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Crop Production Summary, Southeast Kansas – 2016

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Crop Production Summary, Southeast Kansas – 2016

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Summary

Crop production in southeast Kansas is summarized from variety trials and research plot experiments conducted at the Southeast Research and Extension Center fields in 2016.

Introduction

Crop production is dependent on many factors, most notably, environmental conditions during the growing season. Here, we present a summary of environmental conditions experienced during the 2016 growing season in comparison to previous years and the historical averages. Information on crop yields is taken from reported yields from variety trials and research plots in southeast Kansas.

Experimental Procedures

The Kansas State University Crop Performance Tests were conducted in replicated research field plots throughout the state. This report summarizes crop production for southeast Kansas. Wheat, sorghum and sunflowers were grown at the Parsons facility. Soybean varieties were grown at Columbus (upland) and Erie (river bottom). Corn was grown at Erie (full season) and Parsons (short season). Both corn variety tests were abandoned due to crop loss. Please see individual variety results at the K-State Crop Performance Test web page (http://www.agronomy.k-state.edu/services/crop-performance-tests/).

Weather information was collected from the Kansas State Mesonet site (http://mesonet.k-state.edu/weather/historical/). Historical data from the Parsons and Columbus stations were used in preparing these reports.

Results and Discussion

Weather

Rainfall

Rainfall is highly variable, both spatially and temporally. Total rainfall for 2016 was slightly above the six-year average of 39.21 inches at Columbus with 39.73 inches of rain received during the calendar year. The early spring season was dry at Columbus, but nearly average at Parsons. Columbus had a lengthy dry period (0.65 inches total rain)

in June that was broken by 5 inches of rain over a two week period beginning June 30. Two additional periods of heavy rain (6.3 inches from September 8 – 16; 6.35 inches from October 4 – 12) brought the yearly total to average at Columbus. The largest single-day rain event of 2016 in Columbus was recorded on October 6 at 4.43 inches. This storm system brought 6.35 inches of rain to Parsons as well, with the single largest rain event in 2016 of 5.62 inches recorded at Parsons on October 6. Rainfall at Parsons was very close to average throughout the winter and spring. The two-week period from June 23 until July 7 had 9.33 inches of rain. This storm increased total rainfall in Parsons to above average, where it remained for the rest of the calendar year. Rainfall at Parsons was well above the 31.15 inch average, with 44.64 inches of rain during the calendar year.

Temperature

Temperature is a critical determinant of crop growth and performance. Many studies rely on growing degree days or growing degree units to estimate crop growth and development. We have shown that crop growth is also sensitive to the number of days above 90 (corn) and 95 (soybeans). We started the year with an early warm period from mid-June to mid-July, with an above-average number of days exceeding 90°F and 95°F at both Parsons and Columbus (Figure 2). The number of days exceeding 90°F was nearly normal (57 days) at Columbus and slightly below normal (47 days) at Parsons for the remainder of the growing season. The number of days that temperatures exceeded 95°F (12 days, Columbus; 14 days, Parsons) was below normal and similar to temperatures in 2014.

Crop Production

Winter wheat yielded well in 2016 (Figure 3). Yields for the 22 hard red varieties tested ranged from 57 to 77 bu/a, with an average yield for all hard red wheat of 66 bu/a. Nineteen varieties of soft red wheat were tested, with yields ranging from 53 to 96 bu/a, and an overall average of 72 bu/a (Figure 3). These were above the 6-year averages of 52 bu/a for hard red and 62 bu/a for soft red varieties. Wheat yield and quality are particularly sensitive to high rainfall during maturation (approximately April 24 – May 14). During this period, Columbus received 3.82 inches of rain, less than the 6-year average of 4.04 inches for this time period. Parsons also received less rain (2.14 inches) than the six-year average (2.83 inches). This is significantly below the high rainfall (3.87 inches) received at Parsons during this same period in 2015, which was marked by high rates of Fusarium head blight (FHB) infection. We did have some problems with strip rust this year, which resulted in improved wheat yield with fungicide application.

