



DAFTAR PUSTAKA

- Adiningsih, J.S. dan Mulyadi. 1993. Alternatif teknik rehabilitasi dan pemanfaatan lahan alang-alang. Pusat Penelitian Tanah dan Agroklimat, Bogor.
- Adriano, D.C., A.L.Page, A.A. Elseewi, A.A. Chang, and Straughan. 1980. Utilization and disposal of fly-ash and coal residues in terrestrial ecosystem: A review. Journal Enviromental. Quality. Vol 9. pp 333-344.
- Aggarwal, P., Aggarwal, and Gupta. (2007). Effect of bottom ash as replacement of fine aggregates in concrete. Asian Journal of Civil Engineering (Building and Housing): 49-62.
- Alloway, B.J. 1995. Heavy Metal in Soils. Second Edition. Blcakie Academic and professional – Chapman and Hall, New York.
- Álvarez-ayuso, E.,Querol, Plana, Vázquez, E. and Barra. 2007. Enviromental, physical, and structural characterization of geopolymers matrixes synthesisd from coal (co)combustion abu terbanges. Journal of Hazardous Material: 175-183.
- Balittanah, 2009. Analisis Kimia Tanah, Tanaman, Air, dan Pupuk. Balai Penelitian Tanah, Bogor
- Barber, S.A. 1995. Soil Nutrient Bioavailability: A Mechanistic Approach. New York: John Willey & Sons. 384 hal.
- Barcelo, J and C. Poschenrieder. 2003. Phytoremediation: Principle and Perspectives. Contribution to science : 333-344.
- Bayer C, L.P. Martin-Neto, J. Mielniczuk, C.N. Pillon, and L. Sangoi. 2001. Changes in Soil Organic Matter Fractions Under Subtropical No-Till Cropping Systems. *Soil Sci. Soc. Am. J.* 65: 1473-1478.
- Bear, F. E. 1965. Chemistry of Soil. Van Nostrand Reinhold Company, New York.
- Bot, A and Benites. 2005. The importance of soil organic matter, key to drought resistant soil and sustained food production. FAO Soils Bulletin 80.
- Bothe, H., Yates, and Cannon. 1983. Physiology, biochemistry, and genetics of dinitrogen fixation. In: Pirson A, Zimmermann MH. (Eds). *Encyclopedia of Plant Physiology*. Springer Verlag, Berlin.
- Charlena. 2004. Pencemaran Logam Berat Timbal (Pb) dan Cadmium (Cd) pada Sayur-Sayuran. Falsafah Sain Program Pascasarjana (S3) Institut Pertanian Bogor.
- Cottenie,A., Verloo, Kiekens, Velghe and Camerlynck.1982. Chemical Analysis Of Plant and Soils. Laboratory of Analytical and Agrochemistry, State University of Ghent, Belgium.



- Damayanti, R. 2018. Abu batubara dan pemantauatannya: tinjauan teknis karakteristik secara kimia dan toksikologinya . Jurnal Teknologi Mineral dan Batubara: 213 – 231.
- Darmono, 1995. Logam Dalam Sistem Biologi Mahluk Hidup. UI Press, Jakarta.
- Dinas Lingkungan Hidup Kabupaten Bandung, 2008. Pidato pembukaan pada Acara “Sosialisasi Pengolahan Limbah Batubara”, Bandung 3 Maret 2008.
- Dwidevi,S., R.D. Tripathi, Mishra, M.K.Shukla, K.K. Tiwari, R. Singh, and U.N. Rai. 2007. Growth performance and biochemical responses of three rice (*Oryza sativa L.*) cultivars grown in fly-ash amended soil. Chemosphere: 140-151.
- Evangelou, V.P. 1996. Coal ash chemical properties and potential influence on water quality. In: Proceedings of coal combustion by-products associated with coal mining: Interactive Forum. Southern Illinois University at Carbondale.
- Farnham, D.E., G.O. Benson, and R.B. Pearce. 2003. Corn perspective and culture. In P.J. White. dan L.A. Johnson. 1997. Corn: Chemistry and Technology. American Association of Cereal Chemists. Inc. USA..
- Fuat, F. 2009. Budidaya Caisim (*Brassica Juncea L.*) Menggunakan Ekstrak Teh Dan Pupuk Kascing. Jurnal Pertanian.Vol.5 (2):8-14.
- Gaskin, J.W., R.A. Speir, K. Harris, K.C. Das, R.D. Lee, L.A. Morris, D.S. Fisher, 2010. Effect of peanut hull and pine chip biochar on soil nutrients, corn nutrient status, and yield. Agronomy Journal 102, 623–633.
- Gupta, A.K., and S. Sinha. 2008. Decontamination and/or revegetation of fly-ash dikes through naturally growing plants. Journal of Hazardous Materials: 1078-1087.
- Hakim, N, M., Y. Nyakpa, S. G. Nugroho, A. M. Lubis, M. R. Saul, M. A.Diha, G. B. Hong, dan H. H. Bailey. 1986. Dasar-dasar Ilmu Tanah. Lampung: Universitas Lampung.
- Handayani, S. dan B.H. Sunarminto. 2002. Kajian Struktur Tanah Lapis Olah. Jurusan Tanah, Fakultas Pertanian, Universitas Gadjah Mada, Yogyakarta. Makalah.
- Hardjowigeno, S. 1996. Pengembangan Lahan Gambut untuk Pertanian Suatu Peluang dan Tantangan. Orasi Ilmiah Guru Besar Tetap Ilmu Tanah Fakultas Pertanian, IPB.
- Harjadi, S.S dan S. Yahya.1988. Fisiologi Stress Tanaman. PAU IPB, Bogor.
- Havlin, J.L., J.D. Beaton, S.L. Tisdale and W.L. Nelson. 2005. Soil Fertility And Fertilizer. An Introduction To Nutrient Management. Pearson Prentice Hall, New Jersey.



