

DAFTAR PUSTAKA

- Adams, T. M. and Adams, S. N. 1983. The effects of liming and soil pH on carbon and nitrogen contained in the soil biomass. *J Agr Sci*, 101: 553–558. <https://doi.org/10.1017/S0021859600038570>.
- Aguilar-Chávez, Á., M. Díaz-Rojas, M. R. Cárdenas-Aquino, L. Dendooven, and M. Luna-Guido. 2012. Greenhouse gas emissions from a wastewater sludge-amended soil cultivated with wheat (*Triticum spp.* L.) as affected by different application rates of charcoal. *Soil Biol Biochem* 52: 90-95. <https://doi.org/10.1016/j.soilbio.2012.04.022>.
- Ahmad, W., Singh, B., Dijkstra, F. A., and Dalal, R. C. 2013. Inorganic and organic carbon dynamics in a limed acid soil are mediated by plants. *Soil Biol Biochem*, 57: 549–555. <https://doi.org/10.1016/j.soilbio.2012.10.013>.
- Anderson, I. C. and D. S. Robertson. 1960. Role of Carotenoids in Protecting Chlorophyll from Photodestruction. *Plant Physiol.*, 35(4): 531–534.
- Andiani, D. 2009. Pembuatan Asam Oksalat dari Tongkol Jagung dengan Pengaruh Waktu dan Konsentrasi HNO₃. Palembang: Politeknik Negeri Sriwijaya.
- Anugoolprasert, O., Kinoshita, S., Naito, H., Shimizu, M., and Ehara, H. 2012. Effect of low pH on the growth, physiological characteristics and nutrient absorption of sago palm in a hydroponic system. *Plant Production Science*, 15(2): 125–131. <https://doi.org/10.1626/pps.15.125>
- Arnon, D. I. 1949. Copper enzymes in isolated chloroplasts, polyphenoloxidase in *Beta vulgaris*. *Plant Physiology*, 24(1): 1-16.
- Astuti, Y., Umrah and A. R. Thaha. 2020. pengamatan pertumbuhan tanaman bayam (*Amaranthus tricolor* l.) pasca aplikasi biofertilizer (bahan aktif *Aspergillus* sp.) sediaan cair. *Biocelbes*, 14(2): 199-209. www.10.22487/bioceb.v14i2.15272.
- Awad-Allah, E. F. A. and I. H. Elsokkary. 2020. Influence of potassium nutrition and exogenous organic acids on iron uptake by monocot and dicot plants. *Open Journal of Soil Science*, 10(10).

- Azam-Ali, S. and M. Battcock. 2002. *Fermented Fruits and Vegetable*. A global perspectives
FAO Agricultural Services Bulletin.
- Babu, B. V. and A. S. Chaurasia. 2003 Modeling, simulation and estimation of optimum
parameters in pyrolysis of biomass. *Energy Convers Manag*, 44(13):2135–2158.
[https://doi.org/10.1016/S0196-8904\(02\)00237-6](https://doi.org/10.1016/S0196-8904(02)00237-6).
- Baggs, E. M., Smales, C. L., and Bateman, E. J. 2010. Changing pH shifts the microbial source
as well as the magnitude of N₂O emission from soil. *Biol Fertil Soils*, 46: 793–805.
<https://doi.org/10.1007/s00374-010-0484-6>.
- Benjawan Chutichude, Chutichudet, P. and Kaewsit, S. 2010. Effects of dolomite application
on plant growth, activities of polyphenol oxidase and internal quality of Grand Rapids
lettuce. *International Journal of Agricultural Research*, 5: 690-707.
<https://doi.org/10.3923/ijar.2010.690.707>
- Bolan, N. S., Adriano, D. C., Kunhikrishnan, A., James, T, McDowell, R., Senesi, N. 2011.
Dissolved organic matter: biogeochemistry, dynamics, and environmental significance
in soils. *Adv Agron*, 110: 1–75.
- Bougnom, B. P., B. A. Knapp, F-X. Etoa, and H. Insam. 2011. *Possible Use Of Wood Ash And
Compost For Improving Acid Tropical Soils*. In: Insam, H., and B. A. Knapp (eds.)
Recycling of biomass ashes. Springer-Verlag: Berlin Heidelberg, pp. 87-105.
