

## SUPPLEMENTARY MATERIAL

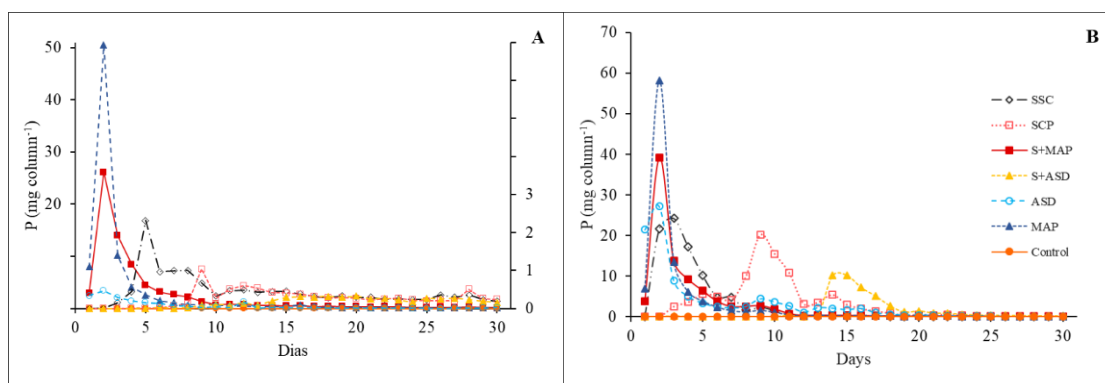


Figure S1. Daily leaching of P from the soil columns, with deionized water (A – left vertical axis for MAP and C+MAP, and right for the others) and citric acid (B). SSC = organic sewage sludge compost; SCP = pelletized organic sewage sludge compost; S+MAP = organic sewage sludge compost + MAP; S+ASD= organic sewage sludge compost + AshDec®; ASD = AshDec®; MAP = monoammonium phosphate

**Table S1.** Chemical analysis of sewage sludge and organic sewage sludge compost from WWT Bela Vista – Piracicaba, SP.

Determinations	Sewage sludge		Organic compost	
	Dry base (65°C)	Wet base	Dry base (65°C)	Wet base
pH (CaCl <sub>2</sub> 0,01 M)	-	7,1	-	6,4
	----- % -----			
Total organic matter	72.64	11.47	67.92	65.42
Organic Carbon	31.22	4.93	36.52	35.18
Total mineral residue	20.96	3.31	26.76	25.78
Nitrogen (N)	6.78	1.07	3.73	3.59
Phosphorus (P <sub>2</sub> O <sub>5</sub> )	2.41	0.38	2.46	2.37
Potassium K <sub>2</sub> O	0.19	0.03	1.10	1.06
Calcium (Ca)	0.82	0.13	3.08	2.97
Magnesium (Mg)	0.32	0.05	0.63	0.61
Sulfur (S)	0.13	0.02	0.52	0.50
	----- mg/kg -----			
Copper (Cu)	108.00	17.00	94.00	91.00
Manganese (Mn)	196.00	31.00	274.00	264.00
Zinc (Zn)	469.00	74.00	407.00	392.00
Iron (Fe)	12483.00	1971.00	13073.00	12592.00
Boron (B)	25.00	4.00	15.00	14.00
Sodium (Na)	969.00	153.00	898.00	865.00
Nickel (Ni)	26.04	-	15.42	-
Selenium (Se)	<4.00	-	<4.00	-
Arsenic (As)	4.97	-	2.71	-
Cadmium (Cd)	<2.00	-	<2.00	-
Lead (Pb)	18.99	-	16.71	-
Mercury (Hg)	<2.00	-	0.34	-

