Optimum Sowing Dates and Seeding Rates for Wheat in Kansas

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Ensuring that the wheat crop is sown at the optimum date and seeding rate are two steps needed to ensure that the maximum yield potential can be attained for a given growing season. Sowing date affects yield potential due to stand establishment, soil and air temperatures to which the crop is exposed, tiller formation, disease pressure, etc. Optimum seeding rate depends on sowing date and its adjustment is crucial to ensure the crop will maximize its yield potential.

The optimum sowing date for winter wheat based on K-State recommendations is here for this area of Kansas. The Zone 2 area for Kansas has an optimum sowing window that can start as early as September 15th and last until October 20th.

According to historical data released by the USDA-NASS crop progress reports, on average, producers in Kansas planted approximately 50% of the crop prior to October 4th and about 90% of the crop prior to October 25th during the 1994-2015 period for the entire state of Kansas. Although 50% of the fields are, on average, planted by October 4th, there is large year-to-year variability in percent planted area within the aforementioned date range. This year-to-year variability is led by sowing conditions as extremely moist or dry soils may keep producers from sowing at the optimum planting date.

Sowing wheat at an earlier-than-optimal date can result in lush vegetative growth which will require more water to maintain the canopy later in the growing season. For that reason, producers who graze their wheat are encouraged to plant wheat two or three weeks earlier than the optimal sowing date for grain. Early sowing can also lead to an increased incidence of fall pest infestation, such as Hessian fly, and diseases transmitted by certain vectors more active in warmer temperatures, such as wheat streak mosaic (transmitted by wheat curl mites) and barley yellow dwarf (transmitted by aphids).

The optimal sowing time differs year-to-year due to environmental conditions, such as temperature and precipitation. Sowing wheat at the optimal time stimulates the right amount of fall tiller formation as well as root development to optimize yields while avoiding a lush vegetative growth. Fall-formed tillers contribute more to yield potential than spring-formed tillers, therefore, it is crucial that about 3 to 5 tillers are well established before winter sets in. Additionally, this tiller formation combined with good crown root system development prior to winter dormancy increases winter hardiness of the crop, and consequently the chances of winter survival.

Many reasons may lead producers to plant wheat late. Double-cropping wheat following a late-harvested summer crop, such as soybeans or sorghum. Delayed planting date due to environmental conditions, such as low or high soil moisture levels, may also occur. When wheat is sown past the optimal window, it is generally sown into colder soils and the crop is exposed to cooler air temperatures during the fall. Sowing into colder soils will delay wheat emergence, so the importance of a seed fungicide treatment increases as planting date is delayed. Additionally, the crop will experience decreased fall tiller formation because wheat
development is dependent on temperatures. An increase in seeding rates in these circumstances is warranted.

Optimum seeding rate varies with geographical location in Kansas, following the existing east-to-west precipitation gradient. If sown at the optimal date, optimum seeding rate should be 900,000 – 1,250,000 seeds/acre in the central region, where annual precipitation ranges between 20 and 30 inches. Seeding rate should always be discussed along with planting date, and in many times with soil fertility status as well. As mentioned above, later planting dates will decrease the potential number of fall tillers formed and grain yield will be more dependent on the main stem and maybe one or two tillers formed during the fall. Thus, seeding rate should be increased as planting date is delayed. On the other hand, producers with a history of manure application and very high soil phosphorus and organic matter levels have been observing a yield increase from reduced plant populations. The reason behind this response is that high phosphorus levels and increased overall fertility resulting from long-term application of manure can increase the wheat tillering potential, decreasing the need for high plant populations. For further information please contact the local K-State Research & Extension Office.

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