School of Environment, Henan Normal University, Key Laboratory for Yellow River and Huai River Water Environmental and Pollution Control, Ministry of Education, Henan Key Laboratory for Environmental Pollution Control, Xinxiang, Henan 453007, China

College of Mechanical and Electronic Engineering, Northwest A&F University, Yangling, Shaanxi 712100, China

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ABSTRACT

D (N)- N N- ( ) ( ) . T . D N 14% 12% NH_3 . A HS ( ) HS 70% 0 30% 27. I GI 80%. T N

1. Introduction

C (J ., 2015; ., 2017). I 2017). N (N) N (G ., 2012). T N 80% N (N ., 2014). T N NH_3 16 74% N (M ., 2002; R ., 2010), (., 2016). T NH_3 I N-

N (D T -K , 2005; N ., 2017). D N- . T N (N ., 2017). S N- N I NH_3 (J ., 2015 ; P ., 2006). M H NH_4-N NH_3 NH_3 N (B ., 2009). T NH_3 N (H ., 2009; R ., 2010; ., 2015). T H 6.7 9.0 (B ., 2009). T H (J ., 2014). A

* C

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$$GI\ (\%) = \frac{S\ (\%) \times R}{S\ (\%) \times R} \times 100\% \quad (1)$$

NH_3 (2%) H_2SO_4. CO_2 N OH, HC T CO_2 NH_3 NH_3 N OH. T NH_3 .

T TKN K/ (B ., 2002). NH_4-N -KC (1:10, /.) N OH -H_2SO_4 . NO_3-N -F SO_4 NH_4-N. T (TOC) . H (HS) L . (2008). T N C :

$$N\ (\%) = (N \times M - N \times M)/(N \times M) \quad (2)$$

$$C\ (\%) = (C \times M - C \times M)/(C \times M) \quad (3)$$

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

2.4. Data analysis

A STD . D SPSS 17.0 (IBM SPSS S I ., C , IL, USA) - ANO A P < .05. A S P - (12.5, S S , I ., S J , CA, USA).

3. Results and discussion

3.1. Temperature

T (., 2015). E P-100 A-100 ,

F . 2 . A

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

3.2. CO_2 emissions

CO_2 (.,

P 8258.1853007.9702224.787314

2004). A F 3,

(F . 2). D -
CO_2 114.1 P-100 94.6 $^{-1}$ A-100
9, . I ,
81.5 $^{-3}$ P-30/70 85.4 $^{-3}$ A-30/70, -
. D , CO_2 -
P-100, P-70/3, P-30/70, A-100, A-70/30, A-30/70
22.5, 20.6, 19.9, 25.5, 23.9 23.6 $^{-3}$,
.
T CO_2-C 54
1216, 1116, 1078 P-100, P-70/30 P-30/70,
37.9%, 34.8% 33.6%
C (T 2). M , 1254,
1172, 1156 , , 39.1%, 36.5%
36% C (T 2). T C
CO_2 -
(11.4 22.5%)
- (C ., 2014)
(29.6 48.9%) N . (2017).
A CO_2
($P < .01$).

2013), NH$_3$ (P < .001), (J ., 2014).

3.4. Nitrogen change and N loss

A TN, NO$_3$-N NH$_4$-N (P < .05) (T . 3). 30% TN 9% NH$_4$-N 26% 175%. H NO$_3$-N 100%

57% 70% I N 35.2 49.8% N (T 3), (B ., 2002; S ., 2010). T N 100% . S N 14% 12% (N . (2017). H N (D T -K , 2005). T NH$_4$-N . P . T NH$_4$-N >1.0 $^{-1}$, NH$_4$-N 0.4 $^{-1}$ (D T -K , 2005). H N F H 100% (D T -K , 2005). B H N- NH$_3$ H > 7.5 (B ., 2009), N . I H NH$_3$ N. M N NH$_3$ (J ., 2014; L -C ., 2016). H (.) EC, C/N, H, (L ., 2013; J ., 2014; L -C ., 2016). T (H EC) . F

3.5. HS contents

H (HS) (B ., 2009). T HS (P < .01) (F . 6). T HS 30%, 20% 10% 100, 70/30, 30/70, . E HS . C HS

HS TOC

. I , HS TOC

P-100, P-70/30, A-100, A-70/30

, P-30/70 A-30/70. T

P-30/70 A-30/70

(B ., 2009).

3.6. *GI*

GI (., 1981). B NH_3 (S ., 2004), GI 9 (F . 7), (L ., 2012). T , GI

. I , GI 80%. T GI P-30/70 80%, EC (5.2 S $^{-1}$) (T . 3) .

4. Conclusion

I , NH_3 . D N 14%

. T

Acknowledgements

F

N N S F C (N. 51508167), K R P / C U E D H P (N . 17A610006 17B610006), S F H N U (N . 2016QK20 2016QK18).

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H , G.F., J. ., , Q.T., N , B.B., 2004. E . C/N M . 24, 805 813.

J , J., D , M.H., H , M., ., 2015. I