

REFERENCES

- Anita K. and Bindhu G., 2016. Effect of Controlled-Release Nitrogen Fertilizer on Methane Emission from Paddy Field Soil. *Procedia Technology* 24 (2016) 196 – 202
- Anonymous, 2015. Controlled and Slow release fertilizer In chemical economic handbook. Accessed on Oct 16, 2017 from <http://www.ihs.com/products/controlled-and-slow-release-chemical-economics-handbook.html>
- Bossio, D., Critchley, W., Geheb, K., van Lynden, G. and Mati, B. (2007) Conserving land – protecting water. In: Molden, D. (ed.) *Water for Food, Water for Life: a Comprehensive Assessment of Water Management in Agriculture*. Earthscan, London, UK and International Water Management Institute (IWMI), Colombo, Sri Lanka, pp. 551–584.
- Choudhury, A.T.M.A. and Y.M. Khanif. 2004. Effects of nitrogen and copper fertilization on rice yield and fertilizer nitrogen efficiency: A ¹⁵N tracer study. *Pak. J. Sci. Int. Res.* 47: 50–55. Choudhury, A.T.M.A. and I.R. Kennedy. 2005. Nitrogen fertilizer losses from rice soils and control of environmental pollution problems. *Commun. Soil Sci. Plant Anal.* 36: 1625–1639
- Choudhury A.T.M.A. and Kennedy I.R. 2005. Nitrogen fertiliser losses from rice soils and control of environmental pollution problems. *Communications in Soil Science and Plant Analysis* 36 : 1625–1639.
- De Datta, S.K., 1981. *Principles and Practices of Rice Production*. John Wiley, New York
- De Datta, S. K., D. S. Mikkelsen and W. N. Obcemea. 1978. Ammonia volatilization losses from flooded rice soils. *Soil Sci. Soc. Am. J.* 42:725-730.
- De Datta S.K. and Buresh R.J. 1989. Integrated nitrogen management in irrigated rice. *Advances in Soil Science* 10 : 143–169.
- Cao, Z.H., DeDatta, S.K., Fillery, I.R.P., 1984. Nitrogen balance and residual effects of urea-N in wetland rice fields as affected by deep placement techniques. *Soil Sci. Soc. Am. J.* 48, 203–208.
- Citraresmini, A dan T. Bachtiar. 2016. Phosphate Dynamics on The Application of Rice Straw Compost Biochar and Phosphate Fertilization in Rice Fields. *A Scientific Journal for The Applications of Isotopes and Radiation* Vol. 12 No. 2 Desember 2016
- Finck, A. (1992): 'Fertilizers and their efficient use'. In: IFA (1992): *World Fertilizer Use Manual*. Editors: Halliday, D. J.; Trenkel, M. E.; Wichmann, W. Publisher: International Fertilizer Industry Association, Paris, France.

- Glaser, B., Lehmann, J., Zech, W., 2002. Ameliorating physical and chemical properties of highly weathered soils in the tropics with charcoal — a review. *Biol. Fertil. Soils* 35, 219–230.
- Glaser, B., 2007. Prehistorically modified soils of central amazonia: a model for sustainable agriculture in the twenty-first century. *Philos. Trans. R. Soc. B* 362 (1478), 187–196.
- Gruhn, P., Goletti, F., Yudelman, M., 2000. Integrated nutrient management, soil fertility, and sustainable agriculture: current issues and future challenges. *Food, agriculture, and the environment discussion paper 32*. IFPRI, Washington, USA, p. 38.
- Harrington J. T., J. G. Mexal, and J. T. Fisher. 1994. Volume Displacement Provides a Quick and Accurate Way To Quantify New Root Production, accessed from <http://www.plantstress.com/methods/Root%20Methods%20PORTAL/Root%20Volume.PDF> on September 2017.
- Jindo. K, H. Mizumoto, Y. Sawada, M. A. Sanchez-Monedero, and T. Sonoki. 2014. Physical and chemical characterization of biochars derived from different agricultural residues. *Biogeosciences*, 11, 6613–6621, 2014
- JCAM Agri 2020. Segment release mechanism. <http://www.jcam-agri.co.jp/en/product/meister.html> (July 7, 2020)
- Johnson, C., G. Albrecht, Q. Ketterings, J. Beckman, and K. Stockin. 2005 *Nitrogen Basics-The Nitrogen Cycle*. Nutrient management spear program at <http://nmssp.css.cornell.edu>.
- Joly, C. (1993): Mineral fertilizers: plant nutrient content, formulation and efficiency. In: *FAO Fertilizer and Plant Nutrition Bulletin* 12, Integrated plant nutrition systems. Edited by Dudal, R. and Roy, R. N. FAO Land and Water Development Division, Rome.
- Kuzyakov, Y., Subbotina, I., Chen, H., Bogomolova, I., Xu, X., 2009. Black carbon decomposition and incorporation into soil microbial biomass estimated by ¹⁴C labeling. *Soil Biology & Biochemistry* 41, 210–219.
- Knoblauch, C., 2011. Effects and fate of biochar from rice residues in rice-based systems. *Field Crops Res.* 121, 430–440.
- Kundhu D. K. and J. K. Ladha. 1995. Efficient management of soil and biologically fixed N₂ in intensively cultivated rice fields. *Soil Bio-Biochem.* 27:431-439 dalam Resource management in rice system: Nutrient: paper presented at International workshop on National Resource Management in Rice Systems. Indonesia 2-5 December 1996.
- Lakitan, B. & N Gofar. 2013. Kebijakan Inovasi Teknologi untuk Pengelolaan Lahan Suboptimal Berkelanjutan. *Prosiding Seminar Nasional Lahan Suboptimal*

