

## DAFTAR PUSTAKA

- Abdurrahman, Amir Tjoneng, dan Saida. (2022). Pengaruh Jenis Air Baku dan Dosis Larutan AB Mix pada Pertumbuhan dan Hasil Tanaman Kailan (*Brassica Oleraceae*) dengan Hidroponik Sistem Deep Flow Technique. *Jurnal AGrotekMAS* Vol. 3 No. 1.
- Adrees, M., Ali, S., Rizwan, M., Zia-ur-Rehman, M., Ibrahim, M., Abbas, F., ... Irshad, M. K. (2015). Mechanisms of silicon-mediated alleviation of heavy metal toxicity in plants: A review. *Ecotoxicology and Environmental Safety*, 119, 186–197. doi:10.1016/j.ecoenv.2015.05.011
- Agarie S, Hanaoka N, Ueno O, Miyazaki A, Kubota F, AgataW, Kaufman PB. (1998) Effects of silicon on tolerance to water deficit and heat stress in rice plants (*Oryza sativa* L.), monitored by electrolyte leakage. *Plant Prod. Sci.*, 1, 96–103. doi:10.1626/pp.1.96
- Alkhatib, R., Maruthavanan, J., Ghoshroy, S., Steiner, R., Sterling, T., & Creamer, R. (2012). Physiological and ultrastructural effects of lead on tobacco. *Biologia Plantarum*, 56(4), 711–716. doi:10.1007/s10535-012-0241-9
- Asngad, A., Lina Agustina, Rivky Arif Rahmat. (2018). *Fisiologi tumbuhan*. Surakarta : Muhammadiyah University Press,.
- Ason, Benjamin & Ababio, Felix & Boateng, Enoch & Yangyuoru, Macarius. (2015). Comparative Growth Response of Maize on Amended Sediment from the Odaw River and Cultivated Soil. *World Journal of Agricultural Research*. DOI:10.12691/wjar-3-4-5
- Barrs, H. D., & Weatherley, P. E. (1962). A Re-Examination Of The Relative Turgidity Technique For Estimating Water Deficits In Leaves By H. D. Barrs\* And P. E. Weatherley. *Australian Journal of Biological Science*, 15, 413–428.
- Bhat, J. A., Shivaraj, S. M., Singh, P., Navadagi, D. B., Tripathi, D. K., Dash, P. K., Deshmukh, R. (2019). Role of Silicon in Mitigation of Heavy Metal Stresses in Crop Plants. *Plants*, 8(3), 71. doi:10.3390/plants8030071
- Bhuiyan, M. A. H., Parvez, L., Islam, M. A., Dampare, S. B., & Suzuki, S. (2010). Heavy metal pollution of coal mine-affected agricultural soils in the northern part of Bangladesh. *Journal of Hazardous Materials*, 173(1-3), 384–392. doi:10.1016/j.jhazmat.2009.08.085
- BMKG. 2000. *Intruksi MET/101/SYNOP/2000*. Jakarta Indonesia.
- Budianta, W. (2012). Lead Contamination in Soil of Yogyakarta city, Indonesia. *Journal South East Asia Appl. Geology*. 4(2). Hal 90-98.
- Campbell, J.B. Reece, dan L.G. Mitchell. (2003). *Biologi Edisi Kelima Jilid II*. Jakarta: Erlangga (2003).
- Clark, H. F., Brabander, D. J., & Erdil, R. M. (2006). Sources, sinks, and exposure pathways of lead in urban garden soil. *Journal of Environmental Quality*, 35, 2066-2074.
- Clemens S., Michael G Palmgren, Ute Krämer. (2002). A long way ahead: understanding and engineering plant metal accumulation. *Trends in Plant Science*, Volume 7, Issue 7, Pages 309-315. [https://doi.org/10.1016/S1360-1385\(02\)02295-1](https://doi.org/10.1016/S1360-1385(02)02295-1).
- Cullen, G., Dines, A., and Kolev, S., 2005. *Lead IPCS INTOX-Data bank*. London: National Poison Information Service.

