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2015 Crop Performance in Southeast Kansas

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2015 Crop Performance in Southeast Kansas

Abstract
Crop variety testing determines the production potential of newly released crop cultivars in Southeast Kansas. The genetic potential is moderated by environmental conditions during the growing season as well as soil productive capacity.

Keywords
wheat, corn, soybean, sorghum

2015 Crop Performance in Southeast Kansas

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Summary

Crop variety testing determines the production potential of newly released crop cultivars in Southeast Kansas. The genetic potential is moderated by environmental conditions during the growing season as well as soil productive capacity.

Introduction

These tests provide unbiased performance information on hybrids and varieties used in the majority of Kansas field crops. In addition to the varieties submitted for testing, three corn hybrids and three soybean varieties were nominated to be in the tests by a local producer.

Experimental Procedures

Corn, soybean, and wheat varieties were planted in replicated test plots. Optimal production methods were employed for fertilization and pest and weed control. All plots were rainfed. Crops were harvested at maturity with a plot combine.

Weather data were collected daily from the Parsons Mesonet weather station. Growing degree days were calculated from average maximum and minimum temperatures, with a base of 50 degrees.

Results and Discussion

The performance of fifteen varieties of hard red and seventeen varieties of soft white winter wheat was tested at Parsons. Yields ranged from 29 to 67 bu/ac for the hard red and 45 to 88 bu/ac for the soft wheat. Short season and full season corn performance trials were conducted at two locations with varying soil types. Yields ranged from 145 to 186 bu/ac for the 18 short-season varieties, and 102 to 213 bu/ac for the 32 full-season varieties. Full season conventional and Roundup Ready (RR) soybean performance trials were conducted on two different soil types using a total of 66 cultivars from maturity groups III, IV, and V. Yields ranged from 46 to 66 bu/ac, with no consistent yield differences between conventional and RR cultivars. Twenty sorghum varieties yielded from 13 to 79 bu/ac; lodging accounted for most of the yield loss.

During the past five years from 2011 to 2015, the 2015 growing season was the wettest growing season and 2012 was the hottest year (Figure 1). The particularly wet spring in 2015 delayed wheat harvest in some places, and contributed to fungal infections. Year 2012 had the highest overall rainfall from March through September but had a period of extended drought from early May through August. 2012 also had the greatest cumulative growing degree days for spring and summer. In contrast, 2013 and 2014 had significantly fewer growing degree days. The temperatures during 2015 were more moderate, with growing degree days early in the season consistent with previous years, and overall growing degrees average for the entire growing season.

Previous studies indicate the sensitivity of corn and soybean yield to high temperatures. As the number of days on which temperatures exceed 90°F (for corn) or 95°F (for soybeans) increases, yields decline. The total number of days on which temperatures exceeded 90 or 95°F during the growing season were determined and summarized for 2011– 2015 (Figure 2). Here, substantial differences during the growing seasons are observed between 2011–2012 and 2013, 2014, and 2015. The number of days on which temperatures exceeded 90°F during 2013, 2014, and 2015 was nearly half the number of days during 2011 and 2012. The number of days temperatures exceeded 95°F dropped by nearly 75% in 2013 and 2014 from the number in 2011 and 2012. 2015 was a particularly cool year, with less than five days exceeding 95°F. In contrast, 2012 was a particularly hot year, with the greatest number of days experiencing temperatures in excess of 90 and 95°F.

General wisdom concludes crop yields are most often limited by lack of water, but temperature extremes and shifts in timing of temperature extremes also contribute to yield losses. The yield limitations of high temperatures may be particularly deleterious when coupled with low rainfall, especially during critical periods of yield development.

