

*The
Connecticut
Agricultural
Experiment
Station,
New Haven*

Inspection of
Commercial
Fertilizers 1991

BY LESTER HANKIN

Bulletin 901

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Official samples of fertilizer collected by inspectors of the Connecticut Department of Agriculture are examined by The Connecticut Agricultural Experiment Station for authenticity of guaranteed analysis that is stated on the label and compliance with State Regulations. During 1991, 139 samples were tested. Although all guaranteed analyses are examined, only the results for the major plant nutrients of nitrogen, phosphoric acid, and potash are presented here. Other fertilizer samples were tested for farmers and Station research, but these findings are not included in this Bulletin.

Table 1 shows individual samples from 41 manufacturers. The numbers preceding the brand name are the guaranteed analyses. For example, 10-10-10, indicates the guaranteed percentage for nitrogen (N), phosphoric acid (P_2O_5), and potash (K_2O), in that order. The actual content follows the brand name, with deficiencies indicated by a dash (-) following the amount found. Table 2 summarizes for each manufacturer the number of guarantees examined for each plant nutrient, the percentage of samples not meeting their guarantee, and the average percentage of guarantee found. Table 3 shows the tonnage of the various grades of mixed fertilizer sold in Connecticut. Only grades prepared by at least three manufacturers are shown; other grades are placed in the miscellaneous category. The tonnage of fertilizer material and mixed fertilizer sold in Connecticut is shown in Table 4.

Two types of variability affect fertilizer analysis and must be considered in judging deficiencies. The first is the variability among different batches of the same grade from a manufacturer. This variability can be noted in Table 1 by examining the analyses of the same grade from the same manufacturer. The second type of variability is between duplicate analyses of the same sample. The variability among duplicate analyses is shown in the statement: the mean difference between duplicates for nitrogen, phosphoric acid, and potash is about two-tenths percent.

Fertilizer samples are deemed deficient in any nutrient if the analysis is below the guarantee by more than the values established by the Association of American Plant Food Control Officials. Overall, 138 guarantees for nitrogen were tested and 2.2% were deficient; 137 guarantees for phosphoric acid were tested and 4.4% were deficient; and 136 guarantees for potash were tested and 11.0% were deficient. In 1990 the percentages of deficiencies for nitrogen were 1.8%, for phosphoric acid 7.5%, and for potash 4.7%. Thus the percentage of deficiencies for nitrogen remained about the same, decreased for phosphoric acid, and increased for potash.

Analyses were performed by Craig Musante, Mamie Pyles, and David Stilwell. Samples were collected by Raymond Weller and Melanie Attwater, under the direction of Alton VanDyke, Fertilizer Control Official for the Department of Agriculture. Fertilizer laws are administered by the Commissioner of Agriculture.

Lester Hankin
Chief, Analytical Chemistry

Table 1. Analysis of individual samples of commercial fertilizers.

				Nutrients found, %		
				N	P ₂ O ₅	K ₂ O
A. H. HOFFMAN						
5	10	10	Hoffman Tomato Food	5.1	10.3	8.4
5	10	5	Hoffman Vegetable Food	6.0	9.3	4.8
10	4	6	Hoffman Azalea & Evergreen Food	10.8	4.0	6.1
AGWAY						
		58	Agway			57.2
	15	40	Agway		15.8	40.3
	15	40	Agway		14.7	39.4
2	24	25	Agway	5.1	26.7	22.8
4	12	4	Agway Bulb Bloomer	7.9	14.8	6.1
5	10	10	Agway Blend Rite	5.2	10.4	9.3
6	2	2	Agway Cottonseed Meal	6.5	1.9	2.1
10	10	10	Agway Blend Rite	11.8	11.1	10.6
10	15	15	Agway	10.1	15.2	13.7
10	20	20	Agway	11.3	21.1	19.4
12	24	24	Agway Lawn Starter Fertilizer	12.8	23.9	25.1
13	13	13	Agway	17.8	15.1	10.6
15	15	15	Agway	15.4	15.4	13.7
18	18	18	Agway	19.8	19.9	20.5
18	18	18	Agway	21.6	19.3	20.9
19		10	Agway	20.1		11.6
20		10	Agway	24.5		10.7
20	20	20	Agway Sol-U-Green	23.0	23.1	20.5
23	12	18	Agway	24.9	11.5	23.1
23	12	18	Agway	23.5	12.1	21.1
23	12	18	Agway	27.3	16.3	16.4
24	11	15	Agway	25.0	12.4	19.5
24	11	15	Agway	23.0	19.6	21.3
24	11	17	Agway	25.8	12.8	23.2
26	12	9	Agway	26.9	14.8	18.0
30	10	10	Agway Acid-Green	30.5	13.4	12.8
35		14	Agway	35.1		16.4
ALLJACK & CO.						
15	30	15	Super K-Gro Plant Food	15.5	35.3	19.7
CADWELL & JONES						
5	10	10	C & J Specialty	5.2	11.3	9.3
7	7	7	C & J	12.1	2.8	14.2
10	6	4	C & J	11.4	8.4	6.2
10	10	10	C & J	10.1	10.7	10.4
10	20	20	C & J	14.8	27.4	18.5
15	10	10	C & J Turf Fertilizer	19.7	10.6	10.4
15	15	15	C & J Specialty	17.0	19.9	14.5
20	10	10	C & J Lawn & Garden	25.1	14.0	11.6
20	10	10	C & J Surge w/Balan	25.7	12.6	11.0
20	10	10	C & J Turf Products	28.0	11.7	8.8
25	5	5	C & J	25.9	6.4	7.9
CHEVRON CHEMICAL CO.						
5	1	1	Ortho-Gro Natural Fish Fertilizer	5.1	2.2	2.2
10	8	7	Ortho Fern & Ivy Food	11.4	10.3	8.6

