

Supplemental Material

Supplemental Table 1. Radish leaf nutrient concentrations from the first two crop cycles. Letters indicate treatment differences as determined by a one-way analysis of variance and post-hoc Tukey means comparisons with $p < 0.05$.

Crop Cycle	Treatment	Radish Leaf Nutrient Concentrations												
		N (%)	Ca (%)	K (%)	Mg (%)	Na (%)	P (%)	Cl (%)	As ($\mu\text{g/g}$)	Cu ($\mu\text{g/g}$)	Fe ($\mu\text{g/g}$)	Mn ($\mu\text{g/g}$)	Pb ($\mu\text{g/g}$)	Zn ($\mu\text{g/g}$)
1	Control	2.59 \pm 0.07 ^b	3.56 \pm 0.58	1.68 \pm 0.07	0.39 \pm 0.01	0.11 \pm 0.01 ^c	0.34 \pm 0.01 ^a	1.32 \pm 0.13 ^c	6.24 \pm 0.41	7.86 \pm 1.64	163 \pm 30.3	292 \pm 52	1.00 \pm 0.58	76.5 \pm 13 ^a
	Urea	2.33 \pm 0.05 ^b	5.06 \pm 0.33	1.60 \pm 0.10	0.33 \pm 0.02	0.25 \pm 0.02 ^{bc}	0.28 \pm 0.02 ^{ab}	0.92 \pm 0.09 ^c	2.49 \pm 1.44	7.34 \pm 1.41	247 \pm 89.5	274 \pm 43	N.D.	49.4 \pm 3.4 ^b
	Compost	3.31 \pm 0.36 ^a	3.41 \pm 0.49	2.39 \pm 0.50	0.34 \pm 0.02	0.44 \pm 0.09 ^{ab}	0.30 \pm 0.04 ^{ab}	3.43 \pm 0.31 ^b	5.89 \pm 0.06	7.40 \pm 0.66	198 \pm 69	205 \pm 18	0.68 \pm 0.39	31.7 \pm 3.1 ^b
	Biosolids	2.69 \pm 0.10 ^b	3.81 \pm 0.61	2.07 \pm 0.24	0.35 \pm 0.03	0.37 \pm 0.09 ^{ab}	0.28 \pm 0.01 ^{ab}	5.06 \pm 1.04 ^a	0.81 \pm 0.47	6.00 \pm 0.94	185 \pm 44	155 \pm 15	N.D.	44.8 \pm 3.7 ^b
	Biofertilizer	2.43 \pm 0.06 ^b	4.00 \pm 0.77	1.76 \pm 0.39	0.35 \pm 0.00	0.56 \pm 0.08 ^a	0.23 \pm 0.02 ^c	0.76 \pm 0.10 ^c	2.17 \pm 0.42	5.55 \pm 0.26	169 \pm 28	190 \pm 31	N.D.	38.0 \pm 1.5 ^b
2	Control	1.90 \pm 0.20	3.32 \pm 0.53	2.77 \pm 0.14	0.36 \pm 0.01	0.12 \pm 0.01 ^b	0.37 \pm 0.02	0.64 \pm 0.10	5.97 \pm 1.61	6.65 \pm 0.75	254 \pm 28	281 \pm 62	N.D.	99.3 \pm 16
	Urea	2.00 \pm 0.08	5.21 \pm 1.28	2.86 \pm 0.49	0.46 \pm 0.05	0.15 \pm 0.01 ^b	0.46 \pm 0.08	0.65 \pm 0.08	N.D.	8.85 \pm 1.33	382 \pm 176	364 \pm 87	0.76 \pm 0.44	136 \pm 30
	Compost	2.64 \pm 0.62	4.29 \pm 0.54	3.02 \pm 0.40	0.38 \pm 0.04	0.35 \pm 0.14 ^{ab}	0.41 \pm 0.05	1.89 \pm 1.14	4.29 \pm 0.50	7.83 \pm 0.67	536 \pm 229	233 \pm 28	N.D.	73.6 \pm 18.3
	Biosolids	2.94 \pm 0.23	5.33 \pm 0.34	2.06 \pm 0.06	0.42 \pm 0.02	0.25 \pm 0.05 ^b	0.34 \pm 0.03	2.94 \pm 2.00	N.D.	5.83 \pm 0.83	312 \pm 9.6	145 \pm 50	N.D.	102 \pm 7.0
	Biofertilizer	2.71 \pm 0.20	4.47 \pm 0.52	2.53 \pm 0.28	0.43 \pm 0.02	0.50 \pm 0.05 ^a	0.42 \pm 0.02	0.61 \pm 0.12	N.D.	5.68 \pm 0.47	236 \pm 38	162 \pm 25	0.91 \pm 0.53	72.9 \pm 3.8

