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2014 Crop Performance in Southeast Kansas

G. F. Sassenrath
Kansas State University, gsassenrath@ksu.edu

J. Lingenfelser
Kansas State University, jling@ksu.edu

J. Mengarelli
Kansas State University, jmengare@ksu.edu

K. Kusel
Kansas State University, kkusel@ksu.edu

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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
crop performance, southeast Kansas, corn, soybean, wheat

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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 of the major 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 19 varieties of hard red and 17 varieties of soft winter wheat was tested at Parsons. Yields ranged from 35 to 50 bu/a for the hard red and 35 to 48 bu/a for the soft. Short-season and full-season corn performance trials were conducted at two locations varying in soil types. Yields ranged from 150 to 213 bu/a for the 34 short-season varieties and 184 to 266 bu/a for the 39 full-season varieties. Full-season conventional and Roundup Ready soybean performance trials were conducted on two different soil types using cultivars from maturity groups III, IV, and V. Yields ranged from 30 to 51 bu/a, with production on the river bottom soil yielding slightly higher than on the silt loam soil. Additional crops tested in the variety trials included sorghum and sunflower.

The 2014 growing season was exceptional, especially for corn production. Compared with previous years, however, total rainfall during the crop growing season was low (Figure 1). 2012 had the highest overall rainfall from March through September but had a period of extended drought from early May through August, which coincided with

the critical yield development period for corn. 2012 also had the greatest cumulative growing degree days for spring and summer. In contrast, 2013 and 2014 had significantly fewer growing degree days.

Previous studies at this location indicate that yields of corn and soybean may be sensitive to high temperatures. Total number of days on which temperatures exceeded 90 or 95°F during the growing season were determined and summarized for 2011–2014 (Figure 2). Here, substantial differences during the growing seasons are observed between 2011–2012 and 2013–2014. The number of days on which temperatures exceeded 90°F during 2013 and 2014 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. 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 high temperatures 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.