Corn yields were good in 2016, though not as good as in 2014 (Figure 4). The short season corn variety test at Parsons was abandoned due to wind damage, and the full season test was abandoned due to animal damage. Corn yield results from full season corn from other studies at the research station are presented. Over the past six years, full season hybrids have averaged 183 bu/a, while short season hybrids averaged 118 bu/a for southeast Kansas. No-till corn studies showed slightly higher yields in 2016, averaging 140 bu/a, while conventional tilled corn yielded 117 bu/a at Columbus (Figure 5).

Soybean yields were also above the 6-year average, with maturity group (MG) 3-4 having an average yield of 53 bu/a, and MG 4-5 yielding 52 bu/a across all varieties and locations (Figure 5). Conventional soybeans also yielded above the 6-year average, with 35 bu/a for MG 3-4 and 44 bu/a for MG 4-5 (Figure 6).

In contrast to other crops in 2016, sorghum production (57 bu/a) was much less than average (97 bu/a) (Figure 6). Sunflowers yielded about average (Figure 7).

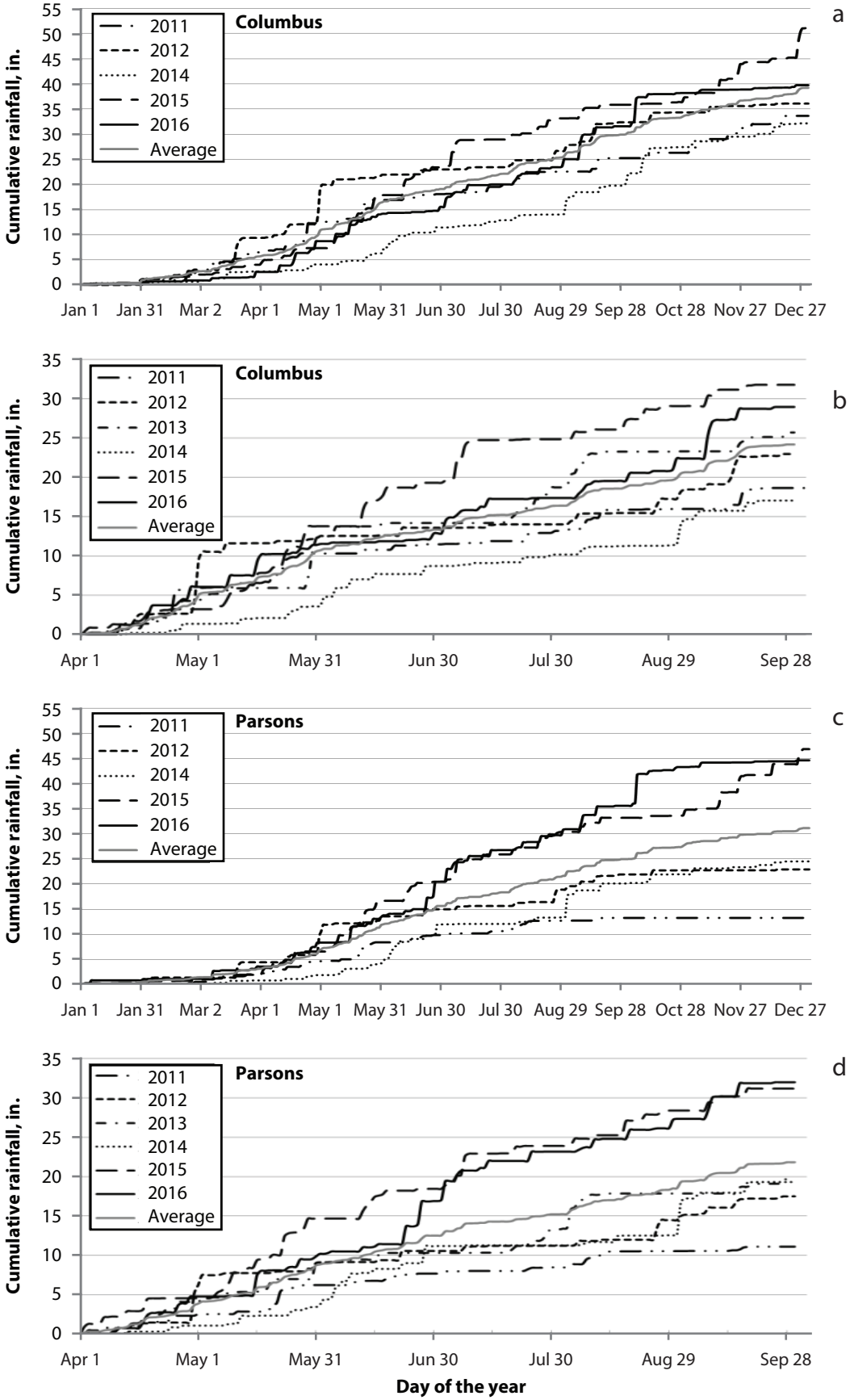

Figure 1. Cumulative rainfall during the calendar year (a and c) and the summer crop production season (b and d) at Columbus (a and b) and Parsons (c and d). Results from 2013 were omitted for clarity. Six-year average rainfall totals are included for comparison.

