

DAFTAR PUSTAKA

- Abdin, M. Z., Ahmad, A., Khan, N., Khan, I., Jamal, A., & Iqbal, M. (2003). Sulphur Interaction with Other Nutrients. In Y. P. Abrol & A. Ahmad (Eds.), *Sulphur in Plants* (pp. 359–374). Springer, Dordrecht. https://doi.org/10.1007/978-94-017-0289-8_20
- Abera, H., Abdisa, M., & Washe, A. P. (2020). Spectrophotometric method to the determination of ascorbic acid in *M. stenopetala* leaves through catalytic titration with hexavalent chromium and its validation. *International Journal of Food Properties*, 23(1), 999–1015. <https://doi.org/10.1080/10942912.2020.1775249>
- Adamson, W. C., Long, F. L., & Bagby, O. M. (1979). Effect of nitrogen fertilization on yield and quality of Kenaf. *Agronomy Journal*, 71(1), 11–14. <https://doi.org/10.2478/v10032-009-0019-6>
- Ahmed, N., Ali, M. A., Danish, S., Chaudhry, U. K., Hussain, S., Hassan, W., Ahmad, F., & Ali, N. (2020). Role of macronutrients in cotton production. In S. Ahmad & M. Hasanuzzaman (Eds.), *Cotton Production and Uses: Agronomy, Crop Protection, and Postharvest Technologies* (pp. 81–104). Springer. https://doi.org/https://doi.org/10.1007/978-981-15-1472-2_6
- Ajit, Dhyani, S. K., Handa, A. K., Newaj, R., Chavan, S. B., Alam, B., Prasad, R., Ram, A., Rizvi, R. H., Jain, A. K., Uma, Tripathi, D., Shakhela, R. R., Patel, A. G., Dalvi, V. V., Saxena, A. K., Parihar, A. K. S., Backiyavathy, M. R., Sudhagar, R. J., ... Gunasekaran, S. (2017). Estimating carbon sequestration potential of existing agroforestry systems in India. *Agroforestry Systems*, 91(6), 1101–1118. <https://doi.org/10.1007/s10457-016-9986-z>
- Ajmi, A., Vázquez, S., Morales, F., Chaari, A., El-Jendoubi, H., Abadía, A., & Larbi, A. (2018). Prolonged artificial shade affects morphological, anatomical, biochemical and ecophysiological behavior of young olive trees (cv. Arbosana). *Scientia Horticulturae*, 241, 275–284. <https://doi.org/10.1016/j.scienta.2018.06.089>
- Al-Saeedi, A. H., & Hossain, M. A. (2015). Total phenols, total flavonoids contents and free radical scavenging activity of seeds crude extracts of pigeon pea traditionally used in Oman for the treatment of several chronic diseases. *Asian Pacific Journal of Tropical Disease*, 5(4), 316–321. [https://doi.org/10.1016/S2222-1808\(14\)60790-8](https://doi.org/10.1016/S2222-1808(14)60790-8)

- Albro, P. W., Corbett, J. T., & Schroeder, J. L. (1986). Application of the thiobarbiturate assay to the measurement of lipid peroxidation products in microsomes. *Journal of Biochemical and Biophysical Methods*, 13(3), 185–194. [https://doi.org/10.1016/0165-022X\(86\)90092-8](https://doi.org/10.1016/0165-022X(86)90092-8)
- Alexander, A. G. (1966). Oxidizing Enzymes of Sugarcane: Peroxidase. *The Journal of Agriculture of the University of Puerto Rico*, 50(1), 36–52. <https://doi.org/10.46429/jaupr.v50i1.3440>
- Alscher, R. G., Erturk, N., & Heath, L. S. (2002). Role of superoxide dismutases (SODs) in controlling oxidative stress in plants. *Journal of Experimental Botany*, 53(372), 1331–1341. <https://doi.org/10.1093/jexbot/53.372.1331>
- Altieri, M. A., Nicholls, C. I., Henao, A., & Lana, M. A. (2015). Agroecology and the design of climate change-resilient farming systems. *Agronomy for Sustainable Development*, 35(3), 869–890. <https://doi.org/10.1007/s13593-015-0285-2>
- American Society for Testing and Materials. (2002). *Annual Book of ASTM Standards*. ASTM International.
- Antil, R. S., & Singh, M. (2007). Effects of organic manures and fertilizers on organic matter and nutrients status of the soil. *Archives of Agronomy and Soil Science*, 53(5), 519–528. <https://doi.org/10.1080/03650340701571033>
- Apel, K., & Hirt, H. (2004). Reactive oxygen species: Metabolism, oxidative stress, and signal transduction. *Annual Review of Plant Biology*, 55, 373–399. <https://doi.org/10.1146/annurev.arplant.55.031903.141701>
- Armecin, R. B. (2008). Nutrient composition of abaca (*Musa textilis* Nee) at seedling, vegetative, and flagleaf stages of growth. *Journal of Natural Fibers*, 5(4), 331–346. <https://doi.org/10.1080/15440470802457136>
- Armecin, R. B., & Coseco, W. C. (2012). Abaca (*Musa textilis* Nee) allometry for above-ground biomass and fiber production. *Biomass and Bioenergy*, 46, 181–189. <https://doi.org/10.1016/j.biombioe.2012.09.004>
- Armecin, R. B., Cosico, W. C., & Badayos, R. B. (2011). Characterization of the different abaca-based agro-ecosystems in leyte, Philippines. *Journal of Natural Fibers*, 8(2), 111–125. <https://doi.org/10.1080/15440478.2011.576114>
- Armecin, R. B., & Gabon, F. M. (2008). Biomass, organic carbon and mineral matter

contents of abaca (*Musa textilis* Nee) at different stages of growth. *Industrial Crops and Products*, 28(3), 340–345.
<https://doi.org/10.1016/j.indcrop.2008.03.014>

Armecin, R. B., Seco, M. H. P., Caintic, P. S., & Milleza, E. J. M. (2005). Effect of leguminous cover crops on the growth and yield of abaca (*Musa textilis* Nee). *Industrial Crops and Products*, 21(3), 317–323.
<https://doi.org/10.1016/j.indcrop.2004.04.028>

Ashori, A., Harun, J., Raverty, W. D., & Yusoff, M. N. M. (2006). Chemical and Morphological Characteristics of Malaysian Cultivated Kenaf (*Hibiscus cannabinus*) Fiber. *Polymer-Plastics Technology and Engineering*, 45(1), 131–134. <https://doi.org/10.1080/03602550500373782>

Ashton, M. S., & Ducey, M. J. (2000). Agroforestry systems as succesional analogs to native forests. In M. S. Ashton & F. Montagnini (Eds.), *The Silvicultural Basis for Agroforestry Systems* (pp. 210–231). CRC Press.

Asigbaase, M., Lomax, B. H., Dawoe, E., & Sjogersten, S. (2020). Influence of organic cocoa agroforestry on soil physico-chemical properties and crop yields of smallholders' cocoa farms, Ghana. *Renewable Agriculture and Food Systems*, 36(3), 255–264. <https://doi.org/10.1017/S1742170520000290>

Balai Penelitian Tanah. (2005). *Petunjuk teknis: Analisis kimia tanah, tanaman, air dan pupuk [Technical instructions: Chemical analysis of soil, plants, water and fertilizers]*. Balittanah.

Balai Penelitian Tembakau dan Tanaman Serat. (1998). *Budidaya Tanaman Abaca (*Musa textilis* Nee)*. Balai Penelitian Tembakau dan Tanaman Serat. [http://repository.pertanian.go.id/bitstream/handle/123456789/12886/Budi_Daya_Tanaman_Abaca_\(Musa_textilis_NEE\).pdf?sequence=1](http://repository.pertanian.go.id/bitstream/handle/123456789/12886/Budi_Daya_Tanaman_Abaca_(Musa_textilis_NEE).pdf?sequence=1)

Balboa, G. R., Sadras, V. O., & Ciampitti, I. A. (2018). Shifts in soybean yield, nutrient uptake, and nutrient stoichiometry: A historical synthesis-analysis. *Crop Science*, 58(1), 43–54. <https://doi.org/10.2135/cropsci2017.06.0349>

Baligar, V. C., Fageria, N. K., Paiva, A. Q., Silveira, A., Pomella, A. W. V., & Machado, R. C. R. (2006). Light intensity effects on growth and micronutrient uptake by tropical legume cover crops. *Journal of Plant Nutrition*, 29(11), 1959–1974. <https://doi.org/10.1080/01904160600927633>

- Bande, M. M. (2012). *Ecophysiological and Agronomic Response of Abaca (Musa textilis) to Different Resource Conditions in Leyte Island* (Issue July). University of Hohenheim.
- Bande, M. M., Asio, V., Sauerborn, J., & Romheld, V. (2016). Growth Performance of Abaca (*Musa textilis* Née) Integrated in Multi-strata Agroecosystems. *Annals of Tropical Research*, 38(1), 19–35. <https://doi.org/10.32945/atr3813.2016>
- Bande, M. M., Grenz, J., Asio, V. B., & Sauerborn, J. (2013). Fiber yield and quality of abaca (*Musa textilis* var. Laylay) grown under different shade conditions, water and nutrient management. *Industrial Crops and Products*, 42, 70–77. <https://doi.org/http://dx.doi.org/10.1016/j.indcrop.2012.05.009>
- Bande, M. M., Grenz, J., Asio, V., & Sauerborn, J. (2012). Nutrient Uptake and Fiber Yield of Abaca (*Musa textilis* var. Laylay) as Affected by Shade, Irrigation and Fertilizer Application. *Annals of Tropical Research*, 34(1), 1–28. <https://doi.org/10.32945/atr3411.2012>
- Barben, S. A., Hopkins, B. G., Jolley, V. D., Webb, B. L., Nichols, B. A., & Buxton, E. A. (2011). Zinc, Manganese and Phosphorus Interrelationships and Their Effects on Iron and Copper in Chelator-buffered Solution Grown Russet Burbank Potato. *Journal of Plant Nutrition*, 34(8), 1144–1163. <https://doi.org/10.1080/01904167.2011.558158>
- Barrow, N. J., & Hartemink, A. E. (2023). The effects of pH on nutrient availability depend on both soils and plants. *Plant and Soil*, 487, 21–37. <https://doi.org/10.1007/s11104-023-05960-5>
- Barrows, A. P. W., Cathey, S. E., & Petersen, C. W. (2018). Marine environment microfiber contamination: Global patterns and the diversity of microparticle origins. *Environmental Pollution*, 237, 275–284. <https://doi.org/https://doi.org/10.1016/j.envpol.2018.02.062>
- Bartoli, C. G., Tambussi, E. A., Diego, F., & Foyer, C. H. (2009). Control of ascorbic acid synthesis and accumulation and glutathione by the incident light red/far red ratio in *Phaseolus vulgaris* leaves. *Federation of European Biochemical Societies Letters*, 583(1), 118–122. <https://doi.org/10.1016/j.febslet.2008.11.034>
- Bárzana, G., & Carvajal, M. (2020). Genetic regulation of water and nutrient transport in water stress tolerance in roots. *Journal of Biotechnology*, 324, 134–142.

