

- Charan, G., V.K. Bharti, S.E. Jadhav, S. Kumar, S. Acharya, P. Kumar, D. Gogoi and R.B. Srivastava. (2013). *Altitudinal variations in soil physico-chemical properties at cold desert high altitude*. Journal of Soil Science and Plant Nourition, 13: 267-277.
- Connolly, E.L. and Guerinot, M.L. (2002). *Iron Stress In Plant*. Genome Biology 3(8), 1021-1024
- Darmawan, Kyuma K, Saleh A, Subagyo, Matsunaga, Wakatsuki T. (2006). *Effect of longterm intensive rice cultivation on the available silica content of sawah soil in Java Island, Indonesia*. Soil Sci. Plant Nutrition 52: 745-753. <http://dx.doi.org/10.1111/j.1747-0765.2006.00089.x>
- De Datta, S.K. (1981). *Principles and Practices of Rice Production*. New York. John Wiley and Sons.
- Departemen Pertanian, (2008). *Pedoman Teknik Reklamasi Lahan Sawah Berbahan Organik Rendah Tahun 2008*. Direktorat Pengolahan Lahan. Direktorat Pengelolaan Lahan dan Air. Jakarta.
- Dobermann, A. and Fairhurst, T. (2000) *Rice: Nutrient Disorders & Nutrient Management. Handbook Series*, Potash & Phosphate Institute (PPI), Potash & Phosphate Institute of Canada (PPIC) and International Rice Research Institute (IRRI).
- Fageria, N. K., Baligar, V. C., & Clark, R. B. (2008). *Physiology of Crop Production*. CRC Press.
- Fageria, N. K., Baligar, V. C., & Jones, C. A. (2011). *Growth and Mineral Nutrition of Field Crops* (3rd ed.). CRC Press.
- Follet, R.H., L.S Murphy dan R.L. Donahue, (1981). *Fertilizer and Soil Amandemet*. Prentice Hall Inc. Englewood, New Jersey.
- Hafeez, R., T. Aziz, M. Farooq, A. Wakeel, Z. Rengel. (2013). *Zinc Nutrition In Rice Production Systems: A Review*. J. Plant Soil. 361: 203-226.
- Hakim, N., Nyakpa, M.Y., Lubis, A.M., Nugroho, S.G., Saul, M.N., Diha, M.A., Hong, G.B., dan Bailey, (1986). *Dasar-Dasar Ilmu Tanah*. Universitas Lampung. Bandar Lampung. 488 hal.
- Hamam, M., B, Pujiasmanto, Supriyono. (2017). *Peningkatan Hasil Padi dan Kadar Zink Dalam Beras melalui Aplikasi Zink Sulfat Heptahidrat*. J Agron. Indonesia. 45(3):203-243-248.
- Hardjowigeno, S. dan M. L. Reyes. (2005). *Tanah Sawah Karakteristik, Kondisi dan Permasalahan Tanah Sawah di Indonesia*. Bayumedia Publishing: Bogor

- Hardjowigeno, S., Subagyo, H., dan Luthfi, R.M. (2004). *Morfologi dan Klasifikasi Tanah Sawah. Di dalam: Tanah Sawah dan Teknologi Pengolahannya*. Pusat Penelitian Tanah dan Agroklimat. Departemen Pertanian: Bogor
- Havlin, J. L. J. D Beaton, S. L Tisdale dan W.L Nelson. (1999) *Soil Fertility and Fertilizers: An Introduction to Nutrient Management*. Pearson Prentice Hall: New Jersey <https://www.epa.gov/chemicalresearch/>
- Husnain, A. Kasno, S. Rochyati. (2016). *Pengelolaan Hara Dan Teknologi Pemupukan Mendukung Swasembada Pangan Di Indonesia*. Jurnal Sumberdaya Lahan 10(1):25-36. Peneliti balai Penelitian Tanah. Bogor
- Husnain, Rochayati, S., Adamy, I. (2008). *Pengelolaan Hara Silika pada Tanah Pertanian di Indonesia [Riset Puslitbangtanak]*. Pusat Penelitian dan Pengembangan Tanah dan Agroklimat). Bogor. 237-246 hal.
- Isnaini, S. (2007). *Kandungan fosfor dan pH tanah akibat pemupukan nitrogen dan fosfor pada Ultisols dan Inceptisols*. Agrista 11(1), 14-20.
- Karathanasis, A.D. (1999). *Subsurface Migration of Copper and Zinc Mediated by Soil Colloid*. Soil. Sci. Soc. Amer. J 63: 830-838.
- Kawaguchi, K. and K. Kyuma. (1977). *Paddy Soils in Tropical Asia, Their Material Nature and Fertility*. University Press of Hawaii, Honolulu.
- Knezek, B, and B.G. Ellis. (1980). *Essential Micronutrient. IV. Copper, Iron, Manganese and Zinc*. Applied Soil Trace Element. Edited by Brian E. Davies.
- Kumar S.D. (2014). *Role of micronutrient in Rice Cultivation and Management Strategy in Organic Agriculture*. Agricultural Sciences Vol.5: 765-769.
- Landon, F. (1986). *Soil Chemistry Analysis*. McGraw Hill Publ. Toronto.
- Lantoi RR, Saiful D, Yosep P, Patudungan. (2016). *Identifikasi Kualitas Tanah Sawah Pada Beberapa Lokasi di Lembah Palu Dengan Metod Skoring Lowery*. Agroland. 23(3): 243-250.
- Ma JF, Takahashi E. (1991). *Availability of Rice Straw Si to Rice Plants*. Soil Sci. Plant Nutr.37:111-116.
- Mahdiyah, A. S., Hermansah, Gusnidar, & Kamil, M. I. (2024). *Spatial Distribution of Silicon Availability in The Highland Paddy Fields of West Sumatera, Indonesia*. Jurnal Ilmu-Ilmu Pertanian Indonesia, 26(1), 33–39. <https://doi.org/10.31186/jipi.26.1.33-39>
- Mahdiyah. A. S. (2024). *Distribusi Unsur Hara Makro dan Mikro Pada Tanah Sawah di Kecamatan Gunung Talang Kabupaten Solok*. Thesis, Universitas Andalas: Padang.

