

Effect of Row Direction on Corn Grain Yield in Silage Production

2013

Rationale

- Where terrain permits, corn rows can be planted in either a north-south or an east-west direction.
- Sunlight penetrates more deeply into the plant canopy with north-south than with east-west rows.

Objectives

- Compare corn grain yields in silage production between corn rows planted north-south versus east-west directions.
- Compare grain yields at two plant populations.

Study Description

Location: 1 in central Illinois**Years:** 2011-2012**Hybrids:** 2 in 2011, 3 in 2012**Row Spacing:** 30 inches**Factors:****Row Direction:** North-south, East-west**Plant Population:** 28,000 and 34,000 plants/acre

- Grain yield, kernel weight and kernels/ear were measured at the time of silage harvest.

Results

Row Direction

- Corn grain yield was significantly greater in north-south rows than in east-west rows in 2011, but did not differ between row directions in 2012.
- The average yield advantage of north-south rows over the two years of the study was 10%.
- The greater yield observed in north-south rows was largely attributable to significantly greater kernel weight.
- Number of kernels/ear was significantly greater in north-south rows in 2011 but not 2012.

Plant Population

- Grain yield was significantly greater with a plant population of 34,000 plants/acre than 28,000 plants/acre in both years of the study.
- The average yield advantage with the greater plant population was 25% over the two years of the study.
- The greater yield was primarily due to more ears/acre.
- Kernel weight was not affected by plant population.
- Plant population effect on kernels/ear was inconsistent between the two years of the study.

Measurement	East-West	North-South	Probability Level	28,000 plants/acre	34,000 plants/acre	Probability Level
Grain Yield at Silage Harvest (bu/acre)						
2011	110	130	P < 0.02	98	141	P < 0.01
2012	175	177	P < 0.67	170	182	P < 0.02
Weight/1000 kernels (g)						
2011	331	375	P < 0.01	349	347	P = 0.81
2012	322	342	P < 0.01	335	330	P = 0.47
Kernels/ear						
2011	486	540	P < 0.01	493	535	P < 0.02
2012	462	468	P = 0.65	487	442	P < 0.01

Research conducted by Dr. Paul Walker, Illinois State University, as a part of the DuPont Pioneer Crop Management Research Awards (CMRA) Program. This program provides funds for agronomic and precision farming studies by university and USDA cooperators throughout North America. The awards extend for up to four years and address crop management information needs of DuPont Pioneer agronomists, Pioneer sales professionals and customers.

2011-2012 data are based on average of all comparisons made in one location through Dec. 31, 2012. Multi-year and multi-location is a better predictor of future performance. Do not use these or any other data from a limited number of trials as a significant factor in product selection. Product responses are variable and subject to a variety of environmental, disease, and pest pressures. Individual results may vary.