



References

- Adhya, T.K., L. Bruce, S. Tim, W. Reiner, & Y. Xiaoyuan. 2014. Wetting and Drying: Reducing Greenhouse Gas Emissions and Saving Water from Rice Production. Working Paper, Installment 8 of Creating a Sustainable Food Future. Washington, DC: World Resources Institute. Available online at <http://www.worldresourcesreport.org>.
- Akiyama, H., Yagi, K., & Yan, X. 2005. Direct N₂O emissions from rice paddy fields: Summary of available data. Global Biochem. Cycles 19: 1-10
- Amon, B., T.T. Amon, G. Moitzi, & J. Boxberger. 2002. Nitrous oxide emissions from agriculture and mitigation options N₂O emission. Paper presented at Nussdorfel Laende A-1190, Vienna, Austria, 29–31.
- Aulakh, M.S., J.W. Doran & Mosier A.R. 1992. Soil denitrification: significance, measurement and effects of management. Adv. Soil Sci. 18: 1–57.
- Balai Penelitian Lingkungan Pertanian (Agricultural Environment Research Institute). 2007. N₂O investigation and analysis. Agricultural Environment Research Institute. Pati.
- Barton, L., C.D.A. McLay, L.A. Schipper & C.T. Smith. 1999. Annual denitrification rates in agricultural and forest soils: a review. Aus. J. Soil Res. 37(6): 1073–1093.
- Baruah, A. & K.K. Baruah. 2015. Organic manures and crop residues as fertilizer substitutes: impact on nitrous oxide emission, plant growth and grain yield in pre-monsoon rice cropping system. J. Environmental Protection. 6: 755-770
- Becker, M., J.K. Ladha, M. Ali. 1995. Green manure technology: Potential, usage, and limitations. A case study for lowland rice. Plant Soil. 174: 181–194.
- Bouwman, A.F. 1996. Direct emissions of nitrous oxide from agricultural soils. J. Nutr Cycl Agroecosyst. 46: 53–70.
- Buresh, R.J., K.R. Reddy, & C.V. Kessel. 2008. Nitrogen Transformations in Submerged Soils. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, 677 S. Segoe Rd., Madison, WI 53711, USA.
- Cai, Z., G. Xing, X. Yan, H. Xu, H. Tsuruta, K. Yagi & K. Minami. 1997. Methane and nitrous oxide emissions from rice paddy fields as affected by nitrogen fertilisers and water management. J. Plant and Soil. 196: 7–14.
- Chen, G.X., G.H.Huang, B. Huang, K.W. Yu, J. Wu & H. Xu. 1997. Nitrous oxide and methane emissions from soil-plant systems. Nutr. Cycling Agroecosyst. 49:41–45
- Cho, Y.S., T. Mineta, K. Hidaka. 2003. Nitrogen fixation and utilization for green manure of common wild legume narrow leaf vetch (*Vicia angustifolia* L.). Jpn. Agric. Res. Q. 37: 45–52.
- Cicerone, R.J. 1989. Analysis of sources and sinks of atmospheric nitrous oxide (N₂O). J Geophys Res. 94: 18265–18271.
- Corak, S.J., W.W. Frye & M.S. Smith. 1991. Legume mulch and nitrogen-fertilizer effects on soilwater and corn production. Soil Sci. Soc. Am. J. 55(5): 1395–1400
- Crandall, S.M., M.L. Ruffo & G.A. Bollero. 2005. Cropping system and nitrogen dynamics under a cereal winter cover crop preceding corn. Plant Soil 268(1–2), 209–219.
- Davidson, E.A., W.T. Swank & T.O. Perry. 1986. Distinguishing between nitrification and denitrification as source of gaseous nitrogen production in soil. Applied Environmental Microbiology 52: 1280–1286.



