

COMPARING VARIOUS WEED TREATMENTS AND THEIR INFLUENCE ON THE ESTABLISHMENT AND BIOMASS YIELD OF *SIDA HERMAPHRODITA* L. RUSBY UNDER FIELD CONDITIONS

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OVERALL

Background:

- Perennial herbaceous plant *Sida hermaphrodita* L. Rusby.
- Promising for solid fuel & biogas production (?)
- Crucial bottleneck: field establishment.

Aim:

- Identifying the most non-invasive and sustainable weed management and establishing practice.

Approach:

- *Sida* seedlings/root cuttings (Hohenheim: 2014; FZJ: March 2021): 2-4 plants/m².
- Treatments FZJ: (i) *Miscanthus* mulch, (ii) manual weeding, (iii) herbicide application, (iv) *Trifolium repens* L. (living mulch), (v) negative control
 - Hohenheim: (i) bio-degradable mulch foil, (ii) negative control
- Determination of (Nov. 2021 - April 2022): weed species richness & specific ground cover, biomass yield.

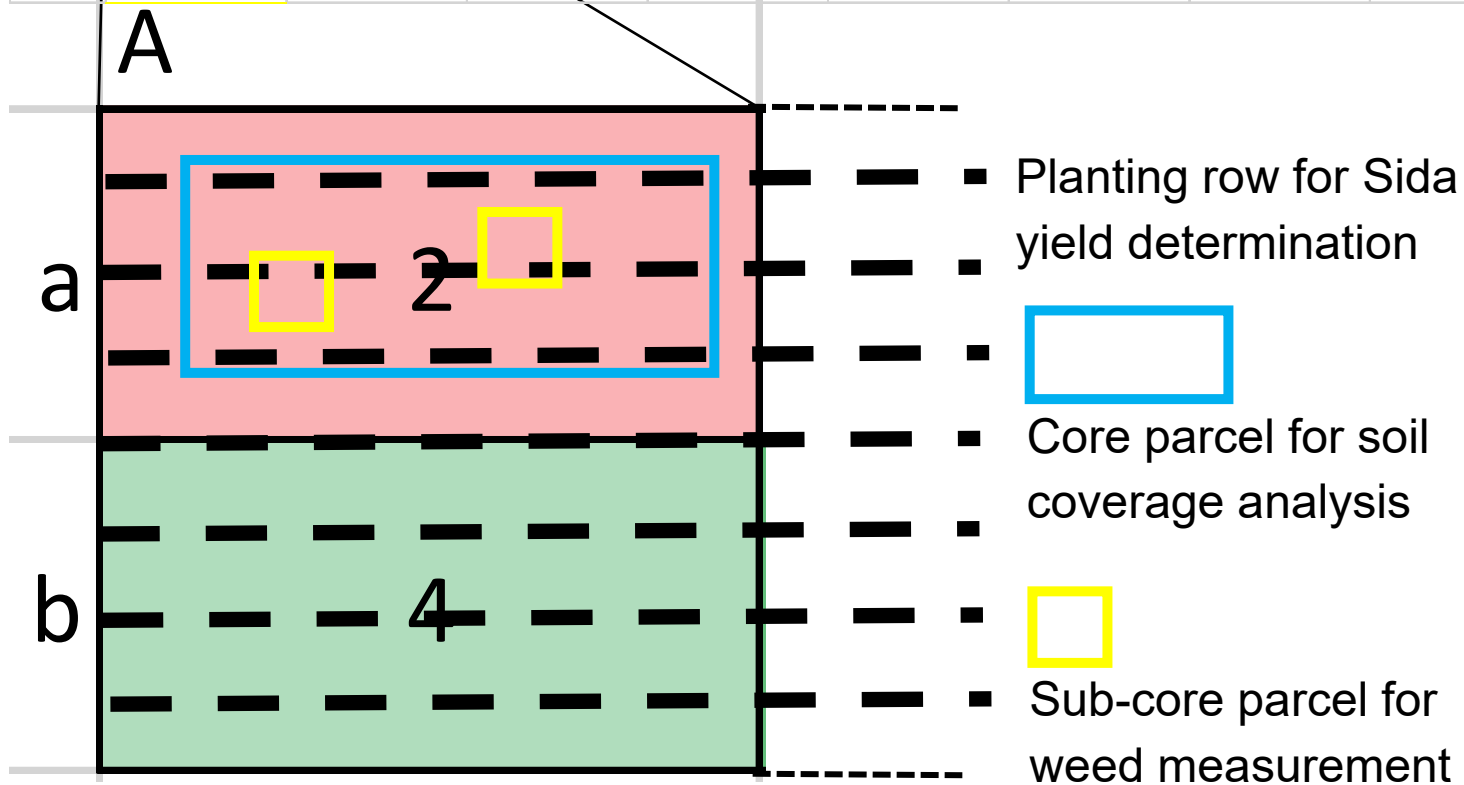


EXPERIMENTAL SET-UP (FZJ)