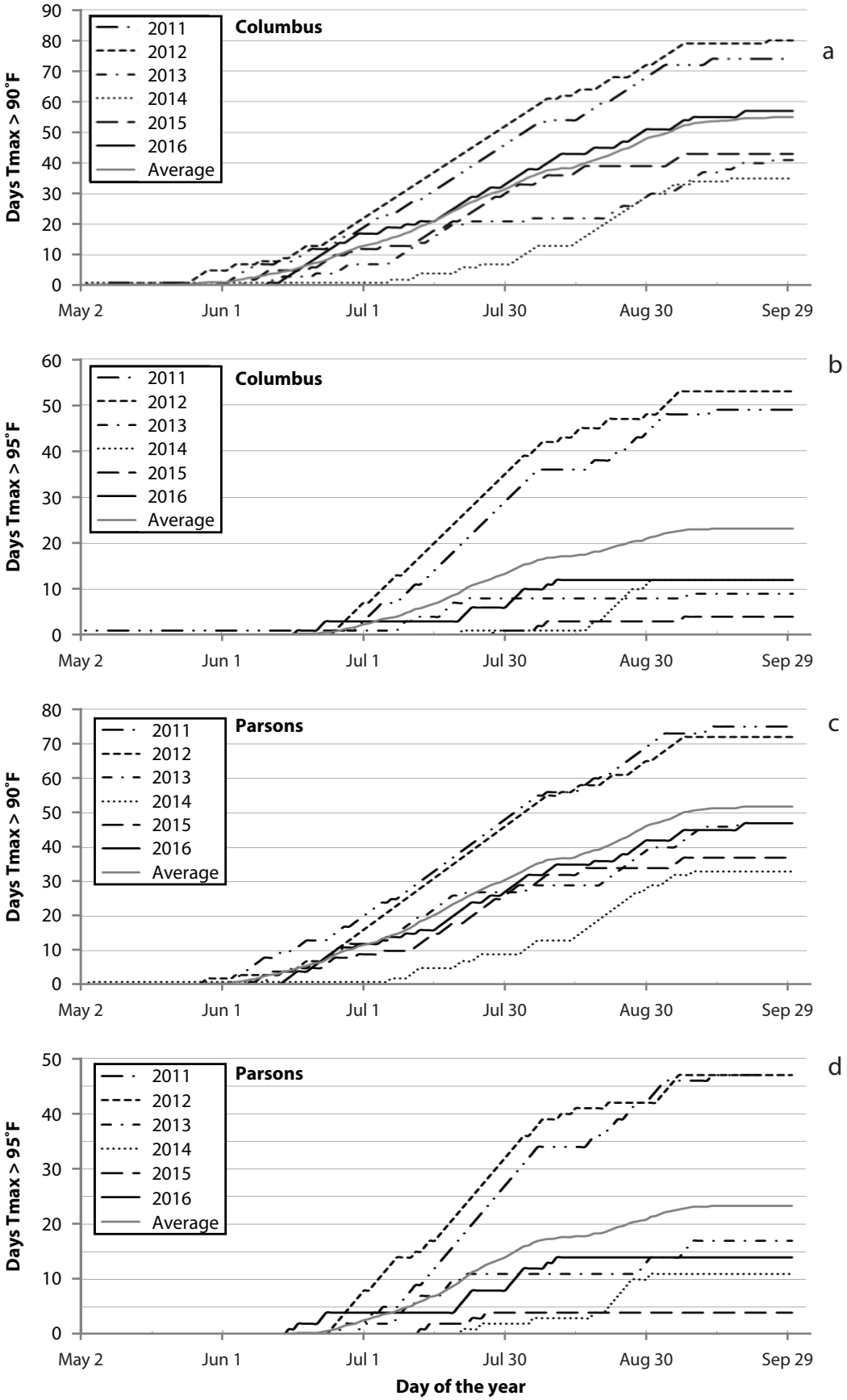

Figure 2. Temperature patterns during 2016 and preceding years for Columbus (a and b) and Parsons (c and d).