Haynes, R.J. 2009. Reclamation and revegetation of abu terbang disposal sites – challenges and research needs. Journal of Environmental Management 90: 43-5

Iskandar, Suwardi, dan Ramadina. 2008. Pemanfaatan bahan amelioran abu terbang pada lingkungan tanah gambut: (I) Pelepasan hara makro. Jurnal Tanah Indonesia 1: 1-6.

Jala S, and D. Goyal . 2006. Abu terbang as a soil ameliorant for improving crop productiona review. Bioresource Technology 97: 1136-1147.

Jambhulkar, H.P., and A.A Juwarkar. 2009. Bioaccumulation of heavy metals on different plant species grown on abu terbang dump. Eco. Enviroment.

Jeffery.S., F.G.A. Verheijen.,M.V.D. Velde.A.C.Bastos. 2011. A quantitative review of the effects of biochar application to soils on crop productivity using meta-analysis. Agriculture, Ecosystems & Environment: 175-187.

Juwarkar, A.A., and H.P., Jambhulkar. 2008. Restoration of fly ash dumps through biological interventions. Environ. Monit. Assess: 355–365.

Kamprath, E. J. 1970. Exchangeable Al as Criterion for Liming Leached Mineral Soil. Soil Science Soc. Am. J. 34: 252-254.

Keller C. 2005. Alternatives for Phytoextraction: Biomass plant versus hyperaccumulators. Geophysic. Res. Abstract, Vol. 7, 03285.

Khan, S and N.N. Khan. 1983. Influence of Lead & Cadmium on Growth and Nutrient Concentration of Tomato & Eggs Plant. Plant & Soil 74 : 58-60.

Kumar, V., A.Z. Kiran, and G. Goswami. 2000. Flyash use in agriculture: a perspective. In: Proceedings of the 2nd international conference on fly ash disposal and utilization. vol. I, FAM & CBIP, New Delhi.

Kuwagaki, H. and K. Tamura. 1990. Aptitude of wood charcoal to a soil improvement and other non fuel use. In Technical report on the research development of the new uses of charcoal and pyroligneous acid, technical research association for multiuse of carbonized material, p. 27-44.

Lahuddin, M., 2007. Aspek Unsur Mikro Dalam Kesuburan Tanah, USU Press.

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. Plant and Soil 249, 343–357.

Listiani,D.D., Muhayatun dan N. Adventini.2010. Karakteristik unsur pada abu bawah dan abu terbang batu bara menggunakan analisis aktivasi neutron instrumental. Jurnal Sains dan Teknologi Nuklir Indonesia: 27-34.

Lepp N.W. 1981. Effect of Heavy Metal Pollution. Effect of Heavy Metal on Plant. Polytechnic. Liverpool UK. Applied Science Publ. London and New Jersey.



Pengaruh Abu Terbang Batubara, Pupuk Kandang, dan Biochar terhadap Cu Tersedia Tanah dan Serapan

Cu pada Jagung di Ultisol dan Alfisol

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GADJAH MADA

Lia, L. Y., and T. C. Ho. 2005. Control of heavy metals in emissions streams, dalam

Wang, L. K., Pereira, N. C., Hung, Y.-T. (eds.), Advanced Air and Noise Pollution Control, Humana Press, Totowa, New Jersey.

