2008

Forage Yields from 2007-2008 Small Grains

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Introduction
In an effort to assist producers in Oklahoma and Texas judge variety performance, the Noble Foundation has held trials to determine forage and grain yields of commercially available varieties and advanced experimental lines of small grains. The objective of this report is to summarize yields from the 2007-2008 trials.

Trial Procedures
The small grains tests were conducted at the Noble Foundation Dupy Farm near Gene Autry and the Red River Demonstration and Research Farm (RRF) near Burneyville, Okla. Soils were a Dale silt loam at Dupy and a Minco fine sandy loam at RRF. Ten sources contributed entries to the trial (Table 1).

The entries were seeded in a clean-tilled seedbed on Oct. 4, 2007, at Dupy and Oct. 2, 2007, at RRF. Each variety was sown at 2,000,000 pure live seed (PLS) per acre, which approximated 90 to 120 lb PLS/acre, depending on the crop and entry. Seeds were drilled in 7-inch rows at a 1-inch planting depth with a HEGE 500 drill. The entries were seeded in two adjacent 5- by 15-foot plots. The adjacent plots represented forage only use and dual purpose forage and grain use. Both plots were harvested at the same time for forage during the fall. Once first hollow stem stage of wheat was reached in the spring, the dual-purpose half was no longer harvested for forage to allow grain production. Plots harvested for forage only were harvested on Dec. 4, Feb. 12, March 14, April 1 and May 16 at Dupy and on Dec. 7, Feb. 12, March 18, April 11 and May 19 at RRF. Plots harvested for forage and grain were harvested for forage on Dec. 4 and Feb. 12 and for grain on June 17 at Dupy. At RRF, plots harvested for forage and grain were harvested for forage on Dec. 7 and Feb. 18 and for grain on June 23.

Fertilization at Dupy consisted of preplant incorporation of 80 lb N/acre on Sept. 11 and a topdress application of 80 lb N/acre on Feb. 12. At RRF, plots were topdressed with N at 80 lbs/ac on Feb. 18, 2007. An application of Amber at 0.56 ou/acre was applied on Oct. 5 at Dupy and RRF to control annual ryegrass.

The trials were randomized complete block designs with three replications. Entries were blocked by crop and randomized within each replication. Data were analyzed by crop with the general linear models procedure in SAS (Statistical Analysis Software, Cary, N.C.), and means were separated by the least significant difference (LSD) method.

Results and Discussion
Growing conditions were fair during the trial (Table 2). Temperatures were above and precipitation was below the long-term location average during autumn at Dupy and RRF. Precipitation increased and temperatures were nearer to the long-term location average in spring.

Forage Production
Total forage production and when the forage occurs seasonally during fall and spring are important traits of small grains in the southern Plains. Historically, rye has produced the most fall forage. Triticale is also a strong fall and early spring forage producer. Wheat matures later and produces the majority of its forage during spring. Oat is the latest maturing of the small grains, producing the majority of its forage from April to May.

On loam soil at Dupy, fall forage production was similar among entries of rye during the 2007-2008 trial (Table 3). Only Bates yielded significantly less forage on the first harvest date of Dec. 4. Fall forage production at Dupy was also strong among entries of wheat; differences among entries were generally not significant. Forage production from wheat and triticale mostly occurred during mid-spring this year. Top spring forage producing entries of wheat, as measured by forage yields exceeding 3500 lb/acre from harvests on March 14 and April 1, included Art, Coker 9553 (soft), Custer, Deliver, Duster, Endurance, NF96131, Overley, Ranger Brand (soft) and Sturdy 2K. Top spring forage producing entries of triticale at Dupy included TAMcale 5019, ThundercaleV, Thundercale, ThundercaleK and Thundertall. As measured by harvests on April 1 and May 16, late spring forage production was best from oat, with many of the experimental lines from Louisiana and Noble Foundation breeding programs outproducing the standard checks of Dallas and Harrison.

On sandy loam soil at RRF, fall and early spring forage production, for the most part, was similar among entries of rye (Table 4). Forage production on the fourth harvest date of April 11, however, was significantly greater for...
Elbon, Maton and Oklon. Triticale and wheat produced most of their forage during early to mid-spring. Among entries of triticale, Noble Foundation experimental lines produced more forage earlier, but less forage later, than TAMcale 5019, ThundercaleV and Thundercale. Among entries of wheat, the best spring forage producing entries, as measured by cumulative forage yields exceeding 4000 lb/acre from harvests on Feb. 18, March 18 and April 11, included Doans, Endurance, Forage Maxx (soft), NF96131 and Tam 203. Entries of oat that produced the most late spring forage, as measured by harvests on April 11 and May 19, included Harrison, LA99017SBSBSB-275-C-B-S2, NF27, NF7 and NF95418.

