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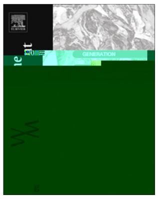

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ABSTRACT

[illegible] (N)-[illegible] N-[illegible] 14% [illegible] 12% [illegible] NH_3 [illegible] HS ([illegible]) [illegible] HS [illegible] 70% [illegible] 0 [illegible] 30% [illegible] 27. [illegible] GI [illegible] 80%. [illegible] N [illegible]

1. Introduction

[illegible] (N) [illegible] N [illegible] 80% [illegible] N [illegible] N [illegible] NH_3 [illegible] 16–74% [illegible] N [illegible] NH_3 [illegible] N-[illegible]

N [illegible] N-[illegible] N [illegible] N-[illegible] N [illegible] NH_3 [illegible] NH_4-N [illegible] NH_3 [illegible] NH_3 [illegible] N [illegible] NH_3 [illegible] N [illegible] 6.7–9.0 [illegible] H [illegible]

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E-mail address: [illegible]@163.[illegible] (J. [illegible]).

[illegible]/10.1016/[illegible].2017.11.025
0956-053X/

$$GI\ (\%) = \frac{\text{[illegible]}\ (\%) \times \text{[illegible]}}{\text{[illegible]}\ (\%) \times \text{[illegible]}} \times 100\% \qquad (1)$$

[illegible] NH_3 [illegible] (2%) [illegible] H_2SO_4. CO_2 [illegible] N OH [illegible] HC [illegible] CO_2 [illegible] NH_3 [illegible] NH_3 [illegible] N OH. [illegible] NH_3 [illegible]

[illegible] TKN [illegible] K [illegible] (B [illegible], 2002). NH_4-N [illegible] -KC [illegible] (1:10, [illegible]) [illegible] N OH [illegible] -H_2SO_4 [illegible] NO_3-N [illegible] -H_2SO_4 [illegible] NH_4-N. [illegible] (TOC) [illegible] H [illegible] (HS) [illegible] (2008). [illegible] N [illegible] C [illegible]:

$$N\ \text{[illegible]}\ (\%) = (N_{\text{[illegible]}} \times M_{\text{[illegible]}} - N_{\text{[illegible]}} \times M_{\text{[illegible]}})/(N_{\text{[illegible]}} \times M_{\text{[illegible]}}) \qquad (2)$$

$$C\ \text{[illegible]}\ (\%) = (C_{\text{[illegible]}} \times M_{\text{[illegible]}} - C_{\text{[illegible]}} \times M_{\text{[illegible]}})/(C_{\text{[illegible]}} \times M_{\text{[illegible]}}) \qquad (3)$$

H [illegible] N [illegible] C [illegible] TN [illegible] C [illegible] ($^{-1}$), N [illegible] C [illegible] TN [illegible] C [illegible] ($^{-1}$), [illegible] M [illegible] M [illegible] ([illegible]).

