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


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

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**Figure 1. Corn grain yield over time when managed for maximum yield at Arlington, WI.**
<table>
<thead>
<tr>
<th>Year</th>
<th>Reference Strips</th>
<th>Grain Yields (bu/A)</th>
<th>Plant Populations (number/A)</th>
<th>Extra 100 lb N (poly-coated urea at lay-by)</th>
<th>No-tillage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>DeKalb DKC 52-59(VT3)</td>
<td>DeKalb DKC 52-59(VT3)</td>
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<tr>
<td>2008</td>
<td>Renk RK770 RRYGCB with Insecticide 213</td>
<td>DeKalb DKC52-47(RR2) with Insecticide 210</td>
<td>Pioneer 35A34 (HX1, LL, RR) 214</td>
<td>224</td>
<td>219</td>
</tr>
<tr>
<td>2007</td>
<td>Pioneer 35A30 187</td>
<td>DeKalb DKC52-40 (YGRWRR) 201</td>
<td>Pioneer 35Y67 (Bt, LL) (Planted to rest of field) 211</td>
<td>204</td>
<td>201</td>
</tr>
<tr>
<td>2006</td>
<td>NK Brand N50-P5 (Bt,LL) 205</td>
<td>Renk 636YGRW (Bt,CR) 200</td>
<td>Pioneer 35Y67 (Bt, LL) (Planted to rest of field) 199</td>
<td>205</td>
<td>204</td>
</tr>
<tr>
<td>2005</td>
<td>Pioneer 35Y67 (Bt,LL) 201</td>
<td>AgriGold A6333Bt (Bt) 194</td>
<td>DeKalb DKC5878YG (Planted to rest of field) 205</td>
<td>204</td>
<td>202</td>
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<td>2004</td>
<td>Pioneer 34M95 182</td>
<td>DeKalb DKC5878YG 191</td>
<td>AgriGold A6333Bt (Planted to rest of field) 178 35000</td>
<td>186 35500 186 37500</td>
<td>180 33500 180 35000 180 33500</td>
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<tr>
<td>2003</td>
<td>Pioneer 35Y65 172</td>
<td>Mycogen 4521Bt 143</td>
<td>Pioneer 35R58 (Planted to rest of field) 175 35000</td>
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<tr>
<td>2002</td>
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<td>Midwest 7101B 155</td>
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<td>188 34750 186 37000 186 37000</td>
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<tr>
<td>2001</td>
<td>Pioneer 35R58 222</td>
<td>Pioneer 35R58 222</td>
<td>Pioneer 35R58 222</td>
<td>201 31750 201 31750 201 31750</td>
<td>196 33250 196 33250 196 33250</td>
</tr>
</tbody>
</table>

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