- Damanik, Fadlhinsyah. (2014). Kajian Komposisi Jalur Hijau Jalan di Kota. Yogyakarta Terhadap Penjerapan Polutan Timbal (Pb). *Planta Tropika*.
- Dharmadewi, A.A. (2020). Analisis Kandungan Klorofil Pada Beberapa Jenis Sayuran Hijau Sebagai Alternatif Bahan Dasar Food Supplement. *Jurnal Emasains: Jurnal Edukasi Matematika dan Sains* Vol. IX No. 2
- Efendi, R. dan Suwandi. (2010). Respon Tanaman Jagung Hibrida terhadap Tingkat Takaran Pemberian Nitrogen dan Kepadatan Populasi. *Prosiding Pekan Serealia Nasional*. Tersedia di: <http://balitsereal.litbang.pertanian.go.id/ind/images/stories/p36.pdf>. Diakses 19 Februari 2014.
- Emamverdian, A., Ding, Y., Mokherdoran, F., Ahmad, Z., & Xie, Y. (2020). Determination of heavy metal tolerance threshold in a bamboo species (*Arundinaria pygmaea*) as treated with silicon dioxide nanoparticles. *Global Ecology and Conservation*, 24, e01306. doi:10.1016/j.gecco.2020.e01306
- Emamverdian, A., Ding, Y., Mokherdoran, F., Xie, Y., Zheng, X., & Wang, Y. (2019). Silicon dioxide nanoparticles improve plant growth by enhancing antioxidant enzyme capacity in bamboo (*Pleioblastus pygmaeus*) under lead toxicity. *Trees*. doi:10.1007/s00468-019-01929-z
- Emamverdian, A., Ding, Y., Xie, Y., & Sangari, S. (2018). Silicon Mechanisms to Ameliorate Heavy Metal Stress in Plants. *BioMed Research International*, 2018, 1–10. doi:10.1155/2018/8492898
- Essington, M. E. (2004). *Soil and Water Chemistry. An Integrative Approach*. CRC Press. Boca Raton London. New York Washington, D. C.
- EVM (Expert Group on Vitamins and Minerals). 2003. Safe upper levels for vitamins and minerals, Silicon. UK Food Standards Agency. Diakses online: <http://www.food.gov.uk/multimedia/pdfs/vitmin2003.pdf>
- Fahmi A., Syamsudin, Sri Nuryani H Utami, dan Bostang Radjagukguk. 2009. PERAN PEMUPUKAN POSFOR DALAM PERTUMBUHAN TANAMAN JAGUNG (*Zea mays* L.) DI TANAH REGOSOL DAN LATOSOL [The Role of Phosphorus Fertilization on the Growth of Maize (*Zea mays* L.) in Regosol and Latosol Soils]. *Berita Biologi* 9(6)
- Fahr, M., Laplace, L., Bendaou, N., Hoher, V., Mzibri, M. E., Bogusz, D., & Smouni, A. (2013). Effect of lead on root growth. *Frontiers in Plant Science*, 4. doi:10.3389/fpls.2013.00175
- Fatemi, H., Esmail Pour, B., & Rizwan, M. (2020). Foliar application of silicon nanoparticles affected the growth, vitamin C, flavonoid, and antioxidant enzyme activities of coriander (*Coriandrum sativum* L.) plants grown in lead (Pb)-spiked soil. *Environmental Science and Pollution Research*. doi:10.1007/s11356-020-10549-x
- Fonte, S. J. and E. Y. Quansah. (2009). Fertilizer and residue quality effects on organic matter stabilization in soil aggregates. *J. of Soil Science*. 73 (1): 961-966
- Gardner. (1991). *Fisiologi Tanaman Budidaya*. Indonesia University Press, Jakarta.
- Gasana, J., Hlaing, W. M., Siegel, K. A., Chamorro, A., & Niyonsenga, T. (2006). Blood lead levels in children and environmental lead contamination in Miami Inner City, Florida. *International Journal of Environmental Research and Public Health*, 3 (3), 228-234.