N.D. indicates non-detectable levels of an element.

Supplemental Table 2. Average annual production of crops and N, P, and K removal by crops in Haiti for 2017 to 2019. Crop production data were obtained from the FAOSTAT database for the years 2017, 2018, and 2019. Crop N, P, and K was calculated based on crop production and crop-specific nutritional demands (Roy et al. 2006).

FAOSTAT Crop Type¹	Average Production (Mt/y)	Crop N (Mt/y)²	Crop P (Mt/y)	Crop K (Mt/y)
Sugar cane	1643279	3451	862	4637
Mangoes, mangosteens, guavas	488840	3275	363	2718
Bananas	254984	1428	145	4296
Avocados	220334	3525	1348	8595
Rice, paddy	173548	3471	834	4321
Vegetables, fresh nes	117015	316	46	350
Rice, paddy (rice milled equivalent)	115756	2315	556	2882
Oranges	78531	707	69	763
Sorghum	53898	803	174	201
Grapefruit (inc. pomelos)	48934	440	43	475
Pigeon peas	45303	3207	303	602
Potatoes	42805	141	17	220
Cow peas, dry	30716	823	75	456
Coconuts	27903	226	48	280
Tangerines, mandarins, clementines, satsumas	22395	202	20	217
Groundnuts, with shell	19662	1142	168	491
Cabbages and other brassicas	18089	52	6	44
Pineapples	8024	14	2	41
Fruit, tropical fresh nes	2781	8	1	5
Castor oil seed	1539	62	6	20
Eggplants (aubergines)	856	20	3	23

Seed cotton	853	21	4	8
Lettuce and chicory	715	5	1	8
Tobacco, unmanufactured	561	16	1	24
TOTAL	3417322	25671	5094	31681

¹ All FAOSTAT crop production data were included in this analysis, except yam, sisal, melon, and chicory root, as these crops lacked information on nutrient removal.

² Notes on N, P, and K value selection: Values for cabbages were used for the category “cabbages and all brassicas”. Values for papaya were used for “fruit, tropical fresh nes.” Values for “rice, paddy (rice milled equivalent)” is assumed be the same as “rice, paddy.” All citrus varieties use the reported values for “citrus.” Sorghum uses “sorghum grain” values. Tobacco assumes “flue-cured” values. Tomato values were used for “vegetables, fresh nes”. Nutrient removal rates for avocados, eggplant, and lettuce were derived from an agriculture industry nutrient removal calculator (Loveland Products, 2021).

Supplemental Material References:

Food and Agriculture Organization of the United Nations. FAOSTAT Statistical Database. [Rome]: FAO, 2021. <http://www.fao.org/faostat/en/#data>

Loveland Products, Inc. Nutrient Removal Calculator. Accessed at <https://cropfertility.com/nutrient-removal-calculator/> on 3/1/2021.

Roy, R.N., A. Finck, G.J.Blair, H.L.S. Tandon. 2006. FAO Plant nutrition for food security: A guide for integrated nutrient management. 366 pg.
Food and Agriculture Organization of the United Nations. Rome, Italy.