EXPERIMENTAL SET-UP

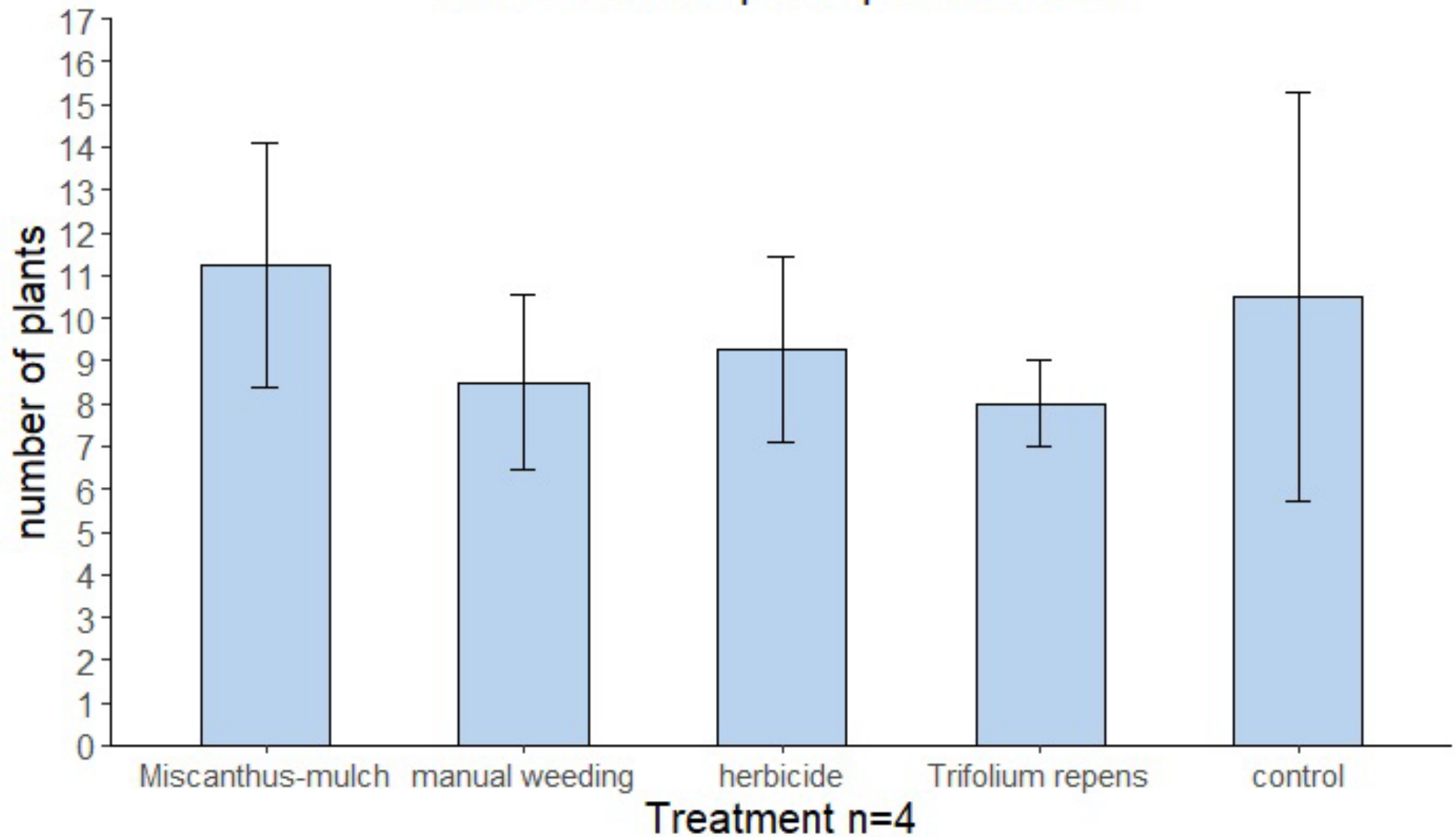
	A	B	C	D	E	F	G	H	I	J			
a	2	3	1	5	4	1	2	4	3	5	} 6 m } 3 m		
b	4	5	3	1	2	5	3	1	4	2			
	60 m												