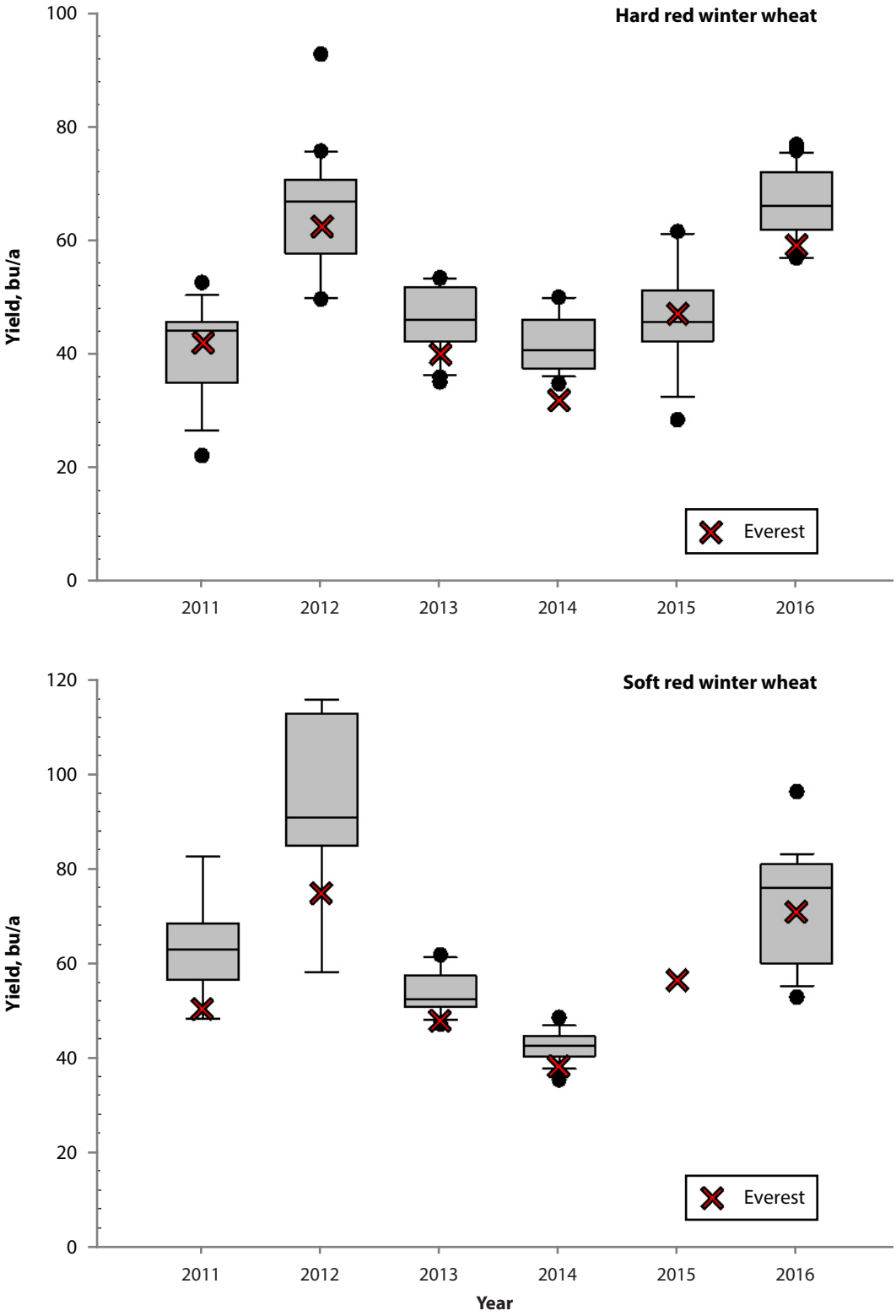

Figure 3. Winter wheat yield for hard red wheat (top) and soft wheat (bottom) from variety trials in southeast Kansas from 2011 through 2016. The line in the middle of the box plots is the median yield of all varieties. The upper and lower quartiles are given by the upper and lower edges of the boxes. The maximum and minimum values are given by the upper and lower "whiskers" extending from the box. Outliers are presented as solid circles. For comparison, average yield for Everest from the variety trial results is highlighted as an X.

