2015 Kansas Winter Annual Forage Variety Trial

Cover Page Footnote

This work was funded in part by the Kansas Agricultural Experiment Station and by seed suppliers. Sincere appreciation is expressed to all participating researchers and seed suppliers who have a vested interest in expanding and promoting annual forage production in the U.S.

2015 Kansas Winter Annual Forage Variety Trial

J. Holman, T. Roberts, and S. Maxwell

Summary

A total of 16 winter annual forage varieties were tested for performance near Garden City, KS, at the Southwest Research-Extension Center in 2014-2015. Winter crops evaluated included wheat, triticale, and cereal rye.

Introduction

In 2014 there was a total of 34,455,000 acres of hay and haylage harvested in the U.S. for a total of 95,372,000 dry matter tons of production. Yields averaged 2.77 tons of dry matter per acre. Of this total, about 13,580,000 acres were alfalfa which averaged 3.76 dry matter tons per acre and all other crops averaged 2.13 dry matter tons/acre.

In Kansas, 2,420,000 acres of hay and haylage were harvested, with an average yield of 2.24 dry matter tons per acre in 2014. Of this total, 650,000 acres were alfalfa with an average yield of 3.72 dry matter tons per acre, and 1,770,000 acres were crops other than alfalfa with an average yield of 1.69 dry matter tons/a. Kansas was ranked 6th in the U.S. for hay and haylage production, which largely supports the state dairy (ranked 19th in the U.S. and valued at $482,765,000), and cattle (feedlot, background, and cow/calf) industries (ranked 2nd in the U.S. and valued at $10,153,087,000). Dairy and beef cattle represented 58% of the total agriculture product of Kansas in 2014. Hay and grain commodities that support these two industries are critical for the state.

Study Objectives

The objectives of the Kansas Winter Annual Forage Variety Trial are to evaluate the performance of released and experimental varieties, determine where these varieties are best adapted, and increase the visibility of winter annual forages in Kansas. Breeders, marketers, and producers use data collected from the trials to make informed variety selections. The Winter Annual Forage Variety Trial is planted at locations across Kansas based on the interest of those entering varieties into the test.

Procedures

The Winter Annual Forage Variety Test was only conducted near Garden City, KS, at the Southwest Research-Extension Center in 2014-2015. All of the 16 entries tested were commercially available and none were experimental. These entries were provided by 6 seed suppliers. Management guidelines were provided to cooperators; however, previous growing experience influenced final management decisions. All trials were

planted in small research plots (approximately 225 ft^2) with three replications. Cultural practices, site descriptions, growing conditions, and performance data are provided for each harvested location (Table 1). Since 2014-2015 was the first year of this test, there are no across-year summaries available. Results are listed alphabetically by seed supplier. No forage nutrient analysis was done this first year; in subsequent years, forage analysis will also be determined.

2014-2015 Growing Conditions

Temperature (Figure 1) and precipitation (Figure 2) data are shown. Thick black lines on the temperature graphs represent long-term average high and low temperatures (°F) for the location. The upper thin line represents actual daily high temperatures, and the lower thin line represents actual daily low temperatures. On the precipitation graph, the line labeled "normal" represents long-term average precipitation (1981-2010), and the line labeled "14-15" represents actual precipitation.

In general, the 2014-2015 growing season saw favorable moisture conditions at planting, a rapid decrease in temperature in November, and below normal temperature and above normal precipitation in the month of May. Ideal weather conditions occurred late in the growing season.

Results and Discussion

Garden City, KS, is the harvested location included in this report. All varieties were harvested between Feekes 10.3 and 10.5 on May 12, 2015. Slick Trit II matured later than other varieties and was harvested on May 27, 2015. The later maturity of Slick Trit II and favorable growing conditions in May likely helped this variety yield well under those conditions. It is advisable to select a variety based on more than one year of performance results. When comparing more than one site, often a value of "percentage of test average" yield calculation is included in the results. In 2014-2015, Garden City was the only test location. This relative yield calculation allows for some comparison of performance across environments. Entries yielding more than 100% of the test average across multiple locations merit some consideration.