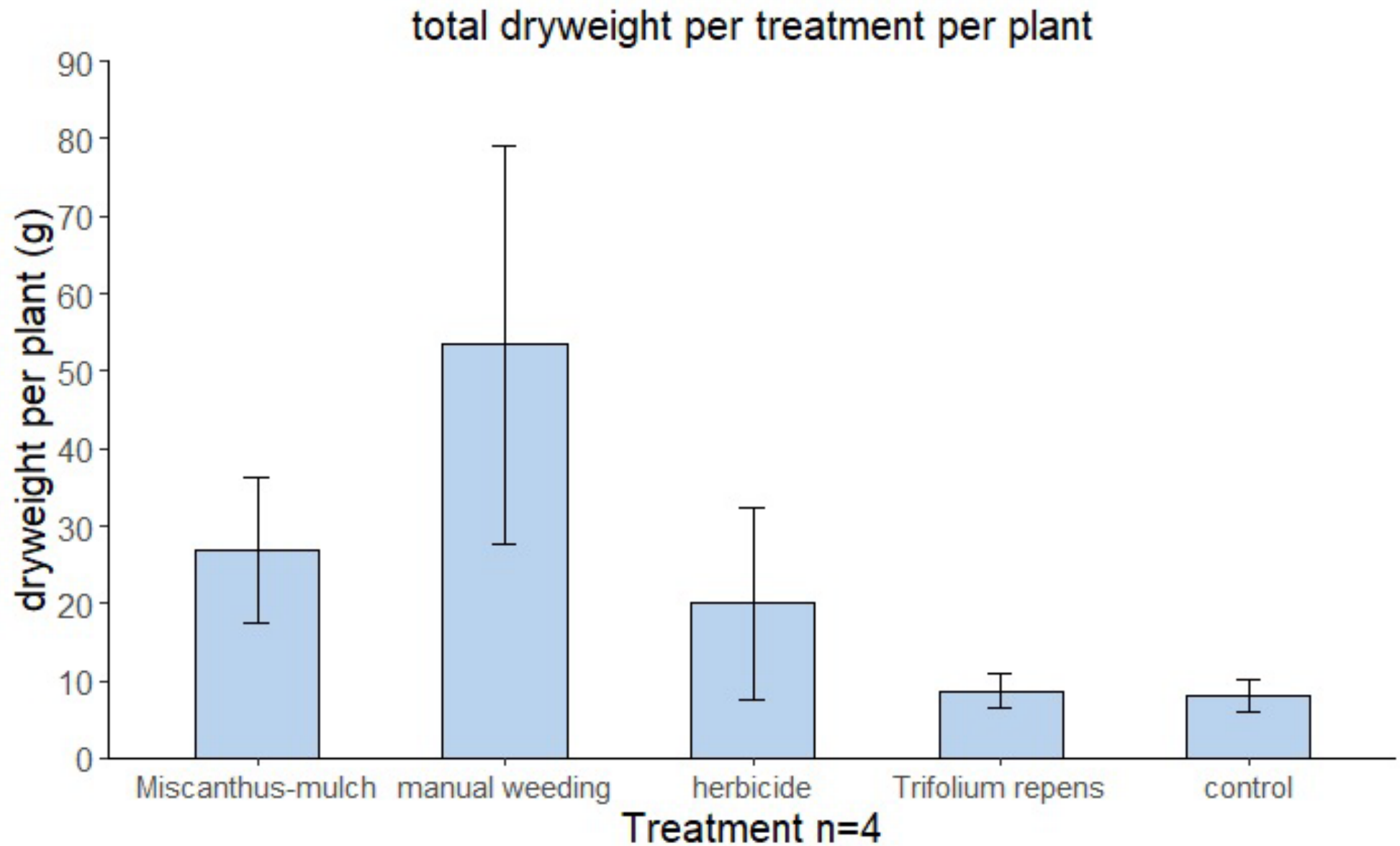
- 1** Miscanthus-mulch (approx. 5 cm layer)
- 2** Manual weeding
- 3** Herbicide (1.6% conc. Glyphos TF Classic)
- 4** *Trifolium repens* (approx. 33 kg/ha)
- 5** Control

