Corn Intensive Management

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The corn intensive management trial is an evolving trial aimed at identifying a combination of production factors that lead to the maximum yield potential in corn for central North Dakota. This trial began in 2012 in Carrington and Prosper, and the first stage of the trial concluded in 2013 at both locations. The trial was established to examine differences between a multitude of factors including hybrid maturity, 26,000 vs 34,000 plants/ac, VT fungicide vs. no fungicide, the corn seed treatments Poncho (insecticide) vs. Votivo (insecticide + nematicide), and a combination of V6 fungicide, foliar micronutrients and in-furrow applications of either MAP or MESZ (MAP + sulfur).

Plant population, hybrid maturity, and V6 fungicide did not influence yield in any environment tested. Foliar micronutrients, in-furrow MAP, and in-furrow MESZ did not increase yield but reduced yield in Prosper in either one or two years (Table 1), only Headline + foliar micronutrients reduced yield one year in Carrington. MAP and MESZ conferred very visual effects in the early growing season. The 2012 growing season in Carrington was the most evident as plots treated with these products were 6” or more taller and had a deeper green color than other plots. Similar but less dramatic results were seen in the other environments. These growth differences carried through until tasseling, at which point all plants reached a similar height, although both years in Carrington the ears were two or more inches lower than in other plots. The end result was no difference in yield at Carrington, but a reduction in yield at Prosper.

Contrasts in corn as influenced in-furrow fertilizer placement.

VT application of Headline significantly affected yield in one environment (Carrington 2012). There was a numerical increase in yield in each of the other three environments but they were not statistically greater. Adding Votivo as a seed treatment provided a boost to yield in 2012 at Carrington. There was a slight numerical advantage from this addition in Prosper both years. In 2013 at Carrington, there was a decline in yield due to this application. The decline in yield from this seed treatment occurred at the higher plant population, whereas the yield of Poncho alone or with Votivo was identical at the lower population (data not shown). This may indicate a combination of a dose effect (more seed = more seed trt/ac) and lack of nematode pressure at this location, although the combination of high population and Votivo positively affected yield in Prosper (slightly).

The interesting combination in three out of four years (excluding Carrington in 2013) is Votivo plus a VT application of Headline. Both years in Prosper, this combination worked additively where the total

increase of applying both products was equal to the increase provided by each product alone (Table 2). In 2012 at Carrington applying both products increased the yield beyond the increase from the individual products (7.5 + 7.5 < 15.9), indicating a synergistic effect.

Table 1. Prosper treatment effects from 2012 and 2013.

Treatment Name	Prosper		Carrington	
	2012 Yield bu/a	2013 Yield bu/a	2012 Yield bu/a	2013 Yield bu/a
Nontreated	201.3	172.4	153.6	129.3
V6 Headline	199.0	174.8	158.0	131.6
Headline + V5 Awaken	201.6	163.6	159.9	126.7
Headline + Awaken + MAP	183.7	164.3	160.9	131.8
Headline + Awaken + MESZ	183.7	165.0	157.1	130.9
C.V. (%)	10.1	10.9	9.4	13.0
LSD (0.1)	8.1	8.1	N.S.*	4.8

*no significant difference

Table 2. Effect of seed treatment and VT fungicide.

Treatment Name	Prosper				Carrington			
	2012		2013		2012		2013	
	Yield bu/a	Increase* %	Yield bu/a	Increase %	Yield bu/a	Increase %	Yield bu/a	Increase %
Headline	197.5	3.8	170.0	2.4	163.8	7.5	130.5	0.7
Poncho + Votivo	194.6	0.8	169.1	1.2	163.5	7.5	126.9	-4.2
Headline + Poncho + Votivo	200.9	4.6	171.9	3.6	166.3	15.9	127.0	-5.7

*indicates an increase over treatments with either no Headline, no Votivo, or both.

Corn intensive management evaluation.