- BPS. 2023. Produksi Tanaman Sayuran 2020; Produksi Tanaman Sayuran 2021. Accessed 14
January 2023. Retrieved at [https://www.bps.go.id/indicator/55/61/3/produksi-
tanaman-sayuran.html](https://www.bps.go.id/indicator/55/61/3/produksi-tanaman-sayuran.html)
- Brady, N. C. and Weil, R. R. 1999. *The Nature and Property of Soils*. New Jersey: Prentice
Hall, Upper Saddle Hall.
- Cai, Y., M. Sun, and H. Corke. 2003. Antioxidant activity of betalains from plants of the
Amaranthaceae. *J. Agric. Food Chem*, 51: 2288-2294.
- Çalışkan M. 2000. The metabolism of oxalic acid. *Turk J Zool*, 24: 103–106.
- Carmeis Filho, A. C. A., Penn, C. J., Crusciol, C. A. C., and Calonego, J. C. 2017. Lime and
phosphogypsum impacts on soil organic matter pools in a tropical Oxisol under long-

- term no-till conditions. *Agric Ecosyst Environ*, 241: 11–23.
<https://doi.org/10.1016/j.agee.2017.02.027>.
- Coleman, N. T., Kamprath, E. J., and Weed, S. B. 1959. Liming. *Adv Agron*, 10: 474–522.
[https://doi.org/10.1016/S0065-2113\(08\)60073-5](https://doi.org/10.1016/S0065-2113(08)60073-5).
- Das, S. 2016. *Amaranthus: A Promising Crop of Future*. Springer Science+Business Media Singapore: Singapore, pp: 13, 25, 28, 34–36.
- Davis, J. G. and Whiting, D. *Choosing a Soil Amendment*. Colorado State University Extension. Colorado. Accessed 7 July 2023. Retrieved from <https://extension.colostate.edu/topic-areas/yard-garden/choosing-a-soil-amendment/#:~:text=Organic%20amendments%20come%20from%20something,biosolids%2C%20sawdust%20and%20wood%20ash>.
- Demeyer, A., J. C. Voundi Nkana, and M. G. Verloo. 2001. Characteristics of wood ash and influence on soil properties and nutrient uptake: an overview. *Bioresource Technology*, 77: 287–295.
- Ding, Y., Y. Liu, S. Liu, X. Huang, Z. Li, X. Tan, G. Zeng, and L. Zhou. 2017. Potential benefits of biochar in agricultural soils: a review. *Pedosphere*, 27(4): 645–661.
[https://doi.org/10.1016/S1002-0160\(17\)60375-8](https://doi.org/10.1016/S1002-0160(17)60375-8).
- Ding, Y., Y. Liu, S. Liu, Z. Li, X. Tan, X. Huang, G. Zeng, L. Zhou, and B. Zheng. 2016. Biochar to improve soil fertility. A review. *Agron Sustain Dev* 36(2): 36.
<https://doi.org/10.1007/s13593-016-0372-z>.
- ELD Initiative (2015) *Report for policy and decision makers: reaping economic and environmental benefits from sustainable land management*. https://www.eld-initiative.org/fileadmin/pdf/ELDpm-report_08_web_72dpi.pdf. Accessed 24 Dec 2022.
- Etiegni, L. and A. G. Campbell. 1991. Physical and chemical characteristics of wood ash. *Bioresource Technology*, 37: 173–178.
- Fageria, N. K. and Baligar, V. C. 2008. Ameliorating soil acidity of tropical oxisols by liming for sustainable crop production. *Adv Agron*, 99: 345–399.
[https://doi.org/10.1016/S0065-2113\(08\)00407-0](https://doi.org/10.1016/S0065-2113(08)00407-0).
- FAO. 1996a. *Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture*. FAO: Roma.

- FAO. 1996b. *Report on the State of the World's Plant Genetic Resources for Food and Agriculture*. International technical conference on plant genetic resources. Leipzig, Jerman, 17-23 Juni 1996. FAO: Roma.
- FAO. 1996c. *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources and the Leipzig Methodologies for Generating Variability*. Use of genetic resources in plant breeding 125 Declaration. International Technical Conference on Plant Genetic Resources. Leipzig, Jerman, 17-23 Juni 1996. FAO: Roma.