- Gong, X., Fan Yang, Xianyu Pan, Ji Feng Shao. (2022). Accumulation of silicon in shoots is required for reducing lead uptake in rice. *The Crop Journal* ISSN 2214-5141. <https://doi.org/10.1016/j.cj.2022.09.014>.
- Greger, M., Landberg, T., & Vaculík, M. (2018). Silicon Influences Soil Availability and Accumulation of Mineral Nutrients in Various Plant Species. *Plants*, 7(2), 41. doi:10.3390/plants7020041
- Guo, J., Tan, X., Fu, H.-L., Chen, J.-X., Lin, X.-X., Ma, Y., & Yang, Z.-Y. (2018). Selection for Cd Pollution-Safe Cultivars of Chinese Kale (*Brassica alboglabra* L. H. Bailey) and Biochemical Mechanisms of the Cultivar-Dependent Cd Accumulation Involving in Cd Subcellular Distribution. *Journal of Agricultural and Food Chemistry*, 66(8), 1923–1934. doi:10.1021/acs.jafc.7b05123
- Hammerschmidt, R. & E.K. Dann. (2000). Induced Resistance to Disease. Environmentally Safe Approach to Crop Disease Control. Chapter 8. Lewish Publishers, Boca Raton. pp. 177-194.
- Hariandi, D. , Didik Indradewa dan Prapto Yudono. (2019). PENGARUH GULMA TERHADAP PERTUMBUHAN BEBERAPA KULTIVAR KEDELAI. *Gontor AGROTECH Science Journal* Vol. 5 No. 1.
- Harmanescu, M., Alda, L., Bordean, D., Gogoasa, I., & Gergen, I. (2011). Heavy metals health risk assessment for population via consumption of vegetables grown in old mining area; a case study: Banat County, Romania. *Chemistry Central Journal*, 5(1), 64. doi:10.1186/1752-153x-5-64
- Haryanti, S. 2010. Pengaruh Naungan yang Berbeda Terhadap Jumlah Stomata Dasn Ukuran Porus Stomata Daun *Zephyranthes Rosea* Lindl. *Buletin Anatomi dan Fisiologi* Vol. XVIII. No. 1.
- Hatamian, M., Rezaei Nejad, A., Kafi, M., Souri, M. K., & Shahbazi, K. (2020). Interaction of lead and cadmium on growth and leaf morphophysiological characteristics of European hackberry (*Celtis australis*) seedlings. *Chemical and Biological Technologies in Agriculture*, 7(1). <https://doi.org/10.1186/s40538-019-0173-0>
- Hou X, Liu A, Call L, Zhou C, Wu P, Zou X, Ma X. (2014) Effects of Pb stress on growth and Pb accumulation of *Paspalum notatum*. *J Agro Environ Sci* 4
- Huang, H., Rizwan, M., Li, M., Song, F., Zhou, S., He, X., Tu, S. (2019). Comparative efficacy of organic and inorganic silicon fertilizers on antioxidant response, Cd/Pb accumulation and health risk assessment in wheat (*Triticum aestivum* L.). *Environmental Pollution*, 113146. doi:10.1016/j.envpol.2019.113146
- Hussain, I., Ashraf, M. A., Rasheed, R., Asghar, A., Sajid, M. A., & Iqbal, M. (2015). Exogenous application of silicon at the boot stage decreases accumulation of cadmium in wheat (*Triticum aestivum* L.) grains. *Brazilian Journal of Botany*, 38(2), 223–234. doi:10.1007/s40415-014-0126-6
- Ikhsanti, A., Budiastuti Kurniasih, Didik Indradewa. 2018. Pengaruh Aplikasi Silika terhadap Pertumbuhan dan Hasil Tanaman Padi (*Oryza sativa* L.) pada Kondisi Salin. *Vegetalika* 7(4): 1-11.