“Intensifikasi Pengelolaan Lahan Suboptimal dalam Rangka Mendukung Kemandirian Pangan Nasional”, Palembang 20-21 September 2013. ISBN 979-587-501-9

- Laird, D.A., 2008. The charcoal vision: a win-win-win scenario for simultaneously producing bioenergy, permanently sequestering carbon, while improving soil and water quality. *Agron. J.* 100 (1), 178–181.
- Lal, R., 2008. Soils and sustainable agriculture. A review. *Agron. Sustain. Dev.* 28 (1), 57–64.
- Lal, R., 2011. Sequestering carbon in soils of agro-ecosystems. *Food Policy* 36, S33–S39.
- Lehmann, J., da Silva, J.P., Steiner, C., Nehls, T., Zech, W., Glaser, B., 2003. Nutrient availability and leaching in an archaeological anthrosol and a ferralsol of the central Amazon Basin: fertilizer, manure and charcoal amendments. *Plant Soil* 249, 343–357.
- Lehmann J dan Joseph. 2009. Biochar for Environmental Management: Science and Technology . Earthscan-UK. p, 71-78.
- Lehmann, J., 2007. Bio-energy in the black. *Frontiers in Ecology and the Environment* 5, 381 – 387.
- Lehmann J, JP da Silva Jr, C Steiner, T Nehls, W Zech & B Glaser. 2003. Nutrient Availability And Leaching In An Archaeological Anthrosol And A Ferralsol Of The Central Amazon Basin: fertilizer, manure and charcoal amendments. *Plant and Soil.* 249, 343–357.
- Liang, B., Lehmann, J., Solomon, D., Kinyangi, J., Grossman, J., O'Neill, B., Skjemstad, J.O., Thies, J., Luizaõ, F.J., Petersen, J., Neves, E.G., 2006. Black carbon increases cation exchange capacity in soils. *Soil Science Society of America Journal* 70, 1719 –1730.
- Liu, M, F. Hua, X. Chen, Q. Huang, J. Jiao, B. Zhang, H. Li. Organic amendments with reduced chemical fertilizer promote soil microbial development and nutrient availability in a subtropical paddy field: The influence of quantity, type and application time of organic amendments. *Applied Soil Ecology* 42 (2009) 166–175
- Liu, E., Changrong, Y., Xurong, M., Wenqing, H., So, H.B., Linping, D., Qin, L., Shuang, L., Tinglu, F., 2010. Long term effect of chemical fertilizer, straw, and manure on soil chemical and biological properties in north-west China. *Geoderma* 150, 173–180.
- Major, J., Ch. Stainer, A. Downie dan J. Lehmann., 2009. Biochar, Effects on Nutrient Leaching. 271-282, dalam Lehmann J. dan S. Joseph., 2009. Biochar for environmental Management. First Published by Earthscan in the UK and USA in 2009.
- Makarim, A.K. Ponimin Pw., Sisniyati R. Otjim S, dan Hidayat A. 1993. Peningkatan Efisiensi dan Efektivitas Pemupukan N pada Padi Sawah Berdasarkan Analisis

Sistem. Prosiding Simposium Penelitian Tanaman Pangan III. Puslitbangtan 3: 675-681.