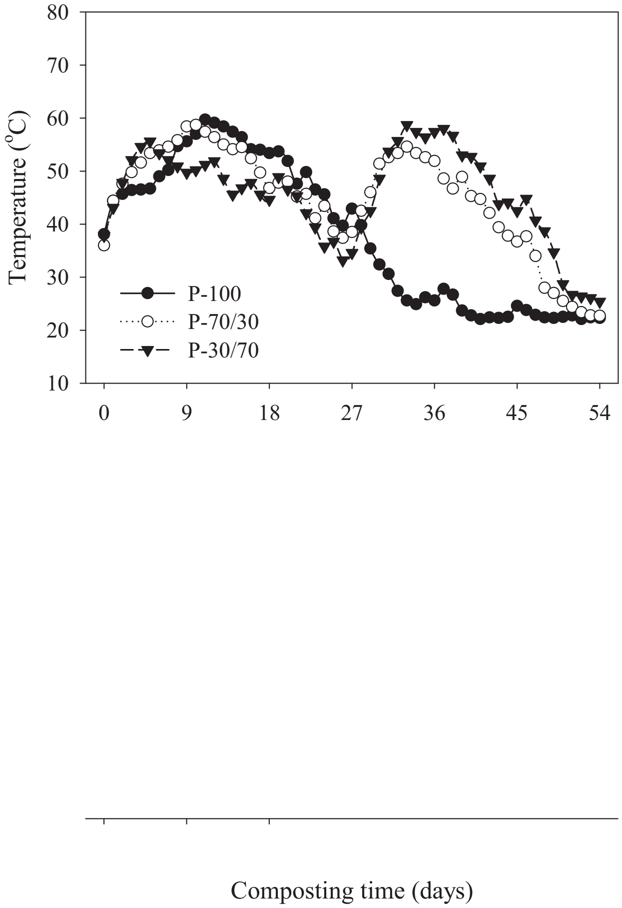
2.4. Data analysis

A [illegible] STD [illegible] SPSS 17.0 (IBM SPSS [illegible] C [illegible], IL, USA) [illegible] ANO [illegible] A [illegible] $P < .05$. A [illegible] S [illegible] P [illegible] ([illegible] 12.5, S [illegible] S [illegible], I [illegible], S [illegible] J [illegible], CA, USA).

3. Results and discussion

3.1. Temperature

T [illegible] ([illegible], 2015). E [illegible] P-100 [illegible] A-100 [illegible] F [illegible] 2 [illegible] A [illegible]



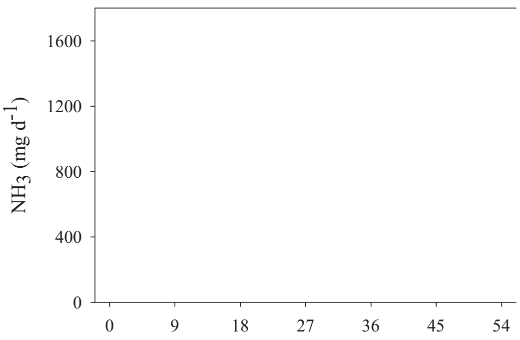
[illegible] P [illegible] 50 °C) [illegible] 4 [illegible] 9 [illegible] P-100 [illegible] 9. J [illegible] (2014) [illegible] ([illegible]) [illegible] H [illegible] EC (6.0 [illegible] 4.8 [illegible] S [illegible] $^{-1}$) [illegible] (6.6 [illegible] 3.0 [illegible] S [illegible] $^{-1}$), [illegible] (B [illegible], 2009). [illegible] D [illegible] 4 (F [illegible] 2 [illegible]). R [illegible] (L [illegible] K [illegible], 2012). [illegible] (C [illegible], 2016).

3.2. CO_2 emissions

CO_2 [illegible] ([illegible]

2004). As [illegible] Fig. 3, [illegible] (Fig. 2). D[illegible] CO_2 [illegible] 114.1 [illegible] P-100 [illegible] 94.6 [illegible] A-100 [illegible] 9, [illegible] 81.5 [illegible]$^{-3}$ [illegible] P-30/70 [illegible] 85.4 [illegible]$^{-3}$ A-30/70, [illegible] D[illegible] CO_2 [illegible] P-100, P-70/3, P-30/70, A-100, A-70/30, [illegible] A-30/70 [illegible] 22.5, 20.6, 19.9, 25.5, 23.9 [illegible] 23.6 [illegible]$^{-3}$, [illegible].

T[illegible] CO_2-C [illegible] 54 [illegible] 1216, 1116, [illegible] 1078 [illegible] P-100, P-70/30 [illegible] P-30/70, [illegible] 37.9%, 34.8% [illegible] 33.6% [illegible] C (Table 2). M[illegible] 1254, 1172, [illegible] 1156 [illegible] 39.1%, 36.5% [illegible] 36% [illegible] C (Table 2). T[illegible] C[illegible] CO_2 [illegible] (11.4 22.5%) [illegible] (C[illegible] et al., 2014) [illegible] (29.6 48.9%) [illegible] N[illegible] et al. (2017). A[illegible] CO_2 [illegible] ($P < .01$).



2013), [illegible] NH_3 [illegible] (P < .001), [illegible] (J[illegible]., 2014).