- Imtiaz, M., Rizwan, M. S., Mushtaq, M. A., Ashraf, M., Shahzad, S. M., Yousaf, B., Tu, S. (2016). Silicon occurrence, uptake, transport and mechanisms of heavy metals, minerals and salinity enhanced tolerance in plants with future prospects: A review. *Journal of Environmental Management*, 183, 521–529. doi:10.1016/j.jenvman.2016.09.009
- Jadid N, Safitri CE, Jannah AL, Muslihatin W, Purwani KI, Mas'ud F. 2022. Genetic diversity and growth responses of Indonesian tomato (*Solanum lycopersicum*

- L.) genotypes under lead stress. *Science Progress*. doi: 10.1177/00368504221122364. PMID: 36002948; PMCID: PMC10358481.
- Jańczak-Pieniżek M, Cichoński J, Michalik P, Chrzanowski G. (2022). Effect of Heavy Metal Stress on Phenolic Compounds Accumulation in Winter Wheat Plants. *Molecules*. 28(1):241. doi: 10.3390/molecules28010241
- Jayasooriya, R., Chamara, R.M.S.R., Gunathilake, G.K.D.C.S., Liyanage, L.P.H., Beneragama, C.K. (2020). Multilocal Evaluation of Growth and Antioxidant Content of Curly Kale (*Brassica oleracea* L. var *acephala*) and Chinese Kale (*Brassica oleracea* L. var. *alboglabra*) in Sri Lanka. *Proceedings of SLIIT International Conference on Advancements in Science & Humanities*.
- Kabata-Pendias, A. dan Pendias, H. (2001). *Trace Elements in Soils and Plants*. Edisi 3. CRC Press. Boca Raton. Hal. 403.
- Karyadi, K., Syafrudin, S., and Soterisnanto, D., 2012. AKUMULASI LOGAM BERAT TIMBAL (Pb) SEBAGAI RESIDU PESTISIDA PADA LAHAN PERTANIAN (Studi Kasus Pada Lahan Pertanian Bawang Merah Di Kecamatan Gemuh Kabupaten Kendal). *Jurnal Ilmu Lingkungan*. Volume 9(1), pp. 1-9. <https://doi.org/10.14710/jil.9.1.1-9>
- Kastori, R., Petrović, M., & Petrović, N. (1992). Effect of excess lead, cadmium, copper, and zinc on water relations in sunflower. *Journal of Plant Nutrition*, 15(11), 2427–2439. doi:10.1080/01904169209364485
- Khan, I., Awan, S. A., Rizwan, M., Ali, S., Hassan, M. J., Brestic, M., Huang, L. (2021). Effects of silicon on heavy metal uptake at the soil-plant interphase: A review. *Ecotoxicology and Environmental Safety*, 222, 112510. doi:10.1016/j.ecoenv.2021.112510.
- Koentjoro, Y., Sukendah, Edi Purwanto, Djoko Purnomo. (2020). Stomatal Behavior of Soybean under Drought Stress with Silicon Application. *Annals of Agri-Bio*.
- Kumar, A., M.M.S., C.-P., Chaturvedi, A. K., Shabnam, A. A., Subrahmanyam, G., Yadav, K. K. (2020). Lead Toxicity: Health Hazards, Influence on Food Chain, and Sustainable Remediation Approaches. *International Journal of Environmental Research and Public Health*, 17(7), 2179. doi:10.3390/ijerph17072179
- Kumar, PBAN., Dushenkov S, Salt DE, Raskin I .(1994). Crop Brassicas and phytoremediation: a novel environmental technology. *Cruciferae Newsletter Eucarpia* 16:18–19
- Lakitan B. (2012). *Dasar-dasar Fisiologi Tumbuhan*. Jakarta (ID): Rajawali Press
- Liang, Y., Sun, W., Zhu, Y.-G., & Christie, P. (2007). Mechanisms of silicon-mediated alleviation of abiotic stresses in higher plants: A review. *Environmental Pollution*, 147(2), 422–428. doi:10.1016/j.envpol.2006.06.008
- Liu C. Xiao R. Dai W. Huang F. Yang & X. (2020). Cadmium accumulation and physiological response of *Amaranthus tricolor* L. under soil and atmospheric stresses. *Environmental Science and Pollution Research*. 28:14041–14053. <https://doi.org/10.1007/s11356-020-11569-3>
- Liu, A. and A. A. Bomke. (2004). Effect of cover crops on soil aggregate stability, total organic carbon and polysaccharides. *J. Soil Science*. 69 (1): 2041-2048.