- DeDatta, S.K. 1995. Nitrogen transformations in wetland rice ecosystems. *J. Fert Res* 42: 193–203.
- DeLaune, R.D., W.H. Patrick, Jr., & R.J. Buresh. 1979. Effect of crude oil on a Louisiana Spartina alterniflora salt marsh. *Environ. Pollut.* 20:21–31.
- Devol, A.H. 2008. Denitrification inluding anammox. In: Capone, D.G., Bronk, D.A., Muholand, M.R., Carpenter, E.J. (eds.) *Nitrogen in the Marine Environment*. pp. 263–301. Elsevier Amsterdam, The Netherland
- Eichner, M.J. 1990. Nitrous oxide emissions from fertilized soils: summary of available data. *J. Environ. Qual.* 19(2): 272–280
- Elfstrand, S., K. Hedlund & A. Martensson. 2007. Soil enzyme activities, microbial community composition and function after 47 years of continuous green manuring. *Appl. Soil Ecol.* 35: 610–621.
- Focht, D.D. 1974. The effect of temperature, pH, and aeration on the production of nitrous oxide and gaseous nitrogen-a zero-order kinetic model. Abstract. <http://journals.lww.com/soilsci/abstract/1974/09000/> Access on Mei 2017.
- Food and Agriculture Organization of United Nations (FAO) 2001: FAOSTAT. <http://www.fao.org/faostat/en/#data> Access on March, 2017.
- Granli, T. & O.C Bockman,. 1994. Nitrous oxide from agriculture. *Norw. J. Agric. Sci.* 12 Supplement, 7–128
- Hansen, M., T.J. Clough & B. Elberling 2014. Flooding-induced N₂O emission bursts controlled by pH and nitrate in agricultural soils. *Soil Biology & Biochemistry* 69: 17-24
- Heincke, M. & M. Kaupenjohann. 1999. Effects of soil solution on the dynamics of N₂O emissions: a review. *Nutr. Cycl. Agroecosyst.* 55: 133–157.
- Hirai, H. & T. Hamazaki. 2004. Historical Aspects of Soil Classification in Japan. *Soil Sci. Plam Nutr.*, 50 (5): 611-622.
- Intergovernmental Panel on Climate Change (IPCC) 2013: In Climate Change 2013: The Physical Science Basis, Chapter 8 Anthropogenic and Natural Radiative Forcing. Contribution of Working Group I to the Fifth Assessment Report of Intergovernmental Panel on Climate Change, Eds. T Stocker et al. <http://www.ipcc.ch/report/ar5/wg1/> Access on March, 2017.
- IPCC. 1996. Climate change 1995: IPCC second assessment report. Vol. 1. The science of climate change. Houghton JT, Filho LGM, Callander BA, Harris N, Kaltenberg A, Maskell K (eds), Cambridge University Press, Cambridge.
- IPCC. 2001. Climate Change 2001: A Scientific Basis: Intergovernmental Panel on Climate Change, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel of Climate Change, Cambridge University Press, Cambridge, UK
- IPCC. 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Houghton, J.T., Ding, Y., Griggs, D.J., Noguer, M., vander Linden, P.J., Dai, X., Maskell, K., Johnson, C.A. (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA
- IPCC. 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. In: Solomon, S., Qin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M., Miller, H.L. (eds.). p. 996. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA
- IPCC. 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.



- Jensen ES. 1997. Nitrogen immobilization and mineralization during initial decomposition of ¹⁵N-labelled pea and barley residues. *Biol Fertil Soils* 24:39–44.
- Jury, W.A., W.R. Gardner & W.H. Gardner. 1991. *Soil Physics*, 5th edn. John Wiley & Sons Inc., New York.
- Kar, B., S. Karmakar, G. Saha & R. Bhattacharya. 2014. Investigations on nitrous oxide emissions from organic rice fields as influenced by atmospheric factors. *J. Crop and Weed*, 10(2):190-195
- Kim, S.Y., J. Gutierrez & P.J. Kim. 2012. Considering winter cover crop selection as green manure to control methane emission during rice cultivation in paddy soil. *Agriculture, Ecosystems and Environment* 161: 130– 136
- Kim, S.Y., S.W. Oh, W.H. Hwang, K.J. Choi & B.G. Oh. 2008. Optimum Soil Incorporation Time of Chinese Milk Vetch (*Astragalus sinicus* L) for its Natural Re-seeding and Green Manuring of Rice in Gyeongnam Province, Korea. *J. Crop Sci. Biotech.* 11 (3): 193-198
- Kyuma, K. 2004. *Paddy soil science*. Kyoto University press. Japan.
- Lee C.H., K.D. Park, K.Y. Jung, M.A. Ali, D. Lee & J. Gutierrez.. 2010. Effect of Chinese milk vetch (*Astragalus sinicus* L.) as a green manure on rice productivity and methane emission in paddy soil. *Agric Ecosyst Environ* 138:343–7.
- Letey, J., W.A. Jury, A. Hadas & N. Valoras. 1980. Gas diffusion as a factor in laboratory incubation studies on denitrification. *J. Environ. Qual.* 9: 223–227.
- Majumdar, D., S. Kumar, H. Pathak, M.C. Jain & U. Kumar. 2000. Reducing nitrous oxide emission from rice field with nitrification inhibitors. *J. Agric Ecosyst Environ.* 81: 163–169.
- Mosier, A.R., Duxbury, J.M., Freney, J.R., Heinemeyer, O., & Minami, K. 1996. Nitrous oxide emissions from agricultural fields: Assessment, measurement and mitigation. *Plant Soil* 181(1): 95–108
- Oomori, S., Y. Toma, O. Nagata, & H. Ueno. 2016. Effects of bamboo biochar application on global warming in paddy fields in Ehime prefecture, Southern Japan. *J. Soil Science and Plant Nutrition.* 62 (5-6): 553-560.
- Pathak, H. 1999. Emissions of nitrous oxide from soil. *Curr. Sci.* 77(3): 359–369
- Payne, W.J. (1973) Reduction of nitrogenous oxides by microorganisms. *Bacterial. Reviews* 37(4): 409–452
- Ponnamperuma, F.N. 1972. The chemistry of submerged soils. *J. Adv Agron.* 24:29–96
- Pramanik, P., Md.M. Haque, S.Y. Kim & P.J. Kim. 2014. C and N accumulations in soil aggregates determine nitrous oxide emissions from cover crop treated rice paddy soils during fallow season. *Science of the Total Environment* 490: 622–628
- Prinn, R., D.Cunnold, R. Rasmussen, P. Simmonds, F. Alyea, A. Crawford, P. Fraser & R. Rosen. 1990 Atmospheric emissions and trends of nitrous oxide deduced from 10 years of ALEGAUGE data. *J. Geophys. Res.-Atmos.* 95 (D11):18369–18385
- Ramaswamy, V., O. Boucher, J. Haigh, D. Hauglustaine, J. Haiwood, G. Mayhre, T. Nakajima, G.Y. Shi & S. Solomon. 2001. Radiative forcing of climate change. In: Houghton, J.T., Ding, Y., Griggs, D.J., Noguer, M., vander Linden, P.J., Dai, X., Maskell, K., Johnson, C.A. (eds.) *Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, vol. . pp. 349–416. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA



- Sander, B.O., M. Samson, R.J. Buresh. 2014. Methane and nitrous oxide emissions from flooded rice fields as affected by water and straw management between rice crops. *Geoderma* 235–236: 355–362
- Savant, N.K., & S.K. De Datta. 1982. Nitrogen transformations in wetland rice soils. *Adv. Agron.* 35, 241–302
- Seitzinger, S., J.A. Harrison, J.K. Bohlke, A.F. Bouwman, R. Lowrance, B. Peterson, C. Tobias, & G.V. Drecht. 2006. Denitrification across landscapes and waterscapes: A synthesis. *Ecol. Appl.* 16(6): 2064–2090
- Simek, M. & J.E. Cooper. 2002. The influence of soil pH on denitrification: progress towards the understanding of this interaction over the last 50 years. *Eur. J. Soil Sci.* 53(3): 345–354.
- Singh, S., J. Singh & A. Kashyap. 1999. Methane flux from irrigated rice fields in relation to crop growth and N-fertilization. *Soil Biol. Biochem.* 31: 1219–1228.
- Singh, Y., C.S. Khind & B. Singh. 1991. Efficient management of leguminous green manures in wetland rice. *Adv Agron.* 45: 135–189.
- Smith, M.S. & J.M. Tiedje. 1979. Phases of denitrification following oxygen depletion in soil. *Soil Biol. Biochem.* 11(3): 261–267.
- Sorai, M., N. Yoshida, & M. Ishikawa. 2007. Biogeochemical simulation of nitrous oxide cycle based on the major nitrogen processes. *J. Geophys. Res.-Bioge.* 112: G01006
- Stępniewski, W., Z. Stępniewska & A. Rożej. 2011. Gas Exchange in Soils. American Society of Agronomy and Soil Science Society of America, 5585 Guilford Road, Madison, WI 53711, USA. *Soil Management: Building a Stable Base for Agriculture*. Jerry L. Hatfield and Thomas J. Sauer (ed.)
- Suzuki, I., U. Dular & S.C. Kwok. 1974. Ammonia or ammonium ion as substrate for oxidation by *Nitrosomonas europaea* cells and extracts. *J. Bacteriol.* 120(1): 556–558
- Sylvia, D.M., P.G. Hartel, J.J. Fuhrmann & D.A. Zuberer. 2005. Nitrogen-based gases, Chapter 23 Global gases, In *Principles and applications of soil microbiology*. pp. 509–513. Prentice Hall, New Jersey.
- Tanaka, F., F. Ono & T. Hayasaka. 1990. Identification and evaluation of toxicity of rice root elongation inhibitors in flooded soils with added wheat straw. *Soil Sci Plant Nutr* 36: 97–103.
- Tiedje, J.M. 1988. Ecology of denitrification and the dissimilatory nitrate reduction to ammonium. In: Zehnder, J.B. (ed.) *Biology of anaerobic microorganisms*. pp. 179–244. Wiley, New York
- Toma Y. & R. Hatano. 2007: Effect of crop residue C:N ratio on N₂O emissions from Gray Lowland soil in Mikasa, Hokkaido, Japan. *Soil Sci. Plant Nutri.* 53: 198–205.
- Toma Y., A. Maruyama, S. Oomori, O. Nagata & H. Ueno. 2013: Study of rice (*Oryza sativa* L.) growth, yield, and quality, and variations of methane and nitrous oxide emissions from paddy field managed under organic farming. *Bull. Exp. Farm Fac. Agric. Ehime Univ.* 35: 1–14. (in Japanese with English summary)
- Toma Y., F.G. Fernandez, S. Sato, M. Izumi, R. Hatano, T. Yamada, A. Nishiwaki, G. Bollero & J.R. Stewart. 2011. Carbon budget and methane and nitrous oxide emissions over the growing season in a *Miscanthus sinensis* grassland in Tomakomai, Hokkaido, Japan. *GCB Bioenergy*, 3: 116–134.
- Toma, Y., S. Oomori, A. Maruyama, H. Ueno, & O. Nagata. 2016. Effect of the number of tillages in fallow season and fertilizer type on greenhouse gas emission from a rice (*Oryza sativa* L.) paddy field in Ehime, Southwestern Japan. *J. Soil Science and Plant Nutrition.* 62 (1): 69-79.