<https://doi.org/https://doi.org/10.1016/j.jbiotec.2020.10.003>

- Berríos, G. A., Luengo Escobar, A., Alberdi, M. R., Nunes-Nesi, A., & Reyes-Díaz, M. (2019). Manganese toxicity amelioration by phosphorus supply in contrasting Mn resistant genotypes of ryegrass. *Plant Physiology and Biochemistry*, 144, 144–156. <https://doi.org/10.1016/j.plaphy.2019.09.034>
- Brady, N. C. (1984). *The Nature and Properties of Soils* (9th ed.). Macmillan Publishing Company.
- Bragazza, L., Fontana, M., Guillaume, T., Scow, K. M., & Sinaj, S. (2021). Nutrient stoichiometry of a plant-microbe-soil system in response to cover crop species and soil type. *Plant and Soil*, 461, 517–531. <https://doi.org/10.1007/s11104-021-04853-9>
- Browning, B. L. (1967). *Methods of wood chemistry*. John Wiley & Sons.
- Bryan, J. A. (2000). Nitrogen fixation of leguminous trees in traditional and modern agroforestry systems. In M. S. Ashton & F. Montagnini (Eds.), *The Silvicultural Basis for Agroforestry Systems* (pp. 165–186). CRC Press.
- Bulmer, D., Kar, G., Hamilton, J., Siciliano, S., & Peak, D. (2018). Extent and Mechanism of Interaction between Phosphate and Citrate in a Calcareous Soil. *Soil Science Society of America Journal*, 82(2), 315–322. <https://doi.org/https://doi.org/10.2136/sssaj2017.08.0289>
- Bureau of Agriculture and Fisheries Standards. (2016). *Philippine National Standard: Abaca fiber – Grading and Classification – Decorticated* (Issue 181).
- Burman, U., Saini, M., & Kumar, P. (2013). Effect of zinc oxide nanoparticles on growth and antioxidant system of chickpea seedlings. *Toxicological and Environmental Chemistry*, 95(4), 605–612. <https://doi.org/10.1080/02772248.2013.803796>
- Cagnola, J. I., Ploschuk, E., Benech-Arnold, T., Finlayson, S. A., & Casal, J. J. (2012). Stem transcriptome reveals mechanisms to reduce the energetic cost of shade-avoidance responses in tomato. *Plant Physiology*, 160(2), 1110–1119. <https://doi.org/10.1104/pp.112.201921>
- Campa, A. (1991). Biological roles of plant peroxidases: known and potential function. In J. Everse, M. B. Grisham, & K. E. Everse (Eds.), *Peroxidases in chemistry and*

biology (Vol. 2, pp. 25–50). CRC Press.

- Candas, D., & Li, J. J. (2013). MnSOD in Oxidative Stress Response-Potential Regulation via Mitochondrial Protein Influx. *Antioxidants & Redox Signaling*, 20(10), 1599–1617. <https://doi.org/10.1089/ars.2013.5305>
- Chaturvedi, S., Khan, S., Bhunia, R. K., Kaur, K., & Tiwari, S. (2022). Metabolic engineering in food crops to enhance ascorbic acid production: crop biofortification perspectives for human health. *Physiology and Molecular Biology of Plants*, 28(4), 871–884. <https://doi.org/10.1007/s12298-022-01172-w>
- Chavarria, G., & dos Santos, H. P. (2012). Plant Water Relations: Absorption, Transport and Control Mechanisms. In G. Montanaro & B. Dichio (Eds.), *Advances in Selected Plant Physiology Aspects* (pp. 105–132). <https://doi.org/10.5772/33478>
- Chaves, A. R. M., Ten-Caten, A., Pinheiro, H. A., Ribeiro, A., & DaMatta, F. M. (2008). Seasonal changes in photoprotective mechanisms of leaves from shaded and unshaded field-grown coffee (*Coffea arabica* L.) trees. *Trees*, 22(3), 351–361. <https://doi.org/10.1007/s00468-007-0190-7>
- Chen, W., He, Z. L., Yang, X. E., Mishra, S., & Stoffella, P. J. (2010). Chlorine nutrition of higher plants: Progress and perspectives. *Journal of Plant Nutrition*, 33(7), 943–952. <https://doi.org/10.1080/01904160903242417>
- Cherubin, M. R., Chavarro-Bermeo, J. P., & Silva-Olaya, A. M. (2019). Agroforestry systems improve soil physical quality in northwestern Colombian Amazon. *Agroforestry Systems*, 93(5), 1741–1753. <https://doi.org/10.1007/s10457-018-0282-y>
- Chormova, D., Messenger, D. J., & Fry, S. C. (2014). Boron bridging of rhamnogalacturonan-II, monitored by gel electrophoresis, occurs during polysaccharide synthesis and secretion but not post-secretion. *Plant Journal*, 77(4), 534–546. <https://doi.org/10.1111/tpj.12403>
- Cortina, J., Amat, B., Castillo, V., Fuentes, D., Maestre, F. T., Padilla, F. M., & Rojo, L. (2011). The restoration of vegetation cover in the semi-arid Iberian southeast. *Journal of Arid Environments*, 75(12), 1377–1384. <https://doi.org/https://doi.org/10.1016/j.jaridenv.2011.08.003>

- Courbier, S., & Pierik, R. (2019). Canopy Light Quality Modulates Stress Responses in Plants. *IScience*, 22, 441–452. <https://doi.org/10.1016/j.isci.2019.11.035>
- Darkoh, M. B. . K. ., & Ould-Mey, M. (1992). Cash Crops Versus Food Crops in Africa : A Conflict Between Dependency and Autonomy. *Transafrican Journal of History*, 21, 36–50. <https://www.jstor.org/stable/24520419>
- Das, K., & Roychoudhury, A. (2014). Reactive oxygen species (ROS) and response of antioxidants as ROS-scavengers during environmental stress in plants. *Frontiers in Environmental Science*, 2(53), 1–13. <https://doi.org/10.3389/fenvs.2014.00053>
- Dauber, J., Brown, C., Fernando, A. L., Finnan, J., Krasuska, E., Ponitka, J., Styles, D., Thrän, D., Van Groenigen, K. J., Weih, M., & Zah, R. (2012). Bioenergy from “surplus” land: Environmental and socio-economic implications. *BioRisk*, 50(7), 5–50. <https://doi.org/10.3897/biorisk.7.3036>
- de Bang, T. C., Husted, S., Laursen, K. H., Persson, D. P., & Schjoerring, J. K. (2021). The molecular–physiological functions of mineral macronutrients and their consequences for deficiency symptoms in plants. *New Phytologist*, 229(5), 2446–2469. <https://doi.org/10.1111/nph.17074>
- de Souza Júnior, J. P., de Mello Prado, R., Campos, C. N. S., Oliveira, D. F., Cazetta, J. O., & Detoni, J. A. (2022). Silicon foliar spraying in the reproductive stage of cotton plays an equivalent role to boron in increasing yield, and combined boron-silicon application, without polymerization, increases fiber quality. *Industrial Crops and Products*, 182, 1–10. <https://doi.org/10.1016/j.indcrop.2022.114888>
- de Souza, N. C. R., & d’Almeida, J. R. M. (2014). Tensile, Thermal, Morphological and Structural Characteristics of Abaca (*Musa Textiles*) Fibers. *Polymers from Renewable Resources*, 5(2), 47–60. <https://doi.org/10.1177/204124791400500201>
- Del Río, J. C., & Gutiérrez, A. (2006). Chemical composition of abaca (*Musa textilis*) leaf fibers used for manufacturing of high quality paper pulps. *Journal of Agricultural and Food Chemistry*, 54(13), 4600–4610. <https://doi.org/10.1021/jf053016n>
- del Río, L. A. (2020). Plant Peroxisomes and Their Metabolism of ROS, RNS, and RSS. In F. M. Cánovas, U. Lüttge, M. Risueño, & H. Pretzsch (Eds.), *Progress*

in *Botany* (pp. 171–209). Springer Nature Switzerland.
https://doi.org/10.1007/124_2020_37

del Río, L. A., Corpas, F. J., López-Huertas, E., & Palma, J. M. (2018). Plant superoxide dismutases: Function under abiotic stress conditions. In D. Gupta, J. Palma, & F. Corpas (Eds.), *Antioxidants and Antioxidant Enzymes in Higher Plants* (pp. 1–26). Springer. https://doi.org/10.1007/978-3-319-75088-0_1

Delagrangé, S., Montpied, P., Dreyer, E., Messier, C., & Sinoquet, H. (2006). Does shade improve light interception efficiency? A comparison among seedlings from shade-tolerant and -intolerant temperate deciduous tree species. *New Phytologist*, 172(2), 293–304. <https://doi.org/10.1111/j.1469-8137.2006.01814.x>

Deltour, P., França, S. C., Liparini Pereira, O., Cardoso, I., De Neve, S., Debode, J., & Höfte, M. (2017). Disease suppressiveness to Fusarium wilt of banana in an agroforestry system: Influence of soil characteristics and plant community. *Agriculture, Ecosystems and Environment*, 239, 173–181. <https://doi.org/10.1016/j.agee.2017.01.018>

Demrati, H., Boulard, T., Fatnassi, H., Bekkaoui, A., Majdoubi, H., Elattir, H., & Bouirden, L. (2007). Microclimate and transpiration of a greenhouse banana crop. *Biosystems Engineering*, 98(1), 66–78. <https://doi.org/10.1016/j.biosystemseng.2007.03.016>

Denton, S., Dodds, D., Krutz, J., Varco, J., Gore, J., Raper, T., Cox, M., & Dhillon, J. (2023). Effect of potassium application rate on cotton growth and yield under irrigated and dryland conditions. *Agronomy Journal*, 115(1), 395–407. <https://doi.org/https://doi.org/10.1002/agj2.21245>

Deopura, B. L., & Padaki, N. V. (2015). Synthetic Textile Fibres: Polyamide, Polyester and Aramid Fibres. In R. Sinclair (Ed.), *Textiles and Fashion: Materials, Design and Technology* (pp. 97–114). Elsevier Ltd. <https://doi.org/10.1016/B978-1-84569-931-4.00005-2>

Derksen, S., & Keselman, H. J. (1992). Backward, forward and stepwise automated subset selection algorithms: Frequency of obtaining authentic and noise variables. *British Journal of Mathematical and Statistical Psychology*, 45(2), 265–282. <https://doi.org/10.1111/j.2044-8317.1992.tb00992.x>

Dessie, E., Tesfaye, T., Fanxizi, L., Gideon, R. K., & Qiu, Y. (2023). The Effect of fibre

- position and gauge lengths along the length of enset bundle fibres on physical and mechanical properties: Application of statistics analysis. *Journal of Natural Fibers*, 20(1). <https://doi.org/10.1080/15440478.2022.2150742>
- DeWitt, T. J., Sih, A., & Wilson, D. S. (1998). Cost of Plasticity. *Trends in Ecology and Evolution*, 13(2), 77–81.
- do Nascimento, C. A. C., Pagliari, P. H., Faria, L. de A., & Vitti, G. C. (2018). Phosphorus Mobility and Behavior in Soils Treated with Calcium, Ammonium, and Magnesium Phosphates. *Soil Science Society of America Journal*, 82(3), 622–631. <https://doi.org/https://doi.org/10.2136/sssaj2017.06.0211>
- Dollinger, J., & Jose, S. (2018). Agroforestry for soil health. *Agroforestry Systems*, 92(2), 213–219. <https://doi.org/10.1007/s10457-018-0223-9>
- Donaldson, L. A. (2008). Microfibril Angle: Measurement, Variation and Relationships – A Review. *Iawa Journal*, 29, 345–386.
- Du, Z., & Bramlage, W. J. (1992). Modified Thiobarbituric Acid Assay for Measuring Lipid Oxidation in Sugar-Rich Plant Tissue Extracts. *Journal of Agricultural and Food Chemistry*, 40(9), 1566–1570. <https://doi.org/10.1021/jf00021a018>
- Dumanović, J., Nepovimova, E., Natić, M., Kuća, K., & Jaćević, V. (2021). The Significance of Reactive Oxygen Species and Antioxidant Defense System in Plants: A Concise Overview. *Frontiers in Plant Science*, 11, 1–4. <https://doi.org/10.3389/fpls.2020.552969>
- Dupont, S., & Brunet, Y. (2008). Influence of foliar density profile on canopy flow: A large-eddy simulation study. *Agricultural and Forest Meteorology*, 148, 976–990. <https://doi.org/10.1016/j.agrformet.2008.01.014>
- Earl May, W., & Macgregor, M. (2022). Interaction between chloride and both macro- and micronutrients in annual canarygrass. *Canadian Journal of Plant Science*, 102(3), 731–743. <https://doi.org/10.1139/cjps-2021-0157>
- Eckstein, K., Robinson, J. C., & Fraser, C. (1997). Physiological responses of banana (*Musa* AAA; Cavendish sub-group) in the subtropics. VII. Effects of windbreak shading on phenology, physiology and yield. *Journal of Horticultural Science*, 72(3), 389–396. <https://doi.org/10.1080/14620316.1997.11515526>
- EEA. (2020). Plastic in textiles : towards a circular economy for synthetic textiles in

Europe Key messages. In *Briefing no. 25/2020*.

