

# Brown Mid-Rib Trait Tradeoffs in Sorghum-Sudangrass and Pearl Millet Yield

A. Barnett ([abarnett@uada.edu](mailto:abarnett@uada.edu)), K.J. Simon, J.O.C. Kubesch, S, Gadberry

## Introduction:

The brown midrib (BMR) trait has been used to improve the nutritive value of sorghum-sudangrass and pearl millet, however it is known to affect yields. Seed cost/lb might influence seed selection; BMR seed costs twice as much as standard seed. This trial sought to combine yield data and economics for producers considering the BMR trait.

## Objective:

To compare tradeoffs of BMR trait in sorghum-sudangrass and pearl millet yield under two different harvest management regimes.

## Materials and Methods:

- Conducted at the Livestock and Forestry Research Station in Batesville, AR.
- Pearl millet and sorghum-sudangrass with and without the BMR trait were no-till planted on May 30, 2024 at 25 lb acre<sup>-1</sup>. Fertilizer was applied equally in 3 split applications (planting and after the first & second harvest) according to soil test recommendations
  - 33 lb N acre<sup>-1</sup>, 27 lb P2O5 acre<sup>-1</sup> and 83 lb K2O acre<sup>-1</sup> per application
- Plots were harvested three times.
- Plots were managed as either best management practices (BMP) or common producer practices (CPP).
  - BMP plots first & second cutting were harvested either on a 6-week interval or reached a target height of 36" whichever came first
    - Harvest date: July 12 and August 23
  - CPP plots first & second cutting were harvested either on an 8-week interval or reached a target height of 72" whichever came first
    - Harvest date: July 19 and September 18
- Final harvest date: October 18
- The first two harvests were cut to 6" stubble and the final harvest was at 2" stubble.
- Harvested forage mass was weighed, and sub-samples were collected for moisture and nutritive value analysis.
  - Samples were dried at 130 °F

## Results:

- The presence of the BMR trait did not affect harvested forage mass. (Table 1)
- Species selection did not affect the harvested forage mass. (Table 2)
- The plots managed according to CPP had higher forage harvests than BMP plots in the first and second harvests. (Table 3)
- The BMP plots had more forage in the third cut than the CPP
- Forage production costs came to a difference of <\$0.005/lb between BMR and standard options of both forages.
- The two-fold seed cost difference seen in BMR and standard summer annual forages does not compare to the greater investments made in weed control, soil fertility, and harvest management.

## Conclusion:

These results suggest prioritizing harvest management regardless of species selection or BMR status, especially on sites with high weed competition.

Table 1

Forage mass (lb acre<sup>-1</sup>) of summer annuals with and without the BMR trait.

Harvest	No BMR	BMR
1st harvest	2599 ± 402	2402 ± 402
2nd harvest	2836 ± 232	2496 ± 232
3rd harvest	1812 ± 79	1730 ± 79

An asterisk (\*) denotes that the yield is significantly higher in that treatment.

Table 2

Forage mass (lb acre<sup>-1</sup>) of pearl millet and sorghum-sudangrass.

Harvest	Pearl Millet	Sorghum-sudangrass
1st harvest	2144 ± 402	2857 ± 402
2nd harvest	2839 ± 233	2494 ± 233
3rd harvest	1898 ± 79*	1644 ± 79

An asterisk (\*) denotes that the yield is significantly higher in that treatment.

Table 3

Forage mass (lb acre<sup>-1</sup>) of summer annuals under two different harvest management regimes.

Harvest	Best Management Practices	Common Producer Practices
1st harvest	1720 ± 402	3281 ± 402*
2nd harvest	2268 ± 233	3065 ± 233*
3rd harvest	2336 ± 82*	1206 ± 82

An asterisk (\*) denotes that the yield is significantly higher in that treatment.

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*University of Arkansas System*

