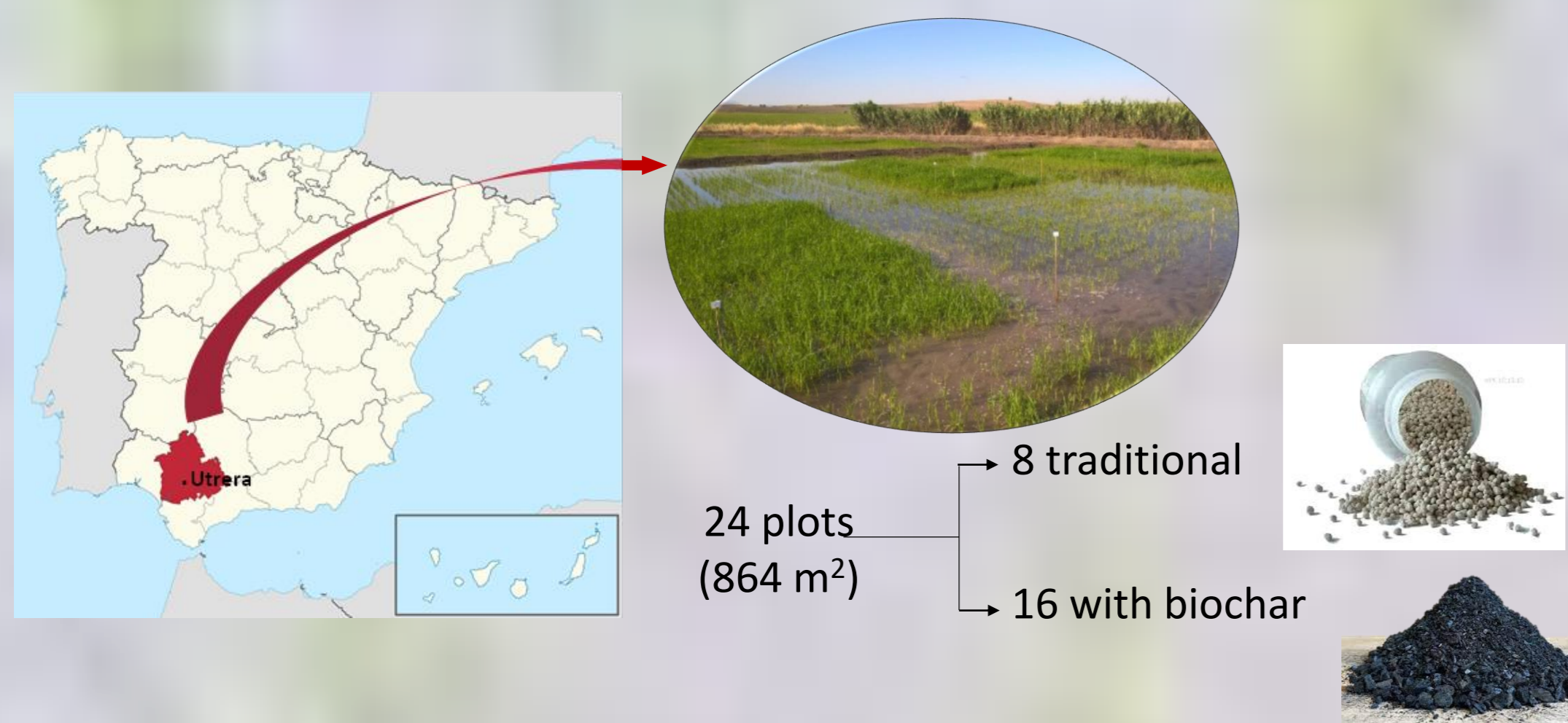
Nowadays, to ensure supplies for the population, it is paramount to maintain the sustainability of rice cultivation. Herbicides application play a key role managing the weed competition, improving labor efficiency, maintaining water management and facilitating effective crop residue management. The use of organic amendments is an interesting option to improve soil fertility, although it could affect the bioavailability and efficacy of herbicides. In this sense, there is limited information on the effect of compost application on weed control and rice production.

The **OBJECTIVE** of this work was to assess the influence of biochar organic amendment on the efficacy of two selected herbicides, pendimethalin and profoxydim, in rice crop, as well as their impact on its final yield.