- Mawardiana , Sufardi , Edi Husen. 2013. PENGARUH RESIDU BIOCHAR DAN PEMUPUKAN NPK TERHADAP SIFAT KIMIA TANAH DAN PERTUMBUHAN SERTA HASIL TANAMAN PADI MUSIM TANAM KETIGA. Jurnal Konservasi Sumber Daya Lahan Pascasarjana Universitas Syiah Kuala Volume 1, No. 1, Mei 2013.
- Mengel, K. 1990. Impact of Intensive Plant Nutrient Management on Crop Production and Environment. 14th Ing. Long. of Soil Sci. Plenary Lecture : 42-52.
- Novak, J.M., Busscher, W.J., Laird, D.L., Ahmedna, M., Watts, D.W., Niandou, M.A.S., 2009. Impact of biochar amendment on fertility of a southeastern coastal plain soil. *Soil Science* 174, 105–112.
- Ogawa, M. 2006. Carbon Sequestration By Carbonization of Biomass and Forestation : Three Case Studies. P. 133-146.
- Palm, C.A., Gachengo, C.N., Delve, R.J., Cadisch, G., Giller, K.E., 2001. Organic inputs for soil fertility management in tropical agroecosystems: application of an organic resource database. *Agric. Ecosyst. Environ.* 83 (1), 27–42
- Pietikäinen, J., Kiikkilä, O., Fritze, H., 2000. Charcoal as a habitat for microbes and its effect on the microbial community of the underlying humus. *Oikos* 89, 231-242.
- Parry, M.L., 2007. Climate change 2007: impacts, adaptation and vulnerability: contribution of working group II to the fourth assessment report of the intergovernmental panel on climate change. 4. Cambridge University Press.
- Pender, J., 2009. The world food crisis, land degradation, and sustainable land management: linkages, opportunities, and constraints. IFPRI, New York, USA.
- Rogovska, N., D. Laird, R. Cruse, P. Fleming, T. Parkin, D. Meek. 2011. Impact of Biochar on Manure Carbon Stabilization and Greenhouse Gas Emissions *Soil Sci. Soc. Am. J.* 75:871–879
- Ruark, M. 2012. Advantages and disadvantages of controlled-release fertilizers. http://www.soils.wisc.edu/extension/materials/Overview_of_fertilizer_technologies_2012_WIFFVC.pdf
- Schnitzer, M. and S. U. Khan. 1989. Soil Organic Matter. Elsevier Science Publishers. The Netherlands.
- Shashidhar HE, Henry A, Hardy B, editors. 2012. Methodologies for root drought studies in rice. Los Baños (Philippines): International Rice Research Institute. 65 p.
- SMITH, K. A., T. BALL, F. CONEN, K. E. DOBBIE, J. MASSHEDER & A. RE Y. 2003. Exchange of greenhouse gases between soil and atmosphere: interactions of soil