- Ekanayake, I. J., Ortiz, R., & Vuylsteke, D. R. (1994). Influence of Leaf Age, Soil Moisture, VPD and Time of Day on Leaf Conductance of Various *Musa* Genotypes in a Humid Forest-Moist Savanna Transition Site. *Annals of Botany*, 74(2), 173–178. <https://doi.org/10.1006/anbo.1994.1106>
- Epron, D., Cabral, O. M. R., Laclau, J.-P., Dannoura, M., Packer, A. P., Plain, C., Battie-Laclau, P., Moreira, M. Z., Trivelin, P. C. O., Bouillet, J.-P., Gérant, D., & Nouvellon, Y. (2016). In situ ¹³CO₂ pulse labelling of field-grown eucalypt trees revealed the effects of potassium nutrition and throughfall exclusion on phloem transport of photosynthetic carbon. *Tree Physiology*, 36(1), 6–21. <https://doi.org/10.1093/treephys/tpv090>
- Erhunmwunse, A. S., & Farmaha, B. S. (2023). Soybean response to potassium, magnesium, and sulfur fertilization on Southeastern Coastal Plain soils. *Agrosystems, Geosciences & Environment*, 6(1), 1–9. <https://doi.org/10.1002/agg2.20333>
- Fageria, V. D. (2001). Nutrient Interactions in Crop Plants. *Journal of Plant Nutrition*, 24(8), 1269–1290. <https://doi.org/10.1080/01904168309363074>
- FAO. (2020). *Abaca. Future Fibers*. <https://www.fao.org/economic/futurefibres/fibres/abaca0/en/>
- FAO. (2021a). Land use statistics and indicators statistics. Global, regional and country trends 1990– 2019. In *FAOSTAT Analytical Brief Series No 28*. <https://doi.org/10.4060/cc0963en>
- FAO. (2021b). *The state of the world's land and water resources for food and agriculture – Systems at breaking point. Synthesis report 2021*. Food and Agriculture Organization of the United Nations. <https://doi.org/https://doi.org/10.4060/cb7654en>
- FAO. (2023). *Soil Permeability*. FAO Training; Food and Agriculture Organization of the United Nations. https://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6706e/x6706e09.htm
- FAOSTAT. (2013). *Commodity Balances (non-food)*. Food and Agriculture

Organization of the United Nations. <https://www.fao.org/faostat/en/#data/CB>

FAOSTAT. (2023). *Export Quantity of Abaca*. Food and Agriculture Organization of United Nations. <https://www.fao.org/faostat/en/#data/TCL>

Faruk, O., Bledzki, A. K., Fink, H.-P., & Sain, M. (2012). Biocomposites reinforced with natural fibers: 2000–2010. *Progress in Polymer Science*, 37(11), 1552–1596. <https://doi.org/https://doi.org/10.1016/j.progpolymsci.2012.04.003>

Feil, S. B., Pii, Y., Valentinuzzi, F., Tiziani, R., Mimmo, T., & Cesco, S. (2020). Copper toxicity affects phosphorus uptake mechanisms at molecular and physiological levels in *Cucumis sativus* plants. *Plant Physiology and Biochemistry*, 157, 138–147. <https://doi.org/https://doi.org/10.1016/j.plaphy.2020.10.023>

Fernando, A. L., Costa, J., Barbosa, B., Monti, A., & Rettenmaier, N. (2018). Environmental impact assessment of perennial crops cultivation on marginal soils in the Mediterranean Region. *Biomass and Bioenergy*, 111, 174–186. <https://doi.org/10.1016/j.biombioe.2017.04.005>

Fernando, A. L., Duarte, M. P., Vatsanidou, A., & Alexopoulou, E. (2015). Environmental aspects of fiber crops cultivation and use. *Industrial Crops and Products*, 68, 105–115. <https://doi.org/10.1016/j.indcrop.2014.10.003>

Fortier, C. A., Zumba, J., Rodgers, J., Peralta, D., French, A., & Hunsaker, D. (2021). The effects of two field conditions on metal ion concentrations in cotton fibers. *American Association of Textile Chemists and Colorists Journal of Research*, 8(1), 8–13. <https://doi.org/10.14504/ajr.8.1.2>

Foyer, C. H., & Hanke, G. (2022). ROS production and signalling in chloroplasts: cornerstones and evolving concepts. *Plant Journal*, 111(3), 642–661. <https://doi.org/10.1111/tpj.15856>

Foyer, C. H., & Noctor, G. (2005). Oxidant and antioxidant signalling in plants: a re-evaluation of the concept of oxidative stress in a physiological context. *Plant, Cell and Environment*, 28, 1056–1071.

Fradj, N. B., Jayet, P. A., & Aghajanzadeh-Darzi, P. (2016). Competition between food, feed, and (bio)fuel: A supply-side model based assessment at the European scale. *Land Use Policy*, 52, 195–205. <https://doi.org/10.1016/j.landusepol.2015.12.027>

- Franck, R. R. (2005). Abaca. In R. E. Franck (Ed.), *Bast and Other Plant Fibres* (pp. 315–321). Woodhead Publishing Series in Textiles. <https://doi.org/https://doi.org/10.1533/9781845690618.315>
- Gayatri, G., Agurla, S., & Raghavendra, A. (2013). Nitric oxide in guard cells as an important secondary messenger during stomatal closure. *Frontiers in Plant Science*, 4. <https://doi.org/10.3389/fpls.2013.00425>
- Ghasemi-Fasaei, R., & Ronaghi, A. (2008). Interaction of iron with copper, zinc, and manganese in wheat as affected by iron and manganese in a calcareous soil. *Journal of Plant Nutrition*, 31(5), 839–848. <https://doi.org/10.1080/01904160802043148>
- Giacometti, G. M., & Morosinotto, T. (2013). Photoinhibition and Photoprotection in Plants, Algae, and Cyanobacteria. In *Encyclopedia of Biological Chemistry: Second Edition* (2nd ed.). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-378630-2.00229-2>
- Gomez, K. A., & Gomez, A. A. (1984). *Statistical Procedures for Agricultural Research*. John Wiley & Sons, Inc.
- Gong, W. Z., Jiang, C. D., Wu, Y. S., Chen, H. H., Liu, W. Y., & Yang, W. Y. (2015). Tolerance vs. avoidance: two strategies of soybean (*Glycine max*) seedlings in response to shade in intercropping. *Photosynthetica*, 53(2), 259–268. <https://doi.org/10.1007/s11099-015-0103-8>
- Grace, S. C., & Logan, B. A. (1996). Acclimation of foliar antioxidant systems to growth irradiance in three broad-leaved evergreen species. *Plant Physiology*, 112(4), 1631–1640. <https://doi.org/10.1104/pp.112.4.1631>
- Graham, B. P., & Haigler, C. H. (2021). Microtubules exert early, partial, and variable control of cotton fiber diameter. *Planta*, 253(47), 1–17. <https://doi.org/10.1007/s00425-020-03557-1>
- Halinski, R. S., & Feldt, L. S. (1970). the Selection of Variables in Multiple Regression Analysis. *Journal of Educational Measurement*, 7(3), 151–157. <https://doi.org/10.1111/j.1745-3984.1970.tb00709.x>
- Halos, S. C. (2008). *The Abaca*. Department of Agriculture.
- Han, C. J., Wang, Q., Zhang, H. bao, Wang, S. hai, Song, H. dong, Hao, J. mei, &

- Dong, H. zhong. (2018). Light shading improves the yield and quality of seed in oil-seed peony (*Paeonia ostii* Feng Dan). *Journal of Integrative Agriculture*, 17(7), 1631–1640. [https://doi.org/10.1016/S2095-3119\(18\)61979-3](https://doi.org/10.1016/S2095-3119(18)61979-3)
- Handayani, R., Fans, K., Mastuti, T. S., & Rosa, D. (2021). Comparison Study of Antioxidant Activity From Three Banana Leaves Extracts. *Jurnal Teknologi Dan Industri Pangan*, 32(1), 92–97. <https://doi.org/10.6066/jtip.2021.32.1.92>
- Hassanzadehdelouei, M., Ul-Allah, S., & Madani, A. (2022). Cotton fiber quality response to nitrogen depends on source-sink process, boll growth habit, and weather condition. *Industrial Crops and Products*, 186, 1–8. <https://doi.org/https://doi.org/10.1016/j.indcrop.2022.115279>
- Hastuti, Purnomo, Sumardi, I., & Daryono, B. S. (2019). Diversity wild banana species (*Musa* spp.) in Sulawesi, Indonesia. *Biodiversitas*, 20(3), 824–832. <https://doi.org/10.13057/biodiv/d200328>
- Hazra, A., Saha, S., Dasgupta, N., Kumar, R., Sengupta, C., & Das, S. (2021). Ecophysiological traits differentially modulate secondary metabolite accumulation and antioxidant properties of tea plant [*Camellia sinensis* (L.) O. Kuntze]. *Scientific Reports*, 11(1), 1–9. <https://doi.org/10.1038/s41598-021-82454-3>
- Heming, N. M., Schroth, G., Talora, D. C., & Faria, D. (2022). Cabruca agroforestry systems reduce vulnerability of cacao plantations to climate change in southern Bahia. *Agronomy for Sustainable Development*, 42(3), 1–16. <https://doi.org/10.1007/s13593-022-00780-w>
- Heyneke, E., Luschin-Ebengreuth, N., Krajcer, I., Wolking, V., Müller, M., & Zechmann, B. (2013). Dynamic compartment specific changes in glutathione and ascorbate levels in *Arabidopsis* plants exposed to different light intensities. *BMC Plant Biology*, 13(1). <https://doi.org/10.1186/1471-2229-13-104>
- Horneck, D. A., Sullivan, D. M., Owen, J. S., & Hart, J. M. (2011). *Soil Test Interpretation Guide* (pp. 1–12). Oregon State University. <https://doi.org/10.1016/j.jpaa.2014.07.021>
- Hossner, L. R. (2008). Macronutrients. In W. Chesworth (Ed.), *Encyclopedia of Soil Science. Encyclopedia of Earth Sciences Series* (pp. 443–445). Springer Netherlands. https://doi.org/10.1007/978-1-4020-3995-9_337

- Huang, W. D., Wu, L. K., & Zhan, J. C. (2002). Effect of weak light on the peroxidation of membrane-lipid of cherry leaves. *Acta Botanica Sinica*, 44(8), 920–924.
- Hussain, S., Iqbal, N., PANG, T., Naeem Khan, M., LIU, W. guo, & YANG, W. yu. (2019). Weak stem under shade reveals the lignin reduction behavior. *Journal of Integrative Agriculture*, 18(3), 496–505. [https://doi.org/10.1016/S2095-3119\(18\)62111-2](https://doi.org/10.1016/S2095-3119(18)62111-2)
- Ibrahim, M. M., El-Zawawy, W. K., Jüttke, Y., Koschella, A., & Heinze, T. (2013). Cellulose and microcrystalline cellulose from rice straw and banana plant waste: preparation and characterization. *Cellulose*, 20(5), 2403–2416. <https://doi.org/10.1007/s10570-013-9992-5>
- Ijaz, M., Ali, Q., Fahad, S., Ashraf, S., Shahid, M., Ahmad, S., & Hasanuzzaman, M. (2019). Role of reactive sulfur species in the oxidative metabolism in plants. In M. Hasanuzzaman, V. Fotopoulos, K. Nahar, & M. Fujita (Eds.), *Reactive Oxygen, Nitrogen and Sulfur Species in Plants: Production, Metabolism, Signaling and Defense Mechanisms* (Vol. 2, pp. 729–742). John Wiley & Sons Ltd. <https://doi.org/10.1002/9781119468677.ch32>
- Imran, M., Hu, C., Hussain, S., Rana, M. S., Riaz, M., Afzal, J., Aziz, O., Elyamine, A. M., Farag Ismael, M. A., & Sun, X. (2019). Molybdenum-induced effects on photosynthetic efficacy of winter wheat (*Triticum aestivum* L.) under different nitrogen sources are associated with nitrogen assimilation. *Plant Physiology and Biochemistry*, 141, 154–163. <https://doi.org/10.1016/j.plaphy.2019.05.024>
- International Union of Soil Sciences Working Group. (2022). *World Reference Base for Soil Resources. International soil classification system for naming soils and creating legends for soil maps* (4th ed.). International Union of Soil Sciences (IUSS). https://wrb.isric.org/files/WRB_fourth_edition_2022-12-18.pdf
- Isaac, M. E., Ulzen-Appiah, F., Timmer, V. R., & Quashie-Sam, S. J. (2007). Early growth and nutritional response to resource competition in cocoa-shade intercropped systems. *Plant and Soil*, 298, 243–254. <https://doi.org/10.1007/s11104-007-9362-x>
- Izumi, H., Ito, T., & Yoshida, Y. (1992). Effect of Light Content Intensity during the Growing Period on Ascorbic Acid and Its Histochemical Distribution of Satsuma in the Leaves Mandarin and Peel , and Fruit Quality. *Journal of the Japanese*