3.4. Nitrogen change and N loss

At [illegible] TN, NO_3-N [illegible] NH_4-N [illegible] (P < .05) (T[illegible]. 3). [illegible] 30% [illegible] TN [illegible] 9% [illegible] NH_4-N [illegible] 26% [illegible] 175%. H[illegible], [illegible] NO_3-N [illegible] 100% [illegible] 57% [illegible] 70% [illegible]

I[illegible] N [illegible] 35.2 [illegible] 49.8% [illegible] N (T[illegible] 3), [illegible] (B[illegible] 2002; S[illegible]., 2010). T[illegible] N [illegible] 100% [illegible] S[illegible] N [illegible] 14% [illegible] 12% [illegible] (N[illegible]. (2017). H[illegible] N [illegible] (D[illegible]-K[illegible], 2005). T[illegible] NH_4-N [illegible] P[illegible] NH_4-N [illegible] >1.0 [illegible]$^{-1}$ [illegible] NH_4-N [illegible] 0.4 [illegible]$^{-1}$ (D[illegible]-K[illegible], 2005). H[illegible] N [illegible] F[illegible] H[illegible] 100% [illegible] (D[illegible]-K[illegible], 2005). B[illegible] N-[illegible] NH_3 [illegible] H > 7.5 (B[illegible]., 2009), [illegible] N [illegible] H[illegible] NH_3 [illegible] N.

M[illegible] N [illegible] NH_3 [illegible] (J[illegible]., 2014; L[illegible]-C[illegible]., 2016). H[illegible], [illegible] EC, [illegible] C/N, [illegible] H, [illegible] (L[illegible]., 2013; J[illegible]., 2014; L[illegible]-C[illegible]., 2016). T[illegible] ([illegible] H [illegible] EC) [illegible] F[illegible]

3.5. HS contents

H[illegible] (HS) [illegible] (B[illegible]., 2009). T[illegible] HS [illegible] (P < .01) [illegible] (F[illegible]. 6). T[illegible] HS [illegible] 30%, 20% [illegible] 10% [illegible] 100, 70/30, [illegible] 30/70. [illegible] E[illegible] HS [illegible] C[illegible] HS [illegible] A[illegible] HS (P < .01) [illegible] HS [illegible] P-70/30 [illegible] A-70/30 [illegible] (F[illegible]. 6). S[illegible] (A[illegible]., 2006; [illegible]., 2000). J[illegible]. (2014) [illegible]

[illegible] HS [illegible] TOC [illegible] HS [illegible] TOC [illegible] P-100, P-70/30, A-100, [illegible] A-70/30 [illegible] P-30/70 [illegible] A-30/70. [illegible] P-30/70 [illegible] A-30/70 [illegible] ([illegible] ., 2009).

3.6. GI

GI [illegible] ([illegible] ., 1981). [illegible] NH_3 ([illegible] ., 2004), GI [illegible] 9 ([illegible] 7), [illegible] ([illegible] ., 2012). [illegible], GI [illegible] GI [illegible] 80%. [illegible] GI [illegible] P-30/70 [illegible] 80% [illegible] EC (5.2 [illegible] S [illegible] $^{-1}$) ([illegible] 3) [illegible]

4. Conclusion

[illegible] NH_3 [illegible]

[illegible]

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References

A[illegible], S., H[illegible], M., [illegible], L., M[illegible], G., G[illegible], M., P[illegible], E., R[illegible], J.C., B[illegible], J. R., A[illegible], A., 2006. [illegible] 41, 410–422.

B[illegible], S., C[illegible], D., T[illegible], M., K[illegible], 2002. [illegible] 83, 189–194.

B[illegible], M.P., A[illegible], J.A., M[illegible], R., 2009. [illegible] 100, 5444–5453.

C[illegible], M.T., S[illegible], A., [illegible], J., 2016. [illegible] 200, 838–844.

C[illegible], M.A., N[illegible], A., [illegible], L.S., 2014. [illegible] 97, 16–25.

D[illegible], D.B., [illegible], K., 2005. [illegible] 96, 1093–1101.

G[illegible], J., [illegible], S.P., B[illegible], R., B[illegible], P., A[illegible], D., [illegible], A.N., [illegible], S. R., 2012. [illegible] 114, 382–388.

H[illegible], M.S., H[illegible], J., A[illegible], O.I., H[illegible], B., 2009. [illegible] 100, 4773–4782.

H[illegible], G.F., [illegible], J. [illegible], Q.T., N[illegible], B.B., 2004. [illegible] C/N [illegible] 24, 805–813.

J[illegible], J., D[illegible], M.H., H[illegible], M., [illegible], 2015. [illegible]