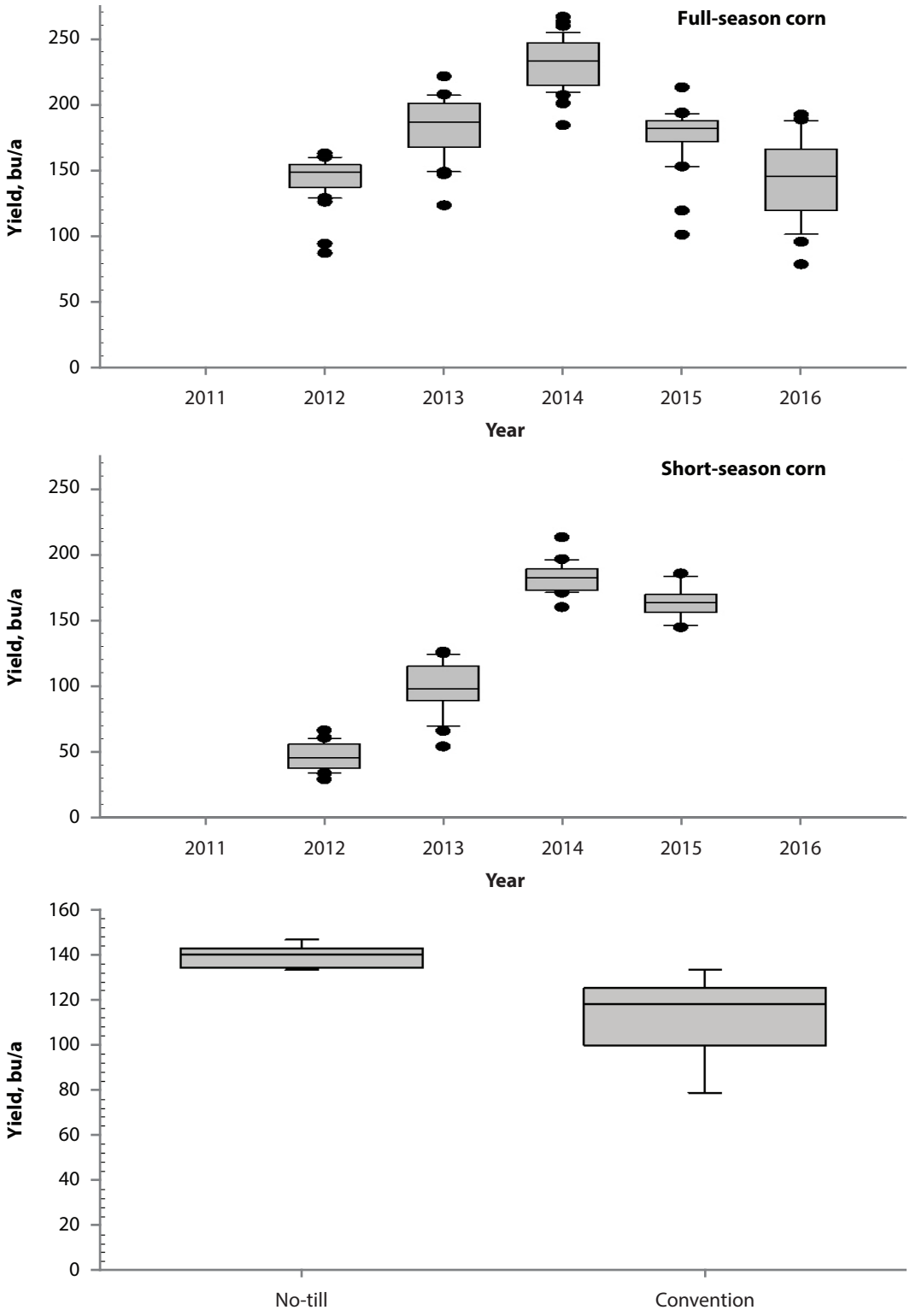

Figure 4. Full-season (top) and short-season (middle) corn yields for two environments in southeast Kansas – upland (Parsons) and river bottom (Erie). 2016 Variety trials were abandoned due to weather. Data from other research plots with full-season corn at Parsons were used for comparison. Comparison of corn yield for conventional tillage and no-till production at Columbus (bottom).