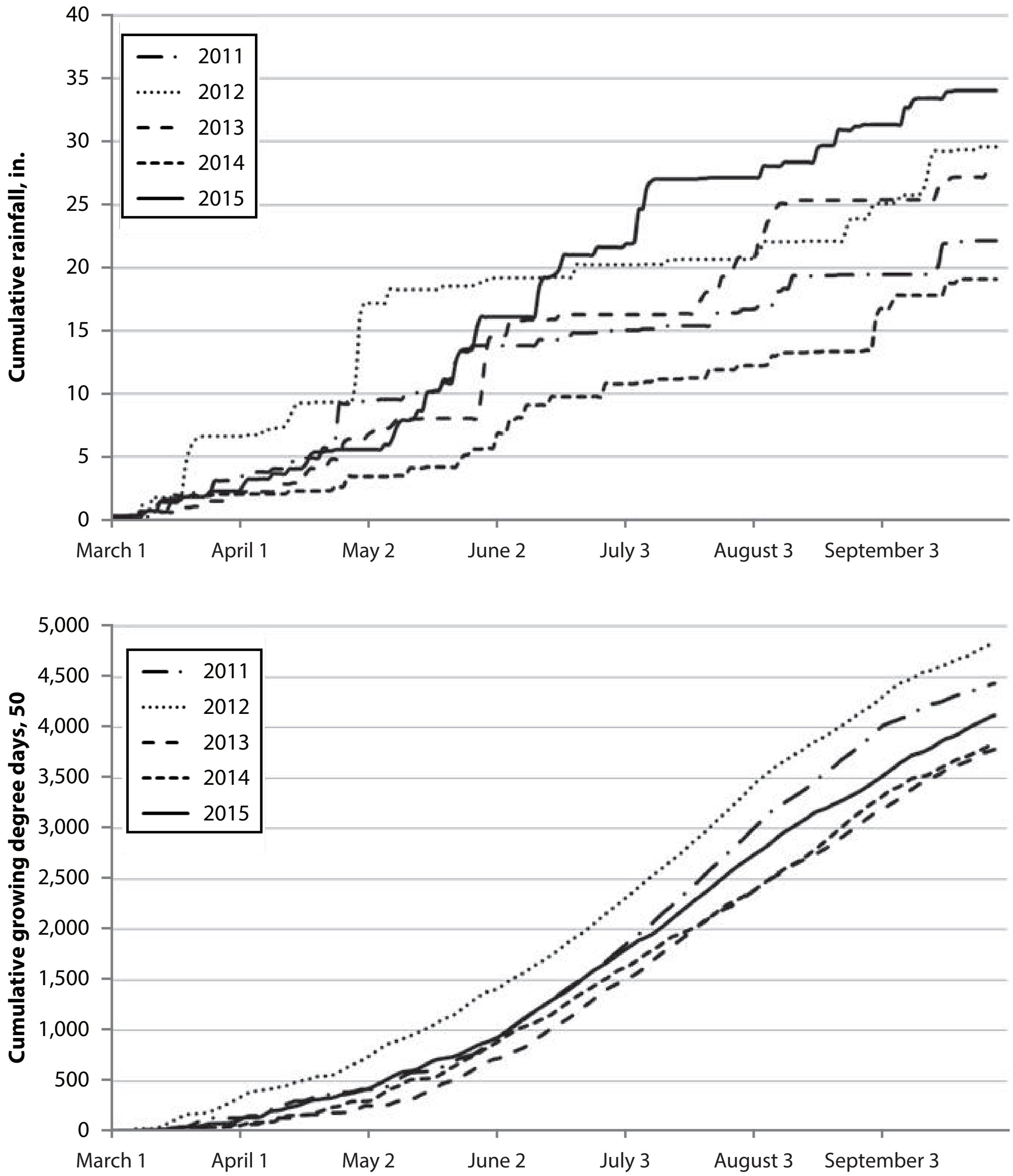
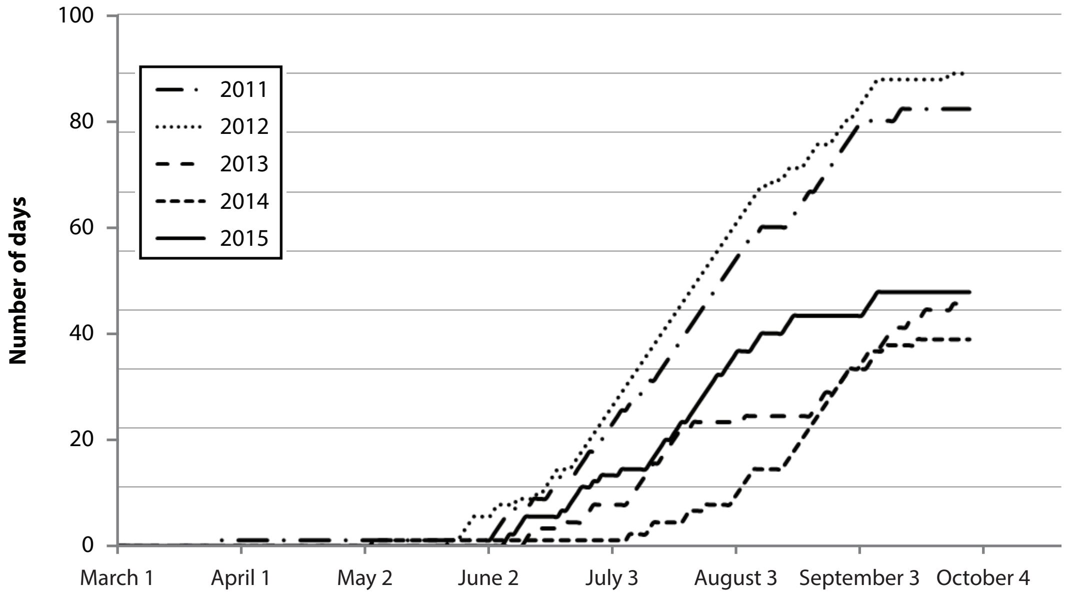