- FAO. 2005. *The State of Food Insecurity in the World*. FAO: Roma.
- Fassett, Dw. 1973. *Oxalates*. In: Toxicants occurring naturally in foods. Washington DC: National Academy of Sciences.
- Feng Ma, J., P. R. Ryan, and E. Delhaize. 2001. Aluminium tolerance in plants and the complexing role of organic acids. *Trends in Plant Science*, 6: 273-278.
- Filep, T., Kincses, I., and Nagy, P. 2003. Dissolved organic carbon (DOC) and dissolved organic nitrogen (DON) content of an arenosol as affected by liming in a pot experiment. *Arch Agron Soil Sci*, 49: 111–117.
<https://doi.org/10.1080/0365034031000079793>.
- Fitriani, H., N. Nurlailah, and D. Rakhmina. 2016. Kandungan Asam Oksalat Sayur Bayam. *Medical Laboratory Technology Journal*, 2(2): 51-55.
<https://doi.org/10.31964/mltj.v2i2.95>.
- Franceschi V. R. and H. T. Horner, Jr. 1980. Calcium oxalate crystals in plants. *Bot Rev*, 46: 361–427.
- Fuentes, J. P., Bezdicek, D. F., Flury, M., Albrecht, S., and Smith, J. L. 2006. Microbial activity affected by lime in a long-term no-till soil. *Soil Tillage Res*, 88: 123–131.
<https://doi.org/10.1016/j.still.2005.05.001>.
- Gagnon, B. and N. Ziadi. 2012. Papermill biosolids and alkaline residuals affect crop yield and soil properties over nine years of continuous application. *Canadian Journal of Soil Science*, 92: 917-930.

- Gallejones, P., Castellón, A., Del Prado, A., Unamunzaga, O., and Aizpurua, A. 2012. Nitrogen and sulphur fertilization effect on leaching losses, nutrient balance and plant quality in a wheat-rapeseed rotation under a humid Mediterranean climate. *Nutr Cycl Agroecosyst*, 93: 337–355.
- Gentili, R., Ambrosini, R., Montagnani, C., Caronni, S., and Citterio, S. 2018. Effect of soil pH on the growth, reproductive investment and pollen allergenicity of *Ambrosia artemisiifolia* L. *Front. Plant Sci.*, 9(1335): 1-12.
- Graham, P. H. and C. P. Vance. 2003. Legumes: Importance and constraints to greater use. *Plant Physiology*, 131: 872-877.
- Guo, J., Liu, X., Zhang, Y., Shen, J., Han, W., Zhang, W., Christie, P., Goulding, K., Vitousek, P., and Zhang, F. 2010. Significant acidification in major Chinese croplands. *Science*, 327: 1008–1010.
- Guo, M. 2020. The 3R principles for applying biochar to improve soil health. *Soil Syst* 4(1): 9. <https://doi.org/10.3390/soilsystems4010009>.
- Haug, A. and C. E. Foy. 1984. Molecular aspects of aluminium toxicity. *Plant Sciences*, 1: 345-373.
- Haynes, R. J. and M. S. Mokolobate. 2001. Amelioration of Al toxicity and P deficiency in acid soils by additions of organic residues: a critical review of the phenomenon and the mechanisms involved. *Nutrient Cycling in Agroecosystems*, 59: 47-63.
- Haynes, R. J. and Swift, R. S. 1986. Effects of soil acidification and subsequent leaching on levels of extractable nutrients in a soil. *Plant and Soil*, 95(3): 327-336. <https://www.jstor.org/stable/42935802>
- Hodges, S. C. 2010. Soil Fertility Basics: NC Certified Crop Advisor Training. North Carolina State University. <http://www2.mans.edu.eg/projects/heepf/ilppp/courses/12/pdf%20course/38/Nutrient%20Management%20for%20CCA.pdf>. Accessed 25 Dec 2022.
- Huang, J., Fisher, P. R., and Argo, W. R. 2007. Container substrate-pH response to differing limestone type and particle size. *Hort Science*, 42: 1268–1273.

- Irwan, A. W. and F. Y. Wicaksono. 2017. Perbandingan pengukuran luas daun kedelai dengan metode gravimetri, regresi dan scanner. *Jurnal Kultivasi*, 16(3): 425-429.