Table 1. Analysis of individual samples of commercial fertilizers (continued).

				Nutrients found, %		
				N	P ₂ O ₅	K ₂ O
23	19	17	Ra-Pid-Gro	24.1	19.9	16.5
23	19	17	Ra-Pid-Gro House Plant Food	25.9	26.0	21.0
CLAREL LABORATORIES						
2	5	4	Jungle Juice Plant Food	3.7	6.1	4.6
CROP PRODUCTION SERVICES						
3	14	44	Agrico Village Green Specialty Fert.	3.8	14.7	42.4
5	10	10	CPS	5.0	9.3	13.7
5	10	5	CPS Village Green	5.9	10.5	5.6
5.7	26.7	23	CPS	5.8	22.9-	23.7
9	3	30	CPS	9.9	24.0	28.5-
10	6	4	CPS Village Green	10.4	7.3	4.3
10	10	10	CPS Village Green	5.4-	12.7	9.4
11	6	28	CPS Village Green	13.9	5.6	26.9
13	2.8	14.4	CPS Lyman Pumpkin	15.2	2.9	9.8-
14	16	22	CPS	14.5	11.3-	25.8
15	8	12	CPS	15.3	7.5	14.1
15	10	10	CPS	16.5	10.9	12.9
15	15	15	CPS	15.1	15.6	9.8-
15	30	15	CPS	17.4	27.8-	15.5
22	10	22	CPS	22.4	10.5	18.5-
24	12	14	CPS	24.3	11.3	16.7
28		8	CPS	29.6		11.7
DEXOL INDUSTRIES						
5	10	5	Dexol Tender Leaf Plant Food	6.3	10.6	4.3-
DOMESTIC FERTILIZER						
10	13	13	Fruit Tree Stakes	14.9	14.1	14.2
11	5	7	Evergreen Tree Stakes	17.8	6.7	7.1
13	4	5	Super K-Gro Houseplant Food Sticks	15.1	5.9	6.9
15	7	6	Tree Food Stakes	17.4	8.0	7.7
EARTHGRO						
4	6	4	Earth Grow's Best Nat Org/Tree & Shrub Food	4.4	6.1	4.4
FAESY & BESTHOFF						
12			F & B Dried Blood	13.4		
FRANK'S NURSERY & CRAFTS						
7	10	7	Long Life Tree & Evergreen Food	8.9	10.7	9.2
GARDEN HARDY						
17	6	12	Garden Hardy	18.2	6.1	9.2-
GARDENA						
14	8	16	Gardena Happy Garden Fertilizer for Vegetables	14.2	7.6	15.5
15	11	15	Gardena Happy Garden Fertilizer Flowers & Patio Plants	15.8	10.9	13.6-
16	8	12	Happy Garden Fertilizer for Rhodeodendrons & Azaleas	17.2	8.1	11.9
18	8	13	Gardena Happy Garden Fertilizer for Lawns	18.1	9.6	12.7
GRACE-SIERRA HORTICULTURAL PRODUCTS CO.						
10	30	20	Peters Professional Blossom Booster	10.2	46.0	23.0
12	36	14	Peters Professional Soluble Plant Food	18.9	39.8	15.4
15	30	15	Peters Professional Soluble Plant Food	16.5	31.5	16.7

Table 1. Analysis of individual samples of commercial fertilizers (continued).

