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Update on Corn Plant Populations and Seed Costs

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Abstract

Plant populations continue to increase and, unfortunately, so do seed costs. Certainly hybrids today withstand the stress of higher seeding rates better than ever before. In fact, higher seeding rates are one component that drove annual yield increases the last several decades.

Keywords

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Update on Corn Plant Populations and Seed Costs

By Roger Elmore and Lori Abendroth, Department of Agronomy

Plant populations continue to increase and, unfortunately, so do seed costs. Certainly hybrids today withstand the stress of higher seeding rates better than ever before. In fact, higher seeding rates are one component that drove annual yield increases the last several decades.

The current questions are where and when does the yield responsiveness to increased seeding rates plateau or stop? If we consider net return, we arrive at this point once increased seeding rates no longer cover the additional seed cost.

Since 2006, we have conducted plant population research across 32 sites in Iowa. Figure 1 displays the yield distribution pattern from these trials expressed as a percent of the maximum yield across the 32 locations. On average, maximum grain yields occur between 34,500 and 37,000 plants per acre (ppa); although there is significant variation across locations and years (Figure 1). This population range, 34,500 to 37,000 ppa, is 2000-3000 ppa greater than what was found in plant population research 5 to 10 years ago.

Seed costs have increased substantially. But, don't forget that transgenic traits add a measure of yield protection – herbicide and insect resistance allowing improved weed and insect management - as they add to the price of seed. Is there a point where adding another 1000 seeds per acre does not return the cost of the increased seed?

We answer that question by comparing a range of seed costs actually paid by producers in 2009 with expected yields at different plant populations based on our 2006 to 2008 data (Figure 2). As seed prices increase, return to seed decreases. The best net returns occur with plant populations between 30,000 and 35,000 ppa.

Not every seed that is planted develops into a plant. Our recorded losses from seeding to plant survival range from 4 to 7 percent. In general, increasing seeding rates by 5 percent will insure that the proper plant population is achieved. We recognize that plant survival depends on many factors and may vary from field to field.

Plant populations between 30,000 and 35,000 ppa optimize yield while maximizing net income. We continue to process these data and are also conducting additional plant population trials this year. Please stay tuned.

Figure 1. Corn grain yield as a percent of maximum yield at different plant populations for 32 sites in Iowa (10-12 locations per year over three years). Iowa State University 2006-2008.

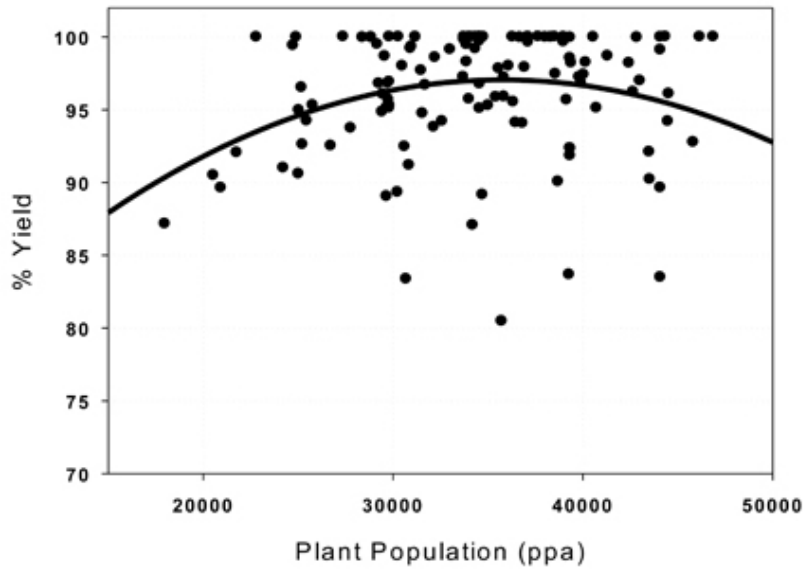
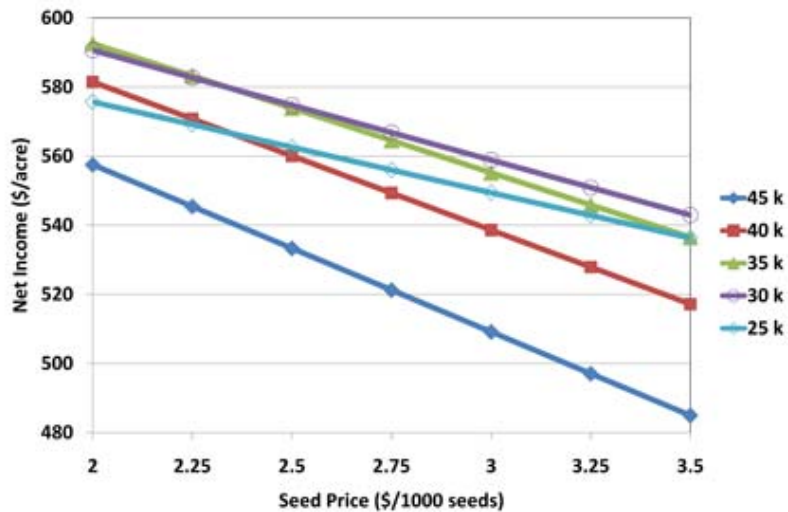


Figure 2. Net income ((200 bu/acre grain yield x \$3.25/bu) - (seeding rate x seed price)) at different plant populations with changes in seed prices (k=1000 seed). Since there are 80,000 kernels in a bag of seed, the range in seed prices here represent a range in price per bag from \$160 to \$280; these are current price ranges paid by growers. Yield data are based on yield responses at different plant populations as shown in Figure 1.



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