- Isakovski, M. K., S. Maletić, D. Tamindžija, T. Apostolović, J. Petrović, J. Tričković, and J. Agbaba. 2020. Impact of hydrochar and biochar amendments on sorption and biodegradation of organophosphorus pesticides during transport through Danube alluvial sediment. *J Environ Manag* 274: 111156. <https://doi.org/10.1016/j.jenvman.2020.111156>.
- Jabborova, D., Annapurna, K., Paul, S., Kumar, S., Saad, H. A., Desouky, S., Ibrahim, M. F. M., and Elkelish, A. 2021. Beneficial features of biochar and arbuscular mycorrhiza for improving spinach plant growth, root morphological traits, physiological properties, and soil enzymatic activities. *J. Fungi*, 7(7): 571. <https://doi.org/10.3390/jof7070571>
- Jardine, P. M., McCarthy, J. F., and Weber, N. L. 1989. Mechanisms of dissolved organic carbon adsorption on soil. *Soil Sci Soc Am J*, 53: 1378–1385. <https://doi.org/10.2136/sssaj1989.03615995005300050013x>.
- Jien, S. H. and C. S. Wang. 2013. Effects of biochar on soil properties and erosion potential in a highly weathered soil. *Catena* 110: 225-233. <https://doi.org/10.1016/j.catena.2013.06.021>.
- Jin, X., M. Ackah, L. Wang, F. K. Amoako, Y. Shi, L. G. Essoh, J. Li, Q. Zhang, H. Li, and W. Zhao. 2023. Magnesium nutrient application induces metabolomics and physiological responses in mulberry (*Morus alba*) plants. *Int. J. Mol. Sci.* 2023, 24(11).
- Jindo, K, M. A. Sánchez-Monedero, G. Mastrolonardo, Y. Audette, F. S. Higashikawa, C. A. Silva, K. Akashi, and C. Mondini. 2020. Role of biochar in promoting circular economy in the agriculture sector. Part 2: a review of the biochar roles in growing media, composting and as soil amendment. *Chem Biol Technol Agric* 7(1):16. <https://doi.org/10.1186/s40538-020-00179-3>.
- Jones, Jr., J. B. 2012. *Plant Nutrition and Soil Fertility Manual*. 2nd Edition. New York: CRC Press. pp. 68.
- Kallner, A. 1986. *Annals of the New York*. Academy of Sciences. pp. 418-423.
- Kanyanjua, S. M., L. Ireri, S. Wambua, and S. M. Nandwa. 2002. *Acidic Soils In Kenya: Constraints And Remedial Options*. Kari Technical Note No. 11.

- Karicheva, E., N. Guseva, and M. Kambalina. 2016. Determination of water-soluble forms of oxalic and formic acids in soils by ion chromatography. *IOP Conference Series Earth and Environmental Science*, 33(1).
- Karkanis A. C., A. Fernandes, J. Vaz, S. Petropoulos, E. Georgiou, A. Ciric, M. Sokovic, T. Oludemi, L. Barros, and I. Ferreira. 2019. Chemical composition and bioactive properties of *Sanguisorba minor* Scop. under Mediterranean growing conditions. *Food Funct.*, 10: 1340–1351.
- Khaleghi, E., K. Azarni, N. Moallemi, and M. Barzegar. 2012. evaluation of chlorophyll content and chlorophyll fluorescence parameters and relationships between chlorophyll a, b, and chlorophyll content index under water stress in *Olea europaea* cv. Dezful. *World Academy of Science, Engineering and Technology*, 68: 1154-1157.
- Khandaker, L., A. S. M. G. M. Akond, and S. Oba. 2009. Air temperature and sunlight intensity of different growing period affects the biomass, leaf color and betacyanin pigment accumulations in red amaranth (*Amaranthus tricolor* L.). *Central European Agriculture Journal*, 10(4): 439-448.
- Khanna, P. K., R. J. Raison, and R. A. Falkiner. 1994. Chemical properties of ash derived from Eucalyptus litter and its effects on forest soil. *Forest Ecology and Management*, 66: 107-125.