**Table S2.** Soil P fractionation of columns leached with deionized water. Fractions separated by lability.

P source	Labile	Mod labile	Non labile	Labile	Mod labile	Non labile
----- mg kg <sup>-1</sup> -----						
	0 - 1			1 - 2		
<b>Control</b>	17.11 e	40.36 c	61.76 c	15.04 d	39.88 c	74.79 b
<b>SSC</b>	180.52 d	140.36 b	87.76 b	157.57 a	161.50 a	72.67 b
<b>SCP</b>	166.82 d	90.10 b	74.70 c	124.43 b	80.59 b	60.71 b
<b>S+MAP</b>	147.71 d	118.96 b	116.73 b	123.95 b	100.26 b	61.49 b
<b>S+ASD</b>	1165.48 b	66.69 c	77.72 c	58.00 c	63.36 b	62.13 b
<b>ASD</b>	1732.43 a	7774.74 a	312.90 a	179.79 a	193.24 a	105.19 a
<b>MAP</b>	306.37 c	191.87 b	95.98 b	138.69 b	99.94 b	66.48 b
	2 - 6			6 - 10		
<b>Control</b>	15.77 d	40.02 c	66.10 <sup>ns</sup>	16.56 c	42.90 c	78.06 a
<b>SSC</b>	150.10 a	103.31 a	74.15	138.34 a	166.40 a	75.60 a
<b>SCP</b>	118.02 b	88.01 a	65.55	109.14 a	89.65 b	64.41 b
<b>S+MAP</b>	101.83 b	79.56 a	63.96	146.76 a	97.38 b	71.70 b
<b>S+ASD</b>	50.85 c	60.45 b	60.66	49.91 c	58.79 c	64.55 b
<b>ASD</b>	54.85 c	89.46 a	66.16	43.89 c	88.53 b	83.98 a
<b>MAP</b>	76.08 c	94.53 a	72.77	82.04 b	87.71 b	85.01 a

Equal letters do not differ statistically according to the Scott-Knott test at 5% significance level (n=3). SSC = organic sewage sludge compost; SCP = pelletized sludge compost; S+MAP = compost + MAP; S+ASD = compost + AshDec®; ASD = AshDec®; MAP = monoammonium phosphate; and control.

**Table S3.** Soil P fractionation from columns leached with 2% citric acid. Fractions separated by lability.

P source	Labile	Mod labile	Non-labile	Lábil	Mod lábil	Não lábil
----- mg kg <sup>-1</sup> -----						
	0-1			1-2		
<b>Control</b>	17.85 b	33.71 <sup>ns</sup>	56.92 <sup>ns</sup>	28.73 b	31.53 b	58.55 <sup>ns</sup>
<b>SSC</b>	24.83 b	55.54	47.75	20.40 b	46.46 a	44.04
<b>SCP</b>	38.85 a	61.22	43.47	53.27 a	59.77 a	52.34
<b>S+MAP</b>	21.36 b	46.34	44.08	27.62 b	44.05 a	41.05
<b>S+ASD</b>	35.70 a	47.66	45.43	42.04 a	50.24 a	45.83
<b>ASD</b>	21.89 b	43.23	49.54	21.89 b	46.70 a	50.66
<b>MAP</b>	17.46 b	45.26	45.37	17.87 b	46.05 a	59.13
	2 - 6			6 - 10		
<b>Control</b>	13.64 d	41.23 <sup>ns</sup>	59.61 <sup>ns</sup>	12.35 d	31.30 <sup>ns</sup>	49.92 a
<b>SSC</b>	21.17 c	48.69	44.95	23.34 c	47.24	44.94 b
<b>SCP</b>	39.54 a	56.93	49.40	42.35 b	48.78	44.12 b
<b>S+MAP</b>	30.58 b	42.66	48.28	27.77 c	38.92	53.37 a
<b>S+ASD</b>	34.64 b	49.66	52.31	41.38 b	49.29	55.01 a
<b>ASD</b>	25.25 c	47.61	49.27	72.32 a	50.41	52.40 a
<b>MAP</b>	26.33 c	43.37	55.09	29.04 c	44.88	71.10 a

Equal letters do not differ statistically according to the Scott-Knott test at 5% significance level (n=3). SSC = organic sewage sludge compost; SCP = pelletized sludge compost; S+MAP = compost + MAP; S+ASD = compost + AshDec®; ASD = AshDec®; MAP = monoammonium phosphate; and control.

