

# 2021 Agro-Expo Demonstration Plot

## Biosolids vs. Commercial Fertilizer



<p><b>Crop:</b> Soybeans  <b>Variety:</b> Pioneer P21A28X  <b>Planting Date:</b> May 12, 2021  <b>Planting Population:</b> 140,000  <b>Yield Goal:</b> 80 bu/acre  <b>Harvest Date:</b> October 28, 2021</p>			
<b>Fertilizer Side</b>		<b>Biosolids Side</b>	
<b>Soil Test Results</b>		<b>Soil Test Results</b>	
<b>NW Plot</b>	<b>SW Plot</b>	<b>NE Plot</b>	<b>SE Plot</b>
Bray P1: 13 ppm Potassium (K): 75 ppm Calcium (Ca): 750 ppm Magnesium (Mg): 135 ppm Zinc (Zn): 3.0 ppm Manganese (Mn): 57 ppm pH: 7.0 Cationic Exchange Capacity (CEC): 5.1 meq/100g	Bray P1: 18 ppm Potassium (K): 90 ppm Calcium (Ca): 900 ppm Magnesium (Mg): 165 ppm Zinc (Zn): 8.2 ppm Manganese (Mn): 61 ppm pH: 7.4 Cationic Exchange Capacity (CEC): 6.1 meq/100g	Bray P1: 15 ppm Potassium (K): 80 ppm Calcium (Ca): 750 ppm Magnesium (Mg): 135 ppm Zinc (Zn): 3.0 ppm Manganese (Mn): 55 ppm pH: 7.2 Cationic Exchange Capacity (CEC): 5.1 meq/100g	Bray P1: 31 ppm Potassium (K): 102 ppm Calcium (Ca): 800 ppm Magnesium (Mg): 145 ppm Zinc (Zn): 4.1 ppm Manganese (Mn): 56 ppm pH: 7.4 Cationic Exchange Capacity (CEC): 5.5 meq/100g
<b>Fertilizer</b>		<b>Biosolids<sup>1</sup></b>	
April 26, 2021: Fertilizer Applied 46-0-0: 21 #/Acre 11-52-0: 154 #/Acre 0-0-62: 306 #/Acre 21-0-0-24S: 21.5 #/Acre 20% Zn: 10 #/Acre PAN <sup>2</sup> applied: 40 #/acre		April 29, 2021: Biosolids Applied 1.5 Tons/Acre PAN <sup>2</sup> : 41 #/Acre Phosphate (P <sub>2</sub> O <sub>5</sub> ): 80 #/Acre Potash (K <sub>2</sub> O): 7.5 #/Acre Sulphur (S): 15 #/Acre Zinc (Zn) 2.1 #/Acre 0-0-62: 306 #/Acre	
<b>Yields (Bushels/Acre)<sup>4</sup></b>			
<b>NW Plot</b>	<b>SW Plot<sup>3</sup></b>	<b>NE Plot</b>	<b>SE Plot<sup>3</sup></b>
<b>85</b>	<b>87</b>	<b>94</b>	<b>85</b>
<b>Harvest Populations (Plants/Acre)<sup>4</sup></b>			
<b>105,000</b>	<b>106,000</b>	<b>105,500</b>	<b>108,000</b>
<p><sup>1</sup> Source: New England Fertilizer Company (NEFCO) Detroit, Michigan  <sup>2</sup> PAN = Plant Available Nitrogen  <sup>3</sup> No Till Cover Crops seeded  <sup>4</sup> Estimated</p>			

# Agro Expo Biosolids Site – 2021

## Soil Test Information

Date	pH	Bray P1	K	Ca	Mg	S	Iron (Fe)	Copper (Cu)	Mn	Boron (B)	Zn	CEC	Organic Matter
		----- ppm -----										Meq/100g	%
<b>North East Plot (Biosolids)</b>													
4/6/20	7.1	11	64	800	130	2	25	0.7	59	0.3	2.5	5.2	1.7
3/23/21	7.2	15	80	750	135	8	29	1.0	55	0.5	3.0	5.1	1.3
<b>South East Plot (Biosolids)</b>													
4/6/20	7.4	10	60	900	125	2	26	0.6	59	0.3	2.5	5.7	1.5
3/23/21	7.4	31	102	800	145	7	34	1.1	56	0.6	4.1	5.5	1.6
<b>North West Plot (Fertilizer)</b>													
4/6/20	7.1	12	57	700	120	4	26	0.7	62	0.3	2.5	4.6	1.6
3/23/21	7.0	13	75	750	135	8	30	0.9	57	0.6	3.0	5.1	1.2
<b>South West Plot (Fertilizer)</b>													
4/6/20	7.5	11	65	900	135	2	28	0.7	66	0.5	3.0	5.8	1.8
3/23/21	7.4	18	90	900	165	7	30	0.9	61	0.9	8.2	6.1	1.5

## 2021 Crop – Soybeans (var. Pioneer P21A28X)

The north plots were chisel plowed in the fall of 2020. The south plots were not tilled. Biosolids were applied on April 29, 2021, and were supplied by NEFCO from Detroit. The soybeans were planted on May 12, 2021. Fertilizer was applied on April 26, 2021. A pre-emergence application of Dual II Magnum® at 1.33 pt/ac was applied over all plots, and a post-emergence application of Roundup Ready WeatherMax® at 1 qt/ac was applied over all plots. All the plots were irrigated in 2021 on the following schedule:

- May 26: 0.5"
- June 3: 1"
- June 15: 1"
- July 20: 0.4"
- July 28: 1"
- August 2: 1"

## Biosolids and Fertilizers Applied

Based on the 2021 soil test results, recommended phosphate levels were about 80 pounds/acre for all plots and potash levels were 190 pounds per acre for all plots. NEFCO biosolids were applied at a rate of 1.5 tons per acre on April 29, 2021. At this rate 41 pounds PAN, 80 pounds phosphate, 190 pounds potash, 15 pounds Sulphur, and 2.1 pounds Zinc per acre were applied to the east plots. 154 pounds of 11-54-0, 21 pounds 46-0-0, 306 pounds 0-0-62, 21.5 pounds 21-0-0-24S, and 10 pounds 20 percent Zn per acre were applied to the west plots on April 26, 2021. These fertilizer applications equated to 40 pounds PAN, 80 pounds phosphate, 190 pounds potash, 15 pounds Sulphur, and 2 pounds Zinc per acre.