## MATERIAL & METHODS

### Field trials



Field trials were carried out in Seville (Spain) with a pre-emergence herbicide, Stomp Aqua (a.s.: pendimethalin), and a post-emergence herbicide, Aura (a.s.: profoxydim). Field dose and half field dose were the treatments performed with biochar and conventional fertiliser

Biochar organic amendment	Conventional fertiliser
1. Blank (without herbicides)	1. Blank (without herbicides)
2. Stomp Aqua (1.25 L ha <sup>-1</sup> ) + Aura (0.375 L ha <sup>-1</sup> )	2. Stomp Aqua (1.25 L ha <sup>-1</sup> ) + Aura (0.375 L ha <sup>-1</sup> )
3. Stomp Aqua (2.5 L ha <sup>-1</sup> ) + Aura (0.75 L ha <sup>-1</sup> )	3. Stomp Aqua (2.5 L ha <sup>-1</sup> ) + Aura (0.75 L ha <sup>-1</sup> )

### Efficacy of herbicide treatments

Three visual evaluations (V1-V3) were carried out at different phenological stages of the rice crop, from emergence (BBCH 14) to maturity (BBCH 89). The percentage of weed control *Echinochloa* spp. and/or *Leptochloa* spp. was determined for each treatment used.

Visual evaluation	Days from pre-emergence application	Days from post-emergence application	Control <i>Echinochloa</i> spp.	Control <i>Leptochloa</i> spp.
V1	15	0	BBCH 14-22	BBCH 14-21
V2	27	13	BBCH 22-24	BBCH 25-31
V3	69	55	BBCH 75-89	BBCH 71-89

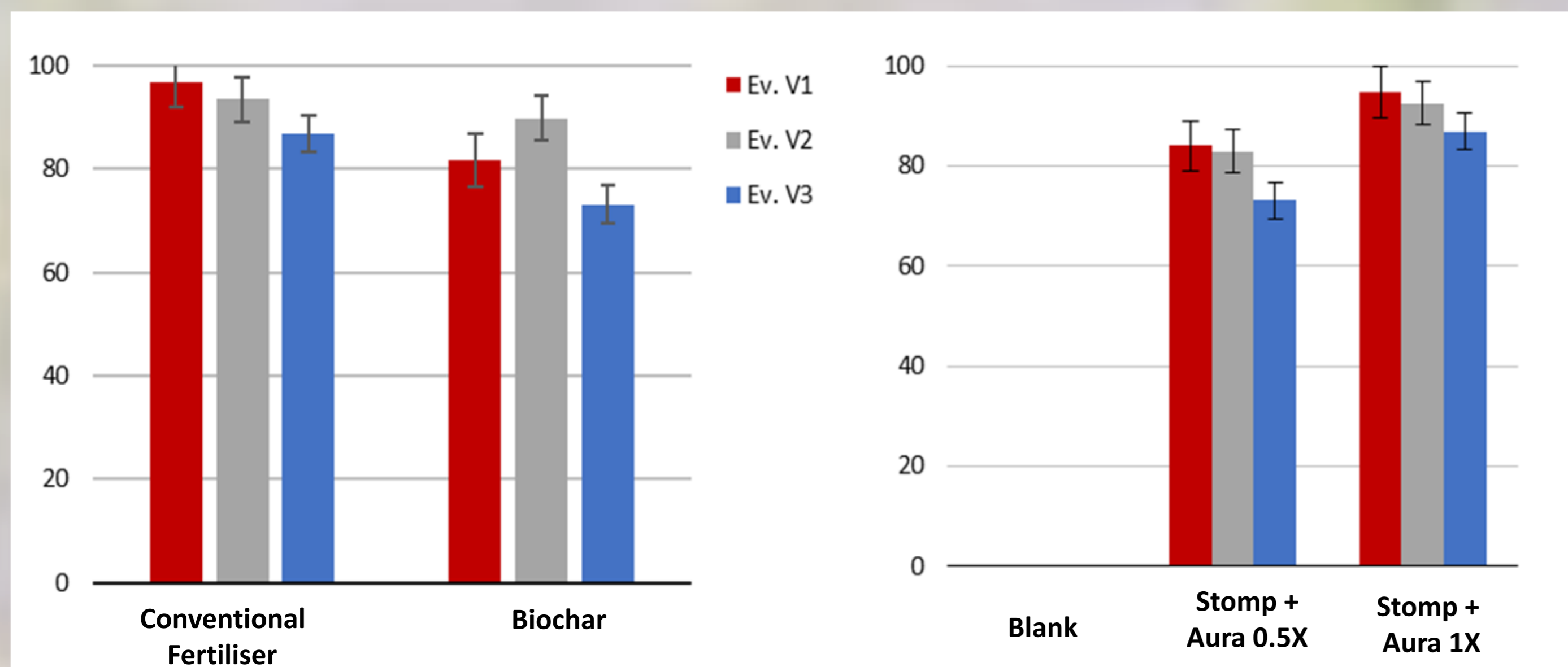
At harvest time, two samples (each of 0.25 m<sup>2</sup>) of rice crop and weed were collected from each plot. The parameters measured were:

