



## DIAGNOSTIC SOIL TESTS

**Objective of Test:** To determine the nutrient levels of select soils with and without Orykta® added for the purpose of establishing recommendations for achieving optimal fertilizer application rates.

### Scope of Tests:

1. Soil samples were taken from nine fields representing typical soils found in various agricultural regions around China.
2. Soil nutrient levels were analyzed by the Testing Authority.
3. Based on the Testing Authority soil analyses, fields were treated with Orykta® on a tons-per-HA (hectare) basis. Application rates were 1 Ton/HA, 1.5 Tons/HA and 2 Tons/HA depending on original soil analysis for the field being treated.

*Note: (1) No NPK fertilizers were added to the soils for this test. Nutrient levels in the non-treated soil samples reflect levels remaining from previous fertilizer applications (previous harvests).*

### Synopsis of Results:

- A comparative analysis indicates that soils treated with Orykta® had closer to optimum pH levels and nutrients than non-treated soils.
- In all cases a reduction in N or NPK fertilizers appears recommendable.
- Based on comparative analysis, recommendations were made for adjusting soil nutrient input per field.

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PARK, PA

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INDEPENDENT  
TESTING  
AUTHORITY:  
AGRICULTURAL  
ANALYTICAL  
SERVICES  
LABORATORY  
COLLEGE OF  
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**Agricultural Analytical Services Laboratory**  
**College of Agricultural Sciences**  
**The Pennsylvania State University**

**Soil Nutrients Levels**

**Lab Results**

FIELD	Soil Nutrients Levels				Lab Results									
	Soil pH	Phosphate (1b/A)	Potash (1b/A)	Magnesium (1b/A)	Soil pH	P lb/A	Acidity	Exchangeable Cations				% Saturation		
								K	Mg	Ca	CEC	K	Mg	Ca
1 – Not Treated	7.9	354	1348	2362	7.9	154	0	1.44	6.2	33.8	22.6	6.3	27.2	66.3
1T - Orykta®	6.5	272	1170	2189	6.5	118	2	1.25	5.7	35	24	5.2	23.7	62.5

Control field: Excessive high pH. High to excessive concentrations of some nutrient levels indicating nutrient lock up.  
 Field with Orykta®: Lowered pH. Increased CEC – (increase in nutrient uptake availability). More balanced nutrient levels.

2 – Not Treated	6	322	178	692	6	140	2.5	0.19	1.8	9.3	13.7	1.3	13.1	67.5
2T - Orykta®	4.4	156	187	715	4.4	68	11.4	0.2	1.9	23.5	28.5	0.7	6.5	52.6

Control field: Low pH. Low CEC, soil imbalance.  
 Field with Orykta®: Lowered pH. Increased CEC – (increase in nutrient uptake availability). More balanced nutrient levels.

3 – Not Treated	8.2	61	496	3748	8.2	27	0	0.53	9.8	75	25.3	2	38.5	59.2
3T - Orykta®	6.8	74	412	3055	6.8	32	0	0.44	8	30	23.4	1.8	33.9	64.1

Control field: Excessive high pH. High to excessive concentrations of some nutrient levels indicating nutrient lock up  
 Field with Orykta®: Lowered pH. More balanced nutrient levels.

4 – Not Treated	5.9	23	402	1003	5.9	10	2.5	0.43	2.6	12.3	17.8	2.4	14.6	68.8
4T - Orykta®	4.7	5	346	888	4.7	2	6.5	0.37	2.3	18.5	24.2	1.5	9.5	61.9

Control field: Low pH. Low CEC, soil imbalance.  
 Field with Orykta®: Lowered pH. Increased CEC – (increase in nutrient uptake availability). More balanced nutrient levels.

5 – Not Treated	7.7	438	627	1206	7.7	191	0	0.67	3.1	28.8	18.8	3.5	16.7	79.7
5T - Orykta®	6.7	354	496	1084	6.7	154	2	0.53	2.8	32.5	20.4	2.5	13.8	73.5

Control field: High pH. Excessive P2O5 indicating imbalanced soil  
 Field with Orykta®: Lowered pH. Increased CEC – (increase in nutrient uptake availability). More balanced nutrient levels.

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**Soil Nutrients Levels**

**Lab Results**

FIELD	Soil Nutrients Levels				Lab Results										
	Soil pH	Phosphate (1b/A)	Potash (1b/A)	Magnesium (1b/A)	Soil pH	P lb/A	Acidity	Exchangeable Cations				% Saturation			
								K	Mg	Ca	CEC	K	Mg	Ca	
6 – Not Treated	7.3	52	112	184	7.3	23	0	0.12	0.5	24	15.6	0.7	3	96.1	
6T - Orykta®	6.8	12	140	311	6.8	5	0	0.15	0.8	35	16	0.9	5	93.7	
Control field: High pH. Low nutrient levels. Low CEC indicating low availability.															
Field with Orykta®: Lowered pH. Increased CEC – (increase in nutrient uptake availability). More balanced nutrient levels.															
7 – Not Treated	7.7	351	777	1784	7.7	153	0	0.83	4.6	27.5	20.5	4	22.6	73.1	
7T - Orykta®	7	219	646	1611	7	95	0	0.69	4.2	35	19.9	3.4	21	75.3	
Control field: High pH. High nutrient levels indicating nutrient lockup.															
Field with Orykta®: Lowered pH. More balanced nutrient levels.															
8 – Not Treated	7.5	37	262	530	7.5	16	0	0.28	1.4	24.5	16.7	1.6	8.2	89.8	
8T - Orykta®	6.4	5	234	576	6.4	2	2	0.25	1.5	37.5	18.8	1.3	7.9	79.7	
Control field: High pH. Low nutrient levels, low CEC indicating low availability.															
Field with Orykta®: Lowered pH. Increased CEC – (increase in nutrient uptake availability). More balanced nutrient levels.															
9 – Not Treated	7.8	251	646	1726	7.8	109	0	0.69	4.5	28.8	20.2	3.4	22.2	74.2	
9T - Orykta®	7	208	618	1668	7	90	0	0.66	4.3	31.3	20	3.3	21.7	75	
Control field: Excessively high pH. High P2O5 and MgO indicating nutrient lockup															
Field with Orykta®: Lowered pH. More balanced nutrient levels.															