				Nutrients found, %		
				N	P ₂ O ₅	K ₂ O
15	30	15	Peters Professional Soluble Plant Food	16.4	34.6	18.0
17	6	10	Osmocote Plant Food for Potting Mixes	17.5	6.6	11.4
17	6	10	Osmocote Time Release Plant Food	18.8	6.6	10.9
20	20	20	Peters Professional Soluble Plant Food	22.2	21.2	19.8
GUBLERS						
23	8	16	Gubler Orchids Pro Blend Orchid Food	24.8	11.7	21.0
HOLLAND BULB PRODUCTS						
9	9	6	Holland Bulb Booster	16.4	9.2	5.8
HY-TROUS/FLASH SALES						
4	12	4	Hy-Trous African Violet Liquid Fertilizer	4.5	11.7	4.1
5	10	5	Hy-Trous Liquid Plant Food	5.9	14.2	6.6
HYPONEX CORP.						
5	3	9	Hyponex Effervescent Plant Food Tablets	5.4	3.4	10.0
8	4	2	Hyponex Plant Food Sticks	9.8	7.9	3.0
8	18	18	Hyponex Fertilizer Spikes/Fruit & Citrus Trees	9.9	18.6	20.6
10	10	4	Jobe's Plant Food Spikes for Beautiful Flowering Plants	12.3	10.3	5.3
12	10	10	Hyponex Evergreen Tree & Shrub Fertilizer	14.6	11.1	10.6
13	4	5	Jobe's Plant Food Spikes for Beautiful Houseplants	13.4	5.1	6.9
15	10	9	Hyponex Tree & Shrub Fertilizer Stakes	16.6	9.7	9.9
16	2	6	Jobe's Plant Food Spikes for Lush Ferns and Palms	19.5	2.9	7.6
INTERNATIONAL SPIKE						
13	4	5	Jobe's Plant Food Stakes	13.1	4.9	7.2
J. & L. ADIKES						
5	10	5	Gro-Well Garden Food	5.2	10.9	5.9
9	6	3	Gro-Well Evergreen Food	10.9	7.0	4.9
15	20	10	Gro-Well Start-up Fertilizer First Step	15.0	19.7	14.9
JRM CHEMICAL						
5	5	5	Soil Moist Plus Spikes	11.0	4.8	4.7
KOOS						
10	1	4	Nature's Best All Natural Organic Lawn Fertilizer	11.1	2.1	4.0
LEBANON CHEMICAL CORP./GREENVIEW DIV.						
30	4	4	Greenview Green Power Long Lasting Lawn Fertilizer	31.2	4.7	3.4
LESCO						
22	4	4	Lesco Fertilizer Plus Pre-M	23.2	0.0	4.2
22	4	4	Lesco Fertilizer Plus Pre-M	27.1	5.1	5.1
LOTUS OF AMERICA						
	90		Lotus Lily Grow Water Plant Fertilizer		90.0	
NATIONAL PRODUCTS						
4	10	10	Green Thumb Plant Food	4.7	12.3	11.6
8	8	8	Green Thumb Plant Food All Purpose	9.0	11.1	10.6
NEW PLANT LIFE						
5	8	3	New Plant Life African Violet Plant Food	5.0	11.1	10.3
8	7	5	New Plant Life Fern & Ivy Plant Food	8.6	9.2	6.4

Table 1. Analysis of individual samples of commercial fertilizers (continued).

