

Using the Population Ratings – Corn

Hybrids vary in response to population for two reasons: genetics, and yield level. Yield level has a greater influence on population response compared to genetics, and should be the first factor considered when determining the optimal seeding rate for a field. Higher yield conditions respond best to higher seeding rates, while lower yielding fields and/or less optimum growing conditions are significantly less responsive to higher seeding rates. From a genetic standpoint, some hybrids are very well adapted to higher seeding rates, while others perform quite well at more moderate seeding rates. However, these hybrid differences are not large enough to overcome the effect of yield environment, and so are best used to modify, up or down a few thousand plants, the optimal seeding rate for the field based on yield level.

While it would be great to utilize the same seeding rate across all acres and hybrids, matching seeding rate to the yield environment of the field and specific response characteristics of the hybrid being planted will result in greater economic return. Rob-See-Co and Innotech Brand¹ corn hybrids are rated for their response to seeding rate. Ratings are based on a combination of how the hybrid performs relative to itself over a range of seeding rates in population density trials, and also on how it performs relative to other hybrids in yield trials planted at different seeding rates. Yield response to population rating symbols and their interpretation are shown in Table 1.

Table 1. Yield Response by Population Rating Symbols and Interpretation

Rating Symbol	Interpretation of Yield Response by Population
	Greatest opportunity to maximize performance relative to other hybrids in maturity group
	Performs very well compared to other hybrids in maturity group
	Performance is average relative to other hybrids in maturity group
	Performance is below desired levels relative to other hybrids in maturity group

These symbols are then applied to five seeding rate categories: well below normal, below normal, normal, above normal, and well above normal, with normal being the seeding rate expected to be optimal in the field for which the hybrid is being selected. Table 2 shows the optimal seeding rate (seeding rate producing the greatest economic return by yield environment) at a constant seed cost and four commodity values for corn, ranging from \$3.00 to \$4.50/Bushel. These seeding rates are based on the same long-term population response database Rob-See-Co uses to rate hybrids, and become the “normal” seeding rate for a field falling into each yield level at a given commodity value.

¹ Innotech is a Syngenta Brand distributed by Rob-See-Co

Table 2. Influence of Yield Environment and Commodity Value (\$/Bu) on Optimal Seeding Rate

Optimal Seeding Rate at Commodity Value (\$/Bu)	Yield Environment (Bu/A)				
	100	140	180	220	260
\$3.00/Bu	14,300	21,300	27,600	30,200	33,500
\$3.50/Bu	15,200	22,500	28,800	31,800	35,200
\$4.00/Bu	16,000	24,000	29,500	33,000	36,000
\$4.50/Bu	17,500	25,100	30,400	33,500	36,600

With the optimal, or “Normal,” seeding rate established, the above and below normal ratings can be used to understand how a hybrid will perform if population is varied from that optimal seeding rate. Table 3 provides an example of how seeding rate varies around the optimal, or “Normal,” seeding rate for the five seeding rate categories in three specific combinations of yield environment and commodity value.

Table 3. Seeding Rates Represented by Population Categories for Three Yield Environment and Commodity Value Combinations

Seeding Rate Represented by:	Yield Environment & Commodity Value		
	140Bu & \$3.50	180Bu & \$4.00	260Bu & \$3.00
Well Below Normal	18,000	25,000	29,000
Below Normal	20,000	27,000	31,000
Normal	22,500	29,500	33,500
Above Normal	25,000	32,000	36,000
Well Above Normal	27,000	34,000	38,000

Common Questions:

- How do I know if a hybrid can “flex?” Hybrids with the capacity to compensate for lower population by “flexing” kernel rows or kernels per row will have a  or  in the Below Normal Yield Response to Population rating column.
- Do hybrids with good “flex” also respond to higher seeding rates? Hybrids with a  or  in both the Below Normal and the Above Normal (and/or Well Above Normal) Yield Response to Population rating columns have good “flex” and also respond to higher densities.
- What hybrids perform best at low to moderate plant populations? Hybrids with a  or  in the Below Normal, and/or Well Below Normal Yield Response to Population rating columns will perform best at lower seeding rates.
- What hybrids perform best at high to ultra-high seeding rates? Hybrids with a  or  in the Above Normal, and/or Well Above Normal Yield Response to Population rating columns will perform best at high and ultra-high seeding rates.

See Table 4 for additional information on how to interpret specific combinations of rating symbols across the five yield response categories.

Table 4. Yield Response Interpretation and Management Suggestions for Specific Population Rating Examples

Yield Response by Population Rating Category					Interpretation of Yield Response to Population	Management Suggestions
Well Below Normal	Below Normal	Normal	Above Normal	Well Above Normal		
-				-	Versatile in a range of +/- 2-3,000 seeds/acre around normal seeding rate	Plant at moderate to moderately-high seeding rates for yield environment
					Best performance at below normal and normal seeding rates, but also responds to higher plant densities	Plant at moderate seeding rates in lower yield environments, and higher seeding rates in higher yield environments
					Best performance at normal and higher seeding rates. Avoid lower plant densities	Plant at normal to high seeding rates in all yield environments
					Versatile at seeding rates from 2,000 below normal to 4-5,000 above normal. Avoid very low plant densities	Plant at moderately low to very high seeding rates for yield environment
					Versatile in a range of +/- 2-3,000 seeds/acre around normal seeding rate	Plant at moderately-low to moderately-high seeding rates for yield environment
					Best performance at below normal and normal seeding rates. Avoid higher plant densities	Plant at low to moderate seeding rates for yield environment
					Versatile in a range of +/- 2-3,000 seeds/acre around normal. Avoid really low and really high plant densities	Plant at normal seeding rate for yield environment