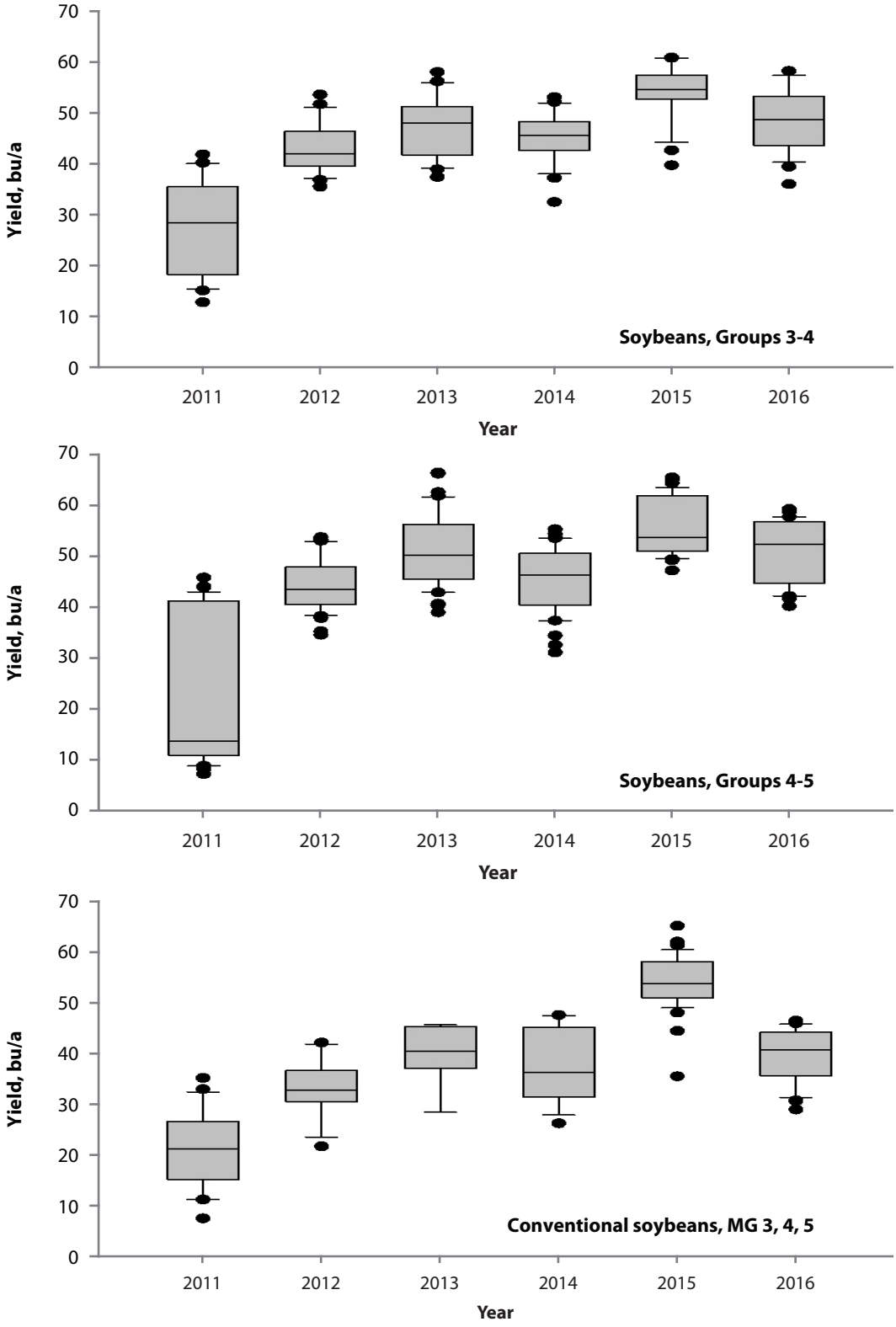

Figure 5. Soybean yields for maturity group (MG) 3-4 (top) and MG 4-5 (middle) in two growing environments: upland (Columbus) and river bottom (Erie). Yield summary for conventional varieties are summarized for MG 3, 4, and 5, for all locations (bottom).