- Kirk, J. T. O and R. L. Allen. 1965. dependence of chloroplast pigment synthesis on protein synthesis: effect of actidione. *Biochemical and Biophysical Research Communication*, 21(6): 523-530.
- Kisinyo, P. O., C. O. Othieno, S. O. Gudu, J. R. Okalebo, P. A. Opala, W. K. Ng’etich, R. O. Nyambati, E. O. Ouma, J. J. Agalo, S. J. Kebeney, E. J. Too, J. A. Kisinyo, and W. R. Opile. 2014. Immediate and residual effects of lime and phosphorus fertilizer on soil fertility and maize production on western Kenya. *Experimental Agriculture*, 50: 128-143.
- Kochhar, S. L. and S. K. Gujral. 2020. *Plant Physiology: Theory and Applications*. 2nd Edition. Cambridge: Cambridge University Press. pp. 107-109, 204-208.
- Kochian, L. V., O. A. Hoekenga, and M. A. Pineros. 2004. How do crop plants tolerate acid soils? – Mechanisms of aluminium tolerance and phosphorus deficiency. *Annual Review of Plant Biology*, 55: 459-493.

- Kopittke, P. M., N. W. Menzies, P. Wang, B. A. McKenna, and E. Lombi. 2019. Soil and the intensification of agriculture for global food security. *Environ Int* 132: 105078. <https://doi.org/10.1016/j.envint.2019.105078>.
- Kurshev, I., P. Bozadjiev, I. Gruncharov, N. Naidenov, K. Bogdanov, and F. Tudjarova. 1986. *Guide of Mineral Fertilizers*. Technika, Sofia.
- Laird, D. A., P. Fleming, D. D. Davis, R. Horton, B. Wang, and D. L. Karlen. 2010. Impact of biochar amendments on the quality of a typical Midwestern agricultural soil. *Geoderma* 158(3): 443-449. <https://doi.org/10.1016/j.geoderma.2010.05.013>.
- Landon, J. R. 1984. *Booker Tropical Soils Manual: A Handbook For Soil Survey And Agricultural Land Evaluation In The Tropics And Subtropics*. John Wiley & Sons Inc.: New York, pp. 106-156.
- Lankinen, Å. 2000. Effects of soil pH and phosphorus on in vitro pollen competitive ability and sporophytic traits in clones of *Viola tricolor*. *Int. J. Plant Sci.*, 161: 885-893.
- Larkcom, J. and E. Douglass. 1991. *Oriental Vegetables: The Complete Guide for the Gardening Cook*. New York: Kodansha America, Inc.
- Lestari, E. G. 2006. Hubungan antara Kerapatan Stomata dengan Ketahanan Kekeringan pada Somaklon Padi Gajahmungkur, Towuti, dan IR 64. *Jurnal Biodiversitas*, 7(1): 44-48.
- Lingga, L. 2010. *Cerdas Memilih Sayuran*. Jakarta: Agro Media Pustaka.
- Marcelo, A., Eduardo Corá, J., and La Scala, J. N. 2012. Influence of liming on residual soil respiration and chemical properties in a tropical no-tillage system. *Rev Bras Cienc Solo*, 36: 45–50. <https://doi.org/10.1590/S0100-06832012000100005>.
- Markus, D. J. 1990. *Composition and Nutritive Value of Vegetable Amaranth as Affected by Stage of Growth, Environment and Method of Preparation*. In: Proceeding of fourth amaranth symposium Minnesota. Minnesota Agricultural University: Minnesota, pp. 35-46.
- Martin, F. W., and L. Telek. 1979. *Vegetables for the Hot Humid Tropics*. U.S. Department of Agriculture: New Orleans, pp 1-21.
- Mayer, R. 1998. Soil acidification and cycling of metal elements: cause-effect relationships with regard to forestry practices and climatic changes. *Agriculture, Ecosystems and Environment*, 67: 145-152.

- Mbah C. N., J. N. Nwite, C. Njoku, and I. A. Nweke. 2010. Response of maize (*Zea mays* L.) to different rates of wood-ash application in acid ultisol in Southeast Nigeria. *African Journal of Agricultural Research*, 5: 580-583.
- McFarland, M. L., V. A. Haby, L. A. Redmon, and D. H. Bade. 2001. *Managing Soil Acidity*. In "Texas cooperative Extension": Texas.
