

## Introduction

- ✓ Numerous studies have been conducted on the impact of heat stress (HS) in the feedlot industry
- ✓ Limited information existis on the effects of HS in a grazing system, especially in cow-calf operations in the southern US
- ✓ Mitigating the effects of HS could be achieved by physical alteration of the environment such as providing artificial shade

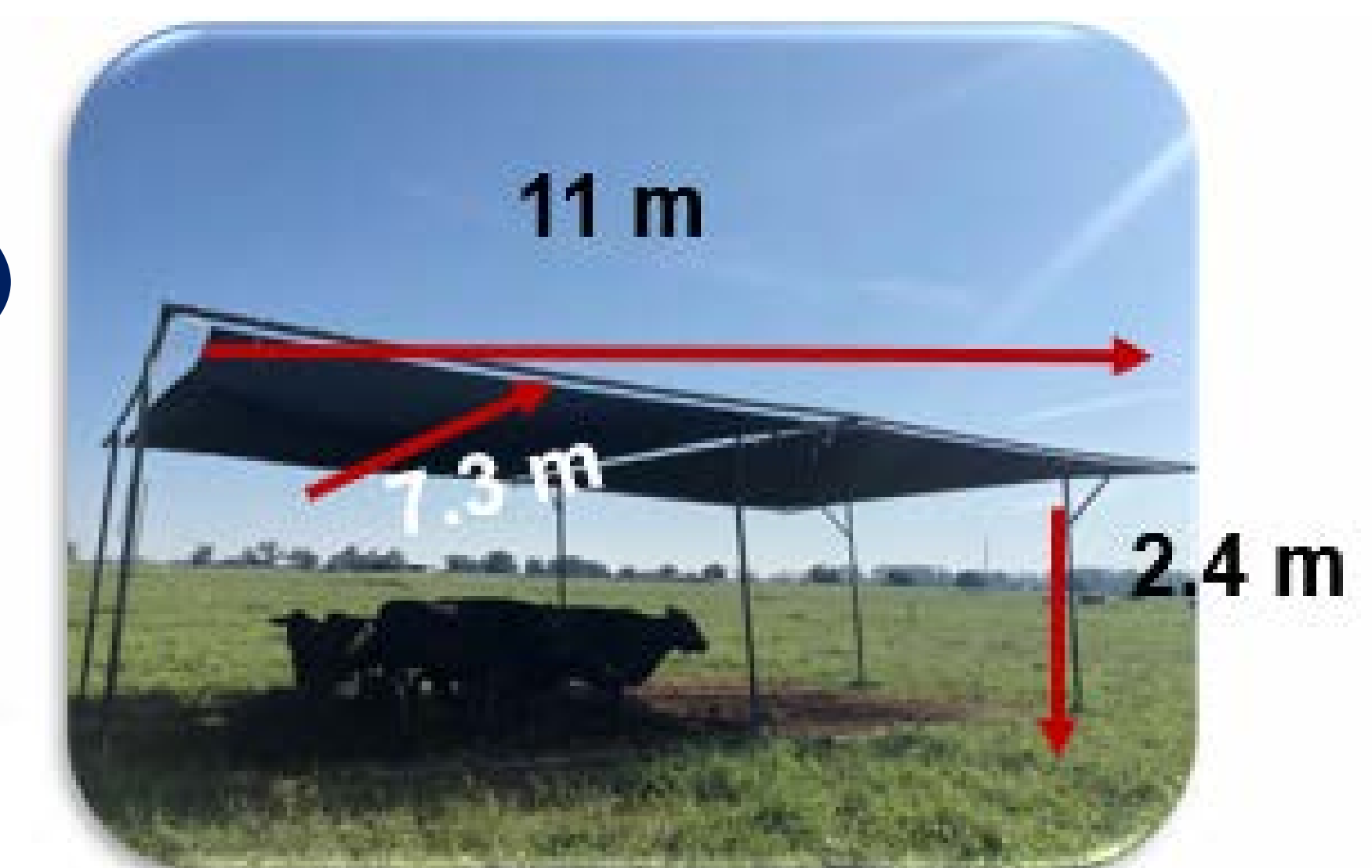
The objective was to evaluate the effect of providing artificial shade during summer on performance of pregnant beef heifers, and on Angus and Brangus cow-calf pairs.