- physical factors and biological processes. *European Journal of Soil Science*, December 2003, 54, 779–791. doi: 10.1046/j.1365-2389.2003.00567.x
- Socolow, R.H., 1999. Nitrogen management and the future of food: lessons from the management of energy and carbon. *Proc. Natl. Acad. Sci.* 96 (11), 6001–6008.
- Sohi, S., Krull, E., Lopez-Capel, E., Bol, R., 2010. A review of biochar and its use and function in soil. *Adv. Agron.* 105, 47–82.
- Sohi, S., E. Lopez-Capel, E. Krull, and R. Bol. 2009. Biochar, climate change and soil: A review to guide future research. CSIRO Land and Water Science Report 05/09, February 2009.
- Steiner C., W.G. Teixeira, J. Lehmann, T. Nehls, J.L.V. Macedo, W.E.H. Blum, and W. Zech. 2007. Long term effects of manure, charcoal and mineral fertilization on crop production and fertility on a highly weathered Central Amazonian upland soil. *Plant and Soil* 291:275-290 .
- Spokas, K. A., J. Baker, and D.C. Reicosky. 2010. Ethylene: Potential Key for biochar amendment impacts. *Plant Soil* 333:443-452
- Sisworo, W.H. 2006. Swasembada pangan dan pertanian berkelanjutan tantangan abad dua satu: Pendekatan ilmu tanah, tanaman dan pemanfaatan iptek nuklir. Dalam A. Hanafiah WS, Mugiono, dan E.L. Sisworo. Badan Tenaga Nuklir Nasional, Jakarta. 207 hlm
- Thies, J., Rillig, M., 2009. Characteristics of biochar: biological properties. In: Lehmann, J., Joseph, S. (Eds.), *Biochar for environmental management*. Earthscan London, UK, pp. 85–102.
- Trenkel, M. E. 2010. Slow- and Controlled-Release and Stabilized Fertilizers: An Option for Enhancing Nutrient Use Efficiency in Agriculture. International Fertilizer Industry Association (IFA) Paris, France, 2010
- UNEP (United Nations Environment Programme) (1997) *World Atlas of Desertification*, Second Edition
- Vanlauwe, B., Bationo, A., Chianu, J., Giller, K.E., Merckx, R., Mokwunye, U., Ohiokpehai, O., Pypers, P., Tabo, R., Shepherd, K.D., Smaling, E.M.A., Woomer, P.L., Sanginga, N., 2010. Integrated soil fertility management: operational definition and consequences for implementation and dissemination. *Outlook Agric.* 39 (1), 17–24.
- Wang S., Xiaokun Li, Jianwei Lu, Juan Hong, Gang Chen, Xinxin Xue, Jifu Li, Yunxia Wei, Jialong Zou, Guangwen Liu. 2013. Effects of controlled-release urea application on the growth, yield and nitrogen recovery efficiency of cotton. *Agricultural Sciences* Vol.4, No.12A, 33-38 (2013). <http://dx.doi.org/10.4236/as.2013.412A003>

- Widowati, W. H. Utomo, L. A. Soehono and B. Guritno. 2011. Effect of biochar on the Release and Loss of Nitrogen from Urea Fertilization. *J. Agric. Food. Tech.*, 1(7) 127-132, 2011
- Wihardjaka, A. 2015. Peran jerami padi dalam memperbaiki hasil gabah dan serapan kalium di lahan sawah tadah hujan di kabupaten Pati, Jawa Tengah. *RICE STRAW ROLE IN IMPROVING GRAIN YIELD AND POTASSIUM UPTAKE IN RAINFED LOWLAND RICE AREAS AT PATI, CENTRAL JAVA*. AGRIC Vol. 27, No. 1 & No.2, Juli & Desember 2015: 15 – 22
- Xing, G., X. Zhao, Z. Xiong, X. Yan, H. Xu, Y. Xie, S. Sh. 2009. Nitrous oxide emission from paddy fields in China. *Acta Ecologica Sinica* 29 (2009) 45–50
- Zimmerman, A.R., 2010. Abiotic and microbial oxidation of laboratory-produced black carbon (biochar). *Environmental Science & Technology* 44, 1295–1301.
- Vallero, D. A., 2019. Chapter 8 - Air pollution biogeochemistry in *Air Pollution Calculations : Quantifying Pollutant Formation, Transport, Transformation, Fate and Risks*. Pages 175-206. <https://doi.org/10.1016/B978-0-12-814934-8.00008-9>
- Raviv, M., S. Medina, A. Krasnovsky, and H. Ziadna. 2004. Organic matter and nitrogen conservation in manure compost for organic agriculture. *Compost Sci. Util.* 12(1): 6–10. doi: 10.1080/1065657X.2004.10702151.
- Mu Z. J., A.Y. Huang, J.P. Ni, J.Q Li, Y. Y. Liu, S. Shi, D.T. Xie, R. Hatano. 2013. Soil greenhouse gas fluxes and net global warming potential from intensively cultivated vegetable fields in southwestern China. *J. Soil Sci. Plant Nutr.* vol.13 no.3 Temuco set. 2013 Epub 27-Ago-2013. <http://dx.doi.org/10.4067/S0718-95162013005000045>.
- Lang M., Z. Cai and S. X. Chang. 2016. Effects of land use type and incubation temperature on greenhouse gas emissions from Chinese and Canadian soils. *J Soils Sediments* (2011) 11:15–24. DOI 10.1007/s11368-010-0260-0.
- Smith, W. N., B. Grant, R. L. Desjardins, R. Lemke & C. Li. 2004. Estimates of the interannual variations of N₂O emission from agricultural soils in Canada. *Nutrient Cycling in Agroecosystems*, 66: 37-45.
- Holzapfel-Pschorn, A. and W. Seiler (1986). Methane emission during a cultivation period from an Italian rice paddy. *Journal of Geophysical Research* 91: 11803-11814.
- Schütz H., A. Holzapfel-Pschorn, R. Conrad, H. Rennenberg and W. Seiler (1989). A three-year continuous record on the influence of daytime season and fertilizer treatment on methane emission rates from an Italian rice paddy field. *Journal of Geophysical Research* 94: 16405-16416.
- Conrad, R. and F. Rothfuss (1991) Methane oxidation in the soil surface layer of a flooded rice field and the effect of ammonium, *Biol. Fert. Soils*, 12:28-32.