**Table S4.** Soil P fractionation of columns leached with deionized water. Fractions separated by extractors.

Tratamento	Lábil			Moderadamente Lábil			Não Lábil			Total
	P (mg kg-1)									
	P-RTA	Pi-Bic	Po-Bic	Pi-Hid 0,1	Po-Hid 0,1	P-HCl	Pi-Hid 0,5	Po-Hid 0,5	P resid.	
0 - 1										
Controle	1.2	1.9	14.0	9.5	28.8	2.0	15.6	9.5	36.7	119.2
CLE	97.1	78.3	5.1	116.0	10.8	13.5	20.3	13.5	53.9	408.6
CLP	105.2	41.7	19.8	79.4	2.9	7.8	15.6	8.3	50.8	331.6
C+MAP	79.8	46.2	21.7	79.4	2.9	7.8	16.6	17.2	82.9	383.4
C+ASD	63.1	12.9	1259.0	98.1	12.4	8.5	14.5	11.4	51.8	1479.5
ASD	630.1	1017.8	84.5	142.7	133.0	7499.0	133.6	46.1	91.0	9777.9
MAP	128.8	211.3	18.4	171.4	11.9	8.6	19.4	9.0	67.5	646.2
1 - 2 cm										
Controle	0.9	2.5	11.6	10.0	27.8	2.0	13.1	3.8	57.9	129.7
CLE	80.5	53.8	23.2	122.1	23.5	16.0	16.9	12.7	43.1	391.8
CLP	74.8	28.6	21.0	62.6	13.0	5.0	13.1	8.8	38.8	265.7
C+MAP	66.5	43.4	14.0	71.5	22.9	5.8	14.2	10.3	37.0	285.7
C+ASD	34.2	5.2	18.6	46.2	13.4	3.8	12.3	8.4	41.4	183.5
ASD	87.0	75.0	17.7	80.5	1.3	111.4	33.0	19.0	53.2	478.2
MAP	69.7	51.4	17.6	77.6	17.1	5.2	16.6	8.9	41.0	305.1
2 - 6 cm										
Controle	1.2	2.3	12.3	10.6	27.3	2.2	12.5	6.3	47.3	121.9
CLE	72.9	66.9	10.3	85.7	7.1	10.5	16.5	13.3	44.4	327.6
CLP	72.4	34.7	10.9	74.1	7.9	6.0	14.3	7.3	43.9	271.6
C+MAP	58.9	33.0	9.9	69.7	4.9	5.0	13.8	8.5	41.6	245.3
C+ASD	27.8	12.8	10.2	37.6	19.1	3.8	37.6	19.1	3.8	171.8
ASD	27.8	12.8	10.2	63.2	17.9	8.4	18.7	5.8	41.6	206.5
MAP	26.5	32.5	17.1	66.1	23.5	5.0	15.6	10.2	47.0	243.4
6 - 10 cm										
Controle	1.2	2.4	13.0	11.6	28.8	2.5	17.8	2.4	57.9	137.5
CLE	63.3	69.7	5.3	141.5	10.7	14.2	19.5	10.1	46.1	380.3
CLP	56.8	37.4	14.9	75.1	7.6	6.9	15.1	6.8	42.5	263.2
C+MAP	57.6	42.8	46.4	79.5	11.6	6.3	15.2	8.6	37.9	305.8
C+ASD	29.9	6.6	13.3	44.5	10.3	4.0	11.9	7.4	45.3	173.2
ASD	14.9	25.4	3.6	60.8	17.6	10.1	18.3	5.9	59.8	216.4
MAP	24.5	41.4	16.2	69.6	12.6	5.5	15.7	8.9	60.4	254.8

SSC = organic sewage sludge compost; SCP = pelletized sludge compost; S+MAP = compost + MAP; S+ASD = compost + AshDec®; ASD = AshDec®; MAP = monoammonium phosphate; and control.

