



PLANT DISEASE IN KANSAS

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KDA WHEAT SURVEY WRAPPED UP FOR 2018-PRELIMINARY FINDINGS

KDA performs an annual survey on wheat disease in conjunction with the Kansas State University plant pathology department to assess the diseases present on wheat each year and to estimate yield losses due to disease. This report comes later in the summer, after harvest. This survey has been performed annually and stored data date back to 1976. This year was no different from the prior years in terms of doing the survey; however, it differed greatly from a usual year as far as typical disease presence. The unusual weather (a cold spring followed by intense heat delayed maturity and then accelerated it) left only a short window of time with ideal disease conditions. This caused low disease pressure in 2018 wheat fields and only low levels of disease were present. The shortened period of reproductive growth also accelerated data collection as compared to an average year.

Although there was little disease present, small amounts of several diseases were found. The most predominant foliar disease was leaf rust, in contrast to average recent years when stripe rust was the most commonly found disease. Leaf rust is characterized by dark orange, small powdery pustules scattered on leaves (Fig. 1A). Stripe rust, on the other hand, produces bright orange powdery pustules on the leaves that tend to be produced in vertical lines, or "stripes," along the leaves (Fig. 1B). Both can cause considerable yield loss in an epidemic year but will likely cause little loss in 2018.

Since 2010, KDA and Kansas State University have also been surveying for wheat lesion nematodes by collecting wheat plants and analyzing them in the lab for presence of nematodes. Results are still pending, but preliminary data show a quantity of nematodes present that is similar to most years this part of the survey has been performed. This is in contrast to 2017 when only low levels of nematodes were detected. In the absence of "average" levels of foliar and head diseases, lesion nematodes may move up towards the top of the list of important wheat diseases in 2018.

In fact, although there was little disease pressure this year, the wheat harvest is nonetheless likely to be severely affected, but by abiotic factors such as late planting, drought, cold spring, and hot May. The accelerated maturity stage also may cause a reduced yield. These factors will be considered when assessing yield loss due to disease and causes as to why disease was low.



(A)



(B)

Figure 1: Leaf rust (A) is characterized by darker red-orange pustules scattered on the leaves. Stripe rust (B) is characterized by bright orange pustules in narrow lines on wheat leaves.

A BACTERIAL WHEAT DISEASE APPEARS IN SOUTHWEST KANSAS

Bacterial leaf streak, a bacterial disease infrequently spotted during regular scouting appeared when KDA employees were conducting the annual wheat survey in Rush county and Finney county. Bacterial leaf streak, caused by *Xanthomonas campestris* pv. *undulosa*, is characterized by small water-soaked spots that soon turn into yellow-brown streaks (Fig. 2A). These streaks are typically narrow but may coalesce into a wider streak and may extend the entire length of the leaf. There may also be flakes or clumps of bacterial exudate on the upper surface of the leaf (Fig. 2B). The pathogen may also infect the head, which causes a disease called black chaff due to the necrosis it causes in the awns (Fig. 2C). This pathogen also infects barley.

Since this is a bacterial disease, applying fungicides will not control it. It is a seedborne pathogen, so planting certified disease-free seed will help control it. It can overwinter in stubble in the field, so if it occurs in a field, allow 2 years of crop rotation before returning to wheat or barley. Few resistance genes have been found that protect against this gene so resistance isn't currently a reliable control measure. Minimize risk of a field sustaining spring freeze damage if possible and control insects if practical to reduce the frequency of injured sites where the bacterium can enter plant tissue.

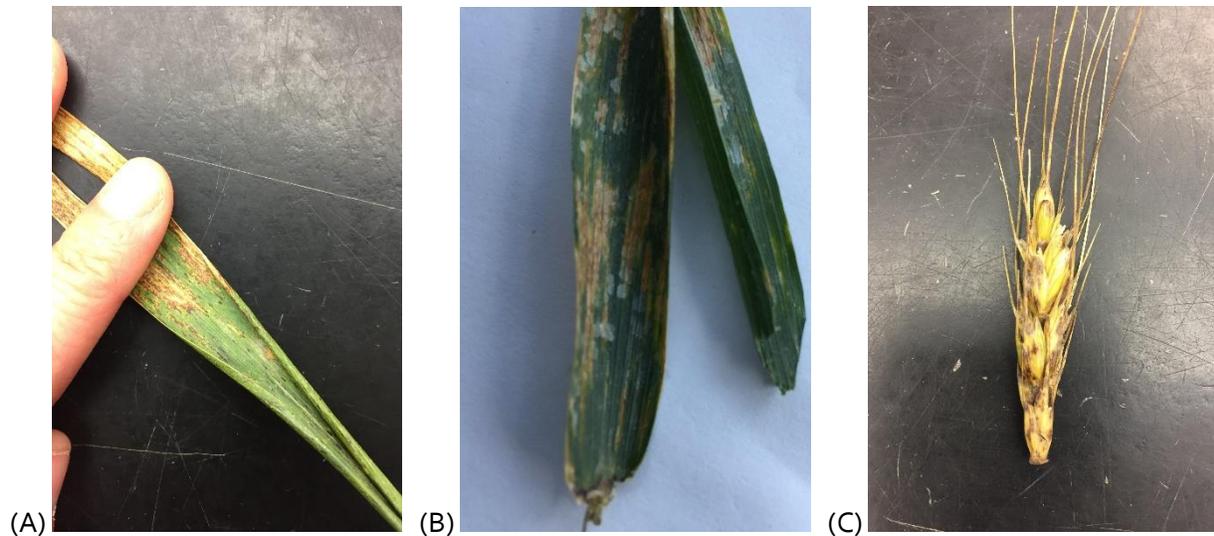


Figure 2: Symptoms of bacterial streak and black chaff include narrow streaks limited by veins on leaves (A); flecks of bacterial ooze on the leaf surface (B) (photo provided by Bob Buhler, KDA); and spots and necrosis on the glumes, chaff, and awns (C).

Plant Protection and Weed Control staff work to ensure the health of the state's native and cultivated plants by excluding or controlling destructive pests, diseases, and weeds. Staff examine and analyze pest conditions in crop fields, rangelands, greenhouses, and nurseries. Action taken to control potential infestations of new pests, whether they are insects, plant diseases, or weeds, is beneficial to the economy and the environment.

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