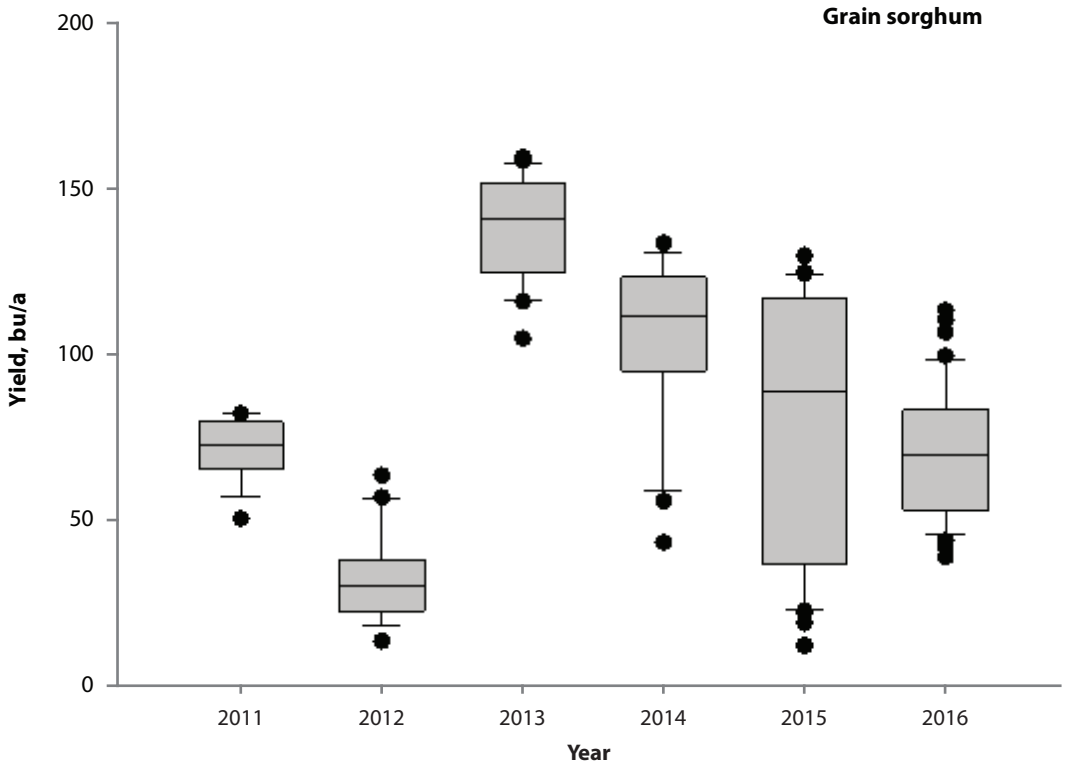

Figure 6. Grain sorghum.

