

Title of Project: AgroLiquid Fertilizer Trial – Commercial Pepper Production – 2016

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Methods:

Pepper transplants (var. Aristotle) were obtained from a local greenhouse grower and were planted by hand June 17, 2016 on a Brookston clay loam sand spot phase soil at the University of Guelph Ridgetown Campus research station. A pre-plant incorporated application of Treflan (trifluralin) was used to control weeds, followed by hand-hoeing for the rest of the season. Peppers were monitored for insect pests; no insecticide was needed. Drip irrigation was used to keep soil moisture tension below 30 kPa, as per tensiometer readings.

The trial was arranged in randomized complete block design, with plots consisting of a single row 8 m long. Rows were spaced 1 m apart, with two buffer rows between each plot row. Plants were spaced 45 cm apart within the row. Treatments were applied as follows:

Trt	Timing	Product	Rate
1	PPI	0-0-60	504 kg/ha
	Transplant	6-24-6	31.6 L/ha
		6-24-6	158 L/ha
	Side dress 2 WAP	28% UAN	310 L/ha
		6-24-6	158 L/ha
	Side dress 4 WAP	28% UAN	310 L/ha
2	Transplant	Pro-Germinator	9.35 L/ha
		Micro 500	9.35 L/ha
		MicroLink Mn	2.3 L/ha
	Side dress 2 WAP	High NRG-N	84.2 L/ha
		28% + eNhance	102.9 L/ha
		Sure-K	140.25 L/ha
		Pro-Germinator	46.75 L/ha
	Side dress 4 WAP	High NRG-N	84.2 L/ha
		28% + eNhance	102.9 L/ha
		Sure-K	130.9 L/ha
		Pro-Germinator	37.4 L/ha
	3	Transplant	Pro-Germinator
Micro 500			9.35 L/ha
MicroLink Mn			2.3 L/ha
Side dress 2 WAP		High NRG-N	84.2 L/ha
		28% + eNhance	102.9 L/ha
		Sure-K	140.25 L/ha
		Pro-Germinator	46.75 L/ha
Side dress 4 WAP		High NRG-N	84.2 L/ha
		28% + eNhance	102.9 L/ha

		Sure-K	130.9 L/ha
		Pro-Germinator	37.4 L/ha
	Foliar (Weekly after 5 WAP)	Ferti-Rain	4.7 L/ha

NOTE: Due to availability, 6-24-6 was substituted for 10-34-0, adjusting for the equivalent amount of N applied. Side dress applications were made by hoeing a trench alongside the row and applying the product in the trench.

Harvests were conducted weekly beginning August 18th and ending September, collecting only fruit with a diameter of 6.35 cm (2.5") or greater. Peppers were graded into marketable (≥ 2.5 " diameter and free of defects), small (< 2.5 " diameter and free of defects) and unmarketable (defected) categories, counted, and weighed. At the second harvest, fruit length, diameter and wall thickness were determined from five random marketable fruit per plot.

Discussion:

The summer of 2016 was hot and dry, but peppers established well after transplanting. There were no adverse effects observed from the transplant fertilizer application, but following the side dress 2 WAP, plants in all treatments wilted. Most plants recovered, but in some, the growing point turned black and slimy, and the plant died. There was no statistical difference in plant numbers among treatments following the first side dress application, though treatments 2 and 3 generally had 5 less plants per row than treatment 1. As all treatments were affected, it is believed that the plants were stressed due to weather conditions prior to application, and the level of nitrogen in the application determined the severity of the effect. As a result, yields of treatments 2 and 3 were numerically lower than treatment 1 (Table 1), but there was no significant difference in yield or fruit quality (Table 2).

Table 1. Yield characteristics of commercial pepper fertilizer applications.

Treatment	Total yield Mg/ha	Marketable yield Mg/ha	Yield per plant g
1	15.5	13.9	1097.4
2	9.4	8.2	972.0
3	10.8	9.5	1103.6
CV	32.78	36.86	18.61
Prob (F)	0.1189	0.1396	0.534

Table 2. Fruit quality characteristics of commercial pepper applications.

Treatment	Fruit Weight g	Length cm	Diameter cm	Wall Thickness mm
1	174.8	8.3	7.7	4.7
2	177.5	8.6	7.9	5.1
3	180.4	8.6	7.3	5.3
CV	4.59	6.28	10.76	9.78
Prob (F)	0.5835	0.6902	0.6023	0.2377