Overall, yields were good to excellent, in part due to supplemental irrigation and favorable growing conditions in May. The consistency of yields was excellent, with varieties averaging 340 lb/a of dry matter yield in the fall and 2,000 lb/a of dry matter yield in the spring (Table 2). Caution should be used when evaluating data with coefficient of variation (CV) values greater than 20. Lower values suggest less error was observed. Inestimable differences in soil type, weather, and environmental conditions play a part in increasing experimental error and CV values. Plant lodging had a very high CV at Garden City, which may have been in part due to location of the plot within the study. Variety replications towards the center of the study were likely more protected from wind damage than variety replications towards the outer edge of the study. Varieties most prone to lodging were 348, Thundertall, ThunderGreen DL Rye, and ThunderGreen II Rye. Lodging of 348 varied from 50% to 100% based on location within the study. Lodging is an important trait to consider since it affects the ability to harvest the crop. Other traits to consider would be fall yield, spring yield, the combination of both fall and spring yield, and forage nutritive value. One should use more than one year of data to make an informed variety selection decision.

Table 2. Winter annual small grain forage yield, 2014-2015, Southwest Research-Extension Center at Garden City, KS.

	Company	Species	Awn-type	Harvest date	Fall yield	Spring yield	Fall + spring yield	Plant height	Lodging
					lb/a[a]			in.	%
348	AgriPro	Triticale	Awnletted	5/12/2015	366	10,284	10,650	48	**83**
Forerunner	Barenburg	Triticale	Awnletted	5/12/2015	**481**	9,727	***10,207***	50	0
Thundercale F	Ehmke Seed	Triticale	Awned	5/12/2015	278	7,575	7,853	37	0
Thundercale	Ehmke Seed	Triticale	Awned	5/12/2015	**520**	9,308	***9,828***[d]	45	0
Thundertall II	Ehmke Seed	Triticale	Awned	5/12/2015	144	9,035	9,179	49	0
Short Beard Thunder	Ehmke Seed	Triticale	Awned[b]	5/12/2015	**424**	9,821	***10,245***	46	0
Thundercale AVO	Ehmke Seed	Triticale	Awned	5/12/2015	197	8,275	8,472	36	0
ThunderGreen DL Rye	Ehmke Seed	Cereal Rye	Awned	5/12/2015	221	7,876	8,097	44	17
Thundercale MAES	Ehmke Seed	Triticale	Awned	5/12/2015	306	9,914	10,221	42	0
ThunderGreen II Rye	Ehmke Seed	Cereal Rye	Awned	5/12/2015	269	8,607	8,876	46	17
Thundercale V	Ehmke Seed	Triticale	Awned	5/12/2015	221	10,116	10,337	44	0
Thundertall	Ehmke Seed	Triticale	Awned	5/12/2015	**600**	9,109	***9,709***	48	33
NF 201 Trit	Noble Foundation	Triticale	Awned	5/12/2015	**531**	9,427	***9,958***	**56**	0
Endurance	Oklahoma State University	Wheat (control)	Awned	5/12/2015	185	5,125	5,310	37	0
Slick Trit II	Watley Seed Co.	Triticale	Awnletted	5/27/2015[c]	338	**14,011**	**1,4349**	45	8
WS I	Watley Seed Co.	Triticale	Awnletted	5/12/2015	**492**	9,744	***1,0236***	46	8
Mean					348	9,247	9,580	45	10
CV					36	13	13	5	183
LSD					211.54	2,000.40	2,049.20	3.65	31.80

[a] Values in bold and underlined are in the highest LSD group, $P \leq 0.05$.
[b] Short Beard Thunder classified as awnletted, but in this study most plants were classified as awned.
[c] All varieties cut at heading, variety Slick Trit II matured later and was harvested on 5/27/2015.
[d] Values in bold and italicized are in the highest LSD group for fall yield and second highest LSD group for spring yield, $P \leq 0.05$.