EFFECT OF PROLONGING MIDSEASON DRAINAGE AND GREEN MANURE APPLICATION ON N₂O EMISSION FROM PADDY FIELD IN JAPAN

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- Ussiri, D. & R. Lal. 2013. Soil emission of nitrous oxide and its mitigation. Springer Dordrecht Heidelberg New York London
- Weitz, A.M., E. Linder, S. Frolking, P.M. Crill & M. Keller. 2001. N₂O emissions from humid tropical agricultural soils: Effects of soil moisture, texture and nitrogen availability. *Soil Biol. Biochem.* 33:1077–1093.
- Xie, Z., F. Shah, S. Tu, C. Xu & W. Cao. 2016. Chinese Milk Vetch as Green Manure Mitigates Nitrous Oxide Emission from Monocropped Rice System in South China. *PLoS ONE* 11(12): e0168134.
- Xiong, Z..Q., G.X. Xing & Z.L. Zhu. 2007. Nitrous oxide and methane emissions as affected by water, soil and nitrogen. *J. Pedosphere.* 17(2): 146-155.
- Yasue, T., 1991. The change of cultivation and utilization of Chinese milk vetch (*Astragalus sinicus* L.) and the effect of fertilizer and soil fertility on paddy field as a green manure. *Jpn. J. Crop Sci.* 60 (4), 583–592.
- Yu, K.W., Z.P. Wang & G.X. Chen. 1997. Nitrous oxide and methane transport through rice plants. *Biol Fertil Soils* 24:341–343
- Yung, Y.L., W.C. Wang & A.A. Lacis. 1976. Greenhouse effect due to atmospheric nitrous oxide. *J. Geophys Res Lett.* 3: 619–621.
- Zhou, C., Z. Zhao, X.H. Pan, S. Huang, X.M. Tan, J.F. Wu & Q.H Shi. 2016. Integration of Growing Milk Vetch in Winter and Reducing Nitrogen Fertilizer Application Can Improve Rice Yield in Double-Rice Cropping System. *Rice Science* 23(3): 132-143
- Zhu, J.G., G. Liu, Y. Han, Y.L. Zhang & G.X. Xing. 2003. Nitrate distribution and denitrification in the saturated zone of paddy field under rice/wheat rotation. *Chemosphere* 50(6): 725–732
- Zou, J., Y. Huang, & J. Jiang. 2005. A 3-year field measurement of methane and nitrous oxide emissions from rice paddies in China: Effects of water regime, crop residue, and fertilizer application. *J. Global Biogeochemical*. 19: 1-9.
- Zou, J.W., Y. Huang, X.H. Zheng & Y.S. Wang. 2007. Quantifying direct N₂O emissions in paddy fields during rice growing season in mainland China: Dependence on water regime. *Atmos. Environ.* 41(37): 8030–8042.