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Corn Plant Populations, 2007 through 2010

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Abstract

Corn hybrid genetics change yearly to increase productivity. The newer hybrids appear to possess plant characteristic that allow for higher plant populations. Over the past several years, field trials across the state have found support for higher plant populations in corn. This trial was designed to collect information to aid in local recommendations.

Keywords

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Disciplines

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Corn Plant Populations, 2007 through 2010

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Introduction

Corn hybrid genetics change yearly to increase productivity. The newer hybrids appear to possess plant characteristic that allow for higher plant populations. Over the past several years, field trials across the state have found support for higher plant populations in corn. This trial was designed to collect information to aid in local recommendations.

Materials and Methods

The previous crop was soybean. The soil type is Monona silt loam with slope ranging from 5 to 14 percent slope. The trial was replicated four times with four seeding rates of the same corn hybrid. Seeding rates ranged from 26,197 to 41,549 seed/acre, based on the gear settings of the planter. Plot width was a minimum of 8 rows wide and plot length was a minimum of 570 ft long.

The trial had no fall or spring tillage and was no-till planted. Adequate nitrogen was applied as anhydrous ammonia and weed control was attained with pre- and post-emergence herbicide applications as needed. Grain yield was determined using a yield monitor.

Results and Discussion

The optimum planting population is variable dependent on the weather conditions of each growing season. In 2007, the corn showed mid-season moisture stress, while 2008 through 2010 both had more than adequate moisture in June and July. As a consequence, in 2007, corn grain yields were higher at lower seeding rates and, in 2009 and 2010, grain yields were best at the higher seeding rates (Table 1).

The loess soils of western Iowa don't have the water holding capacity of the glacial till soils to the east. As a result, in-season precipitation is more critical in attaining desired corn yields. Additionally, higher corn populations increase the demand for soil moisture. Therefore, determining the perfect corn seeding rate is not easy unless there is a clear, reliable forecast for the growing season. Figure 1 illustrates how a dry season (2007) and a wet season (2009 and 2010) have contrasting optimal seeding rates.

The penalty of seeding too high in a dry year is much greater than the penalty of seeding too low in a wet year. As a result, overtime the optimal seeding rate for corn in loess soils of western Iowa is between 30,000 and 33,000 seeds/acre.

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Table 1. Grain yield results from four corn seeding rates at the Western Research and Demonstration Farm from 2007 to 2009.

Seeding Rate	Grain Yield				
	2007	2008	2009	2010	4-yr average
seeds/acre	----- bushels/acre -----				
26,197	174.3 a	-	216.6 b	184.9 d	191.9
31,162	163.8 ab	185.9 a	222.6 ab	194.5 c	191.7
36,082	155.4 bc	181.7 a	228.1 a	211.1 a	194.1
41,549	145.8 c	208.7 a	225.4 a	204.4 b	196.1
LSD _(0.05)	16.9	ns	6.8	5.8	n/a

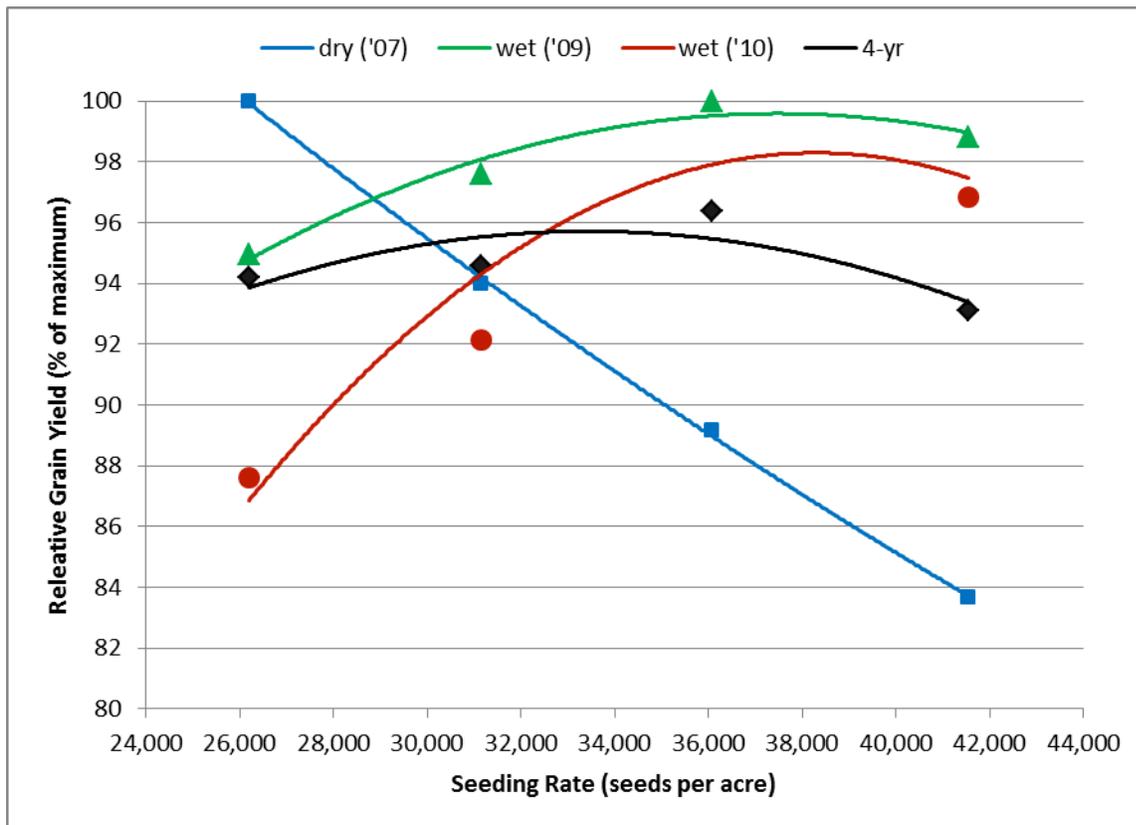


Figure 1. Corn grain yield trendlines for wet (2009 and 2010), dry (2007), and 4-yr average.