- Lou, Y., Luo, H., Hu, T., Li, H., & Fu, J. (2012). Toxic effects, uptake, and translocation of Cd and Pb in perennial ryegrass. *Ecotoxicology*, 22(2), 207–214. doi:10.1007/s10646-012-1017-x
- Maghsoudi, K., Emam, Y., & Pessarakli, M. (2016). Effect of silicon on photosynthetic gas exchange, photosynthetic pigments, cell membrane stability and relative

- water content of different wheat cultivars under drought stress conditions. *Journal of Plant Nutrition*, 39(7), 1001–1015. doi:10.1080/01904167.2015.1109108
- Magno, J., Budianta W. (2022). Spatial distribution and pattern of heavy metals in urban soils of Yogyakarta, Indonesia. *IOP Conference Series: Earth and Environmental Science*. doi:10.1088/1755-1315/1071/1/012032
- Makarim, A.K., Suhartatik, E. dan Kartohardjono, A. (2007). Silikon: Hara Penting pada Sistem Produksi Padi. *Iptek Tanaman Pangan*, 2 (2): 195–204
- Malar S, Vikram SS, Favas PJ, Perumal V (2016) Lead heavy metal toxicity induced changes on growth and antioxidative enzymes level in water hyacinths [*Eichhornia crassipes*(Mart.)]. *Bot Stud* 55:1–11
- Malčovská M., S., Dučaiová, Z., Maslaňáková, I., & Bačkor, M. (2014). Effect of Silicon on Growth, Photosynthesis, Oxidative Status and Phenolic Compounds of Maize (*Zea mays* L.) Grown in Cadmium Excess. *Water, Air, & Soil Pollution*, 225(8). doi:10.1007/s11270-014-2056-0
- Mielke, H. W., Gonzales, C., Powell, E., & Mielke, P. W. (2008). Urban soil-lead (Pb) footprint: retrospective comparison of public and private properties in New Orleans. *Environmental Geochemical Health*, 30, 231–242.
- Morikawa CK, Saigusa M (2004): Mineral composition and accumulation of silicon in tissues of blueberry (*Vaccinium corymbosum* cv. Bluecrop) cuttings. *Plant Soil*, 258, 1–8. doi:10.1023/B:PLSO.0000016489.69114.55
- Mousavi, S.M., Moteszarehadeh, B., Hosseini, H.M. (2022). Efficiency of different models for investigation of the responses of sunflower plant to Pb contaminations under SiO<sub>2</sub> nanoparticles (NPs) and *Pseudomonas fluorescens* treatments. *Arab J Geosci* 15, 1256
- Nascimento-Silva, K., Benlloch-González, M., & Fernández-Escobar, R. (2022). Silicon Nutrition in Young Olive Plants: Effect of Dose, Application Method, and Cultivar. *HortScience*, 57(12), 1534–1539. <https://doi.org/10.21273/HORTSCI16750-22>
- Nasrullah. (2011). Rancang Bangun Sistem Penyiraman Tanaman Secara Otomatis Menggunakan Sensor Suhu LM35 Berbasis Mikrokontroler ATmega8535. *J. Rekayasa dan Teknol. Elektro*, vol. 5, no. 3, pp. 182–192
- Ngugi, M.M., Harun I. Gitari, Catherine W. Muui & Joseph P. Gweyi-Onyango. (2022). Growth tolerance, concentration, and uptake of heavy metals as ameliorated by silicon application in vegetables. *International Journal of Phytoremediation*. Doi: <https://doi.org/10.1080/15226514.2022.2045251>
- Nuraisah, A., C. Suherman, M. Ariyanti, A. Nuraini, M.A. Soleh. 2019. Pertumbuhan, hasil, dan karakter fisiologis padi yang diberi pupuk hayati pada pertanaman kelapa sawit belum menghasilkan I. *Jurnal Kultivasi* Vol. 18 (3).
