

News Column

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Optimal corn seeding rate recommendations

The optimal corn seeding rate depends on the hybrid (genotype, G) and the interaction with the environment (E), researchers termed this as the G x E interaction. Producers can look back to their corn crop from the previous growing season, or wait until the current growing season is nearly complete, and evaluate whether the plant population they used was adequate. Another factor that sometimes we neglect to mention is the effect of management practices (M). Planting date, row spacing, and crop rotations can also exert some influence on the yield response to the plant population factor.

Individual hybrids can respond differently, but the following guidelines may help in deciding if current seeding rates need to be adjusted.

- If more than about 5% of the plants are barren or if most ears have fewer than 250 kernels per ear, the plant population may be too high.
- If there are consistently more than 600 kernels per ear or if most plants have a second ear contributing significantly to grain yield, the plant population may be too low. Of course the growing conditions will influence ear number and ear size as well, so it is important to factor in the growing conditions for that season when interpreting these plant responses.
- In addition to the growing conditions, nutrient status can also influence the final number of grains per ear. For example, severe nitrogen (N) deficiency will have a high impact on the final number of grains, ear size and ear number.

Don't be too concerned if a half-inch or so of the ear tip has no kernels. If kernels have formed to the tip of the ear, there may have been room in that field for more plants contributing to grain yield. Again, "tipping back" will vary with the G x E x M interaction. Potential ear size and potential number of kernel (1,000-1,200 per ear) are set before silking. But the actual final number of kernels is not determined until after pollination and early grain fill due to relative success of fertilization and degree of early abortion.

Always keep the long-term weather conditions in mind. In a drought year, almost any population is too high for the available moisture in some areas.

Making a decision on whether to keep seeding rates at your usual level, or increase somewhat this year if the soil profile is wetter-than-normal is a little like the famous line in the movie Dirty Harry: "Do I feel lucky?" If you think weather conditions will be more favorable for corn this

year than the past years, stay about in the middle to upper part of the range of seeding rates in the table below. If you do not think growing conditions will improve enough to make up for dry subsoils, you might want to consider going toward the lower end of the range of recommended seeding rates, with the warning that if growing conditions improve, you will have limited your top-end yield potential.

Optimal seeding rates may need to be adjusted for irrigated corn if fertilizer or irrigation rates are sharply increased or decreased. For example, research at the Irrigation Experiment Field near Scandia has shown that if fertilizer rates are increased, seeding rates also have to be increased to realize the maximum yield benefit. Consult seed company recommendations to determine if seeding rates for specific hybrids should be at the lower or upper end of the recommended ranges for a given environment.

The recommended planting rates in the following tables attempt to factor in these types of questions for the typical corn growing environments found in Kansas. Adjust within the recommended ranges depending on the specific conditions you expect to face and the hybrid you plan to use.

Table 1. Suggested dryland corn final populations and seeding rates

Area	Environment	Final Plant Population	Seeding Rate*
		(plants per acre)	(seeds per acre)
Northeast	100-150 bu/a potential	22,000-25,000	26,000-29,500
	150+ potential	24,000-28,000	28,000-33,000
Southeast	Short-season, upland, shallow soils	20,000-22,000	23,500-26,000
	Full-season bottom ground	24,000-26,000	28,000-30,500
North Central	All dryland environments	20,000-22,500	23,500-26,500
South Central	All dryland environments	18,000-22,000	21,000-26,000
Northwest	All dryland environments	16,000-20,000	19,000-23,500
Southwest	All dryland environments	14,000-20,000	16,500-23,500

Table 2. Suggested irrigated corn final populations and seeding rates

Environment	Hybrid Maturity	Final Plant Population	Seeding Rate*
		(plants per acre)	(seeds per acre)
Full irrigation	Full-season	28,000-34,000	33,000-40,000
	Shorter-season	30,000-36,000	35,000-42,500
Limited irrigation	All	24,000-28,000	28,000-33,000

* Assumes high germination and that 85 percent of seeds produce plants. Seeding rates can be reduced if field germination is expected to be more than 85%.

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