Mahale, N.K., S.D.Patil, D.B. Sarode, and S.B. Attarde. 2012. Effect of abu terbang as an admixture in agriculture and the study of heavy metal accumulation in wheat (*triticum aestivum*), mung bean (*vigna radiata*), and urad beans (*vigna mungo*). Journal of Environmental Study : 1713-1719.

Mengel K and E.A. Kirby . 1987. Principles of Plant Nutrition. Inter. Potash Ins. Bern. Switzerland. 687p

Merian, E. 1994. Toxic Metal In The Environment. VCH Verlagsgesellschaft mbH. Weinheim.

Miller, R.W. and R.L. Donahue. 1990. Soils: an introduction to soils and plant growth. Prantice Hall. Englewood Cliffs, New Jersey.

Minardi. 2006. Peran Asam Humat dan Fulfat dari Bahan Organik dalam Pelepasan P Terjerap pada Andisol. Universitas Brawijaya, Malang. Disertasi.

Minardi S. 2002. Kajian Komposisi pupuk NPK terhadap hasil beberapa hasil beberapa varietas tanaman buncis tegak (*Phaseoulus vulgaris* L.) di tanah Alfisols. J Sains Tanah 2(1).

Molina, A. and C. Poole. 2004. A comparative study using two methods to produce zeolites from fly ash. Minerals Engineering: 167–173.

Munawar, A. 2011. Kesuburan Tanah dan Nutrisi Tanaman. IPB Press, Bogor.

Munir, M. 1996. Tanah-Tanah Utama Indonesia. Dunia Pustaka Jaya, Jakarta.

Noviardi, R. 2012. Limbah batubara sebagai pemberah tanah dan sumber nutrisi kasus tanaman bunga matahari. Riset Geologi dan Pertambangan : 91-104.

Nugraha, P dan Antoni. 2007. Teknologi Beton: Dari Material, Pembuatan, ke beton Kinerja Tinggi. Penerbit Andi, Bandung.

Nurhayati, S. dan Ismiyati. 2007. Pengaruh Dosis Pupuk Kandang dan Waktu Aplikasi Jamur Antagonis *Trichoderma* spp. Sebagai Pengendali Penyakit Layu Fusarium Terhadap Pertumbuhan dan Hasil Bawang Merah. Jurnal Agrijati 6 (1): 25-40.

Nurida, N.L, A. Dariah dan A. Rachman. 2013. Peningkatan kualitas tanah dengan pemberah tanah biochar limbah pertanian. Jurnal tanah dan Iklim 37(2): 69-78.

Ogawa, M. 2006. Carbon sequestration by carbonization of biomass and forestation:three case studies: 133-146.

Ogawa, M., 1994. Symbiosis of people and nature in the tropics. Farming Japan 28, 10–34.



Olowoake AA, Ojo JA, and Osunlola OS. 2015. Growth and yield of okra (*Abelmoschus esculentus* L.) as influenced by NPK, jatropha cake and organomineral fertilizer on an Alfisol in Ilorin, Southern Guinea Savanna of Nigeria. *J Organic Systems*. 10(1): 3-8.

Page A.L., A.A. Elseewi, and I.R. Straughan. 1979. Physical and chemical properties of flyash from coal-fired power plants with special reference to environmental impacts. *Residue Rev* : 83–120.

Palar .1994. Pencemaran Dan Toksikologi Logam Berat. Rineka Cipta, Jakarta.

Peraturan Pemerintah. 1999. Peraturan Pemerintah No. 85 Tahun 1999 Tentang : Perubahan Atas Peraturan Pemerintah No. 18 Tahun 1999 Tentang Pengelolaan Limbah Bahan Berbahaya Dan Beracun, Presiden Republik Indonesia, Jakarta.

Perera, S.D. and Trautman. 2006, Geopolymers with the potential for use as refractory castables, *azojomo*: 132-140.

Prasetyo, B. H. 2009. Tanah Merah dari Berbagai Bahan Induk diIndonesia: Prospek dan Strategi Pengelolaannya. *Jurnal Sumberdaya Lahan*: 47-60.

Prasetyo, B. H dan D. A. Suriadikarta. 2006. Karakteristik , Potensi, dan Teknologi Pengelolaan Tanah Ultisol Untuk Pengembangan Pertanian Lahan Kering di Indonesia. *J. Litbang Pertanian*, Bogor.

Rahman, A, 2006, Kandungan Logam Berat Timbal (Pb) dan Kadmium (Cd) pada Beberapa Jenis Krustasea Di Pantai Batakan dan Takisung Kabupaten Tanah Laut Kalimantan Selatan, *Bioscientiae*, 3: 93-101.