Society for Horticultural Science, 61(1), 7–15.
<https://doi.org/https://doi.org/10.2503/jjshs.61.7>

- Jahan, M. S., Guo, S., Baloch, A. R., Sun, J., Shu, S., Wang, Y., Ahammed, G. J., Kabir, K., & Roy, R. (2020). Melatonin alleviates nickel phytotoxicity by improving photosynthesis, secondary metabolism and oxidative stress tolerance in tomato seedlings. *Ecotoxicology and Environmental Safety*, 197, 1–12. <https://doi.org/10.1016/j.ecoenv.2020.110593>
- Jahan, M. S., Shu, S., Wang, Y., Chen, Z., He, M., Tao, M., Sun, J., & Guo, S. (2019). Melatonin alleviates heat-induced damage of tomato seedlings by balancing redox homeostasis and modulating polyamine and nitric oxide biosynthesis. *BMC Plant Biology*, 19(1), 1–16. <https://doi.org/10.1186/s12870-019-1992-7>
- Jakhar, S., & Mukherjee, D. (2014). Chloroplast pigments, proteins, lipid peroxidation and activities of antioxidative enzymes during maturation and senescence of leaves and reproductive organs of *Cajanus cajan* L. *Physiology and Molecular Biology of Plants*, 20(2), 171–180. <https://doi.org/10.1007/s12298-013-0219-x>
- Jakobsen, S. T. (1993). Interaction between plant nutrients. *Soil and Plant Science*, 43, 1–5.
- Jasiukaityte-Grojzdek, E., Kunaver, M., & Poljanšek, I. (2012). Influence of cellulose polymerization degree and crystallinity on kinetics of cellulose degradation. *BioResources*, 7(3), 3008–3027. <https://doi.org/10.15376/biores.7.3.3008-3027>
- Jayaprabha, J. S., Brahmakumar, M., & Manilal, V. B. (2011). Banana Pseudostem Characterization and Its Fiber Property Evaluation on Physical and Bioextraction. *Journal of Natural Fibers*, 8(3), 149–160. <https://doi.org/10.1080/15440478.2011.601614>
- Jhala, A., & Hall, L. (2010). Flax (*Linum usitatissimum* L.): Current uses and future applications. *Australian Journal of Basic and Applied Sciences*, 4, 4304–4312.
- Ji, C., Li, J., Jiang, C., Zhang, L., Shi, L., Xu, F., & Cai, H. (2022). Zinc and nitrogen synergistic act on root-to-shoot translocation and preferential distribution in rice. *Journal of Advanced Research*, 35, 187–198. <https://doi.org/10.1016/j.jare.2021.04.005>
- Jiang, Y., Ding, X., Wang, J., Zou, J., & Nie, W. F. (2021). Decreased low-light

- regulates plant morphogenesis through the manipulation of hormone biosynthesis in *Solanum lycopersicum*. *Environmental and Experimental Botany*, 185, 1–12. <https://doi.org/10.1016/j.envexpbot.2021.104409>
- Jones, D. R., & Daniells, J. W. (2019). Introduction to banana, abacá and enset. In *CABI Books*. CABI Books. <https://doi.org/10.1079/9781780647197.0001>
- Joseph, P., Jessy, M. D., & Mohan, M. (2022). Soil carbon pools under rubber (*Hevea brasiliensis*) based agroforestry systems in South India. *Agroforestry Systems*, 96(8), 1121–1133. <https://doi.org/10.1007/s10457-022-00770-7>
- Julian, P., Gerber, S., Bhomia, R. K., King, J., Osborne, T. Z., & Wright, A. L. (2020). Understanding stoichiometric mechanisms of nutrient retention in wetland macrophytes: stoichiometric homeostasis along a nutrient gradient in a subtropical wetland. *Oecologia*, 193(4), 969–980. <https://doi.org/10.1007/s00442-020-04722-9>
- Kaiser, B. N., Gridley, K. L., Brady, J. N., Phillips, T., & Tyerman, S. D. (2005). The role of molybdenum in agricultural plant production. *Annals of Botany*, 96(5), 745–754. <https://doi.org/10.1093/aob/mci226>
- Kanjana, D. (2020). Foliar application of magnesium oxide nanoparticles on nutrient element concentrations, growth, physiological, and yield parameters of cotton. *Journal of Plant Nutrition*, 43(20), 3035–3049. <https://doi.org/10.1080/01904167.2020.1799001>
- Kelty, M. (1999). Species Interactions, Stand Structure, and Productivity in Agroforestry Systems. In M. S. Ashton & F. Montagnini (Eds.), *The Silvicultural Basis For Agroforestry Systems*. CRC Press. <https://doi.org/10.1201/9781420049466.ch9>
- Khan, T., Hameed Sultan, M. T. Bin, & Ariffin, A. H. (2018). The challenges of natural fiber in manufacturing, material selection, and technology application: A review. *Journal of Reinforced Plastics and Composites*, 37(11), 770–779. <https://doi.org/10.1177/0731684418756762>
- Kido, N., Yokoyama, R., Yamamoto, T., Furukawa, J., Iwai, H., Satoh, S., & Nishitani, K. (2015). The matrix polysaccharide (1;3,1;4)-2- d -glucan is involved in silicon-dependent strengthening of rice cell wall. *Plant and Cell Physiology*, 56(2), 268–276. <https://doi.org/10.1093/pcp/pcu162>

- Koelmans, A. A., Mohamed Nor, N. H., Hermesen, E., Kooi, M., Mintenig, S. M., & De France, J. (2019). Microplastics in freshwaters and drinking water: Critical review and assessment of data quality. *Water Research*, 155, 410–422. <https://doi.org/https://doi.org/10.1016/j.watres.2019.02.054>
- KOHYAMA, T., HARA, T., & TADAKI, Y. (1990). Patterns of Trunk Diameter, Tree Height and Crown Depth in Crowded Abies Stands. *Annals of Botany*, 65(5), 567–574. <https://doi.org/10.1093/oxfordjournals.aob.a087970>
- Komosa, A., & Górniak, T. (2015). The Effect of Chloride on Yield and Nutrient Interaction in Greenhouse Tomato (*Lycopersicon Esculentum* Mill.) Grown in Rockwool. *Journal of Plant Nutrition*, 38(3), 355–370. <https://doi.org/10.1080/01904167.2014.934466>
- Komuraiah, A., Kumar, N. S., & Prasad, B. D. (2014). Chemical Composition of Natural Fibers and its Influence on their Mechanical Properties. *Mechanics of Composite Materials*, 50(3), 359–376. <https://doi.org/10.1007/s11029-014-9422-2>
- Kong, D., Hu, H.-C., Okuma, E., Lee, Y., Lee, H. S., Munemasa, S., Cho, D., Ju, C., Pedoeim, L., Rodriguez, B., Wang, J., Im, W., Murata, Y., Pei, Z.-M., & Kwak, J. M. (2016). L-Met Activates Arabidopsis GLR Ca²⁺ Channels Upstream of ROS Production and Regulates Stomatal Movement. *Cell Reports*, 17(10), 2553–2561. <https://doi.org/https://doi.org/10.1016/j.celrep.2016.11.015>
- Kozlowski, R., Baraniecki, P., & Barriga-Bedoya, J. (2005). Bast fibres (Flax, hemp, jute, Ramie, Kenaf, Abaca). In R. Blackburn (Ed.), *Biodegradable and Sustainable Fibres: A Volume in Woodhead Publishing Series in Textiles* (pp. 36–88). Cambridge: Woodhead Publishing Ltd. <https://doi.org/10.1533/9781845690991.36>
- Krouk, G., & Kiba, T. (2020). Nitrogen and Phosphorus interactions in plants: from agronomic to physiological and molecular insights. *Current Opinion in Plant Biology*, 57, 104–109. <https://doi.org/https://doi.org/10.1016/j.pbi.2020.07.002>
- Lambers, H., Clements, J. C., & Nelson, M. N. (2013). How aphosphorus-acquisition strategy based on carboxylate exudation powers the success and agronomic potential of lupines (*Lupinus*, Fabaceae). *American Journal of Botany*, 100(2), 263–288. <https://doi.org/10.3732/ajb.1200474>

- Leal, A. J. F., Piatì, G. L., Leite, R. C., Zanella, M. S., Osorio, C. R. W. S., & Lima, S. F. (2020). Nitrogen and mepiquat chloride can affect fiber quality and cotton yield Nitrogênio e cloreto de mepiquat podem afetar qualidade de fibra e produtividade do algodoeiro. *Revista Brasileira de Engenharia Agrícola e Ambiental*, 24(4), 238–243.
- Lebanon Reforestation Initiative. (2022). *Guidelines for implementing Agroforestry in Lebanon* (Issue 1).
- Lewin, M. (2007). *Handbook of fiber chemistry* (3rd ed.). CRC Press.
- Lewis, D. H. (2019). Boron: the essential element for vascular plants that never was. *New Phytologist*, 221(4), 1685–1690. <https://doi.org/10.1111/nph.15519>
- Li, F. S., Xu, Y. Z., & Zhang, C. (1999). Effects of nitrogen, phosphorus and potassium on the development of cotton bolls in summer. *Acta Gossypii Sinica*, 11, 24–30.
- Li, X. (2012). Improved pyrogallol autoxidation method: A reliable and cheap superoxide-scavenging assay suitable for all antioxidants. *Journal of Agricultural and Food Chemistry*, 60(25), 6418–6424. <https://doi.org/10.1021/jf204970r>
- Li, Y., Wang, R., Liu, H., Feng, X., Wang, B., Wang, Z., Cai, J., Yang, L., & Jiang, Y. (2022). Synergistic interactions between zinc and nitrogen addition in promoting plant Zn uptake as counteracted by mowing management in a meadow grassland. *Plant and Soil*, 473, 305–318. <https://doi.org/10.1007/s11104-021-05286-0>
- Liu, K. H., Diener, A., Lin, Z., Liu, C., & Sheen, J. (2020). Primary nitrate responses mediated by calcium signalling and diverse protein phosphorylation. *Journal of Experimental Botany*, 71(15), 4428–4441. <https://doi.org/10.1093/jxb/eraa047>
- Liu, K., Takagi, H., & Yang, Z. (2013). Dependence of tensile properties of abaca fiber fragments and its unidirectional composites on the fragment height in the fiber stem. *Composites Part A: Applied Science and Manufacturing*, 45, 14–22. <https://doi.org/10.1016/j.compositesa.2012.09.006>
- Liu, Q. hua, Wu, X., Chen, B. cong, Ma, J. qing, & Gao, J. (2014). Effects of Low Light on Agronomic and Physiological Characteristics of Rice Including Grain Yield and Quality. *Rice Science*, 21(5), 243–251. [https://doi.org/10.1016/S1672-6308\(13\)60192-4](https://doi.org/10.1016/S1672-6308(13)60192-4)