Figure 1. Cumulative rainfall and growing degree days (GDD, base 50) during the spring and summer of 2011, 2012, 2013, 2014, and 2015.



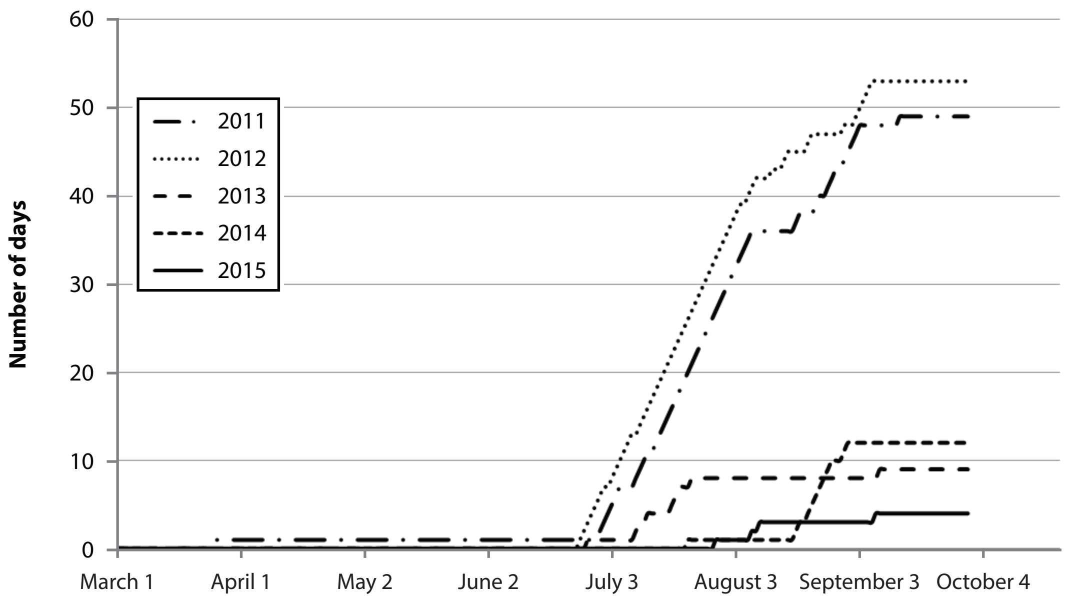


Figure 2. Difference in number of days that temperatures exceeded 90 (upper) and 95 (lower)°F for the 2011–2015 period.