

# Technical Note

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USDA –Natural Resources Conservation Service  
Booneville Plant Materials Center

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Plant Materials Technical Report

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CP 512 – Pasture & Hay Planting

## Dry-Matter Production of Five Indiangrass Cultivars

### SUMMARY

A three-year study was conducted at the USDA-Natural Resources Conservation Service, Booneville Plant Materials Center in Booneville, AR, for the purpose of evaluating the dry-matter production of five Indiangrass cultivars.

### CONCLUSIONS

- ~ Dry-matter production for Indiangrass cultivars increased from 1997 to 1998 and from 1998 to 1999 ( $P < 0.05$ ).
- ~ Increases in production were greater between years 1997 and 1998 (1940 lb/acre) than between 1998 and 1999 (1000 lb/acre).
- ~ Dry-matter means in 1997 ranged from 2969 to 3772 lb/acre, 1998 from 4621 to 5823 lb/acre, and 1999 from 5622 to 6823 lb/acre, however, no significant difference was observed for dry-matter production within year.
- ~ In 1999 PI-514673, Lometa, and Rumsey produced more dry-matter (6823, 6444, and 6286 lb/acre respectively) than Cheyenne (5898 lb/acre) or Osage (5622 lb/acre) although there was no significant difference between these dry-matter observations.

### INTRODUCTION

Studies have been conducted evaluating the dry-matter production of Indiangrass (*Sorghastrum nutans* L. Nash) varieties at various locations throughout the south central United States. However, limited information exists on the production potential of Indiangrass in the Booneville PMC service area.

Ohio studies (Bartholomew, et al., 1995) indicated that Osage Indiangrass with nitrogen fertilizer (150 lbs/acre) averaged (10-year dry-matter yield) 2.41 tons/acre and ranged from 1.05 to 3.71 tons/acre. In another Ohio study (Bartholomew, et al., 1995) Indiangrass nitrogen fertilized with 67 and 268 lb/acre produced dry-matter yields of 2.54 and 2.93 tons/acre, respectively, with a two harvest regime. Hall, et al., 1982 determined that Indiangrass averaged

over N levels and years yielded 2.54 tons/acre. Big bluestem out-yielded switchgrass and Indiangrass and in 2 out of 3 years Indiangrass yielded significantly less than one or both of the other species. Missouri Indiangrass variety trials (Henning, 1993) for Rumsey, Osage, Oto, and Holt produced 3.0, 2.7, 2.3, and 2.4 tons/acre, respectively. Henning stated that it is important to use seed whose place of origin is within 250 to 400 miles south, or within 100 to 150 miles north of the intended location of use. Extreme southern-grown seed may produce stands that die during the winter of establishment or at least not produce viable seed. Stands planted to northern-grown seed will tend to mature early and be less productive. The important characteristic of named varieties is that they have proven adaptation in the area to be seeded. Henning indicated that productivity is difficult to predict in native grasses because individual sites are variable and maturity dates vary with latitude. Early maturity usually means less forage production. Moving northern-adapted varieties south shortens time to maturity and vice versa.

This three-year study was conducted to determine the production potential of five native warm-season Indiangrass cultivars with commercial fertilizer.

## **METHODS and MATERIALS**

The study was located at the NRCS Plant Materials Center, Booneville, AR. The study was conducted on a Taft silt loam (fine-silty, siliceous, Thermic Glossaquic Fradiuoult) soil. Five Indiangrass varieties were harvested at the end of the growing season. The five entries included Cheyenne, Lometa, Osage, PI-514673 (released as Americas from the Jimmy Carter Plant Materials Center), and Rumsey. Establishment seeding rates for replicated subplots were based on NRCS and University of Arkansas Extension Service recommendations. Harvest data was obtained two years after establishment year. Commercial fertilizer (400 lb/acre of 13-13-13) was applied at the beginning of each growing season. The plots were burned in the spring of each season. The harvest regime for end of season and total dry-matter production were based on best management practices for maximizing production and/or hay production for individual grass species. Clipping height for each variety was 4 inches. Grab samples were obtained from individual plots after the harvest for dry-matter determination. Results (lb/acre) are reported on an oven dry-weight basis. Dry-matter yield data was analyzed with analysis of variance and significant means were determined at  $P < 0.05$  using Tukey's HSD.

## **RESULTS and DISCUSSION**

Dry-matter (DM) results for cultivars and ranged from 2969 to 6823 lb/acre for PI-514673 in 1997 and 1999 ( $P < 0.05$ ), respectively. Generally, dry-matter values increased from 1997 through 1999 for the Indiangrass cultivars. This observation is due to the plant material from which the samples were obtained becoming better established and developing more extensive root systems. Although not significant, dry-matter yields for 1997 ranged from 2696 to 3772 for PI-514673 and Rumsey, respectively. Dry-matter results within each were similar for all cultivars for 1997, 1998, and 1999. Dry-matter produced in 1998 ranged from 4621 to 5823 lb/acre for Osage and PI-514673, respectively. In 1999 Cheyenne and PI-514673 produced from 5898 to 6823 lb/acre, respectively. Changes in dry-matter production for Lometa and PI-514673 were greater between 1997 and 1998 than between 1998 and 1999 and were higher than for other cultivars tested. Differences in dry-matter production between 1997 to 1998 were 2152 and 2854 lb/acre for Lometa and PI-514673, respectively.

Year means (averaged over cultivars) were 3335, 5275, and 6275 ( $P<0.05$ ) for 1997, 1998, and 1999, respectively. Differences in dry-matter production between years was greater between 1997 and 1998 (1949 lb/acre) than between 1998 and 1999 (1000 lb/acre).

**Dry-matter production of five Indiangrass cultivars at the USDA-NRCS, PMC, Booneville, AR. 1997-1999**

Variety	Year			3 yr. Avg
	1997	1998	1999	
	-----lb/acre-----			
Cheyenne	3350 a <sup>1</sup>	4898 a	5898 a	4715 a
Lometa	3292 a	5444 a	6444 a	5060 a
Osage	3290 a	4621 a	5621 a	4511 a
PI-514673	2969 a	5823 a	6823 a	5205 a
Rumsey	3772 a	5586 a	6586 a	5314 a
Mean	3335 a <sup>2</sup>	5275 b	6275 c	

1/- means in year column followed by the same letters are not significantly different at  $P<0.05$ .

2/- means in row followed by different letters are significantly different at  $P<0.05$ .

**LITERATURE CITED**

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