- LIU, W. guo, Hussain, S., LIU, T., ZOU, J. lin, REN, M. lu, ZHOU, T., LIU, J., YANG, F., & YANG, W. yu. (2019). Shade stress decreases stem strength of soybean through restraining lignin biosynthesis. *Journal of Integrative Agriculture*, 18(1), 43–53. [https://doi.org/10.1016/S2095-3119\(18\)61905-7](https://doi.org/10.1016/S2095-3119(18)61905-7)
- Liu, X., Rahman, T., Song, C., Su, B., Yang, F., Yong, T., Wu, Y., Zhang, C., & Yang, W. (2017). Changes in light environment, morphology, growth and yield of soybean in maize-soybean intercropping systems. *Field Crops Research*, 200, 38–46. <https://doi.org/10.1016/j.fcr.2016.10.003>
- Loneragan, J. F., & Webb, M. J. (1993). Interactions Between Zinc and Other Nutrients Affecting the Growth of Plants. *Zinc in Soils and Plants*, 119–134. https://doi.org/10.1007/978-94-011-0878-2_9
- López-Lefebvre, L. R., Rivero, R. M., García, P. C., Sánchez, E., Ruiz, J. M., & Romero, L. (2001). Effect of calcium on mineral nutrient uptake and growth of tobacco. *Journal of the Science of Food and Agriculture*, 81(14), 1334–1338. <https://doi.org/10.1002/jsfa.948>
- Maharani, D., Sudomo, A., Swestiani, D., Murniati, Sabastian, G. E., Roshetko, J. M., & Fambayun, R. A. (2022). Intercropping Tuber Crops with Teak in Gunungkidul Regency, Yogyakarta, Indonesia. *Agronomy*, 12(2), 1–20. <https://doi.org/10.3390/agronomy12020449>
- Mankowski, J., Pudelko, K., & Kołodziej, J. (2013). Cultivation of Fiber and Oil Flax (*Linum usitatissimum* L.) in No-tillage and Conventional Systems. Part I. Influence of No-tillage and Conventional System on Yield and Weed Infestation of Fiber Flax and the Physical and Biological Properties of the Soil. *Journal of Natural Fibers*, 10, 326–340. <https://doi.org/10.1080/15440478.2013.797949>
- Marklund, S., & Marklund, G. (1974). Involvement of the Superoxide Anion Radical in the Autoxidation of Pyrogallol and a Convenient Assay for Superoxide Dismutase. *European Journal of Biochemistry*, 47(3), 469–474. <https://doi.org/10.1111/j.1432-1033.1974.tb03714.x>
- Marschner, H. (2011). *Marschner's mineral nutrition of higher plants*. Academic press.
- Marsoem, S. N., Prasetyo, V. E., Rachman, W. B., & A., D. S. (2009). Pemanfaatan Serat Monokotil Bambu Legi (*Gigantochloa atter*) sebagai Bahan Baku Pulp secara Mekano-Organosolv. *Prosiding Seminar Nasional MAPEKI XII*, 819–834.

- Matros, A., Peshev, D., Peukert, M., Mock, H.-P., & Van den Ende, W. (2015). Sugars as hydroxyl radical scavengers: proof-of-concept by studying the fate of sucralose in *Arabidopsis*. *The Plant Journal*, 82(5), 822–839. <https://doi.org/https://doi.org/10.1111/tjp.12853>
- Mattila, T. J., & Rajala, J. (2022). Estimating cation exchange capacity from agronomic soil tests: Comparing Mehlich-3 and ammonium acetate sum of cations. *Soil Science Society of America Journal*, 86(1), 47–50. <https://doi.org/https://doi.org/10.1002/saj2.20340>
- Medici, A., Szponarski, W., Dangeville, P., Safi, A., Dissanayake, I. M., Saenchai, C., Emanuel, A., Rubio, V., Lacombe, B., Ruffel, S., Tanurdzic, M., Rouached, H., & Krouk, G. (2019). Identification of Molecular Integrators Shows that Nitrogen Actively Controls the Phosphate Starvation Response in Plants. *The Plant Cell*, 31(5), 1171–1184. <https://doi.org/10.1105/tpc.18.00656>
- Melo, R. P., Rosa, M. P. da, Beck, P. H., Tienne, L. G. P., & Marques, M. de F. V. (2020). Thermal, morphological and mechanical properties of composites based on polyamide 6 with cellulose, silica and their hybrids from rice husk. *Journal of Composite Materials*, 55(13), 1811–1821. <https://doi.org/10.1177/0021998320978290>
- Merilo, E., Laanemets, K., Hu, H., Xue, S., Jakobson, L., Tulva, I., Gonzalez-Guzman, M., Rodriguez, P. L., Schroeder, J. I., Brosch , M., & Kollist, H. (2013). PYR/RCAR receptors contribute to ozone-, reduced air humidity-, darkness-, and CO₂-induced stomatal regulation. *Plant Physiology*, 162(3), 1652–1668. <https://doi.org/10.1104/pp.113.220608>
- Merle, I., Villarreyana-Acu a, R., Ribeyre, F., Rounsard, O., Cilas, C., & Avelino, J. (2022). Microclimate estimation under different coffee-based agroforestry systems using full-sun weather data and shade tree characteristics. *European Journal of Agronomy*, 132, 1–13. <https://doi.org/10.1016/j.eja.2021.126396>
- Messant, M., Hani, U., Hennebelle, T., Gu rard, F., Gaki re, B., Gall, A., Thomine, S., & Krieger-Liszkay, A. (2023). Manganese concentration affects chloroplast structure and the photosynthetic apparatus in *Marchantia polymorpha*. *Plant Physiology*, 192(1), 356–369. <https://doi.org/10.1093/plphys/kiad052>
- Milan, P. P., & G ltenboth, F. (2005). *Abaca and Rainforestation Farming*. Leyte State

University.

- Minotta, G., & Pinzauti, S. (1996). Effects of light and soil fertility on growth, leaf chlorophyll content and nutrient use efficiency of beech (*Fagus sylvatica* L.) seedlings. *Forest Ecology and Management*, 86(1), 61–71. [https://doi.org/https://doi.org/10.1016/S0378-1127\(96\)03796-6](https://doi.org/https://doi.org/10.1016/S0378-1127(96)03796-6)
- Miwa, K., & Fujiwara, T. (2010). Boron transport in plants: Co-ordinated regulation of transporters. *Annals of Botany*, 105(7), 1103–1108. <https://doi.org/10.1093/aob/mcq044>
- Møller, I. M. (2001). Plant mitochondria and oxidative stress: Electron transport, NADPH turnover, and metabolism of reactive oxygen species. *Annual Review of Plant Biology*, 52, 561–591. <https://doi.org/10.1146/annurev.arplant.52.1.561>
- Monroe, P. H. M., Gama-Rodrigues, E. F., Gama-Rodrigues, A. C., & Marques, J. R. B. (2016). Soil carbon stocks and origin under different cacao agroforestry systems in Southern Bahia, Brazil. *Agriculture, Ecosystems and Environment*, 221, 99–108. <https://doi.org/10.1016/j.agee.2016.01.022>
- Muhammad, A. A., JIANG, H. ke, SHUI, Z. wei, CAO, X. yu, HUANG, X. yu, IMRAN, S., AHMAD, B., ZHANG, H., YANG, Y. ning, SHANG, J., YANG, H., YU, L., LIU, C. yan, YANG, W. yu, SUN, X., & DU, J. bo. (2021). Interactive effect of shade and PEG-induced osmotic stress on physiological responses of soybean seedlings. *Journal of Integrative Agriculture*, 20(9), 2382–2394. [https://doi.org/10.1016/S2095-3119\(20\)63383-4](https://doi.org/10.1016/S2095-3119(20)63383-4)
- Munawar, S. S., Umemura, K., & Kawai, S. (2007). Characterization of the morphological, physical, and mechanical properties of seven nonwood plant fiber bundles. *Journal of Wood Science*, 53(2), 108–113. <https://doi.org/10.1007/s10086-006-0836-x>
- Musulini, R. R., & King, C. G. (1936). Metaphosphoric Acid in The Extraction and Titration of Vitamin C. *Journal of Biological Chemistry*, 116(1), 409–413. [https://doi.org/https://doi.org/10.1016/S0021-9258\(18\)74693-0](https://doi.org/https://doi.org/10.1016/S0021-9258(18)74693-0)
- Mwaikambo, L. Y. (2006). Review of the history, properties and application of plant fibres. *African Journal of Science and Technology*, 7(2), 120–133.
- Nahar, K., Hasanuzzaman, M., Alam, M. M., & Fujita, M. (2015). Exogenous

glutathione confers high temperature stress tolerance in mung bean (*Vigna radiata* L.) by modulating antioxidant defense and methylglyoxal detoxification system. *Environmental and Experimental Botany*, 112, 44–54.
<https://doi.org/10.1016/j.envexpbot.2014.12.001>

Negash, M., Starr, M., & Kanninen, M. (2013). Allometric equations for biomass estimation of Enset (*Ensete ventricosum*) grown in indigenous agroforestry systems in the Rift Valley escarpment of southern-eastern Ethiopia. *Agroforestry Systems*, 87(3), 571–581. <https://doi.org/10.1007/s10457-012-9577-6>

Neocleous, D., Nikolaou, G., Ntatsi, G., & Savvas, D. (2021). Nitrate supply limitations in tomato crops grown in a chloride-amended recirculating nutrient solution. *Agricultural Water Management*, 258, 1–15.
<https://doi.org/10.1016/j.agwat.2021.107163>

Nie, Z., Hu, C., Liu, H., Tan, Q., & Sun, X. (2014). Differential expression of molybdenum transport and assimilation genes between two winter wheat cultivars (*Triticum aestivum*). *Plant Physiology and Biochemistry*, 82, 27–33.
<https://doi.org/10.1016/j.plaphy.2014.05.002>

Niether, W., Armengot, L., Andres, C., Schneider, M., & Gerold, G. (2018). Shade trees and tree pruning alter throughfall and microclimate in cocoa (*Theobroma cacao* L.) production systems. *Annals of Forest Science*, 75(2).
<https://doi.org/10.1007/s13595-018-0723-9>

Nimse, S. B., & Pal, D. (2015). Free radicals, natural antioxidants, and their reaction mechanisms. *RSC Advances*, 5(35), 27986–28006.
<https://doi.org/10.1039/c4ra13315c>

Norgrove, L., & Hauser, S. (2013). Black leaf streak disease and plantain fruit characteristics as affected by tree density and biomass management in a tropical agroforestry system. *Agroforestry Systems*, 87(2), 349–354.
<https://doi.org/10.1007/s10457-012-9555-z>

Nurhasnawati, H., Sundu, R., Sapri, Supriningrum, R., Kuspradini, H., & Arung, E. T. (2019). Antioxidant activity, total phenolic and flavonoid content of several indigenous species of ferns in East Kalimantan, Indonesia. *Biodiversitas*, 20(2), 576–580. <https://doi.org/10.13057/BIODIV/D200238>

Oliver, C. D., & Larson, B. C. (1996). *Forest Stand Dynamics*. Wiley.