- Mensah, A. K. and K. A. Frimpong. 2018. Biochar and/or compost applications improve soil properties, growth, and yield of maize grown in acidic rainforest and coastal savannah soils in Ghana. *Int J Agron* 2018. <https://doi.org/10.1155/2018/6837404>.
- Miyasaka, S. C., N. V. Hue, and M. A. Dunn. 2007. *Aluminium*. In: Barker, A.V., Pilbeam, D.J. (eds.) Handbook of plant nutrition. CRC Press, Taylor and Francis Group: New York, pp. 439-497.
- Moise, A. R., S. Al-Babili, and E. T. Wurtzel. 2014. Mechanical aspects of carotenoid biosynthesis. *Chem Rev.*, 114(1): 164–193.
- Morrison, S. C. and G. P. Savage. 2003. In *Encyclopedia of Food Sciences and Nutrition*. 2nd Edition. Elsevier Science Ltd. p. 4282.
- Mueller, E. 2018. The Effect of Acid Rain on Soil Nutrien Levels and Plant Growth. Accessed 9 Maret 2022. Retrieved from <https://ui.adsabs.harvard.edu/abs/2018AGUFMED41D1217M/abstract#:~:text=Sulfuric%20and%20nitric%20acid%20solutions,and%20overall%20growth%20of%20crops>
- Nkana, J. C. V., A. Demeyer, and M. G. Verloo. 1998. Chemical effects of wood ash on plant growth in tropical acid soils. *Bioresource Technology*, 63: 251-260.
- Nzanza, B., D. Marais, and P. Soundy. 2012. Effect of arbuscular Mycorrhizal fungal inoculation and biochar amendment on growth and yield of tomato. *Int J Agric Biol* 14(6): 965-969.
- O' Brien, G. K. and D. M. L. Price. 1983. Amaranth Grain & Vegetable Types. ECHO.
- Ohno, T. 1992. Neutralization of soil acidity and release of phosphorus and potassium by wood ash. *Journal of Environmental Quality*, 21: 433-438.
- Paradelo, R., Virto, I., and Chenu, C. 2015. Net effect of liming on soil organic carbon stocks: a review. *Agric Ecosyst Environ*, 202: 98–107.

- Pastircakova. 2004. Determination of trace metal concentrations in ashes from various biomass materials. *Energy Education Science and Technology*, 13(2): 97-104.
- Perry, L. 2003. pH for the Garden. Accessed 9 Maret 2022. Retrieved from <http://pss.uvm.edu/ppp/pubs/oh34.htm>
- Petropoulos, S. A., A. Fernandes, M. I. Dias, C. Pereira, R. C. Calhelha, M. Ivanov, M. D. Sokovic, I. C. F. R. Ferreira, and L. Barros. 2020. The effect of nitrogen fertigation and harvesting time on plant growth and chemical composition of *Centaurea raphanina* subsp. mixta (DC.) Runemark. *Molecules.*, 25(14): 3175.
- Pitman, R. M. 2006. Wood ash use in forestry – a review of environmental impacts. *Forestry*, 79: 563-588.
- Pokorny, K. 2021. Keeping pH in the Right Range is Essential. Accessed 9 Maret 2022. Retrieved from <https://today.oregonstate.edu/news/keeping-ph-right-range-essential>
- Prakash, D. and M. Pal. 1991. Nutritional and anti-nutritional composition of vegetable and grain amaranth leaves. *J Sci Food Agric*, 57: 573-583.
- Rajan, S. and B. L. Markose. 2007. *Propagation of Horticultural Crops*. In: Peter K. V. (ed) New India Publishing Agency: New Delhi, pp: 110-113.
- Rasyid, M., M. H. Irawati, and M. Saptasari. 2017. Anatomi Daun *Ficus Racemosa* L. (Biraeng) Dan Potensinya Di Taman Nasional Bantimurung Bulusaraung. *Jurnal Pendidikan*, 2(6): 861-866.
- Reed, E. Y. S., D. R. Chadwick, P. W. Hill, and D. L. Jones. 2017. Critical comparison of the impact of biochar and wood ash on soil organic matter cycling and grassland productivity. *Soil Biology and Biochemistry*, 110: 134-142.
