

5, 50 and Fungicide: Final SMART Corn Summary (Thames Valley SCIA Partner Grant – Final Report)

Purpose:

This project was initiated to evaluate the yield and economic response to more intensive corn management practices through increasing plant populations, nitrogen rates and fungicide application relative to existing grower practices.

Methods:

The yield response of SMART managed plots (standard grower practice plus an additional 5,000 seed/acre, an additional 50 lbs/ac of nitrogen, and a fungicide application) relative to the standard practice of each co-operator were compared through replicated strip plots within a field at each trial. A total of seventeen site-years of data were collected across four growing seasons in Middlesex County.

Results:

Corn yield response to SMART management practices were variable, with yield increases at thirteen trials, no response at one trial, and yield decreases at three trials (Table 1). The overall average response to SMART management practices across all site years was +7 bu/ac.

Table 1. Corn yield response to SMART management practices across fourteen site-years in Middlesex County, 2011-2014.

Year	Trial	Control	SMART	Response*
		----- bu/ac -----		
2011	1	223	230	+7
2011	2	166	156	-10
2011	3	228	215	-13
2011	4	196	210	+14
2011	5	200	200	0
2011	6	164	170	+6
2011	7	239	251	+12
2011	8	236	263	+27
2012	9	186	188	+2
2012	10	199	192	-7
2012	11	169	178	+9
2013	12	211	226	+15
2013	13	177	187	+10
2013	14	181	190	+9
2013	15	199	216	+17
2013	16	190	196	+6
2014	17	182	196	+14
Average		197	204	+7

*numbers may not appear to add up due to rounding

The total additional cost for SMART management practices in 2014 was estimated to be \$67/ac (Table 2), which assuming a corn price of \$4.50/bu would result in a breakeven yield requirement of 15 bu/ac. This was higher than the average 7 bu/ac yield response across all seventeen trials from 2011-2014. Only 2 trials (8, 12) yielded higher than the breakeven yield in this dataset.

Table 2. Cost estimates for SMART management practices in Ontario for the 2014 growing season.

Practice	Adjustment	Cost
Population	+ 5,000 seed/ac @ \$290/80,000	\$18/ac
Nitrogen	+ 50 lb/ac N @ \$600/tonne Urea	\$29/ac
Fungicide	1 Application @ \$20/ac (incl. app)	<u>\$20/ac</u>
	Total cost.	\$67/ac

Summary:

Corn yield response to further intensifying nitrogen, population and fungicide relative to existing management practices was variable across the seventeen field trials conducted from 2011-2014. Across all trials, the average yield response of 7 bu/ac was less than the breakeven yield requirement of 15 bu/ac. While a positive yield response was observed at eleven trials, only two were economical. On average, this data suggests that SMART practices did not deliver economic benefits relative to these growers' standard practices. Given the fact that standard grower practices were not the same across all trials, actual yield responses may depend on the relative aggressiveness of existing practices. The 2014 growing season has now concluded this project with the Middlesex Soil and Crop Improvement Association.

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