Rahmi, L.A., 2006, Pemanfaatan Abu terbang Batubara Untuk Stabilisasi Ion Logam Berat Besi (Fe^{3+}) dan Seng (Zn^{2+}) Dalam Limbah Cair Buangan Industri, Tugas Akhir II, Program Strata 1, Jurusan Kimia Universitas Negeri Semarang, Semarang.

Ross, S.M., 1994. Toxic Metal in Soil-Plant Systems. John Wiley and Sons, Singapore.

Santoso, I. dan Roy, S.K. 2003. Pengaruh Penggunaan Bottom Ash terhadap Karakteristik Campuran Aspal Beton. *Jurnal Dimensi Teknik Sipil* :75-81.

Santoso, B., F. Haryanti dan S.A. Kadarsih. 2004. Pengaruh pemberian pupuk kandang ayam terhadap pertumbuhan dan produksi serat tiga klon rami di lahan aluvial Malang. *Jurnal Pupuk*. 5(2):14-18.

Schnitzer, M. 1991. Soil organic matter. The next 75 years. *Soil Sci.Am. J.*, 151:41-58.

Soepardi, G. 1983. Sifat dan Ciri Tanah. Fakultas Pertanian Institut Pertanian Bogor, Bogor.



Soil Survey Staff. 2014. Key to Soil Taxonomy Twelfth Edition. United States Department of Agriculture Natural Resources Conservation Service. USA.

Stevenson, F.T. 1982. Humus Chemistry. John Wiley and Sons, Newyork.

Subagyo, H., N. Suharta., dan A. B. Siswanto. 2004. Tanah-Tanah Pertanian di Indonesia. Hal:21-66 dalam Buku Sumber Daya Lahan Indonesia dan Pengelolaannya. Pusat Penelitian dan Pengembangan Tanah dan Agroklimat, Bogor.

Subekti, N.A., Syafruddin, R. Efendi, dan S. Sunarti. 2007. Morfologi dan Fase Pertumbuhan Jagung. Pusat Penelitian dan Pengembangan Tanaman Pangan, Jakarta.

Sudaryono. 1988. The physical condition-soils, erosion problems in the South Malang limestone area. Penelitian Palawija 3(1):5560. Balai Penelitian Tanaman Kacang-kacangan dan Umbi-umbian, Malang.

Sulistiyowati,N.A. 2013. Bata beton berlubang dari abu batubara (abu terbang dan bottom ash) yang ramah lingkungan. Teknik Sipil & Perencanaan: 87 – 96.

Syekhfani. 2000. Arti penting bahan organik bagi kesuburan tanah. Jurnal Penelitian Pupuk Organik.

Tan, K.H. 1998. Dasar-dasar Kimia Tanah. Gadjah Mada University Press. Yogyakarta.

Tanaka, S. 1963. Fundamental study on wood carbonization. Bull. Exp. Forest of Hokkaido University.

Tripathy S., Bhattacharyya P., Chakrabdorty A., Chakrabarti and Powell M.A. 2006. Copper and Zinc Uptake by Rice and Accumulation in Soil Amended with Municipal Solid Waste Compost. Environmental Geology, 49 (7): 1064-1070.

Wahyuningsih, E. Proklamasiningsih, dan M. Dwiaty. 2016. Serapan Fosfor dan Pertumbuhan Kedelai (*Glycine max*) pada Tanah Ultisol dengan Pemberian Asam Humat. Biosfera : 66-70.

Winarso, S. 2005. Kesuburan Tanah: Dasar Kesehatan dan Kualitas Tanah. Gava media, Yogjakarta.

Wirjodihardjo, M.W. 1963. Ilmu tanah. Jilid III. Yasaguna, Jakarta.

Wiryanta. W dan Bernardinus .T. 2002. Bertanam Cabai Pada Musim Hujan. Agromedia Pustaka, Jakarta.

Wong, J.W.C. and Su, DC. 1997. "Reutilization Of Coal Ash And Sewage Sludge As Aan Artificial Soil Mix : Effect Of PreIncubation On Soil Physico-Chemical Properties" Biore-source Technology Vol. 59. pp 97 – 102.



Yamato, M., Okimori, Y., Wibowo, I.F., Anshori, S., and Ogawa, M., 2006. Effects of the application of charred bark of Acacia mangium on the yield of maize, cowpea and peanut, and soil chemical properties in South Sumatra, Indonesia. *Soil Science and Plant Nutrition* 52, 489–495.

Yetti, H., Nelvia, dan A. Pratama. 2012. Pengaruh Pemberian Berbagai Macam Kompos pada Lahan Ultisol terhadap Pertumbuhan dan Produksi Jagung Manis (*Zea mays Saccharata Sturt*). *J. Agrotek. Trop.* 1 (2): 31-37.