

Maximizing Corn Yield Potential in Wisconsin

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Corn growers need to set a realistic corn yield goal in order to make sound decisions on hybrid, seeding rate, fertilizer application, and irrigation. **The goal should be the most profitable yield** that can be expected for a particular set of soil, climate, and management practices. The **yield potential** is the maximum production of a crop cultivar that can be achieved in a given environment. To achieve the yield potential, the crop must receive optimum levels of water and nutrients and be completely protected against weeds, pests, diseases, and other factors that may reduce growth. Growth-limiting factors such as water and nutrients determine the **actual yield**. Yield potential is reduced by insufficient nutrients, water supply, diseases, insects, weeds, lodging, or poor soil physical traits and quality. Maximum yields obtained in corn yield contests are reasonable estimates of yield potential because corn is grown in these plots at high density and nutrient supply, and full weed and pest control.

Objectives:

- 1) To maximize corn yield on a Plano silt loam.
- 2) To compare test plot yields at Arlington to the yield of a field managed for maximum yield.

General Management Philosophy

Use management practices thought to maximize yield. Use farm scale equipment. Field = 18.6 A.

Tillage: Fall chisel plow and spring soil finisher. In reference strip #10, use no tillage.

Rotation: Continuous corn. Strip # 5 and #7= soybean

Hybrid = Standard + 2 others to test. Hybrid planted in first reference strip is also planted in headlands. In reference strips #1 and #2, plant hybrids to test as future replacement.

Target planting date = Monday before May 1. Start in southwest corner, finish in no-tillage reference strip

Planter: JD six-row unit.

Planting speed: 4 mph (slightly slower than normal)

Plant population: Seed at 40 000 seeds/A for target of 36 000 harvested plants/A. In reference strip #8 increase by 5000 plants/A

Soil Fertility:

N rate: Use starter fertilizer plus 350 units N/A; split-applied

- 50 units in fall before chisel plow, or manure before chisel plow
- Starter: 200# of 5-14-42 (or 9-23-30 or 6-24-24). In reference strip #6, double starter fertilizer rate (400#). Placement = 2x2.
- 200 units in spring before spring soil finisher, and
- 100 units of 28% urea at lay-by. In reference strip #9, double lay-by N rate (200 units).
- In NT apply urea with air flow spreader

Manure: Fall apply 11,000 gal/A liquid manure

P rate: None

K rate: None

Micronutrients: None

Cultivation: No

Fungicide: Strip #4 Headline

Herbicide: Pre-emerge grass and broadleaf plus post emergence application if necessary with objective to kill all weeds

Insecticide: Force 3G @ 4.4 lb/A

Harvest: GPS Yield map everything. Double-check across scale middle 12 rows of each reference strip. Leave six-row border on each side of reference strip for re-check.

Fall operations: Chop stalks, 50 lb N or manure, chisel

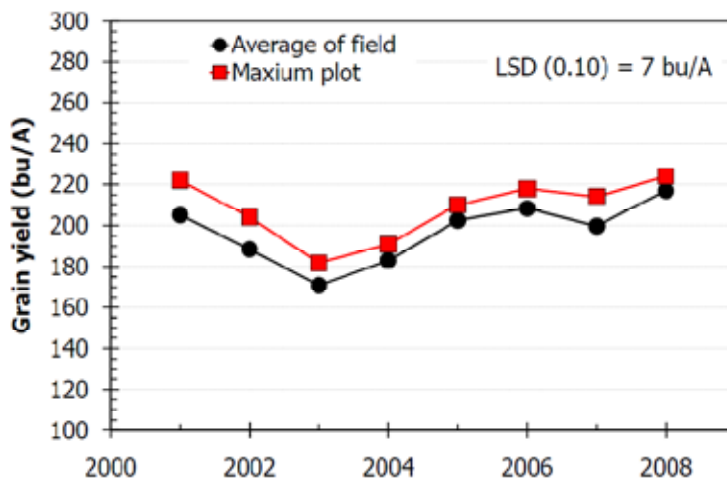


Figure 1. Corn grain yield over time when managed for maximum yield at Arlington, WI.