				Nutrients found, %		
				N	P ₂ O ₅	K ₂ O
O. M. SCOTT & SONS CO.						
12	10	12	Scott's All-Purpose Builder	15.3	11.3	14.2
14	3	6	Scott's Next Generation Lawn Food	14.0	3.0	6.6
14	22	6	Scott's Bulb Builder	16.2	23.7	7.9
17	10	12	Scott's Citrus, Nut and Fruit Builder	17.6	11.7	14.0
17	23	6	Burpee Grow-Vegetables	18.6	22.3	7.5
18	3	7	Burpee Grow Azales, Camellias, Rhododendrons	20.6	2.8	8.4
29	3	4	Scott's Turf Builder	29.7	2.6	5.1
OFFSHORE VENTURES						
3	4	3	Squantos Secret for Bonsai	2.9	6.7	4.0
OPTIFLORA						
19.7	5	10	Optimara Plant Food	19.8	5.7	10.6
PARKER FERTILIZER CO.						
20	5	18	Home & Garden Showplace Premium Winterizer	24.1	4.4	18.2
PETERS FERTILIZER PRODUCTS/W. R. GRACE						
5	10	5	Peters Plant Food Concentrated Liquid	5.9	11.7	5.6
30	10	10	Peters Professional Soluble Plant Food	31.5	12.6	10.5
PLANTABBS CORP.						
11	15	20	Plantabbs African Violet Plant Food	15.4	16.4	22.2
RINGER CORP.						
5	8	5	Ringer Rose Restore	5.4	8.3	6.3
ROSS DANIELS						
6	12	6	Ross Plant Food Spikes for Beautiful Flowering Plants	8.5	14.0	6.3
12	24	12	Ross Sprinkle Feeder	14.2	26.8	13.2
14	5	5	Ross Plant Food Spikes for Foliage Plants	15.4	5.6	5.1
SCHULTZ CO.						
10	15	10	Schultz-Instant Liquid Plant Food	10.3	19.2	13.0
STERN'S MIRACLE-GRO PRODUCTS						
8	7	6	Stern's Liquid Miracle-Gro House Plant Food	8.9	9.8	7.2
15	30	15	Stern's Miracle-Gro All Purpose Plant Food	15.3	38.9	18.2
20	20	20	Stern's Miracle-Gro	22.7	23.0	24.7
30	10	10	Stern's Miracid Plant Food	31.2	11.4	13.0
SUDBURY LAWN & GARDEN PRODUCTS/DIV. OF FARNAM CO.						
	6	5	Sudbury Granby's Bloomers formerly Nu-Bud	0.4	9.6	6.5
THE ANDERSON'S/LAWN FERTILIZER DIV.						
5	12	8	Long Life Rose Food	5.1	9.2-	9.3
5	18	18	Long Life Tomato Food	8.2	18.0	17.2
7	10	7	Long Life Tree & Evergreen Food	5.3-	8.5-	8.5
THE ESPOMA CO.						
4	3	2	Espoma Plant Tone	4.8	5.3	4.0
4	6	6	Espoma Garden-Tone for Tomatoes, Vegetables & Shrubs	4.7	9.0	9.1
6	2	1	Espoma Cotton Seed Meal	6.5	2.4	2.0

Table 2. Summary for each manufacturer of number of claims for individual plant nutrients, percentage of claims not meeting guarantee, and average percentage of guarantee for each nutrient.

Company	Number samples	Number of claims			% Not meeting claim			Average % of claim		
		N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O
A. H. Hoffman	3	3	3	3	0	0	33	110	99	94
Agway	27	24	23	27	4	0	15	115	113	113
Alljack	1	1	1	1	0	0	0	103	118	131
Cadwell & Jones	11	11	11	11	0	9	18	126	117	120
Chevron	4	4	4	4	0	0	0	108	148	141
Clarel	1	1	1	1	0	0	0	185	122	115
Crop Production	17	17	16	17	6	19	29	106	144	105
Dexol Industries	1	1	1	1	0	0	100	126	106	86
Domestic Fert.	4	4	4	4	0	0	0	136	126	119
Earthgro	1	1	1	1	0	0	0	110	102	110
Faesy & Besthoff	1	1	0	0	0	-	-	112	-	-
Franks	1	1	1	1	0	0	0	127	107	131
Garden Hardy	1	1	1	1	0	0	100	107	102	77
Gardena	4	4	4	4	0	0	25	104	104	96
Grace-Sierra	7	7	7	7	0	0	0	115	120	117
Gublers	1	1	1	1	0	0	0	108	146	131
Holland Bulb	1	1	1	1	0	0	0	182	102	97
Hytrous/Flash Sales	2	2	2	2	0	0	0	115	120	117
Hyponex	8	8	8	8	0	0	0	117	125	124
International Spike	1	1	1	1	0	0	0	101	123	144
J & L Adikes	3	3	3	3	0	0	0	108	108	143
JRM Chemical	1	1	1	1	0	0	0	220	96	94
Koos	1	1	1	1	0	0	0	111	210	100
Lebanon	1	1	1	1	0	0	100	104	118	85
Lesco	2	2	2	0	0	50	-	114	64	128
Lotus	1	0	1	0	-	0	-	-	100	-
National Prod.	2	2	2	2	0	0	0	115	131	124
New Plant Life	2	2	2	2	0	0	0	104	135	236
O. M. Scott & Sons	7	7	7	7	0	0	0	110	102	121
Offshore Ventures	1	1	1	1	0	0	0	97	168	133
Optiflora	1	1	1	1	0	0	0	101	114	106
Parker Fert.	1	1	1	1	0	0	0	120	88	101
Peters Fert. Prod.	2	2	2	2	0	0	0	112	122	109
Planttabs	1	1	1	1	0	0	0	140	109	111
Ringer	1	1	1	1	0	0	0	108	104	126
Ross Daniels	3	3	3	3	0	0	0	123	113	106
Schultz	1	1	1	1	0	0	0	103	128	130
Sterns Miracle-Gro	4	4	4	4	0	0	0	108	125	124
Sudbury	1	0	1	1	-	0	0	-	160	130
The Anderson's	3	3	3	3	33	66	0	114	87	111
The Espoma Co.	3	3	3	3	0	0	0	115	149	184
TOTALS	139	138	137	136						