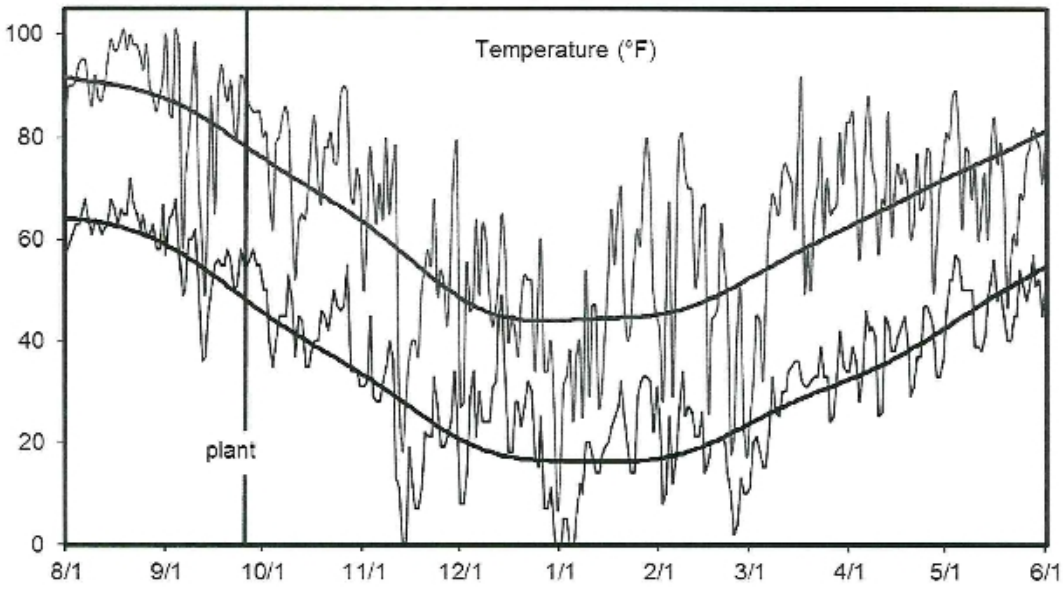

Figure 1. Daily and mean (1981 to 2010) high and low temperature during the growing season at the Southwest Research-Extension Center in Garden City, KS. Thinner lines represent temperatures for the 2014-2015 year.

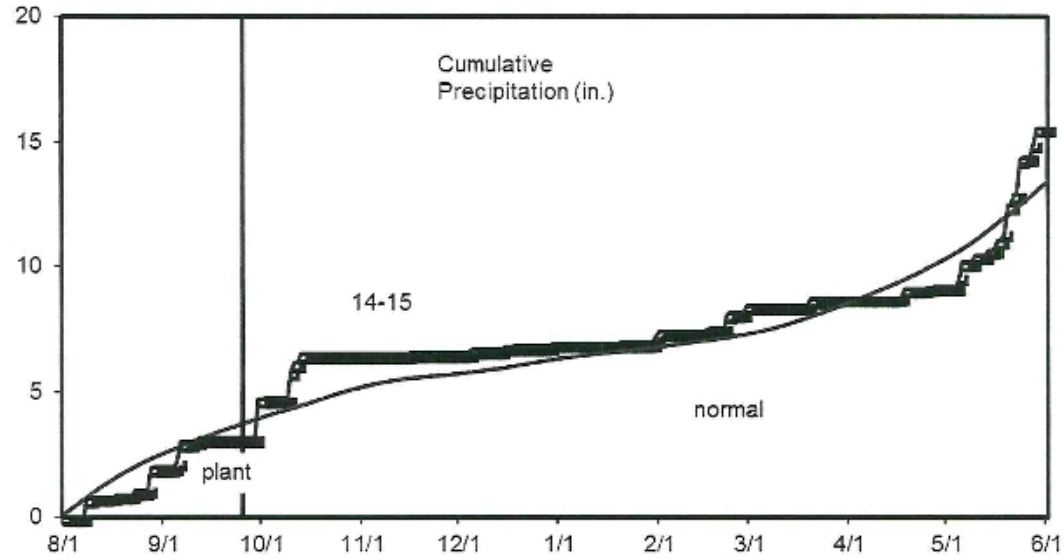

Figure 2. Daily and mean (1981 to 2010) cumulative precipitation during the growing season at the Southwest Research-Extension Center in Garden City, KS.