- Gerard, G and J. Chanton (1993) Quantification of methane oxidation in the rhizosphere of emergent aquatic macrophytes: defining upper limits. *Biogeochemistry*, 23:79-97.
- Sass, R.L., F.M. Fisher, Y.B. Wang, F.T. Turner, and M.F. Jund (1992) Methane emission from rice fields: The effect of floodwater management. *Global Biogeochem. Cycles*, 6:249-262.
- Nugroho, R.A., Röling, W.F.M., Laverman, A.M., Verhoef, H.A., 2007. Low nitrification rates in acid Scots pine forest soils are due to pH-related factors. *Microbiol. Ecol.* 53, 89–97.
- Neue, H.U. and R. Sass (1994). *Trace gas emissions from rice fields*. In: *Prinn R.G.* (ed.) *Global Atmospheric-Biospheric Chemistry*. Environmental Science Res. 48. Plenum Press, New York, pp. 119-148.
- Abdalla, M., Jones, M., Smith, P., Williams, M., 2009. Nitrous oxide fluxes and denitrification sensitivity to temperature in Irish pasture soils. *Soil Use Manage.* 25, 376–388.
- Okuda A, Takahashi E (1962) Studies of the physiological role of silicon in crop plants (Part 6). Effect of silicon on iron uptake by rice plant and oxidation power of root. *J Sei Soil Manure Jpn* 33:59–64
- Gutierrez J, Sarah LA, Kim GW, Kim PJ (2014) Importance of rice root oxidation potential as a regulator of CH₄ production under waterlogged conditions. *Biol Fertil Soils* 50:861–868
- Stoyle, A. 2011. Biochar production for carbon sequestration. A Major qualifying project. Degree of Bachelor of Science in Chemical Engineering. Worcester Polytechnic Institute. England, 18.
- Basile-Doelsch, I., Amudson, R., Stone, W.E.E., Borschneck, D., Bottero, J.Y., Moustier, T., Masin, F., Colin, F. 2007. Mineral control of carbon pools in a colcanic horizon. *Geoderma*. 137, 437-489.
- Saha, Biswajit, P. Panda, P. S. Patra, R. Panda, A. Kundu, A.K. Singha Roy and N. Mahato. 2017. Effect of Different levels of Nitrogen on Growth and Yield of Rice (*Oryza sativa* L.) Cultivars under *Terai-agro* Climatic Situation. *Int.J.Curr.Microbiol.App.Sci* (2017) 6(7): 2408-2418. <https://doi.org/10.20546/ijcmas.2017.607.285>
- Chaturvedi, Indira. 2005. Effect of nitrogen fertilizers on growth, yield and quality of hybrid rice (*Oryza sativa*). *Journal of Central European Agriculture* Vol 6 (2005) No 4 (611-618).

