

Analysis of Fertilizer Products Sold in Connecticut During 2023

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INTRODUCTION

In the State of Connecticut, the Agricultural Commodities Division of the Department of Agriculture is responsible for the regulation and inspection of commercial fertilizer products. A sampling of these products is delivered to The Connecticut Agricultural Experiment Station for analysis to ensure label compliance.

METHODS

After delivery to The Connecticut Agricultural Experiment Station these products were sub-sampled and prepared for analysis. The samples were analyzed for nitrogen, (N), phosphorus (P; as P₂O₅) and potassium (K; as K₂O) using standard analytical methods. In some cases, secondary and micronutrients (Ca, S, Mg, Cu, Fe and Zn) analysis is requested. Fertilizer samples are readied for analysis by hot nitric acid digestion using a SCP Sciences Hot Block. The nitrogen content is determined by using a Leco FP-828 combustion analyzer. P and K nutrient content along with requested micronutrients are determined using a Thermo Scientific iCAP PRO Inductively Coupled Plasma -Optical Emission Spectroscopy (ICP-OES).

RESULTS AND DISCUSSION

From January 1, 2023, to December 1, 2023, the Department of Analytical Chemistry at The Connecticut Agricultural Experiment Station analyzed 32 fertilizer products that were for sale in Connecticut. These products were collected by Agricultural Commodities Inspectors at The Connecticut Department of Agriculture. The products were collected at manufacturing facilities and wholesale dealers as well as from retail stores. The fertilizer products tested, the sample analysis results and the guarantees for January 2023 through December 31, 2023, can be found in Table 1.

Fertilizer products are reported to be unsatisfactory (failed) if the nutrient amount in the sample is found to differ from the label guarantee according to the percent analytical variation guidelines as established by the Association of American Plant Food Control Officials (AAPFCO).

The number of samples deemed unsatisfactory in 2023 was 7. Specifically, 1 sample failed for N (representing 3.1 % of the total samples), 1 sample failed for both P and K (representing 3.1% of the total samples), and 5 samples failed for K (representing 15.6% of the total samples). These samples deemed unsatisfactory can be seen in Table-1.

Table 1. Fertilizer Products Analyzed in 2023 Note: * At or below method detection limit of 0.5 ** At or below method level of quantitation of 0.01 *** Not Requested
 ^ Not Done ^^ Guarantee/Adjusted Guarantee according to AAPFCO analytical variation guidelines.