RESULTS

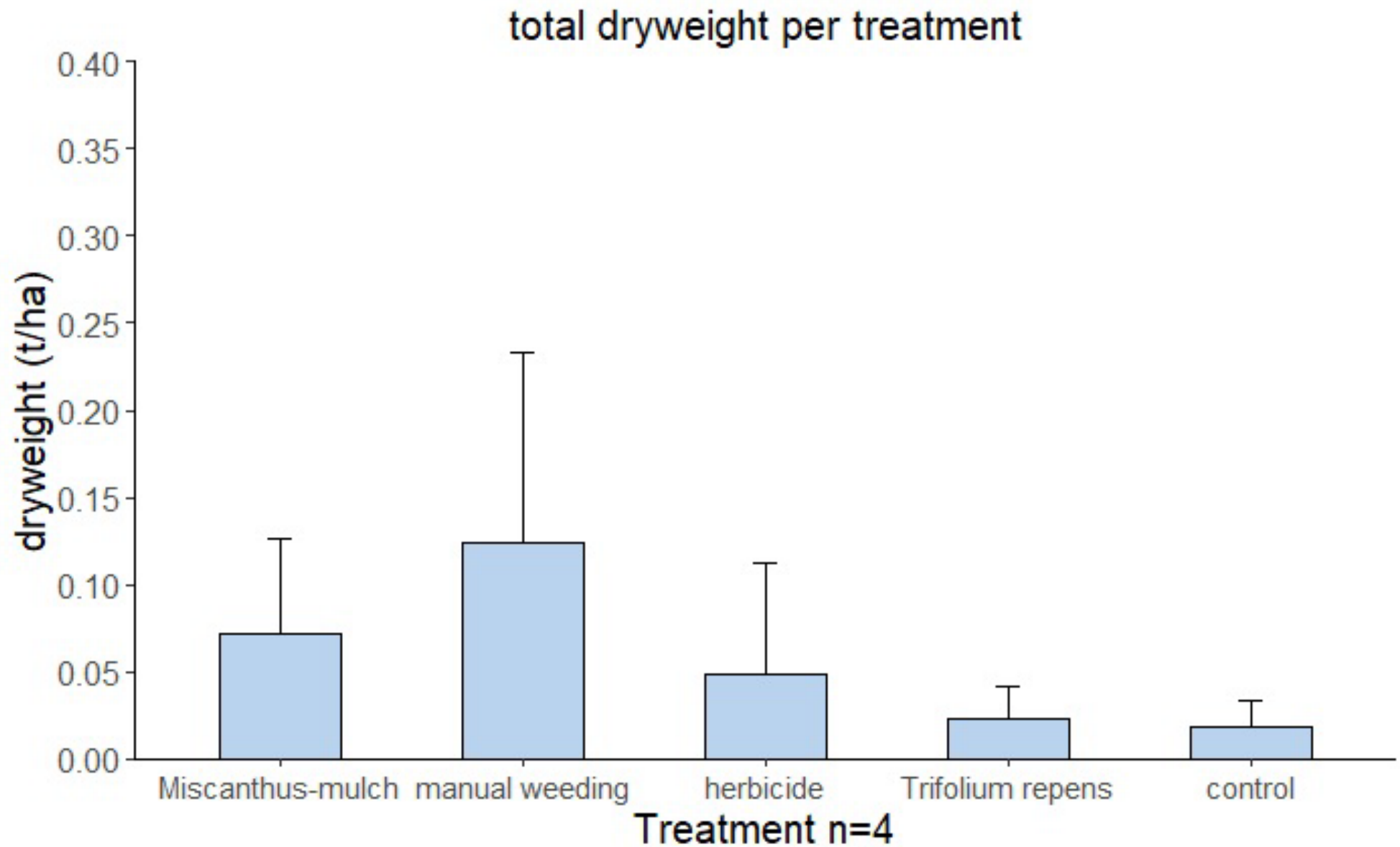
total number of plants per treatment



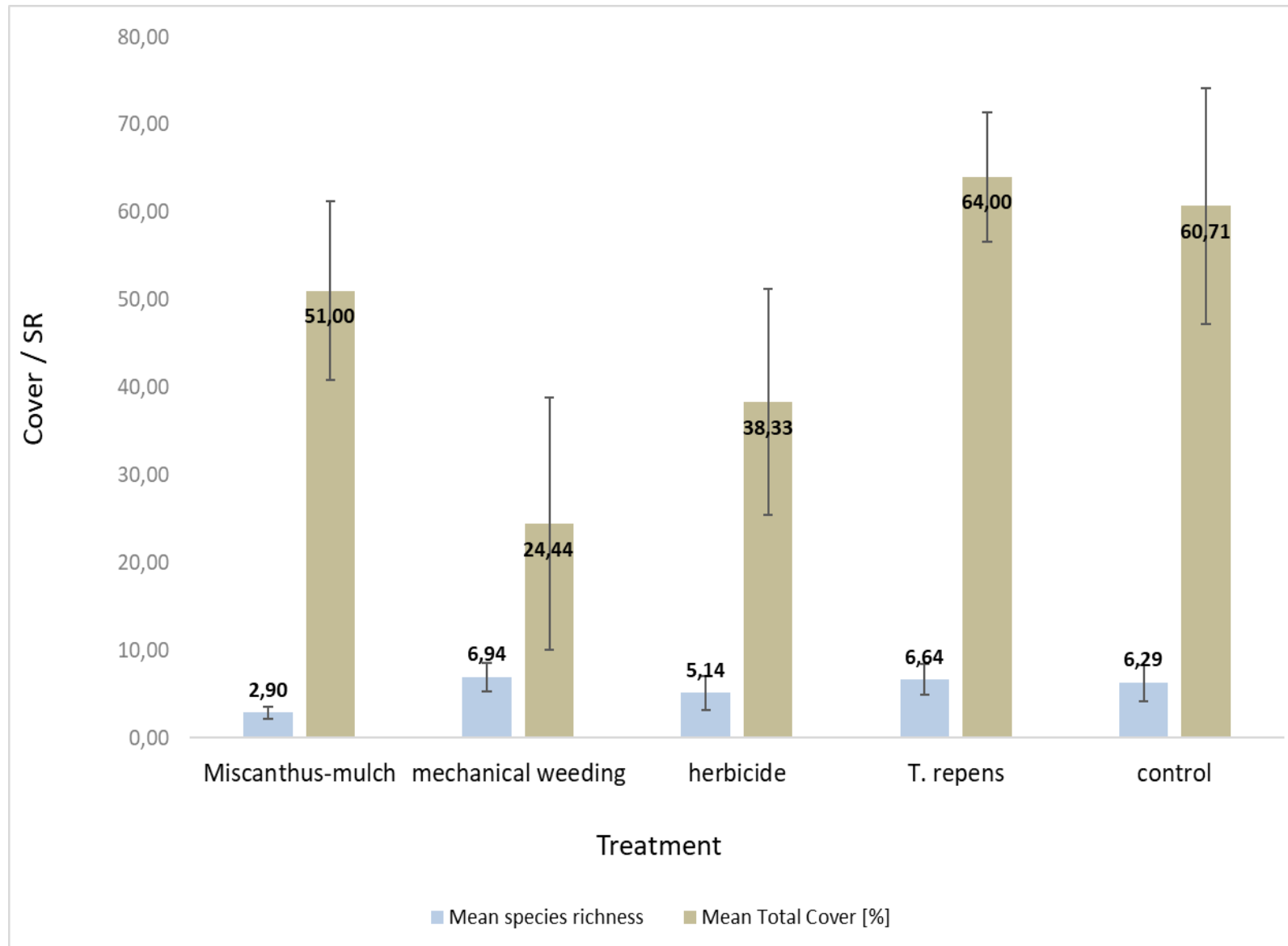
RESULTS



RESULTS

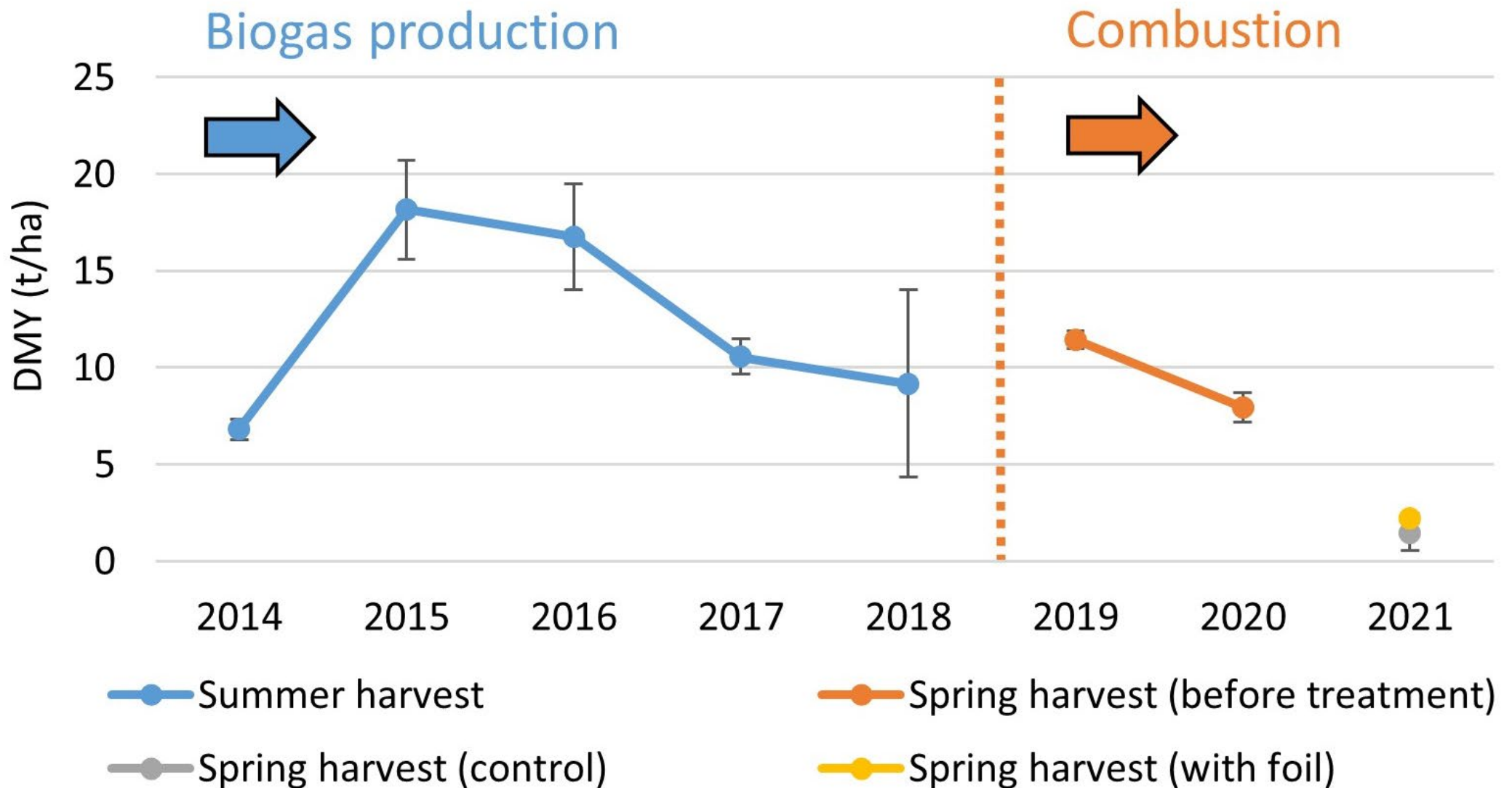


RESULTS



Species richness & total plot cover by weeds

BACKGROUND RESULTS → MOTIVATION!



RESULTS



Sida harvest, April 11, 2022:

Left: mulch foil

Right: no weed control



Associated weeds, April 11, 2022:

Left: mulch foil

Right: no weed control

SUMMARY & OUTLOOK

Preliminary, i.e. “early” results and conclusions:

- First vegetation period 2021: Sida growth was highly affected by weeds in all treatments.
- Miscanthus mulch suppressed most weed species except for *Cirsium arvense*.
- Sida biomass yields in order of treatments: “manual weed control” >> “Miscanthus mulch” ≥ “herbicide” > “Trifolium repens” ≥ “control”.
- Treatments had different effects on the weed’s relative abundance and species composition, while “manual weed control” was most efficient in weeds reduction.
- Application of bio-degradable mulch-foil during planting might be promising to suppress weeds and support Sida growth and re-establishing.
- Cost-efficient solutions need to be found and implemented to make Sida field establishment a success.

THANK YOU FOR LISTENING!

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***Agronomy* Special Issue "Sustainable Cropping Systems and Biomasses for Energy and Biorefinery Applications":**

https://www.mdpi.com/journal/agronomy/special_issues/cropping_biomass_energy_biorefinery

PLANTING



March 24, 2021

TREATMENTS



May 20, 2021



June 2, 2021

EXPERIMENTAL EVOLUTION



June 8, 2021



June 15, 2021



September 13, 2021

EXPERIMENTAL SET-UP



Sida field preparation, May/June 2021

EXPERIMENTAL EVOLUTION



Sida re-growth, pre-/post-harvest, April 11, 2022