Table 1. Treatment description of reference strips, grain yields (bu/A) and plant populations (number/A).

Year	Reference Strips									
	1	2	3	4	5	6	7	8	9	10
2009	DeKalb DKC 52-59(VT3)	Pioneer 35F40 with Poncho 1250	Pioneer 35F40 (HX1, LL, RR)	Headline fungicide	Untreated	Double starter fertilizer rate	Soybean	Increase seeding rate by 5000 plants/A	Extra 100 lb N (poly-coated urea at lay-by)	No-tillage
2008	Renk RK770 RRYGCB with Insecticide 213	DeKalb DKC52-47(RR2) with Insecticide 210	Pioneer 35A34 (HXX, RR2, LL) (Planted to rest of field) 214	Spring broadcast Potassium - Sunflower disk ripper 222	Untreated 224	Double starter fertilizer rate 219	Insecticide + Bt-CR trait 223	Increase seeding rate by 5000 plants/A 221	Extra 100 lb N (poly-coated urea) at lay-by 223	No-tillage 201
2007	Pioneer 35A30 187	DeKalb DKC52-40 (YGRWRR) 186	Pioneer 35Y67 (Bt,LL) (Planted to rest of field) 201	Spring broadcast Potassium - Sunflower disk ripper 203	Untreated 204	Double starter fertilizer rate 201	Poncho 1250 214	Increase seeding rate by 5000 plants/A 200	Extra 100 lb N (poly-coated urea) at lay-by 208	No-tillage 193
2006	NK Brand N50-P5 (Bt,LL) 205	Renk 636YGRW (BtCR) 202	Pioneer 35Y67 (Bt,LL) (Planted to rest of field) 211	Fall broadcast Potassium - chisel plow 207	Untreated 213	Double starter fertilizer rate 212	Poncho 1250 218	Increase seeding rate by 5000 plants/A 207	Extra 100 lb N (28% N) at lay-by 214	No-tillage 194
2005	Pioneer 35Y67 (Bt,LL) 208	AgriGold A6333Bt (Bt) 194	DeKalb DKC5878YG (Planted to rest of field) 199	Deep placement of Potassium 205	Untreated 204	Double starter fertilizer rate 202	Poncho 1250 210	Increase seeding rate by 5000 plants/A 200	Extra 100 lb N at lay-by 202	No-tillage 201
2004	Pioneer 34M95 182 40000	DeKalb DKC5878YG 191 40330	AgriGold A6333Bt (Planted to rest of field) 178 35000	Deep placement of Potassium 186 35500	Untreated 186 37500	Double starter fertilizer rate 184 37500	Untreated 180 33500	Increase seeding rate by 5000 plants/A 188 42000	Extra 100 lb N at lay-by 184 35500	No-tillage 172 29500
2003	Pioneer 35Y65 172 37000	Mycogen 4521Bt 143 39000	Pioneer 35R58 (Planted to rest of field) 175 35000	Spring broadcast Potassium - chisel plow 180 36000	Untreated 182 39000	Double starter fertilizer rate 174 40000	Untreated 173 35000	Seeding rate = 45000 plants/A 178 40000	Extra 100 lb N at lay-by 175 40000	No-tillage 157 40000
2002	AgriGold 6382 192 32750	Midwest 7101B 155 38250	Pioneer 35R58 (Planted to rest of field) 186 34250	Half-speed at harvest 184 33500	Untreated 201 31750	Double starter fertilizer rate 204 34000	Half-speed planting 188 34750	Seeding rate = 45000 plants/A 186 37000	Extra 100 lb N at lay-by 196 33250	No-tillage 194 33750
2001	Pioneer 35R58 --- 222 35500	Pioneer 35R58 --- 222 35500	Pioneer 35R58 --- 222 35500	Midwest G7711 192 37250	Midwest G7711 --- 201 31750	DeKalb DK493 206 34000	Growmark FS3969 202 36500	Growmark FS3969 --- 202 36500	Cargill 4521 199 40000	Cargill 4521 --- 201 37250