- Permanasari, I., dan Endang Sulistyaningsih. 2013. KAJIAN FISILOGI PERBEDAAN KADAR LENGAS TANAH DAN KONSENTRASI GIBERELIN PADA KEDELAI (*Glycine max* L.). *Jurnal Agroteknologi*, Vol. 4 No. 1.
- Pracaya. (2001). *Bertanam 8 Sayuran Organik*. Penebar Swadaya. Jakarta.
- Prescha, A., Zabłocka-Słowińska, K., & Grajeta, H. (2019). Dietary Silicon and Its Impact on Plasma Silicon Levels in the Polish Population. *Nutrients*, 11(5), 980. doi:10.3390/nu11050980
- Ramadhan, H., Ahmad Tusi, Diding Suhandy, Iskandar Zulkarnain. 2015. RANCANG BANGUN SISTEM HIDROPONIK PASANG SURUT UNTUK TANAMAN



- BABY KAILAN (*Brassica oleraceae*) DENGAN MEDIA TANAMSERBUK SERABUT KELAPA. *Jurnal Teknik Pertanian Lampung* Vol. 4, No. 4: 281-292.
- Rasman dan Hasmayani. 2018. FAKTOR-FAKTOR YANG MEMPENGARUHI KANDUNGAN TIMBAL (Pb) PADA BAWANGMERAH (*Allium Cepa*) DI DESA PEKALOBAN KABUPATEN ENREKANG. *Jurnal Sulolipu : Media Komunikasi Sivitas Akademika dan Masyarakat*. Vol. 18No.1 201
- Rastogi, A., Saurabh Yadav, Sajad Hussain, Sunita Kataria, Shokoofeh Hajihashemi, Pragati Kumari, Xinghong Yang, Marian Brestic. 2021. Does silicon really matter for the photosynthetic machinery in plants...?. *Plant Physiology and Biochemistry*, Vol. 169, Hal. 40-48. <https://doi.org/10.1016/j.plaphy.2021.11.004>.
- Rea, Rafea Sultana, Mohammad Rafiqul Islam, Mohammad Mahmudur Rahman, Bibhash Nath, and Ken Mix. 2022. "Growth, Nutrient Accumulation, and Drought Tolerance in Crop Plants with Silicon Application: A Review" *Sustainability* 14, no. 8: 4525. <https://doi.org/10.3390/su14084525>
- Rizwan, M., Ali, S., Rehman, M.Z. 2018. Lead Toxicity in Cereals and Its Management Strategies: a Critical Review. *Water Air Soil Pollut* 229, 211. <https://doi.org/10.1007/s11270-018-3865-3>
- Rogalla, H., & Romheld, V. (2002). Role of leaf apoplast in silicon-mediated manganese tolerance of *Cucumis sativus* L. *Plant, Cell and Environment*, 25(4), 549–555. doi:10.1046/j.1365-3040.2002.00835.x
- Samadi. (2013). *Budidaya Intensif Kailan Secara Organik dan Anorganik*. Pustaka Mina. Jakarta. Hal. 107.
- Sasmitamihardja, D. and A.H. Siregar. 1996. *Fisiologi Tumbuhan*. Proyek Pendidikan Akademik Dirjen Dikti. Depdikbud. Bandung. pp253-281.
- Schaller, J., Puppe, D., Kaczorek, D., Ellerbrock, R., & Sommer, M. (2021). Silicon Cycling in Soils Revisited. *Plants*, 10(2), 295. doi:10.3390/plants10020295
- Sekarningsih, A., Budianta W, Warmada I, Hinode H. (2021). Assessing the spatial distribution of urban soil lead contamination in Yogyakarta City, Indonesia. *E3S Web of Conferences* 325, 03001. Doi: <https://doi.org/10.1051/e3sconf/202132503001>
- Sengar, R. S., Gautam, M., Garg, S. K., Sengar, K., & Chaudhary, R. (2008). Lead Stress Effects on Physiobiochemical Activities of Higher Plants. *Reviews of Environmental Contamination and Toxicology* Vol 196, 73–93. doi:10.1007/978-0-387-78444-1\_3
- Setiari, N., dan Yulita N., 2009. Eksplorasi Kandungan Klorofil pada beberapa Sayuran Hijau sebagai Alternatif Bahan Dasar Food Supplement. *Bioma* Vol. 11, No. 1, Hal. 6-10.