<https://books.google.co.id/books?id=vZ7wAAAAMAAJ>

- Ova, E. A., Kutman, U. B., Ozturk, L., & Cakmak, I. (2015). High phosphorus supply reduced zinc concentration of wheat in native soil but not in autoclaved soil or nutrient solution. *Plant and Soil*, 393, 147–162. <https://doi.org/10.1007/s11104-015-2483-8>
- Pachas, A. N. A., Sakanphet, S., Soukky, O., Lao, M., Savathvong, S., Newby, J. C., Souliyasack, B., Keoboulapha, B., & Dieters, M. J. (2019). Initial spacing of teak (*Tectona grandis*) in northern Lao PDR: Impacts on the growth of teak and companion crops. *Forest Ecology and Management*, 435, 77–88. <https://doi.org/10.1016/j.foreco.2018.12.031>
- Pan, Z., Sun, D., Sun, J., Zhou, Z., Jia, Y., Pang, B., Ma, Z., & Du, X. (2010). Effects of fiber wax and cellulose content on colored cotton fiber quality. *Euphytica*, 173(2), 141–149. <https://doi.org/10.1007/s10681-010-0124-0>
- Pandey, N. (2018). Role of Plant Nutrients in Plant Growth and Physiology. In M. Hasanuzzaman, M. Fujita, H. Oku, K. Nahar, & B. Hawrylak-Nowak (Eds.), *Plant Nutrients and Abiotic Stress Tolerance* (pp. 1–590). Springer. https://doi.org/https://doi.org/10.1007/978-981-10-9044-8_2
- Pardon, P., Reubens, B., Mertens, J., Verheyen, K., De Frenne, P., De Smet, G., Van Waes, C., & Reheul, D. (2018). Effects of temperate agroforestry on yield and quality of different arable intercrops. *Agricultural Systems*, 166, 135–151. <https://doi.org/10.1016/j.agsy.2018.08.008>
- Park, S.-Y., Fung, P., Nishimura, N., Jensen, D. R., Fujii, H., Zhao, Y., Lumba, S., Santiago, J., Rodrigues, A., Chow, T. F., Alfred, S. E., Bonetta, D., Finkelstein, R., Provart, N. J., Desveaux, D., Rodriguez, P. L., McCourt, P., Zhu, J.-K., Schroeder, J. I., ... Cutler, S. R. (2009). Absciscic Acid Inhibits Type 2C Protein Phosphatases via the PYR/PYL Family of START Proteins. *Science*, 324(5930), 1068–1071. <https://doi.org/10.1126/science.1173041>
- Patil, V. M., & Masand, N. (2018). Anticancer Potential of Flavonoids: Chemistry, Biological Activities, and Future Perspectives. In A.-R. FRS (Ed.), *Studies in Natural Products Chemistry* (1st ed., Vol. 59). Elsevier B.V. <https://doi.org/10.1016/B978-0-444-64179-3.00012-8>
- Pelmenschikov, V., & Siegbahn, P. E. M. (2005). Copper–Zinc Superoxide

- Dismutase: Theoretical Insights into the Catalytic Mechanism. *Inorganic Chemistry*, 44(9), 3311–3320. <https://doi.org/10.1021/ic050018g>
- Pérez, J., Muñoz-Dorado, J., De La Rubia, T., & Martínez, J. (2002). Biodegradation and biological treatments of cellulose, hemicellulose and lignin: An overview. *International Microbiology*, 5(2), 53–63. <https://doi.org/10.1007/s10123-002-0062-3>
- Pervez, H., Ashraf, M., & Makhdum, M. I. (2005). Effects of Potassium Rates and Sources on Fiber Quality Parameters in Four Cultivars of Cotton Grown in Aridisols. *Journal of Plant Nutrition*, 27(12), 2235–2257. <https://doi.org/10.1081/pln-200034711>
- Petronilo, J., Cagasan, E., Catalla, J., Fernandez, L., Galvez, L., Cocal, O., Javellana, M. L., Castronuevo, A., Gray, M. J., Radek, M., Chua, A., Prodigio, V., Peñera, C., Dolatre, E., & Gopez, G. (2016). *Abaca Sustainability Manual*. Philippine Fiber Industry Development Authority. <http://www.philfida.da.gov.ph/images/Publications/abacasustainabilitymanual/ASM.pdf>
- Petroudy, S. R. D. (2017). Physical and mechanical properties of natural fibers. In M. Fan & F. Fu (Eds.), *Advanced High Strength Natural Fibre Composites in Construction* (pp. 59–83). Elsevier Ltd. <https://doi.org/10.1016/B978-0-08-100411-1.00003-0>
- Pettigrew, W. T., Heitholt, J. J., & Meredith, W. R. (1996). Genotypic interactions with potassium and nitrogen in cotton of varied maturity. *Agronomy Journal*, 88(1), 89–93. <https://doi.org/10.2134/agronj1996.00021962008800010019x>
- Pitre, F. E., Lafarguette, F., Boyle, B., Pavy, N., Caron, S., Dallaire, N., Poulin, P. L., Ouellet, M., Morency, M. J., Wiebe, N., Ly Lim, E., Urbain, A., Mouille, G., Cooke, J. E. K., & MacKay, J. J. (2010). High nitrogen fertilization and stem leaning have overlapping effects on wood formation in poplar but invoke largely distinct molecular pathways. *Tree Physiology*, 30(10), 1273–1289. <https://doi.org/10.1093/treephys/tpq073>
- Poderoso, J. J., Helfenberger, K., & Poderoso, C. (2019). The effect of nitric oxide on mitochondrial respiration. *Nitric Oxide*, 88, 61–72. <https://doi.org/https://doi.org/10.1016/j.niox.2019.04.005>

- Prehaten, D., Hardiwinoto, S., Naã™iem, M., Supriyo, H., Widiyatno, W., & Rodiana, D. (2021). Productivity of Arrowroots and Taro Grown Under Superior Teak Clones with Several Levels of Stand Density. *Biosaintifika: Journal of Biology & Education*, 13(1), 51–57. <https://doi.org/10.15294/biosaintifika.v13i1.26428>
- Pridgeon, A. J., & Hetherington, A. M. (2021). ABA signalling and metabolism are not essential for dark-induced stomatal closure but affect response speed. *Scientific Reports*, 11(1), 5751. <https://doi.org/10.1038/s41598-021-84911-5>
- Punchard, N. A., & Kelly, F. J. (1996). *Free Radicals: a Practical Approach*. IRL Press at Oxford University Press.
- Rahman, A., Hossain, M. S., Mahmud, J.-A., Nahar, K., Hasanuzzaman, M., & Fujita, M. (2016). Manganese-induced salt stress tolerance in rice seedlings: regulation of ion homeostasis, antioxidant defense and glyoxalase systems. *Physiology and Molecular Biology of Plants : An International Journal of Functional Plant Biology*, 22(3), 291–306. <https://doi.org/10.1007/s12298-016-0371-1>
- Rai, S., Singh, P. K., Mankotia, S., Swain, J., & Satbhai, S. B. (2021). Iron homeostasis in plants and its crosstalk with copper, zinc, and manganese. *Plant Stress*, 1, 1–9. <https://doi.org/https://doi.org/10.1016/j.stress.2021.100008>
- Ramankutty, N., Mehrabi, Z., Waha, K., Jarvis, L., Kremen, C., Herrero, M., & Rieseberg, L. H. (2018). Trends in Global Agricultural Land Use: Implications for Environmental Health and Food Security. *Annual Review of Plant Biology*, 69, 789–815. <https://doi.org/10.1146/annurev-arplant-042817-040256>
- Raza, M. A., Feng, L. Y., Iqbal, N., Khan, I., Meraj, T. A., Xi, Z. J., Naeem, M., Ahmed, S., Sattar, M. T., Chen, Y. K., Huan, C. H., Ahmed, M., Yang, F., & Yang, W. (2020). Effects of contrasting shade treatments on the carbon production and antioxidant activities of soybean plants. *Functional Plant Biology*, 47(4), 342–354. <https://doi.org/10.1071/FP19213>
- Raza, M. A., Feng, L. Y., van der Werf, W., Iqbal, N., Khan, I., Hassan, M. J., Ansar, M., Chen, Y. K., Xi, Z. J., Shi, J. Y., Ahmed, M., Yang, F., & Yang, W. (2019). Optimum leaf defoliation: A new agronomic approach for increasing nutrient uptake and land equivalent ratio of maize soybean relay intercropping system. *Field Crops Research*, 244, 1–11. <https://doi.org/10.1016/j.fcr.2019.107647>

- Reich, M., Shahbaz, M., Prajapati, D. H., Parmar, S., Hawkesford, M. J., & De Kok, L. J. (2016). Interactions of Sulfate with Other Nutrients As Revealed by H₂S Fumigation of Chinese Cabbage. *Frontiers in Plant Science*, 7, 541. <https://doi.org/10.3389/fpls.2016.00541>
- Rhodes, R., Miles, N., & Hughes, J. C. (2018). Interactions between potassium, calcium and magnesium in sugarcane grown on two contrasting soils in South Africa. *Field Crops Research*, 223, 1–11. <https://doi.org/10.1016/j.fcr.2018.01.001>
- Richter, S., Stromann, K., & Müssig, J. (2013). Abacá (*Musa textilis*) grades and their properties-A study of reproducible fibre characterization and a critical evaluation of existing grading systems. *Industrial Crops and Products*, 42(1), 601–612. <https://doi.org/10.1016/j.indcrop.2012.06.025>
- Rietra, R. P. J. J., Heinen, M., Dimkpa, C. O., & Bindraban, P. S. (2017). Effects of Nutrient Antagonism and Synergism on Yield and Fertilizer Use Efficiency. *Communications in Soil Science and Plant Analysis*, 48(16), 1895–1920. <https://doi.org/10.1080/00103624.2017.1407429>
- Riveras, E., Alvarez, J. M., Vidal, E. A., Oses, C., Vega, A., & Gutiérrez, R. A. (2015). The calcium ion is a second messenger in the nitrate signaling pathway of Arabidopsis. *Plant Physiology*, 169(2), 1397–1404. <https://doi.org/10.1104/pp.15.00961>
- Robinson, J. C. (1996). *Bananas and plantains*. CAB INTERNATIONAL.
- ROE, J. H. (1954). Chemical determination of ascorbic, dehydroascorbic, and diketogulonic acids. *Methods of Biochemical Analysis*, 1, 115–139. <https://doi.org/10.1002/9780470110171.ch5>
- Rout, G. R., & Sahoo, S. (2015). Role of Iron in Plant Growth and Metabolism. *Reviews in Agricultural Science*, 3(0), 1–24. <https://doi.org/10.7831/ras.3.1>
- Rowell, R., Pettersen, R., & Tshabalala, M. (2012). Cell Wall Chemistry. In R. M. Rowell (Ed.), *Handbook of Wood Chemistry and Wood Composites, Second Edition* (2nd ed., pp. 33–72). CRC Press. <https://doi.org/10.1201/b12487-5>
- Sadowska-Bartos, I., Adamczyk, R., & Bartosz, G. (2014). Protection against peroxynitrite reactions by flavonoids. *Food Chemistry*, 164, 228–233.

<https://doi.org/https://doi.org/10.1016/j.foodchem.2014.04.105>

- Sakakibara, H., Honda, Y., Nakagawa, S., Ashida, H., & Kanazawa, K. (2003). Simultaneous Determination of All Polyphenols in Vegetables, Fruits, and Teas. *Journal of Agricultural and Food Chemistry*, 51(3), 571–581. <https://doi.org/10.1021/jf020926l>
- Saleem, M. H., Rehman, M., Zahid, M., Imran, M., Xiang, W., & Liu, L. (2019). Morphological changes and antioxidative capacity of jute (*Corchorus capsularis*, Malvaceae) under different color light-emitting diodes. *Brazilian Journal of Botany*, 42, 581–590. <https://doi.org/10.1007/s40415-019-00565-8>
- Sánchez-Rodríguez, A. R., del Campillo, M. C., & Torrent, J. (2017). Phosphorus reduces the zinc concentration in cereals pot-grown on calcareous Vertisols from southern Spain. *Journal of the Science of Food and Agriculture*, 97(10), 3427–3432. <https://doi.org/https://doi.org/10.1002/jsfa.8195>
- Sandhu, R., Bhati-Kushwaha, H., & Malik, C. P. (2013). Correlating Macro and Micronutrient Contents with the Fibre Quality in *Gossypium* Cultivars. *Journal of Plant Science Research*, 29(1), 75–81.
- Sankaranarayanan, K., Praharaj, C. S., Nalayini, P., Bandyopadhyay, K. K., & Gopalakrishnan, N. (2010). Effect of magnesium, zinc, iron and boron application on yield and quality of cotton (*Gossypium hirsutum*). *Indian Journal of Agricultural Sciences*, 80(8), 699–703. <https://epubs.icar.org.in/index.php/IJAgS/article/view/266>
- Sarker, J. R., Singh, B. P., He, X., Fang, Y., Li, G. D., Collins, D., & Cowie, A. L. (2017). Tillage and nitrogen fertilization enhanced belowground carbon allocation and plant nitrogen uptake in a semi-arid canola crop–soil system. *Scientific Reports*, 7, 1–13. <https://doi.org/10.1038/s41598-017-11190-4>
- Sarker, S. R., Chowdhury, M. A. H., Mohiuddin, K. M., & Saha, B. K. (2008). Influence of different levels of potassium on yield and fibre strength of jute. *Journal of Agroforestry and Environment*, 2(2), 9–13. <https://jagroforenviron.com/wp-content/uploads/2018/09/8.-Influence-of-different-levels-of-potassium-on-yield-and-fibre-strength-of-jute-SR-Sarker.pdf>
- Sasaki, A., Kanzaki, M., Mochizuki, K., Choocharoen, C., & Preechapanya, P. (2020). Aboveground biomass and carbon sequestration potential of tea and shade trees

in Miang tea gardens, an agroforestry system in Northern Thailand. *Tropics*, 29(4), 105–119. <https://doi.org/10.3759/tropics.MS20-01>