- Peng S, Garcia FV, Gines HC, Laza RC, Samson MI, Sanico AL, Visperas RM, Cassman KG. 1996a. Nitrogen use efficiency of irrigated tropical rice established by broadcast wet seeding and transplanting. *Fert. Res.* 45:123-134.
- Peng S, Garcia FV, Laza RC, Sanico AL, Visperas RM, Cassman KG. 1996b. Increased N-use efficiency using a chlorophyll meter on high-yielding irrigated rice. *Field Crops Res.* 47:243-252.
- Arregui, L.M., Lasa, B., Lafarga, A., Iraneta, I., Baroja, E., and Quemada, M. (2006). Evaluation of chlorophyll meters as tools for N fertilization in winter wheat under humid Mediterranean conditions. *Eur. J. Agron.* 24, 140–148. doi: 10.1016/j.eja.2005.05.005
- Hawkins, T.S., Gardiner, E.S., and Comer, G.S. (2009). Modeling the relationship between extractable chlorophyll and SPAD-502 readings for endangered plant species research. *J. Nat. Conserv.* 17, 123–127. doi: 10.1016/j.jnc.2008.12.007
- Yuan, Z., Ata-Ul-Karim, S.T., Cao, Q., Lu, Z., Cao, W., Zhu, Y., et al. (2016). Indicators for diagnosing nitrogen status of rice based on chlorophyll meter readings. *Field Crops Res.* 185, 12–20. doi: 10.1016/j.fcr.2015. 10.003
- Ziadi, N., M Brassard, G. Bélanger,., Claessens, A., Tremblay, N., Cambouris, A.N., et al. (2008). Chlorophyll measurements and nitrogen nutrition index for the evaluation of corn nitrogen status. *Agron. J.* 100, 1264–1273. doi: 10.2134/agronj2008.0016
- Olivier J.G.J., K.M. Schure and J.A.H.W. Peters, 2017. Trends in global CO₂ and total greenhouse gas emissions: 2017 Report. PBL Netherlands Environmental Assessment Agency The Hague. 69 pages
- Boer R, R G Dewi, M Ardiansyah, U W Siagian, A Faqih, R Barkey, I W Suadnya, I Sofyan, A Koropitan, Perdinan, A Buono, 2017. Third National Communication Under The United Nations Framework on Climate Change. Minister of Environment and Forestry Republic of Indonesia. 219 pages
- GRISP (Global Rice Science Partnership). 2013. Rice almanac, 4th edition. International Rice Research Institute. Los Baños (Philippines). 283 p.
- Ministry of Agriculture. 2018. Statistik Pertanian 2018/Agricultural Statistics 2018. Pusat Data dan Informasi/Center for Agricultural Statistics. Jakarta. Indonesia. 382 p
- Wassmann R, L V Buendia, R S Lantin, C S Bueno, L A Lubigan, A Umali, N N Nocon, A M Javellana & H U Neue. 2000. Mechanisms of Crop Management Impact on Methane Emissions from Rice Fields in Los Baños, Philippines. *Nutrient Cycling in Agroecosystems* Volume 58. pages 107–119
- Zou J, Y Huang, L Zong, Y Wang, RL Sass. 2003. Integrated effect of incorporation with different organic manures on CH₄ and N₂O emissions from rice paddy. *Huan Jing Ke Xue.* Jul;24(4) 7-12. PMID: 14551949

- Cheng W, K Yagi, H Sakai and K Kobayashi. 2006. Effects of elevated atmospheric CO₂ concentrations on CH₄ and N₂O emission from rice soil: an experiment in controlled-environment chambers. *Biogeochemistry* 77: 351–373. DOI 10.1007/s10533-005-1534-2
- Mackill D, W R Coffman and D P Garrity. 1996. Rainfed Lowland Rice Improvement. International Rice Research Institute, Manila, Philippines. P 242.
- IAARD. 2008. Pengelolaan Tanaman Terpadu (PTT) Padi Sawah Tadah Hujan. Badan litbang Pertanian (IAARD). Jakarta. 53 pages
- Sulaiman A A., A Candradijaya, and M Syakir. Technological Advancement and the Economic Benefit of Indonesian Rain-Fed Farming Development. *Advances in agriculture* Volume 2019 |Article ID 9689037 | <https://doi.org/10.1155/2019/9689037>
- West T.O and Post W. M .2002: Soil organic carbon sequestration rates by tillage and crop rotation: a global data analysis. *Soil Sci. Soc. Am. J.*, 66, 1930–1946. doi:10.3334/CDIAC/tcm.002
- Arunrat N, N Pumijumnong, R Hatano. 2016. Practices sustaining soil organic matter and rice yield in a tropical monsoon region. *SSPN* 63 (3): 274-287
- Khunthasuvona S, S Rajastasereekul, P Hanviriyapant, P Romyen, S Fukai, J Basnayake, E Skulkhu. 1998. Lowland rice improvement in northern and northeast Thailand: 1. Effects of fertilizer application and irrigation. *Field Crops Research* Volume 59, Issue 2, 6 November 1998, Pages 99-108. [https://doi.org/10.1016/S0378-4290\(98\)00109-9](https://doi.org/10.1016/S0378-4290(98)00109-9)
- Tadesse, T, N Dechassa, W Bayu, S Gebeyehu. 2013. Effects of Farmyard Manure and Inorganic Fertilizer Application on Soil Physico-Chemical Properties and Nutrient Balance in Rain-Fed Lowland Rice Ecosystem. *American Journal of Plant Sciences* Vol.4 No.2. Article ID:28313,8 pages. DOI:10.4236/ajps.2013.42041
- Haefele, S.M., , Y Konboon, , W Wongboon,. S Amarante, , A A Maarifat, , E M Pfeiffer, C Knoblauch. 2011. Effects and fate of biochar from rice residues in rice-based systems. *Field Crop Research* 121:430-440.
- Rice husk, taken from <http://www.knowledgebank.irri.org/step-by-step-production/postharvest/rice-by-products?tmpl=component-category&print=1> access at September 17, 2020
- Deniel S., A B Rosenani, S H Ahmad, K B Abdul Rahim. Influences of rice husk biochar (RHB) on rice growth performance and fertilizer nitrogen recovery up to maximum tillering stage. 2018. *Journal of Wetlands Environmental Management* Vol 6. No 1 page 32 – 44 <http://dx.doi.org/10.20527/jwem.v5i2.108>