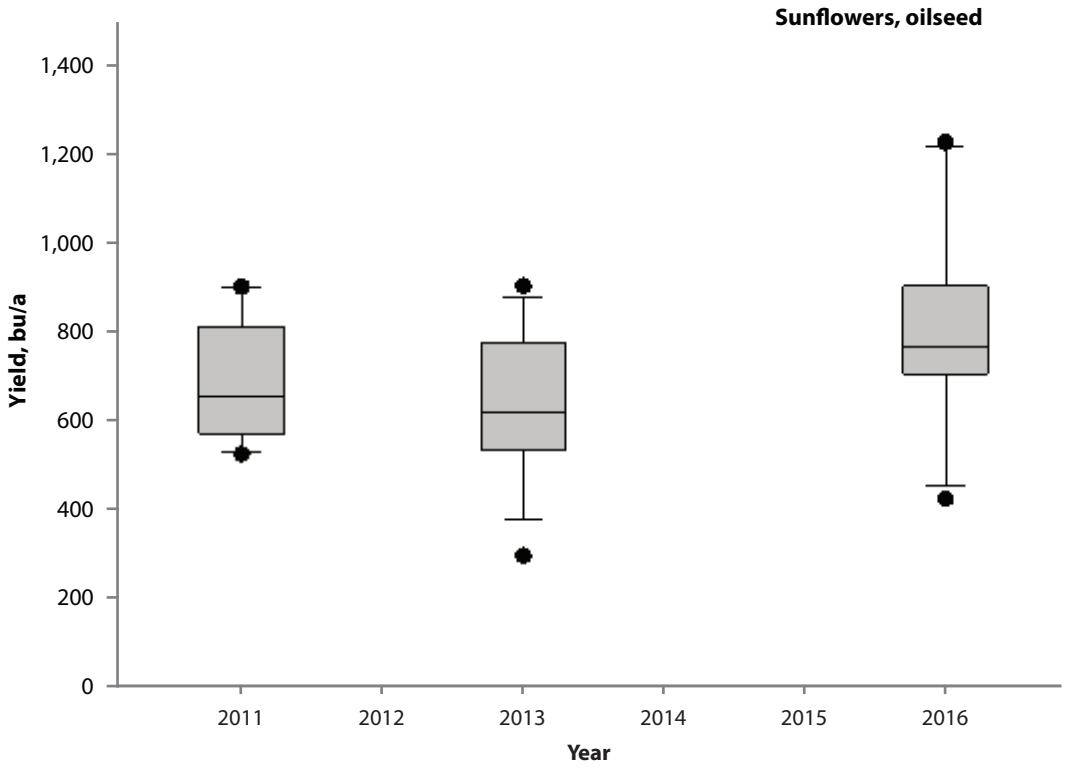

Figure 7. Oilseed sunflowers.