

Recommended Planting Rates for Grain Corn on Silt Loam Soils

Bill Cox, Crop & Soil Sciences, Cornell University

Many new corn hybrid releases have stacked traits or have been treated with seed-applied insecticides so seed costs have increased significantly in recent years. Consequently, planting at the correct rate to obtain the optimum harvest population has increased in importance. Planting at too high a rate without a yield benefit reduces profit because of the high seed costs. Planting at too low a rate while incurring a yield loss reduces profit because the lost revenue offsets the reduced input costs for seed. Now more than ever corn producers must plant at the correct rate to maximize profit from the expensive input costs.

We initiated a 3-year plant population study on grain corn at the Aurora Research Farm in Cayuga Co. on a well-drained silt loam soil in 2003 to evaluate the response of 21st century hybrids to harvest populations. We planted a Pioneer and a DeKalb hybrid on 7 May 2003, 6 May 2004, and 29 April 2005. Plots measured 100 by 10 feet and each population for each hybrid was replicated four times for each hybrid. We harvested the center two rows of each plot with an Almaco plot combine when grain moistures averaged about 25%.

Although we did not achieve our targeted harvest populations in all years of the study, the results are very clear. About 26,000 – 27,000 plants/acre at harvest was the optimum harvest population for both hybrids in years of the study (Table 1). The 2003 growing season was conducive for lodging, which limited the yield of DKC53-34, once harvest populations exceeded 24,700 plants/acre. The 2004 growing season was stress-free with lodging problems, but yields topped out at harvest populations of 25,125 plants/acre for DKC53-34 and 27,700 plants/acre for 37F16. The

2005 growing season had significant heat and drought stress but once again DKC53-34 and 37F16 had optimum yields at harvest populations of 26,631 and 25,870 plants/acre, respectively. When averaged across the very different growing seasons, DKC53-34 had optimum yields at harvest populations of 26,785 plants/acre and 37F16 had optimum yields at 26,858 plants/acre. This clearly indicates that harvest populations of about 27,000 plants/acre was optimum on well-drained silt loam soils across very different climatic conditions.

Table 1. Harvest populations and grain yield of a DeKalb and a Pioneer hybrid in 2003, 2004, and 2005 and pooled across years at the Aurora Research Farm in Cayuga Co., NY.							
DKC53-34				37F16			
2003	2004	2005	Avg.	2003	2004	2005	Avg.
-----plants/acre-----							
24700	20310	20870	21960	18420	27700	20000	22040
28600	25125	26631	26785	21580	33125	25870	26858
33160	28000	31305	30822	25090	34875	29565	29260
37020	30440	34457	33972	27370	39000	37066	34479
-----bu/acre-----							
187	178	148	171	165	186	143	165
188	197	152	179	171	189	150	170
187	189	142	173	180	180	134	165
175	188	142	168	186	180	138	168

Moderately well-drained to well-drained silt loam soils represent more than half the grain corn acreage in NY so we believe harvest populations of about 27,000 plants/acre optimum for many grain corn producers in New York. When planting corn from April 25th to May 7th, we assume only an 85% emergence rate and recommend a planting rate for grain corn of about 32,000 plants/acre. When planting corn from May 8th to May 22nd, we assume a 90% emergence rate and recommend a planting rate of about 30,000 plants/acre. When planting corn after May 22nd, we assume a 95% emergence rate and recommend a planting rate of about 28,500 plants/acre.