- Romdhane, L., Ebinezer, L. B., Panozzo, A., Barion, G., Cortivo, C. D., Radhouane, L., and Vamerali, T. 2021. Effects of soil amendment with wood ash on transpiration, growth, and metal uptake in two contrasting maize (*Zea mays* L.) hybrids to drought tolerance. *Plant Sci.*, 12. <https://doi.org/10.3389/fpls.2021.661909>
- Rosa, J. M. D. I. 2020. *Biochar as Soil Amendment: Impact on Soil Properties and Sustainable Resource Management*. Basel: MDPI.

- Rosta, H. R. and Rezaei, H. 2014. Effect of nutrien solution pH on the vegetative and reproductive growth and physiological characteristics of Rose Cv. 'Grand Gala' in hydroponic system. *J. Plant Nutr.*, 37: 2179-2194.
- Rupali T., S. Chavan, and N. Pandhure. 2012. Occurrence of chloride enriched calcium oxalate crystal in *cissus quadrangularis* linn. *Int J Pharm*, 2(2):337–340.
- Sakata Ornamentals Europe. 2020. *Amaranthus tricolor*. sakataornamentals.eu. Accessed 29 January 2023. Retrieved at https://sakataornamentals.eu/wp-content/uploads/2020/08/Culture-Guide_Amaranthus-Tricolor.pdf.
- Saleem, M. H., K. Usman, M. Rizwan, H. A. Jabri, and M. Alsafran. 2022. Functions and strategies for enhancing zinc availability in plants for sustainable agriculture. *Front Plant Sci*. 13.
- Sanchez, P. A. and G. J. Salinas. 1981. Low-input technology for managing Oxisols and Utisols in tropical America. In: Cichy, A. K., M. W. Blair, C. H. Galeano Mendoza, S. S. Snapp, and J. D. Kelly (eds) Quantitative trait analysis of root architecture traits and low phosphorus tolerance in Andean bean population. *Crop Science*, 49: 59-68.
- Schnetzler, K. A. and W. M. Breene. 1994. *Food Uses and Amaranth Product Research: a comprehensive review*. In: Peredes-Lopez O (ed) Amaranth biology, chemistry and technology. CRC Press: Boca Raton, pp. 155-184.
- Sekaran, U. K. L. Sagar, and S. Kumar. 2021. Soil aggregates, aggregate-associated carbon and nitrogen, and water retention as influenced by short and long-term no-till systems. *Soil and Tillage Research*, 208.
- Serafimova, Ek., M. Mladenov, I. Mihailova, and Y. Pelovski. 2011. Study on the characteristics of waste wood ash. *Journal of the University of Chemical Technology and Metallurgy*, 46(1): 31-34.
- Shaaban, M., Peng, Q., Hu, R., Lin, S., Wu, Y., Ullah, B., Zhao, J., Liu, S., and Li, Y. 2014. Dissolved organic carbon and nitrogen mineralization strongly affect CO₂ emissions following lime application to acidic soil. *J Chem Soc Pak*, 36: 875–879.
- Shaaban, M., Wu, L., Peng, Q-A., van Zwieten, L., Chhajro, M. A., Wu, Y., Lin, S., Ahmed, M. M., Khalid, M. S., Abid, M., and Hu, R. 2017. Influence of ameliorating soil acidity

- with dolomite on the priming of soil C content and CO₂ emission. *Environ Sci Pollut Res*, 24: 9241–9250. <https://doi.org/10.1007/s11356-017-8602-8>.
- Shukla, S., A. Bhargava, A. Chatterjee, *et al.* 2006. Mineral profile and variability in vegetable amaranth (*Amaranthus tricolor*). *Plant Foods Hum Nutr*, 61: 23-28.
- Si, L., Y. Xie, Q. Ma, and L. Wu. 2018. The short-term effects of rice straw biochar, nitrogen and phosphorus fertilizer on rice yield and soil properties in a cold waterlogged paddy field. *Sustainability* 10(2): 537. <https://doi.org/10.3390/su10020537>.
- Sieling, K. and Kage, H. 2006. N balance as an indicator of N leaching in an oilseed rape-winter wheat-winter barley rotation. *Agric Ecosyst Environ*, 115: 261–269.