**Table S5.** Soil P fractionation of the columns leached with 2% citric acid. Fractions separated by extractors.

P source	Labile		Moderately-labile				Non-labile			Residual	Total
	P (mg kg <sup>-1</sup> )										
	Resin	NaHCO <sub>3</sub> (i)	NaHCO <sub>3</sub> (o)	NaOH 0.1(i)	NaOH 0.1(o)	HCl	NaOH 0.5(i)	NaOH 0.5(o)			
0-1											
Control	7.2	4.4	6.3	7.1	25.9	0.7	15.9	4.7	36.4	108.5	
SSC	9.8	7.0	8.0	15.2	38.9	1.4	6.9	3.9	37.0	128.1	
SCP	11.3	14.4	13.1	20.5	37.9	2.8	8.8	4.0	30.6	143.5	
S+MAP	6.7	6.3	7.1	11.5	34.0	0.8	7.2	6.6	30.3	110.6	
S+ASD	13.5	12.5	9.7	19.7	26.4	1.6	8.7	6.3	30.5	128.8	
ASD	6.6	13.6	1.7	14.7	23.7	4.8	14.1	1.2	34.3	114.7	
MAP	6.7	7.1	3.7	20.4	22.3	2.6	7.4	3.9	34.1	108.1	
1-2											
Control	9.9	5.8	13.1	7.4	23.1	1.0	13.8	8.0	36.7	118.8	
SSC	5.9	6.3	8.2	16.1	28.7	1.6	7.8	3.4	32.9	110.9	
SCP	13.8	14.1	18.9	19.8	30.4	2.5	9.1	5.2	38.0	151.8	
S+MAP	6.2	6.3	15.2	12.8	30.3	0.9	6.9	5.5	28.6	112.7	
S+ASD	13.9	12.8	15.4	19.5	28.9	1.8	8.9	3.1	33.9	138.1	
ASD	9.0	10.5	2.3	17.7	25.3	3.8	11.0	4.0	35.7	119.3	
MAP	8.8	7.0	2.1	18.0	23.5	4.6	8.0	8.3	42.8	123.1	
2-6											
Control	4.4	3.9	5.3	6.9	24.7	9.6	13.7	7.1	38.9	114.5	
SSC	9.0	8.7	3.4	18.4	28.6	1.7	8.1	3.2	33.6	114.8	
SCP	14.8	14.0	10.7	20.4	31.4	2.3	9.8	6.2	33.4	143.0	
S+MAP	12.9	6.8	10.9	16.4	24.9	1.4	7.6	10.1	30.6	121.5	
S+ASD	16.7	14.5	3.4	20.4	26.8	2.4	13.3	8.0	31.0	136.6	
ASD	9.4	13.5	2.4	19.7	25.4	2.5	10.9	1.4	37.0	122.1	
MAP	13.3	9.8	3.2	19.5	21.0	2.8	9.0	6.1	40.0	124.8	
6-10											
Control	4.9	4.1	3.4	6.5	23.8	1.0	11.0	7.0	31.9	93.6	
SSC	10.3	9.4	3.6	20.5	25.0	1.7	8.3	3.2	33.4	115.5	
SCP	18.7	14.5	6.0	22.1	18.8	2.5	10.3	3.0	27.3	123.2	
S+MAP	11.0	10.1	6.7	18.1	18.8	2.0	9.7	8.4	35.2	120.1	
S+ASD	21.8	15.4	4.2	22.9	22.1	4.2	9.5	4.6	40.9	145.7	
ASD	19.4	12.5	40.4	21.8	24.0	4.6	9.0	2.8	40.6	175.1	
MAP	12.8	9.3	7.0	20.9	19.6	1.7	8.8	4.5	57.8	142.4	

SSC = organic sewage sludge compost; SCP = pelletized sludge compost; S+MAP = compost + MAP; S+ASD = compost + AshDec<sup>®</sup>; ASD = AshDec<sup>®</sup>; MAP = monoammonium phosphate; and control.