## Materials and Methods

- Exp. 1:**
- ❖ 36 black-hided Angus and Angus crossbred pregnant heifers (418 ± 20 kg initial BW; approximately 90 d of gestation).
  - ❖ Randomized complete block design; 12 bahiagrass pastures (*Paspalum notatum* Flügge; 1.3 ha/pasture with 3 heifers each), with (SHADE) or without (NO SHADE) artificial shade for 47-d.
- Exp. 2:**
- ❖ 24 black-hided Angus (589 ± 73 kg of BW) and 24 Brangus (569 ± 66 kg BW) pregnant lactating cows and their nursing heifers.
  - ❖ Completely randomized design with a 2 × 2 (SHADE × BREED) factorial arrangement of treatments.
  - ❖ Pairs were assigned to 12 bahiagrass pastures (4 pairs each) for 56-d before weaning.

BW obtained every 14 d.



## Results - Performance

**Exp. 1: Performance of pregnant beef heifers.**

Item	Treatment		SEM	P-value
	SHADE	NO SHADE		
BW, kg				
Initial BW (d 0)	414	422	8.9	0.41
Final BW (d 47)	423	420	7.6	0.79
BW change, kg	9.22	-0.87	3.54	0.08
ADG, kg				
d 0 to 47	0.20	-0.02	0.076	0.08

**Exp. 2: Performance of pregnant beef cows and their nursing calves.**

**Exp. 2: Performance of pregnant beef cows and their nursing calves.**

Item	Shade		No shade		TRT × Breed	
	Angus	Brangus	Angus	Brangus	SEM	P-value
<b>Cow</b>						
Final BW, kg	576 <sup>b</sup>	599 <sup>a</sup>	579 <sup>b</sup>	565 <sup>b</sup>	6.0	0.01
BW change, kg	0.2 <sup>b</sup>	22.5 <sup>a</sup>	3.0 <sup>b</sup>	-9.9 <sup>b</sup>	4.4	0.004
Final BCS, kg	4.3 <sup>b</sup>	5.2 <sup>a</sup>	4.6 <sup>b</sup>	4.7 <sup>ab</sup>	0.16	0.05
ADG, kg	0.00 <sup>b</sup>	0.39 <sup>a</sup>	0.06 <sup>b</sup>	-0.18 <sup>b</sup>	0.081	0.004
<b>Nursing heifers</b>						
BW d 28, kg	240 <sup>ab</sup>	230 <sup>bc</sup>	249 <sup>a</sup>	220 <sup>c</sup>	4.4	< 0.001
BW d 42, kg	250 <sup>a</sup>	243 <sup>a</sup>	247 <sup>a</sup>	232 <sup>b</sup>	3.6	< 0.001
BW d 56, kg	253 <sup>a</sup>	247 <sup>a</sup>	259 <sup>a</sup>	233 <sup>b</sup>	5.1	< 0.001
BW d 70, kg	261 <sup>a</sup>	258 <sup>a</sup>	268 <sup>a</sup>	242 <sup>b</sup>	5.1	< 0.001

Body weight and body condition score (BSC) of cows at the end of the treatment period (d 56; weaning day) were covariate adjusted for initial BW ( $P = 0.002$ ).

Difference in ADG for SHADE vs. NO SHADE nursing calves were 0.14 kg/d ( $P = 0.10$ ).

Gestation length was greater for SHADE vs. NO SHADE cows (292 vs. 274;  $P = 0.02$ ), but with no impacts on subsequent calf birth and weaning weight ( $P \geq 0.25$ ).

## Conclusions

Providing artificial shade during summer improved BW gain of replacement heifers, nursing calves, and Brangus cows in 0.22, 0.14, and 0.39 kg/d, respectively, with no impact on the subsequent offspring or in the performance of Angus cows. Unavailability of shade in the pre-weaning phase exacerbated Brangus calf performance post-weaning, as no compensatory growth during the 14-d post-weaning was observed.