Table 3. Distribution of mixed fertilizers sold in Connecticut July 1, 1990 - June 30, 1991

Grade	Tons
05-10-05	489.3
05-10-10	385.6
08-08-08	86.4
10-06-04	384.7
10-10-10	1601.3
10-15-10	21.2
14-03-03	9.0
15-00-00	17.0
15-10-10	80.0
15-15-15	463.2
15-30-15	126.5
18-24-16	7.2
20-10-05	8.5
20-10-10	79.0
20-20-20	90.3
25-03-03	89.8
25-03-05	127.1
27-03-03	105.7
30-10-10	38.0
TOTAL	4209.8
Miscellaneous	15252.7
GRAND TOTAL	19462.5

Table 4. Tonnage of fertilizer material and mixed fertilizers sold in Connecticut July 1, 1990-June 30, 1991

Commodity	Tons	Commodity	Tons
CHEMICAL NITROGEN		NATURAL ORGANICS	
Ammonium nitrate	161.2	Blood, dried	2.8
Ammonium sulfate	23.0	Compost	1637.0
Calcium nitrate	90.1	Cottonseed meal	1.3
Nitrogen solution-<28%	3.4	Manure	3740.6
Nitrogen solution-28%	134.6	Sewage sludge, activated	394.0
Sodium nitrate	4.1	TOTAL	5775.7
Urea	737.1	SECONDARY AND MICRONUTRIENTS	
Nitrogen, not identified	0.1	Aluminum sulfate	1.8
TOTAL	1153.6	Borax (boron as borax)	44.9
PHOSPHATES		Ferrous sulfate	0.08
Diammonium phosphate	17.0	Gypsum	222.0
Bone meal, steamed	14.1	Iron chelate	1.0
Bone precipitated	2.4	Magnesia (magnesium oxide)	2.0
Phosphate rock	0.2	Managanese oxide	1.3
Phosphoric acid	9.9	Sulfur	5.3
Superphosphate, normal	6.9	Zinc sulfate	0.8
Superphosphate, concentrated	28.0	TOTAL	279.2
Phosphates, not identified	0.1	LIME PRODUCTS	
TOTAL	78.6	Liming materials	3.1
POTASH		TOTAL	3.1
Muriate of potash-60%	199.7	UNIDENTIFIED PRODUCTS	
Sulfate of potash-magnesia	19.5	Single nutrients (not ident)	133.6
Potassium nitrate	1.5	TOTAL	133.6
Potassium sulfate	7.1	TOTAL COMMODITIES	
Tobacco stems	1.6		7653.4
Potash, not identified	0.2	TOTAL COMMERCIAL FERT	
TOTAL	229.6		19462.5
		GRAND TOTAL	
			27115.9



The Connecticut Agricultural Experiment Station,

founded in 1875, is the first experiment station in America. It is chartered by the General Assembly to make scientific inquiries and experiments regarding plants and their pests, insects, soil and water, and to perform analyses for State agencies. The laboratories of the Station are in New Haven and Windsor; its Lockwood Farm is in Hamden. Single copies of bulletins are available free upon request to Publications; Box 1106; New Haven, Connecticut 06504.

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