- Setiawan, E. 2009. Kajian Hubungan Unsur iklim terhadap produktivitas cabe jamu (*Piper retrofractum* Vahl) di kabupaten sumenep. *Jurnal Agrovigor* vol. 2 no. 1.
- Shahid M. Dumat C. Khalid S. Schreck E. Xiong T. Niazi NK. (2017). Foliar heavy metal uptake. toxicity and detoxification in plants: A comparison of foliar and root metal uptake. Vol. 325. *Journal of Hazardous Materials*. Elsevier B.V.. p. 36–58. <https://doi.org/10.1016/j.jhazmat.2016.11.063>
- Sharma, P., & Dubey, R. S. (2005). Lead toxicity in plants. *Brazilian Journal of Plant Physiology*, 17(1), 35–52. doi:10.1590/s1677-04202005000100004

- Sharma, R. K., Agrawal, M., & Marshall, F. M. (2008). Heavy metal (Cu, Zn, Cd and Pb) contamination of vegetables in urban India: A case study in Varanasi. *Environmental Pollution*, 154(2), 254–263. doi:10.1016/j.envpol.2007.10.01
- Shu, X., Yin, L., Zhang, Q., & Wang, W. (2011). Effect of Pb toxicity on leaf growth, antioxidant enzyme activities, and photosynthesis in cuttings and seedlings of *Jatropha curcas* L. *Environmental Science and Pollution Research*, 19(3), 893–902. doi:10.1007/s11356-011-0625-y
- Siemonsma, J.S., dan K. Piluek. (1994). *Plant Resources of South-East Asia (PROSEA). No. 8 Vegetables*. Prosea Foundation. Bogor
- Sima, G., Zarinkamar Fatemeh, Niknam Vahid. 2012. Determination of peroxidase activity, total phenolic and flavonoid compounds due to Lead toxicity in *Medicago sativa* L. *Advances in Environmental Biology*, 6(8): 2357-2364.
- Sitompul, S. M. dan Guritno, B. 1995. *Analisis Pertumbuhan Tanaman*. UGM Press: Yogyakarta
- Skuza, L.; Szućko-Kociuba, I.; Filip, E.; Bozek, I. (2022). Natural Molecular Mechanisms of Plant Hyperaccumulation and Hypertolerance towards Heavy Metals. *International Journal of Molecular Sciences*. <https://doi.org/10.3390/ijms23169335>
- Soetarso. 1989. *Indeks Panen Sebagai Kriteria Seleksi dalam Pemuliaan Tanaman Kedelai (Glycine max (L.) Merrill)*. Ilmu Pertanian.
- Soto-Vaca, A., Ashley Gutierrez, Jack N. Losso, Zhimin Xu, dan John W. Finley. (2012). Evaluation of Phenolic Compounds from Color and Flavor Problems to Health Benefits. *Journal of Agricultural and Food Technology*. Us: Lousiana State University.
- Souri, Z., Khanna, K., Karimi, N., & Ahmad, P. (2020). Silicon and Plants: Current Knowledge and Future Prospects. *Journal of Plant Growth Regulation*, 40(3), 906–925. doi:10.1007/s00344-020-10172-7
- Stoskopf, N.C. 1981. *Understanding crop Production*. Respon Publishing. Company. Inc. Reston. Virginia A Prentile – Hall Company. 433 p
- Su, Y.-L., Wang, Y.-F., & Ow, D. W. (2020). Increasing effectiveness of urban rooftop farming through reflector-assisted double-layer hydroponic production. *Urban Forestry & Urban Greening*, 126766. doi:10.1016/j.ufug.2020.126766
- Susana, R. dan Suswati D. (2013). Bioakumulasi dan Distrisusi Cd Pada Akar dan Pucuk 3 Jenis Tanaman Famiti Brassicaceae: Implementasinya untuk Fitoremeatasi. *Jurnal Manusia Dan Lingkungan*, Vol. 20, No. 2.