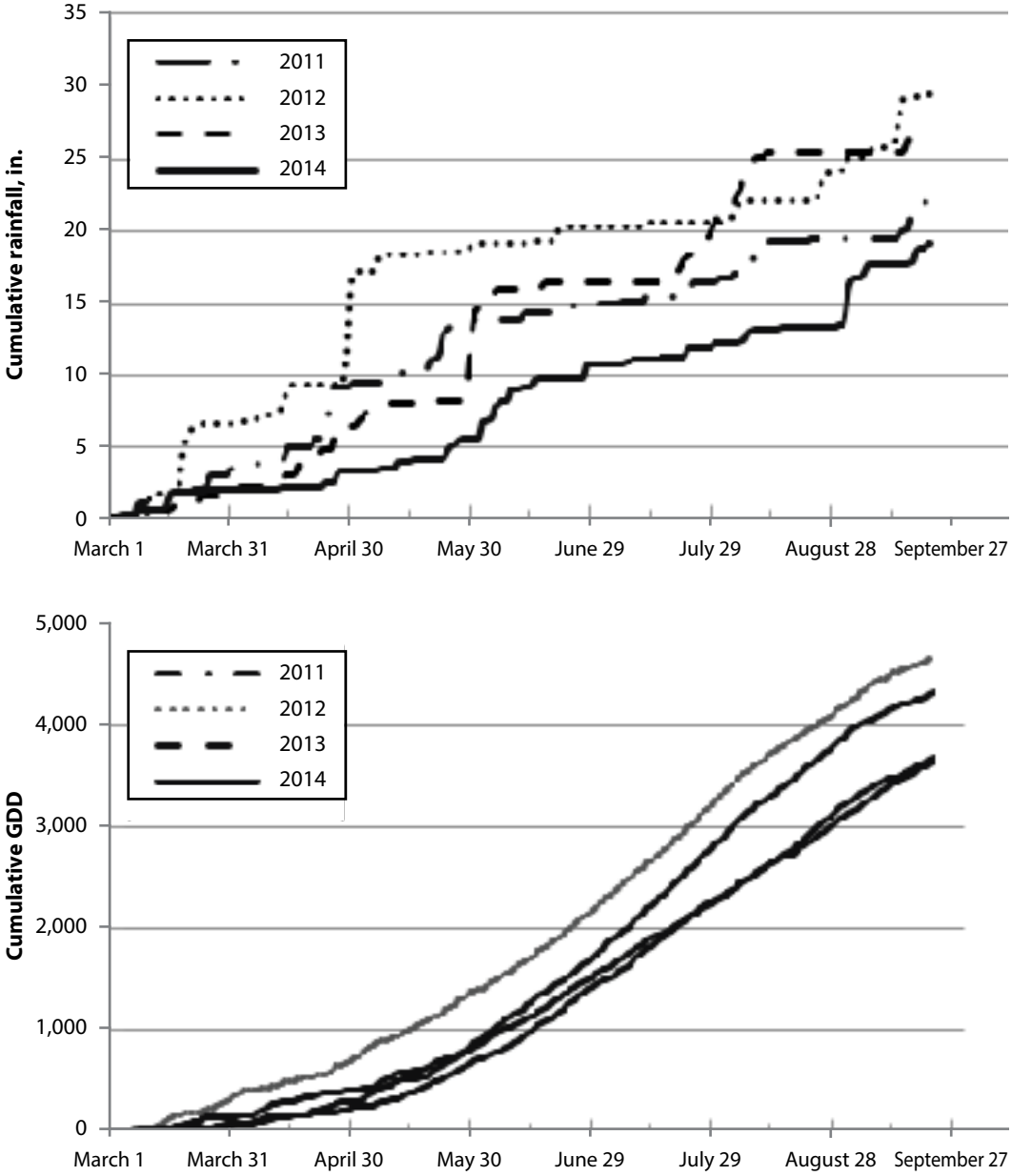

Figure 1. Cumulative rainfall and growing degree days (GDD, base 50) during the spring and summer of 2011, 2012, 2013, and 2014.

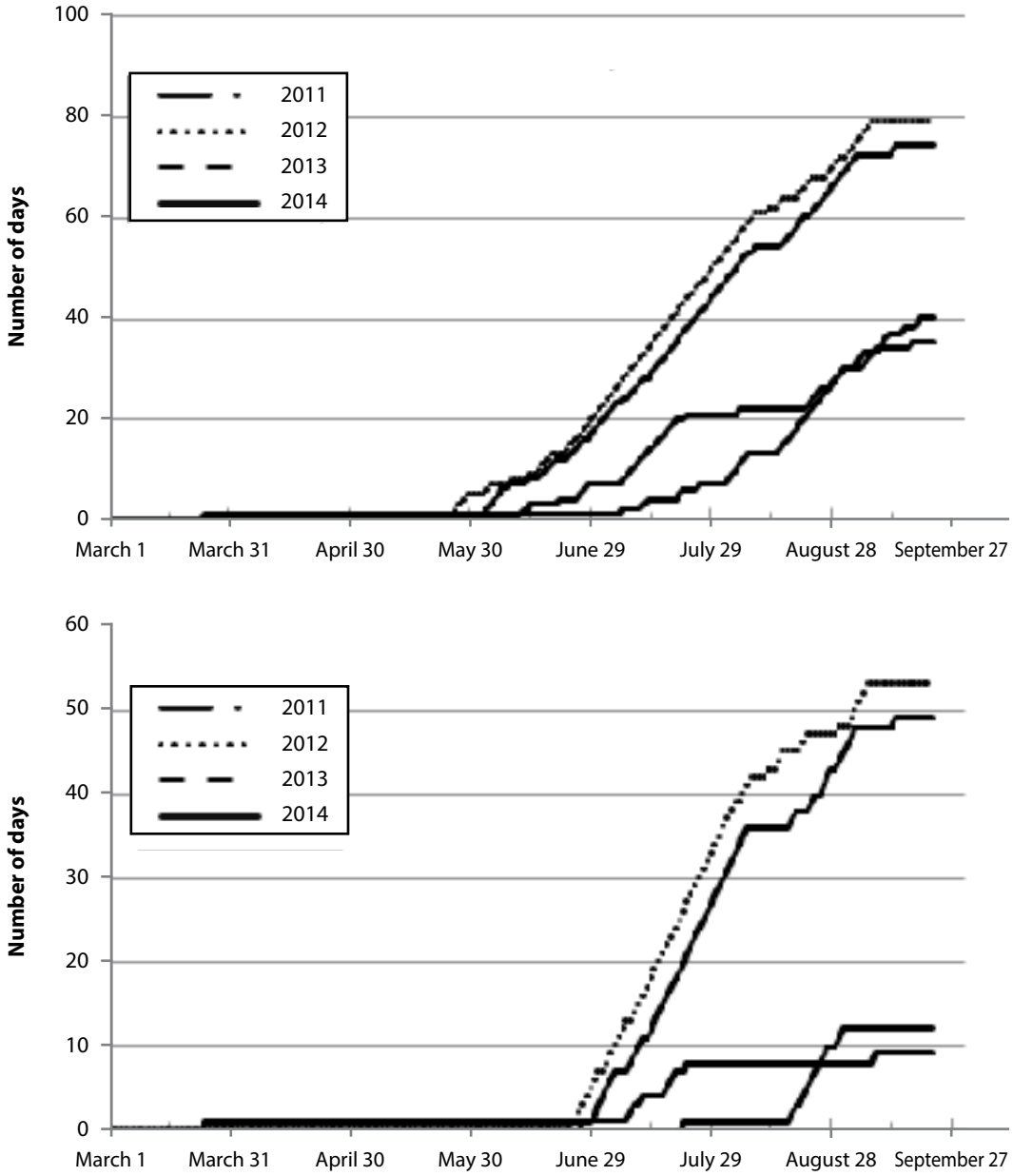

Figure 2. Difference in number of days that temperatures exceeded 90 (upper) and 95 (lower) °F for the 2011–2014 period.