- Masulili A., W H Utomo, Syechfani. 2010. Rice Husk Biochar for Rice Based Cropping System in Acid Soil 1. The Characteristics of Rice Husk Biochar and Its Influence on the Properties of Acid Sulfate Soils and Rice Growth in West Kalimantan, Indonesia. *Journal of Agricultural Science* Vol. 2 No. 1 page 39-47.
- Agegnehu, G, A M Bass, P N Nelson, M I Bird. 2016. Benefits of biochar, compost and biochar–compost for soil quality, maize yield and greenhouse gas emissions in a tropical agricultural soil. *Science of the Total Environment* 543 p. 295–306.
- Wada, G., R. G. Aragonés, and H. Ando. 1991. Effect of Slow Release Fertilizer (Meister) Uptake and yield of the rice plant in the tropics. *Japan. Jour. Crop Sci.* 60 (1) : 101-106.
- Xu, M G., D C Li, J M Li, D Z Qin, Y Hosen, H P Shen, R H Cong, X H He. 2013. Polyolefin-coated urea decreases ammonia volatilization in a double rice system of Southern China. *Agronomy Journal*, 105 (2013), p. 277-284
- JCAM Agri 2020. Segment release mechanism. <http://www.jcam-agri.co.jp/en/product/meister.html> (July 7, 2020)
- Shaviv A., 2001. Advances in Controlled-release fertilizers. *Advances in Agronomy Volume 71*, 2001, Pages 1-49.
- Haefele, S. M., 2008. Biochar in rice-based systems: characteristics and agronomic effects. Biochar: Sustainability and security in a changing climate. Proceedings of the 2nd International Biochar Initiative Conference, Newcastle 2008.
- Rondon M, Lehmann J, Ramirez J, Hurtado M (2007). Biological nitrogen fixation by common beans (*Phaseolus vulgaris* L.) increases with biochar additions. *Biol. Fertil. Soils* 43:688-708.
- Lehmann J, Pereira da Silva Jr J, Steiner C, Nehls T, Zech W, Glaser B (2003). Nutrient availability and leaching in an archaeological Anthrosol and a Ferralsol of the Central Amazon basin: fertilizer, manure and charcoal amendments. *Plan Soil* 249:343-357
- Chan KY, Xu Z (2009). Biochar: nutrient properties and their enhancement. In: Biochar for environmental management (J. Lehmann and S. Joseph eds.), Science and Technology, Earthscan, London. pp. 67-84
- Spokas KA, Koskinen WC, Baker JM, Reicosk DC (2009). Impacts of woodchip biochar additions on greenhouse gas production and sorption/degradation of two herbicides in a Minnesota soil. *Chemosphere* 77:574-581.

Purakayastha TJ (2010). Effect of biochar on yield of different crops.IARI. Annual Report2010-11, Indian Agricultural Research Institute, New Delhi-110012, India. P. 55.

Major J, Steiner C, Downie A, Lehmann J (2009). Biochar effects on nutrient leaching. In: Biochar for environmental management(J. Lehmann and S. Joseph eds.), Science and Technology, Earthscan, London. pp. 271-287.

Kartikawati, R., E. Yulianingsih, S. Wahyuni, A. Wihardjaka. 2017. *Strategi budidaya padi untuk mendukung ketahanan pangan di lahan tadah hujan dalam menghadapi perubahan iklim dalam Prosiding Seminar Nasional Fakultas Pertanian UNS Vol. 1, No. 1 hal 103-108.*