- Susilawati., Wardah dan Irmasari. 2016. Pengaruh Berbagai Intensitas Cahaya Terhadap Pertumbuhan Semai Cempaka (*Michelia champaca* L.) Di Persemaian. *Jurnal Forest Sains*, vol.14, No.1
- Swarinoto, Y.S., dan sugiyono. (2011). PEMANFAATAN SUHU UDARA DAN KELEMBAPAN UDARA DALAM PERSAMAAN REGRESI UNTUK SIMULASI PREDIKSI TOTAL HUJAN BULANAN DI BANDAR LAMPUNG. *JURNAL METEOROLOGI DAN GEOFISIKA VOLUME 12 NOMOR 3 - DESEMBER 2011*: 271- 281.
- Taga, M.S., E.E. Miller and D.E. Pratt. (1984). Chia seeds as a source of natural lipid antioxidants. *Journal American Oil Chem. Soc.* 61:928-931.
- Turkmen, M., Turkmen, A., and Tepe, Y., 2008. Metal Contaminations in Five Fish Species From Black, Marmara, Aegean, and Mediteranean Sea, Turkey. *Journal Chil. Chem. Soc.*, 53(1), 1435-1439.

- USDA. (2010). Classification for Kingdom Plantae Down to Species *Brassica oleracea* var. *alboglabra*. [www.usda.gov](http://www.usda.gov). Diakses pada 30 Agustus 2022.
- Vega, Isis, Cornelia Rumpel, Antonieta Ruíz, María de la Luz Mora, Daniel F. Calderini, and Paula Cartes. 2020. "Silicon Modulates the Production and Composition of Phenols in Barley under Aluminum Stress" *Agronomy* 10, no. 8: 1138. <https://doi.org/10.3390/agronomy10081138>
- Wang, B., Chu, C., Wei, H., Zhang, L., Ahmad, Z., Wu, S., & Xie, B. (2020). Ameliorative effects of silicon fertilizer on soil bacterial community and pakchoi (*Brassica chinensis* L.) grown on soil contaminated with multiple heavy metal. *Environmental Pollution*, 115411. doi:10.1016/j.envpol.2020.115411
- Webb, N. (2012). User Manual for the WinDIAS 3 Image Analysis System. Delta T Devices Limited. Cambridge.
- Wong, C. S., & Li, X. D. (2004). Pb contamination and isotopic composition of urban soils in Hong Kong. *The Science of the Total Environment* (319), 185-195.
- World Health Organization. (2007). Exposure of children to chemical hazards in food. <https://www.euro.who.int>.
- Xiong, Z. T. (1998). Lead Uptake and Effects on Seed Germination and Plant Growth in a Pb Hyperaccumulator *Brassica pekinensis* Rupr. *Bulletin of Environmental Contamination and Toxicology*. 60, 285-291.
- Yan YH, Zheng ZC, Li TX, Zhang XZ, Wang Y. 2014. Effect of silicon on translocation and morphology distribution of lead in soil-tobacco system. *Ying Yong Sheng Tai Xue Bao*. Oct;25(10):2991-8. Chinese. PMID: 25796910
- Yukamgo, E. dan N. W. Yuwono. 2007. Peran Silikon sebagai Unsur Bermanfaat pada Tanaman Tebu. *Jurnal Ilmu Tanah dan Lingkungan*, Vol. 7 (2): 103 – 116.
- Zulfiqar, U., Farooq, M., Hussain, S., Maqsood, M., Hussain, M., Ishfaq, M. Anjum, M. Z. (2019). Lead toxicity in plants: Impacts and remediation. *Journal of Environmental Management*, 250, 109557. doi:10.1016/j.jenvman.2019.109557