- Silberhorn, E. M. 2014. In *Encyclopedia of Toxicology* by Philip Wexler. 3rd Edition. London: Academic Press. p. 320-321.
- Singh, B. P. and W. F. Whitehead. 1991. Population density and soil pH effects on vegetable amaranth production. *New crops Proceedings of the Second National Symposium: New crops, exploration, research and commercialization*, Indianapolis, Indiana, October 6-9: 562-564.
- Stintzing, F. C. and R. Carle. 2007. Betalains-emerging prospects for food scientists. *Trends Food Sci. Technol*, 18: 514-525.
- Sumner, M. E. and A. D. Noble. 2003. *Soil Acidification: The World Story*. In: Rengel, Z. (ed.) *Handbook of soil acidity*. Marcel Dekker: New York, p. 12.
- Suyanti. 2008. *Membuat Mie Sehat Bergizi dan Bebas Pengawet*. Jakarta: Penebar Swadaya.
- Svishtov. 2006. *Application for the Complex Permit of "Svilosa"*.
- United Nations. 2019. Growing at a slower pace, world population is expected to reach 9.7 billion in 2050 and could peak at nearly 11 billion around 2100: *UN Report*. United Nations Department of Global Communications. https://population.un.org/wpp/Publications/Files/WPP2019_PressRelease_EN.pdf. Accessed 24 Dec 2022.
- Van Zwieten, L., S. Kimber, S. Morris, K. Y. Chan, A. Downie, J. Rust, S. Joseph, and A. Cowie. 2010. Effects of biochar from slow pyrolysis of papermill waste on agronomic

- performance and soil fertility. *Plant Soil* 327(1):235–246.
<https://doi.org/10.1007/s11104-009-0050-x>.
- Vieira, F. C. B., C. Bayer, J. Mietniczuk, J. Zanatta, and C. A. Bissani. 2008. Long-term acidification of a Brazilian Acrisol as affected by no till cropping systems and nitrogen fertilizer. *Australian Journal of Soil Research*, 46: 17-26.
- Von-Uexküll, H. and Mutert, E. 1995. Global extent, development and economic impact of acid soils. *Plant Soil*, 171: 1–15.
- Willstätter, R. and Stoll, A. 1912. Untersuchungen über Chlorophyll. XIX. Über die Chlorophyllide. *Justus Liebigs Annalen der Chemie*, 387(3): 317-386.
<https://doi.org/10.1002/jlac.19123870304>
- Yaashikaa, P. R., P. S. Kumar, S. Varjani, and A. Saravanan. 2020. A critical review on the biochar production techniques, characterization, stability and applications for circular bioeconomy. *Biotechnol Rep* 28. <https://doi.org/10.1016/j.btre.2020.e00570>.
- Zalidis, G., S. Stamatiadis, V. Takavakoglou, K. Eskridhe, and N. Misopolinos. 2002. Impacts of agricultural practices on soil and water quality in the Mediterranean region and proposed assessment methodology. *Agric Ecosyst Environ*, 88(2):137-146.
[https://doi.org/10.1016/S0167-8809\(01\)00249-3](https://doi.org/10.1016/S0167-8809(01)00249-3).
- Zhang Y. P. S. Y., X. Y. Lin, S. J. Zheng, and S. T. Du. 2005. Effects of nitrogen levels and nitrate/ammonium ratios on oxalate concentrations of different forms in edible parts of spinach. *J. Plant Nutr.*, 28: 2011–2025.
- Zhang, P., H. Sun, L. Yu., and T. Sun. 2013. Adsorption and catalytic hydrolysis of carbaryl and atrazine on pig manure-derived biochars: impact of structural properties of biochars. *J Hazard Mater* 244-245: 217-224. <https://doi.org/10.1016/j.jhazmat.2012.11.046>.
- Zhu, J. J. H. Park, S. Lee, J. H. Lee, D. Hwang, J. M. Kwak, and Y. J. Kim. 2020. Regulation of stomatal development by stomatal lineage miRNAs. *Proc Natl Acad Sci U S A.*, 117(11): 6237–6245.
- Zobel, R. W. and S. F. Wright. 2015. *Roots and Soil Management: Interactions Between Roots and The Soil*. United States: Wiley & Sons, Inc.