- Sastrosupadi, A. (2000). Informasi Budidaya Abaca Untuk-Menunjang Pengembangan Agribisnis Abaca. *Balai Pengkajian Teknologi Pertanian Palangka Raya*, 170–176.
- Sathish, S., Prabhu, L., Gokulkumar, S., Karthi, N., Balaji, D., & Vigneshkumar, N. (2022). Extraction, Treatment and Applications of Bio Fiber Composites A Critical Review. *Composite and Composite Coatings: Mechanical and Tribology Aspects, January*, 1–22. <https://doi.org/10.1201/9781003109723-1>
- Sawan, Z. M., Mahmoud, M. H., & El-Guibali, A. H. (2008). Influence of potassium fertilization and foliar application of zinc and phosphorus on growth, yield components, yield and fiber properties of Egyptian cotton (*Gossypium barbadense* L.). *Journal of Plant Ecology*, 1(4), 259–270. <https://doi.org/10.1093/jpe/rtn021>
- Scharwies, J. D., & Dinneny, J. R. (2019). Water transport, perception, and response in plants. *Journal of Plant Research*, 132(3), 311–324. <https://doi.org/10.1007/s10265-019-01089-8>
- Schoenbeck, M., Shrestha, B., McCormick, M., Kellner, T., & Rauter, C. (2015). Light suppression of nitrate reductase activity in seedling and young plant tissues. *Transactions of the Nebraska Academy of Sciences and Affiliated Societies*, 35, 41–52.
- Schulten, A., & Krämer, U. (2017). *Interactions Between Copper Homeostasis and Metabolism in Plants*. 111–146. https://doi.org/10.1007/124_2017_7
- Sendhil, R., Anuj K., Amit, K. S., Poonam, J., et al. (2018). *Strengthening Value Chain in Wheat and Barley for Doubling Farmers Income*. ICAR-INDIAN INSTITUTE OF WHEAT AND BARLEY RESEARCH.
- Señeris, G. T., Vedasto, E. P., Teodosio, M. M., Ragaas, M. L., & Teodosio, L. J. (2022). Morphological Characteristics of Abaca (*Musa textilis* Nee') Cultivars Grown in Two Municipalities of Aklan, Philippines. *Universal Journal of Agricultural Research*, 10(2), 175–183. <https://doi.org/10.13189/ujar.2022.100209>

- Senthilkumar, M., Amaresan, N., & Sankaranarayanan, A. (2021). *Plant-Microbe Interactions: Laboratory Techniques*. Springer Science & Business Media.
- Shafi, A., Hassan, F., & Khanday, F. A. (2022). Reactive oxygen and nitrogen species: Oxidative damage and antioxidative defense mechanism in plants under abiotic stress. *Plant Abiotic Stress Physiol*, 1, 71.
- Shafiq, I., Hussain, S., Hassan, B., Raza, A., Ahmad, I., Asghar, M. A., Wang, Z., Tan, T., Li, S., Tan, X., Ghafoor, A., Manaf, A., Ansar, M., Yang, F., & Yang, W. (2021). Crop responses and management strategies under shade and drought stress. *Photosynthetica*, 59(4), 664–682. <https://doi.org/10.32615/ps.2021.057>
- Shafiq, I., Hussain, S., Raza, M. A., Iqbal, N., Ashgar, M. A., Raza, A., Fan, Y. fang, Mumtaz, M., Shoaib, M., Ansar, M., Manaf, A., Yang, W. yu, & Yang, F. (2021). Crop photosynthetic response to light quality and light intensity. *Journal of Integrative Agriculture*, 20(1), 4–23. [https://doi.org/10.1016/S2095-3119\(20\)63227-0](https://doi.org/10.1016/S2095-3119(20)63227-0)
- She, X. P., Song, X. G., & He, J. M. (2004). Role and relationship of nitric oxide and hydrogen peroxide in light/dark-regulated stomatal movement in *Vicia faba*. *Acta Botanica Sinica*, 46(11), 1292–1300.
- Shimazaki, K. I., Doi, M., Assmann, S. M., & Kinoshita, T. (2007). Light regulation of stomatal movement. *Annual Review of Plant Biology*, 58, 219–247. <https://doi.org/10.1146/annurev.arplant.57.032905.105434>
- Sierla, M., Waszczak, C., Vahisalu, T., & Kangasjärvi, J. (2016). Reactive oxygen species in the regulation of stomatal movements. *Plant Physiology*, 171(3), 1569–1580. <https://doi.org/10.1104/pp.16.00328>
- Silatsa, F. B. T., Yemefack, M., Ewane-Nonga, N., Kemga, A., & Hanna, R. (2017). Modeling carbon stock dynamics under fallow and cocoa agroforest systems in the shifting agricultural landscape of Central Cameroon. *Agroforestry Systems*, 91(5), 993–1006. <https://doi.org/10.1007/s10457-016-9973-4>
- Siles, P., Bustamante, O., Valdivia, E., Burkhardt, J., & Staver, C. (2013). Photosynthetic performance of banana (“gros michel”, AAA) under a natural shade gradient. *Acta Horticulturae*, 986, 71–78. <https://doi.org/10.17660/actahortic.2013.986.5>

- Simbaña, E. A., Ordóñez, P. E., Ordóñez, Y. F., Guerrero, V. H., Mera, M. C., & Carvajal, E. A. (2020). Abaca: Cultivation, obtaining fibre and potential uses. In R. M. Kozłowski & M. Mackiewicz-Talarczyk (Eds.), *Handbook of Natural Fibres* (2nd ed., pp. 197–218). Elsevier Ltd. <https://doi.org/10.1016/B978-0-12-818398-4.00008-6>
- Simpson, M. G. (2010). Diversity and Classification of Flowering Plants. In *Plant Systematics* (2nd ed.). Elsevier Inc. <https://doi.org/10.1016/b978-0-12-374380-0.50007-5>
- Smith, P., Gregory, P. J., Van Vuuren, D., Obersteiner, M., Havlík, P., Rounsevell, M., Woods, J., Stehfest, E., & Bellarby, J. (2010). Competition for land. *Philosophical Transactions: Biological Sciences*, 365(1554), 2941–2957. <https://doi.org/10.1098/rstb.2010.0127>
- Snapp, S. (2017). Agroecology: Principles and Practice. In *Agricultural Systems: Agroecology and Rural Innovation for Development: Second Edition*. Elsevier Inc. <https://doi.org/10.1016/B978-0-12-802070-8.00002-5>
- Somporn, C., Kamtuo, A., Theerakulpisut, P., & Siriamornpun, S. (2012). Effect of shading on yield, sugar content, phenolic acids and antioxidant property of coffee beans (*Coffea Arabica* L. cv. Catimor) harvested from north-eastern Thailand. *Journal of the Science of Food and Agriculture*, 92(9), 1956–1963. <https://doi.org/10.1002/jsfa.5568>
- Spencer, J. E. (1951). The Abaca Plant and Its Fiber , Manila Hemp. *Economic Botany*, 7(3), 195–213. <http://www.jstor.org/stable/4287774>
- Srivastava, A. K., Penna, S., & Stanislaus, F. D. (2012). Interaction and Crosstalk Between Calcium and Redox Signaling Events in Plants. *Plant Stress*, 6(1), 29–36.
- Stiff, M. R., & Haigler, C. H. (2016). Cotton fiber tips have diverse morphologies and show evidence of apical cell wall synthesis. *Scientific Reports*, 6(1), 1–13. <https://doi.org/https://doi.org/10.1038/srep27883>
- Stine, A. R. (2019). Global Demonstration of Local Liebig's Law Behavior for Tree-Ring Reconstructions of Climate. *Paleoceanography and Paleoclimatology*, 34(2), 203–216. <https://doi.org/https://doi.org/10.1029/2018PA003449>

- Strickler, G. S. (1959, December). Use of the densiometer to estimate density of forest canopy on permanent sample plots. *Pacific Northwest Old Series Research Notes*, 180, 1–5.
- Suganya, A., Saravanan, A., & Manivannan, N. (2020). Role of Zinc Nutrition for Increasing Zinc Availability, Uptake, Yield, and Quality of Maize (*Zea Mays* L.) Grains: An Overview. *Communications in Soil Science and Plant Analysis*, 51(15), 2001–2021. <https://doi.org/10.1080/00103624.2020.1820030>
- Sui, X. L., Mao, S. L., Wang, L. H., Zhang, B. X., & Zhang, Z. X. (2012). Effect of Low Light on the Characteristics of Photosynthesis and Chlorophyll a Fluorescence During Leaf Development of Sweet Pepper. *Journal of Integrative Agriculture*, 11(10), 1633–1643. [https://doi.org/10.1016/S2095-3119\(12\)60166-X](https://doi.org/10.1016/S2095-3119(12)60166-X)
- Sultana, C. (1983). The cultivation of fibre flax. *Outlook on Agriculture*, 12(3), 104–110. <https://doi.org/10.1177/003072708301200301>
- Suryanto, P., Putra, E. T. S., Kurniawan, S., Suwignyo, B., & Sukirno, D. A. P. (2014). Maize Response at Three Levels of Shade and its Improvement with Intensive Agro Forestry Regimes in Gunung Kidul, Java, Indonesia. *Procedia Environmental Sciences*, 20, 370–376. <https://doi.org/10.1016/j.proenv.2014.03.047>
- Suwardi, & Srilestari, R. (2018). *Budi Daya Pisang Abaka*. LPPM UPN Veteran Yogyakarta.
- Szymańska, R., Ślesak, I., Orzechowska, A., & Kruk, J. (2017). Physiological and biochemical responses to high light and temperature stress in plants. *Environmental and Experimental Botany*, 139, 165–177. <https://doi.org/https://doi.org/10.1016/j.envexpbot.2017.05.002>
- Tabart, J., Kevers, C., Pincemail, J., Defraigne, J. O., & Dommes, J. (2010). Evaluation of spectrophotometric methods for antioxidant compound measurement in relation to total antioxidant capacity in beverages. *Food Chemistry*, 120(2), 607–614. <https://doi.org/10.1016/j.foodchem.2009.10.031>
- Tellu, A. T. (2008). Chemical properties of different rattan species traded in Central Sulawesi Province. *Biodiversitas Journal of Biological Diversity*, 9(2), 108–111. <https://doi.org/10.13057/biodiv/d090207>