- Mahreban, P. Zadeh, A.A. and Sideghipour, H.R. (2008). *Iron Toxity in Rice (Oryza Sativa L.) Under Diferent Potassium Nutrition*. Asian Journal of Plant Science 7 251-259.
- Makarim AK, Suhartatik E, Kartohardjono A. (2007). *Silikon: hara penting pada sistem produksi padi*. Iptek tanaman Pangan. 2(2): 195 - 204.
- Marschner, H. (1986) *Mineral Nutrition of Higher Plants*. Academic Press Harcourt Brace Jovanivich Publisher: London. P 309-312.
- Marschner, H. (1995). *Mineral Nutrition of Higher Plants*. 2nd ed. London: Academic Press.
- Mas'ud, P. (1993). *Telaah Kesuburan Tanah*. Angkasa: Bandung.
- Massaccesi, L., M.D. Feudis, A. Leccese and A. Agnelli. (2020). *Altitude and vegetation affect soil organic carbon, basal respiration and microbial biomass*. Apennine Forest Soils. Forests, 11: 710.
- Mengel, K. and Kirkby, E.A. (1982). *Principles of Plant Nutrition*. International Potash Institute: Bern, Switzerland.
- Mengel, K., & Kirkby, E. A. (1987). *Principles of Plant Nutrition*. International Potash Institute, Bern, Switzerland.
- Muliarta IN. (2021). *Pengetahuan dan persepsi petani terhadap pengomposan limbah jerami padi*. Jurnal AGRISEP. 20 (1): 81-94.
- Munawar, A. (2011). *Kesuburan Tanah dan Nutrisi Tanaman*. IPB press. Bogor.
- Mustafa, G., Ehsanullah, N. Akbar, S.A. Qaisrani, A. Iqbal, Haroon, Z. Khan, K. Jabran, A.M. Chattha, R Trethowa, T. Chattha, B. Manzoor. (2011). *Effect Of Zinc Application On Growth And Yield Of Rice (Oryza sativa L.)* Int. J. Agro Vet. Med. Sci. 5: 530-535.
- Novarizan. (2005). *Petunjuk Pemupukan yang Efektif*. PT. AgroMedia Pustaka: Jakarta.
- Nurmegawati. (2012). *Tingkat Kesuburan dan Rekomendasi pemupukan N, P dan K tanah sawah kabupaten Bengkulu Selatan*. 9 (2) : 1-8.
- Oldeman, L.R. Darwis, S.N. Las, I. (1978). *Agro-climate Of Sumatera*. IPB: Bogor.
- Olsen, S.R. (1972). *Micronutrient Interaction*. In JJ Mortvedt., PM Giordano and Lindsay (Eds.) *Micronutrient in Agriculture*. Soil Sci. Soe. Amer. Publ. p. 243-261.
- Pettit, R.E. (2011). *Organic Matter, Humus, Humate, Humic Acid, Fulvie Acid and Humin*, [http://Www.Calciumproduct.Com/Article/Dr.Pettit\\_Humate.Pdf](http://Www.Calciumproduct.Com/Article/Dr.Pettit_Humate.Pdf).