Among top producing entries on loam soil at Dupy, total forage yield ranged from 5537 to 7348 lb/acre for oat, 7117 to 8125 lb/acre for rye, 5241 to 6185 lb/acre for triticale, and 5643 to 6955 lb/acre for wheat. On the sandy loam soil at RRF, total forage yield ranged from 5158 to 6274 lb/acre for oat, 5090 to 6768 lb/acre for rye, 3317 to 5126 lb/acre for triticale, and 4473 to 5206 lb/acre for wheat.

**Grain Production**

Grain yield among entries of oat was highly variable (Table 5). On loam soil at Dupy, top producing entries included FL99201, LA02048SBSBSB-S1, LA99017SBSBSB-275-C-B-S2, NF27A and Plot Spike LA9339. Test weights were significantly better for LA99017SBSBSB-275-C-B-S2 and Plot Spike LA9339. On sandy loam soil at RRF, grain yield was best for Dallas, FL99201, FL99212, LA99016SBSB-98-S, LA99017SBSBSB-275-C-B-S2, NF7, NF95401A and Plot Spike LA9339. Test weights were similar among varieties with the exception of Thunderleaf, which winter-killed.

Grain yield of rye varieties were similar among entries regardless of location. Test weights were best for Bates, Bates RS4, Elbon, NF95307A and NF97326 at Dupy. At RRF, test weights were similar among entries, with the exception of Thundergreen, whose test weight was 4 lb/bu lower than the other entries. Among entries of triticale, grain yields were significantly better for TAMcale 5019, ThundercaleV and Thundercale at RRF. Of these, TAMcale 5019 had the best test weight.

Grain yield of entries of wheat were best for Art, Duster, Endurance, NF95134A, OKO3305 and Tam 203 of the hard red types on loam soil at Dupy. Of these entries, Endurance and OKO3305 had the best test weight. Among soft red types, grain yield was best for 372, Coker 9553, Crawford and Ranger Brand. Coker 9553 had the best test weight of these entries. On the sandy loam at RRF, grain yield was reduced considerably. Among hard red types, 2174, APO4T8211 (Jackpot), Art, Custer, Deliver, Duster, Endurance, NF95134A and Tam 203 had the best yield. Similar to results at Dupy, grain yield of soft red types was best for 372, Coker 9553, Crawford and Ranger Brand. Test weights were similar among most entries of hard and soft red wheat at RRF.

### Table 1. Contributors to the 2007-2008 small grains variety test at the Noble Foundation Dupy Farm, Gene Autry, Okla., and Red River Demonstration and Research Farm, Burneyville, Okla.

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<th>Code</th>
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<td>AgriPro</td>
<td>AgriPro, Vernon, Texas</td>
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<td>Ehmkke</td>
<td>Vance Ehmkke, Ehmkke Seed Co., Healy, Kan.</td>
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<tr>
<td>FL</td>
<td>Ann Blount, North Florida Research and Education Center, University of Florida, Marianna, Fla.</td>
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<tr>
<td>LA</td>
<td>Steve Harrison, LSU Ag Center, Baton Rouge, La.</td>
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<tr>
<td>NF</td>
<td>Malay Saha, Forage Improvement Division, Noble Foundation, Ardmore, Okla.</td>
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<td>OKFS</td>
<td>Oklahoma Foundation Seed Stocks, Inc., Stillwater, Okla.</td>
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<td>OSU</td>
<td>Brett Carver, Plant and Soil Science Dept., Oklahoma State Univ., Stillwater, Okla.</td>
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Table 2. Average 2007-2008 and 30-year (1971-2000) temperature (°F) and precipitation (inches) for the Noble Foundation Dupy Farm, Gene Autry, Okla., and Red River Demonstration and Research Farm (RRF), Burneyville, Okla.

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### Table 3. Forage yield of small grains at the Noble Foundation Dupy Farm, Gene Autry, Okla.

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<th>Sum</th>
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Table 3. (cont.) Forage yield of small grains at the Noble Foundation Dupy Farm, Gene Autry, Okla.

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Table 4. (cont.) Forage yield of small grains at the Noble Foundation Red River Demonstration and Research Farm (RRF), Burneyville, Okla.

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### Table 5. Grain yield of small grains at the Noble Foundation Dupy Farm, Gene Autry, Okla., and Red River Demonstration and Research Farm (RRF), Burneyville, Okla.

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<th>Yield</th>
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