Sample Number	Analysis	Brand Name	N			P2O5			K2O		
			Amount (%)	Pass/Fail	G/Adj G^^	Amount (%)	Pass/Fail	G/Adj G^^	Amount (%)	Pass/Fail	G/Adj G^^
Fert23 - 001	K	Earth Juice Hi-Brix Molasses For Plants	NR***	NR***	NR***	NR***	NR***	NR***	2.1	Pass	1/0.59
Fert23 - 002	NPK	FoxFarm Grow Big Liquid Plant Food	6.2	Pass	6/5.7	3.9	Pass	4/3.3	3.9	Pass	4/3.6
Fert23 - 003	PK	Clonex Clone Solution	ND^	ND^	ND^	0.71	Pass	0.6/-0.07	2.2	Pass	1/0.59
Fert23 - 004	PK	FoxFarm Cultivation Nation Bloom	NR***	NR***	NR***	6.6	Pass	5/4.3	5.4	Pass	4/3.6
Fert23 - 005	NPK	General Hydroponics Floralicious Organic Base Enhancer	1.3	Pass	1/0.78	1	Pass	0.7/0.03	0.62	Pass	0.6/0.19
Fert23 - 006	NPK	Miracle Gro Blooming Houseplant Food	0.52	Pass	0.5/0.29	1.1	Pass	1/0.33	0.52	Pass	0.5/0.09
Fert23 - 007	NPK	Espoma Organic Orchid! Bloom Booster	1.1	Pass	1/0.78	2.8	Pass	3/2.3	4.1	Pass	1/0.59
Fert23 - 008	NPK	Neptune's Harvest Fish and Seaweed Fertilizer	2	Pass	2/1.8	3.6	Pass	3/2.3	0.78	Pass	1/0.59
Fert23 - 009	NPK	Jobs Fruit Tree Spikes	14.5	Pass	8/7.6	13.5	Pass	11/10.3	11.6	Pass	11/10.3
Fert23 - 010	NPK	Jobs Fertilizer Spikes Tomatoes	10.1	Pass	6/5.7	22.2	Pass	18/17.3	3.3	Failed	6/5.5
Fert23 - 011	NPK	Miracle Gro Indoor Plant Food Spikes	6.6	Pass	6/5.7	12.2	Pass	12/11.3	5	Failed	6/5.5
Fert23 - 012	NPK	Miracle Gro All Purpose Plant Food	25.1	Pass	24/23.3	8.5	Pass	8/7.3	14.9	Failed	16/15.1
Fert23 - 013	NPK	Espoma Organic Bio-tone Starter Plus	4.4	Pass	4/3.7	4.8	Pass	3/2.3	3.6	Pass	3/2.6
Fert23 - 014	NPK	Hurricane Hydroponics Tropical Storm	1	Pass	1/0.78	2	Pass	2/1.3	3.6	Pass	4/3.6
Fert23 - 015	NPK	Schultz Plant Food	9.4	Pass	10/9.6	15.4	Pass	15/14.3	9.3	Pass	10/9.3
Fert23 - 016	NPK	Bonide Liquid Plant Food	9.2	Pass	10/9.6	9.9	Pass	10/9.3	9.2	Failed	10/9.3
Fert23 - 017	NPK	Alpaca Grow The worlds most natural plant food	1.3	Failed	1.7/1.5	1.5	Pass	1.8/1.1	0.61	Pass	0.7/0.29
Fert23 - 018	NPK	Osmocote Flower and Vegetable	14.4	Pass	14/13.5	12.2	Failed	14/13.3	11.2	Failed	14/13.1
Fert23 - 019	NPK	Jack's Classic Blossom Booster	11.4	Pass	10/9.6	30.8	Pass	30/29.3	20.6	Pass	20/18.9
Fert23 - 021	NPK	Espoma Garden Food	5.1	Pass	5/4.7	9.3	Pass	10/9.3	3.7	Failed	5/4.6
Fert23 - 022	NPK	Espoma Organic Berry - tone	3.9	Pass	4/3.7	4.7	Pass	3/2.3	4.6	Pass	4/3.6
Fert23 - 023	NPK	Sulf-N Granular Ammonium Sulfate 21-0-0-24	21.3	Pass	21/20.4	< 0.01**	< 0.01*	0/-0.67	0.17	Pass	0/-0.41
Fert23 - 024	NPK	K-Mag Trio 0-0-21	< 0.5	< 0.5*	0/NA	< 0.01**	< 0.01*	0/-0.67	20.3	Pass	21/19.9
Fert23 - 025	NPK	Urea 46-0-0	47.1	Pass	46/44.9	< 0.01**	< 0.01*	0/-0.67	0.03	Pass	0/-0.41
Fert23 - 026	NPK	Potash 0-0-60	< 0.5	< 0.5*	0/NA	0.09	Pass	0/-0.67	58.4	Pass	60/58.2
Fert23 - 027	NPK	Monoammonium Phosphate MAP 11-52-0	10.7	Pass	11/10.6	51.4	Pass	52/50.9	0.21	Pass	0/-0.41
Fert23 - 028	NPK	U-Premium	46.4	Pass	46/44.9	0.02	Pass	0/-0.67	0.03	Pass	0/-0.41
Fert23 - 029	NPK	Ammonium Sulfate	19.8	Pass	21/20.4	< 0.01**	< 0.01**	0/-0.67	< 0.01**	< 0.01**	0/-0.41
Fert23 - 030	NPK	XCU	44	Pass	43/41.9	< 0.01**	< 0.01**	0/-0.67	< 0.01**	< 0.01**	0/-0.41
Fert23 - 031	NPK	AccuBlu	45.3	Pass	45/43.9	0.04	Pass	0/-0.67	0.02	Pass	0/-0.41
Fert23 - 032	NPK	DAP	15.9	Pass	18/17.4	45.5	Pass	46/45	0.25	Pass	0/-0.41

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