- Purba FR, Razali, Hidayat B, 2018. Pemetaan status hara lahan sawah IP-200 dan IP-300 di desa Baru Kecamatan Batang Kuis Kabupaten Deli Serdang. *Jurnal Agroekoteknologi FP USU*. 6 (3): 547-557.
- Roesmarkam. (2011). *Ilmu Kesuburan Tanah*. Kanisius: Yogyakarta.
- Sadeghzadeh, B. (2013). *A review of zinc nutrition and plant breeding*. *Journal of Soil Science and Plant Nutrotion*. Vol. 13, No 11. Doi:10.1371/ journal.pone. 0142455.
- Sahara, N., Wardah., dan Rahmawati. (2019). *Populasi fungi dan bakteri tanah di hutan pegunungan dan dataran rendah di kawasan taman nasional Lore Lindu Sulawesi Tengah*. *Jurnal ForestSains*, 16: 85-93.
- Sahrawat, K. I., (2012). *Soil Fertility in Flooded and non-Flooded Irrigated Rice System*. *Archive of Agron Soil Sci*, 58(4): 423-436.
- Salampak, D. (1999). *Peningkatan Produktivitas Tanah Gambut yang Disawahkan dengan Pemberian Bahan Amelioran tanah Mineral Berkadar Besi Tinggi*. Disertasi program Pascasarjana, Institute Pertanian Bogor: Bogor.
- Salawati., Ende, S., Basir, M., Kadekoh, I., Thaha, A. R. (2021). *Peningkatan Kadar Zn Beras Pecah-Kulit pada Sistem Penggenangan Berselang Melalui Aplikasi Pupuk Kandang Diperkaya Zn Heptahidrat*. *Jurnal Ilmu Pertanian Indonesia* 26 (4): 630–638.
- Sanchez, P.A. (1993). *Sifat dan Pengelolaan Tanah Tropika Jilid 2*. Terjemahan Amir Hamzah dari properties and management of soil in the tropic ITB. Bandung. 273 hal
- Schaller, J., Wu, B., Amelung, W. Hu, Z., Stein, M., Lehndorff, E., Obst, M. (2002). *Silicon as a potential limiting factor for phosphorus availability in paddy soils*. *Sci Rep* 12, 16329
- Schmidt, F.H., and Ferguson, J.H.A. (1951). *Rainfall Type Based on Wet and Dry Period Ratio for Indonesia With Westren New Gurinea*. Djawatan Meteorologidan Geofisika. Jakarta.
- Simanungkalit RDM, Suriadikarta DA, Saraswati R, Setyorini D, Hartatik W, (2006). editor. *Pupuk Organik dan Pupuk Hayati*. Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian. hlm. 1-10. Bogor.
- Sitepu RB, Anas I, Djuniwati S. (2017). *Pemanfaatan jerami sebagai pupuk organik untuk meningkatkan pertumbuhan dan produksi padi (Oryza Sativa)*. *Buletin Tanah dan Lahan*. 1 (1): 100-108.
- Soepardi, G. (1983). *Sifat dan Ciri Tanah*. Fakultas Pertanian Institut Pertanian Bogor: Bogor.

- Stanton, D. A., R.D.T. Burger. (1987). *Availability to Plant of Zinc Sorbed by Soil and Hydrous Iron Oxide*. Geoderma 1. P. 13-17.
- Stevenson, Randy C. (1986). *Studies on The Spin-Spin Interaction Between Flavin and Iron-Sulfur In an Iron-Sulfur Flavoprotein*. Biochimica et Biophysica Acta (BBA)- Protein Structure and Molecular Enzymology.
- Stucky, J.W (2006). *Properties and Behavior of Iron in Clay Minerals*. In: F Bergaya, B.K.G Theng and G. Lagaly. (2006) *Hand Book of Clay Science*. Development in Clay Science vol. 1. Elsevier. 1224 p.
- Su-Jein, C. (2002). *Effect of silicon nutrient on bacterial blight resistance of rice (Oryza sativa L.)*. pp 31-33. Tsuruoka, Yamagata, Japan
- Sumida H. (1992). *Silicon supplying capacity of paddy soils and characteristics of silicon uptake by rice plants in cool regions in Japan*. Bulletin Tohoku Agric. 851-46.
- Supriyo, H dan Prehaten, D. (2014). *Kandungan Unsur Hara Dalam Daun Jati Yang Baru Jatuh Pada Tapak Yang Berbeda*. Jurnal Ilmu Kehutanan, 8(2)
- Syawal, F., Rauf, A., & Rahmawaty. (2017). *Upaya rehabilitasi tanah sawah terdegradasi dengan menggunakan kompos sampah kota Di Desa Serdang Kecamatan Beringin Kabupaten Deli Serdang*. Jurnal Pertanian Tropik, 4(3), 183-189. <https://doi.org/10.32734/jpt.v4i3.3089>.
- Tan, K. H. (2011). *Principles of Soil Chemistry*. CRC Press.
- Vasanthi, N., Saleena, fL. M., & Raj, S. A. (2014). *Silicon in crop production and crop protection -A review*. Agricultural Reviews, 35(1), 14.