- Fresh weight in rice and weeds
- Dry weight in rice and weeds
- Number of stems in rice and weeds

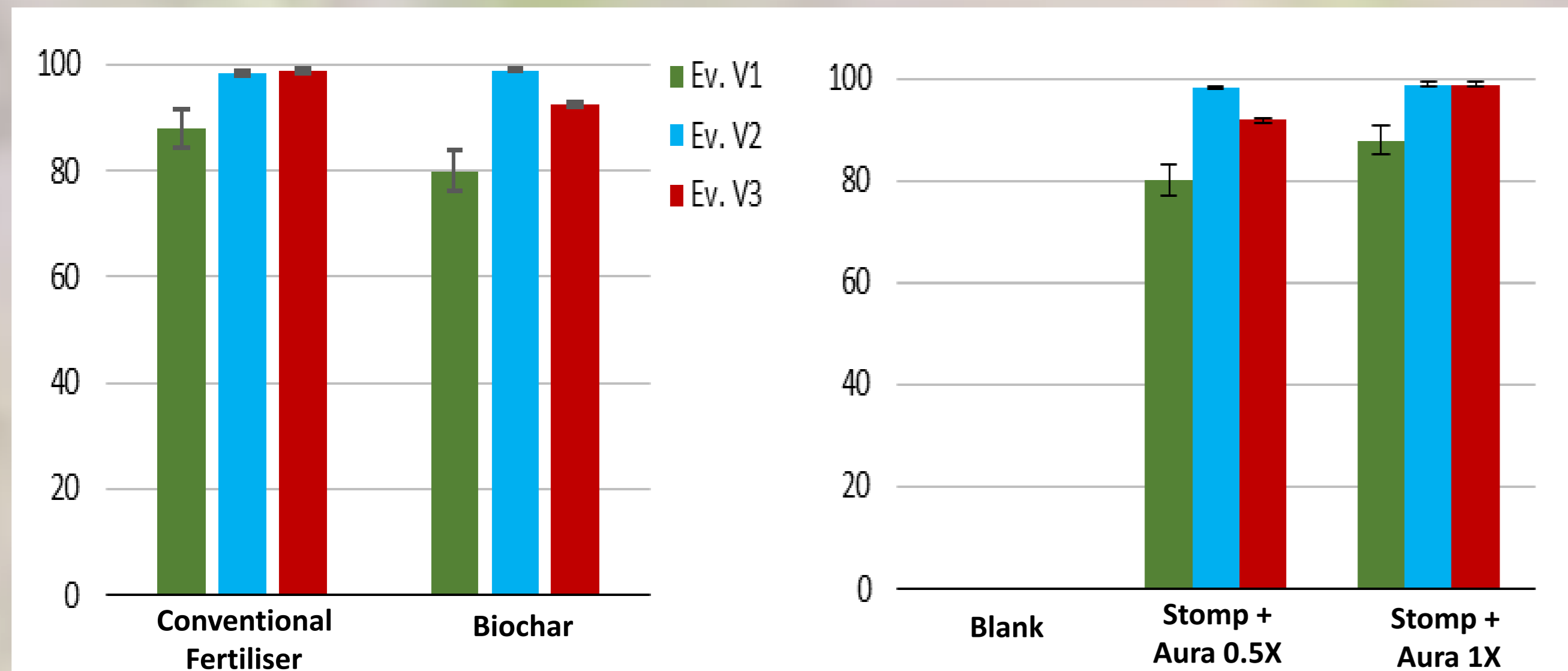
## RESULTS & DISCUSSION

### Weeds control

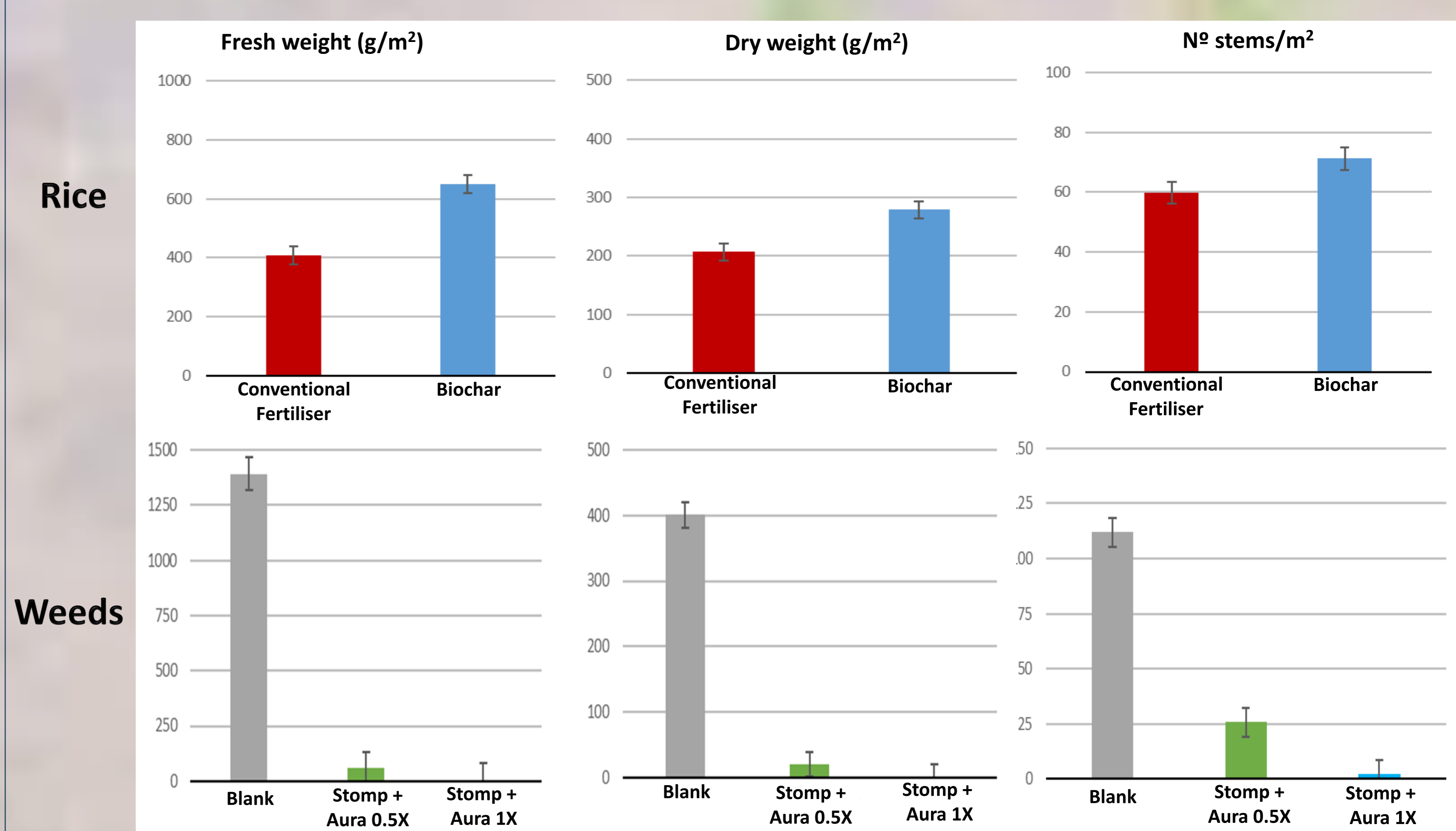
#### *Leptochloa* spp.



#### *Echinochloa* spp.



### Effect of biochar and herbicide treatments



- The use of biochar increased the fresh and dry weight and the number of stems in rice crop.
- Half dose of both herbicides showed good efficacy to control weeds of field plots.

## CONCLUSIONS

- ✓ Visual evaluations showed to be a good methodology to assess herbicide management and efficacy
- ✓ Biochar amendment increased rice growth compared to conventional fertiliser
- ✓ Half commercial doses seems to show good weed control though further studies are needed