- Tessier, J. T., & Raynal, D. J. (2003). Use of nitrogen to phosphorus ratios in plant tissue as an indicator of nutrient limitation and nitrogen saturation. *Journal of Applied Ecology*, 40(3), 523–534. <https://doi.org/10.1046/j.1365-2664.2003.00820.x>
- Tewari, R. K., Yadav, N., Gupta, R., & Kumar, P. (2021). Oxidative Stress Under Macronutrient Deficiency in Plants. *Journal of Soil Science and Plant Nutrition*, 21(1), 832–859. <https://doi.org/10.1007/s42729-020-00405-9>
- Thaker, V. S., Saroop, S., Vaishnav, P. P., & Singh, Y. D. (1986). Role of peroxidase and esterase activities during cotton fiber development. *Journal of Plant Growth Regulation*, 5(1), 17–27. <https://doi.org/10.1007/BF02027383>
- Tian, Y., Sacharz, J., Ware, M. A., Zhang, H., & Ruban, A. V. (2017). Effects of periodic photoinhibitory light exposure on physiology and productivity of Arabidopsis plants grown under low light. *Journal of Experimental Botany*, 68(15), 4249–4262. <https://doi.org/10.1093/jxb/erx213>
- Tomczak, F., Sydenstricker, T. H. D., & Satyanarayana, K. G. (2007). Studies on lignocellulosic fibers of Brazil. Part II: Morphology and properties of Brazilian coconut fibers. *Composites Part A: Applied Science and Manufacturing*, 38(7), 1710–1721. <https://doi.org/10.1016/j.compositesa.2007.02.004>
- Tomkins, M., Hughes, A., & Morris, R. J. (2021). An update on passive transport in and out of plant cells. *Plant Physiology*, 187(4), 1973–1984. <https://doi.org/10.1093/plphys/kiab406>
- Toumi, M., Nedjimi, B., Halitim, A., & Garcia, M. (2016). Effects of K-Mg ratio on growth and cation nutrition of *Vitis vinifera* L. cv. “Dattier de Beiruth” grafted on SO4 rootstock. *Journal of Plant Nutrition*, 39(7), 904–911. <https://doi.org/10.1080/01904167.2015.1087564>
- Treml, J., & Šmejkal, K. (2016). Flavonoids as Potent Scavengers of Hydroxyl Radicals. *Comprehensive Reviews in Food Science and Food Safety*, 15(4), 720–738. <https://doi.org/https://doi.org/10.1111/1541-4337.12204>
- Tripathi, D. K., Singh, S., Singh, S., Mishra, S., Chauhan, D. K., & Dubey, N. K. (2015). Micronutrients and their diverse role in agricultural crops: advances and future prospective. *Acta Physiologiae Plantarum*, 37(7), 1–14. <https://doi.org/10.1007/s11738-015-1870-3>

- Tsikas, D. (2017). Assessment of lipid peroxidation by measuring malondialdehyde (MDA) and relatives in biological samples: Analytical and biological challenges. *Analytical Biochemistry*, 524, 13–30. <https://doi.org/https://doi.org/10.1016/j.ab.2016.10.021>
- Turner, D. W., Fortescue, J. A., & Thomas, D. S. (2007). Environmental physiology of the bananas (*Musa* spp.). *Brazilian Journal of Plant Physiology*, 19(4), 463–484. <https://doi.org/10.1590/S1677-04202007000400013>
- Tziaferidis, S. R., Spyroglou, G., Fotelli, M. N., & Radoglou, K. (2022). Allometric models for the estimation of foliage area and biomass from stem metrics in black locust. *IForest*, 15(4), 281–288. <https://doi.org/10.3832/ifor3939-015>
- United States Department of Agriculture. (1999). *Soil Quality Test Kit Guide*. USDA. https://efotg.sc.egov.usda.gov/references/public/WI/Soil_Quality_Test_Kit_Guide.pdf
- Valverde, J. C., Araya, M., Arias-Aguilar, D., Masís, C., & Muñoz, F. (2022). Evaluation of the Optimal Uses of Five Genotypes of *Musa textilis* Fiber Grown in the Tropical Region. *Polymers*, 14(9). <https://doi.org/10.3390/polym14091772>
- Vera, I., Wicke, B., Lamers, P., Cowie, A., Repo, A., Heukels, B., Zumpf, C., Styles, D., Parish, E., Cherubini, F., Berndes, G., Jager, H., Schiesari, L., Junginger, M., Brandão, M., Bentsen, N. S., Daioglou, V., Harris, Z., & van der Hilst, F. (2022). Land use for bioenergy: Synergies and trade-offs between sustainable development goals. *Renewable and Sustainable Energy Reviews*, 161, 1–13. <https://doi.org/https://doi.org/10.1016/j.rser.2022.112409>
- Waller, V., & Wilsby, A. (2019). *Abaca in the Philippines*.
- Wang, H., Cai, Y., Deng, W., Li, C., Dong, Y., Zhou, L., Sun, J., Li, C., Song, B., Zhang, F., & Zhou, G. (2023). The Effects of Tree Canopy Structure and Tree Coverage Ratios on Urban Air Temperature Based on ENVI-Met. *Forests*, 14(1). <https://doi.org/10.3390/f14010080>
- Wang, Q. H., Yu, L. J., Liu, Y., Lin, L., Lu, R. gang, Zhu, J. ping, He, L., & Lu, Z. L. (2017). Methods for the detection and determination of nitrite and nitrate: A review. *Talanta*, 165, 709–720. <https://doi.org/10.1016/j.talanta.2016.12.044>
- Wang, R., Lü, L., Cao, Y., Sardans, J., Liu, H., Li, B., Zhang, Y., Peñuelas, J., Dijkstra,

- F. A., & Jiang, Y. (2021). Stability of elemental content correlates with plant resistance to soil impoverishment. *Plant and Soil*, 467, 213–226. <https://doi.org/10.1007/s11104-021-05079-5>
- Wang, W.-H., He, E.-M., Chen, J., Guo, Y., Chen, J., Liu, X., & Zheng, H.-L. (2016). The reduced state of the plastoquinone pool is required for chloroplast-mediated stomatal closure in response to calcium stimulation. *The Plant Journal*, 86(2), 132–144. <https://doi.org/10.1111/tpj.13154>
- Wang, W., Zhang, C., Shang, M., Lv, H., Liang, B., Li, J., & Zhou, W. (2022). Hydrogen peroxide regulates the biosynthesis of phenolic compounds and antioxidant quality enhancement in lettuce under low nitrogen condition. *Food Chemistry: X*, 16, 1–9. <https://doi.org/10.1016/j.fochx.2022.100481>
- Wang, Y. bo, Huang, R. dong, & Zhou, Y. fei. (2021). Effects of shading stress during the reproductive stages on photosynthetic physiology and yield characteristics of peanut (*Arachis hypogaea* Linn.). *Journal of Integrative Agriculture*, 20(5), 1250–1265. [https://doi.org/10.1016/S2095-3119\(20\)63442-6](https://doi.org/10.1016/S2095-3119(20)63442-6)
- Wang, Y., Yang, J., Miao, R., Kang, Y., & Qi, Z. (2021). A novel zinc transporter essential for Arabidopsis zinc and iron-dependent growth. *Journal of Plant Physiology*, 256, 1–9. <https://doi.org/10.1016/j.jplph.2020.153296>
- Wang, Y., Zhao, Z., Wang, S., Shi, L., Ding, G., & Xu, F. (2022). Boron mediates nitrogen starvation-induced leaf senescence by regulating ROS production and C/N balance in *Brassica napus*. *Environmental and Experimental Botany*, 200, 1–12. <https://doi.org/10.1016/j.envexpbot.2022.104905>
- Wařkiewicz, A., Beszterda, M., & Goliński, P. (2014). Nonenzymatic Antioxidants in Plants. In P. Ahmad (Ed.), *Oxidative Damage to Plants: Antioxidant Networks and Signaling* (pp. 201–234). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-799963-0.00007-1>
- Wezel, A., Casagrande, M., Celette, F., Vian, J. F., Ferrer, A., & Peigné, J. (2014). Agroecological practices for sustainable agriculture. A review. *Agronomy for Sustainable Development*, 34(1), 1–20. <https://doi.org/10.1007/s13593-013-0180-7>
- White, P. J., & Broadley, M. R. (2001). Chloride in soils and its uptake and movement within the plant: A review. *Annals of Botany*, 88(6), 967–988.

<https://doi.org/10.1006/anbo.2001.1540>

- Wu, X., He, X., Wu, C., Dong, Y., Zhang, Y., Xu, Y., Qin, W., Lu, J., Wang, S., & Zong, X. (2019). Effect of shading on photosynthetic and antioxidant characteristics of *Pueraria lobata*. *Acta Prataculturae Sinica*, 28(5), 68–78.
- Xie, K., Cakmak, I., Wang, S., Zhang, F., & Guo, S. (2021). Synergistic and antagonistic interactions between potassium and magnesium in higher plants. *Crop Journal*, 9(2), 249–256. <https://doi.org/10.1016/j.cj.2020.10.005>
- Xing, Y., Du, X., Xu, X., Wang, F., Jiang, Y., Tian, G., Zhu, Z., Ge, S., & Jiang, Y. (2022). A balance between calcium and nitrate promotes the growth of M9T337 apple rootstocks. *Scientia Horticulturae*, 300, 1–13. <https://doi.org/10.1016/j.scienta.2022.111063>
- Xu, J., Guo, Z., Jiang, X., Ahammed, G. J., & Zhou, Y. (2021). Light regulation of horticultural crop nutrient uptake and utilization. *Horticultural Plant Journal*, 7(5), 367–379. <https://doi.org/10.1016/j.hpj.2021.01.005>
- Xu, X.-R., Li, H.-B., Li, X.-Y., & Gu, J.-D. (2004). Reduction of hexavalent chromium by ascorbic acid in aqueous solutions. *Chemosphere*, 57(7), 609–613. <https://doi.org/https://doi.org/10.1016/j.chemosphere.2004.07.031>
- Xu, Z., Zhou, G., Han, G., & Li, Y. (2011). Photosynthetic Potential and its Association with Lipid Peroxidation in Response to High Temperature at Different Leaf Ages in Maize. *Journal of Plant Growth Regulation*, 30(1), 41–50. <https://doi.org/10.1007/s00344-010-9167-7>
- Xue, T., Zhang, H., Zhang, Y., Wei, S., Chao, Q., Zhu, Y., Teng, J., Zhang, A., Sheng, W., Duan, Y., & Xue, J. (2019). Full-length transcriptome analysis of shade-induced promotion of tuber production in *Pinellia ternata*. *BMC Plant Biology*, 19(1), 1–13. <https://doi.org/10.1186/s12870-019-2197-9>
- Yabuta, Y., Mieda, T., Rapolu, M., Nakamura, A., Motoki, T., Maruta, T., Yoshimura, K., Ishikawa, T., & Shigeoka, S. (2007). Light regulation of ascorbate biosynthesis is dependent on the photosynthetic electron transport chain but independent of sugars in *Arabidopsis*. *Journal of Experimental Botany*, 58(10), 2661–2671. <https://doi.org/10.1093/jxb/erm124>
- Yadav, G. S., Kandpal, B. K., Das, A., Babu, S., Mohapatra, K. P., Devi, A. G., Devi,

- H. L., Chandra, P., Singh, R., & Barman, K. K. (2021). Impact of 28 year old agroforestry systems on soil carbon dynamics in Eastern Himalayas. *Journal of Environmental Management*, 283, 1–11. <https://doi.org/https://doi.org/10.1016/j.jenvman.2021.111978>
- Yang, J., Cao, Y., & Zhang, N. (2020). Spectrophotometric method for superoxide anion radical detection in a visible light (400–780 nm) system. *Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy*, 239(2), 118556. <https://doi.org/10.1016/j.saa.2020.118556>
- Yokokura, M. (1992). Early agriculture in Southeast Asia. *Southeast Asian Studies (Kyoto)*, 30(3), 272–314.
- Young, K. J. (2017). Mimicking Nature: A Review of Successional Agroforestry Systems as an Analogue to Natural Regeneration of Secondary Forest Stands. In F. Montagnini (Ed.), *Integrating Landscapes: Agroforestry for Biodiversity Conservation and Food Sovereignty. Advances in Agroforestry*, vol 12 (pp. 179–209). Springer International Publishing. https://doi.org/10.1007/978-3-319-69371-2_8
- Yruela, I. (2009). Copper in plants: Acquisition, transport and interactions. *Functional Plant Biology*, 36(5), 409–430. <https://doi.org/10.1071/FP08288>
- Yu, Y., Wang, J., Li, S., Kakan, X., Zhou, Y., Miao, Y., Wang, F., Qin, H., & Huang, R. (2019). Ascorbic acid integrates the antagonistic modulation of ethylene and abscisic acid in the accumulation of reactive oxygen species. *Plant Physiology*, 179(4), 1861–1875. <https://doi.org/10.1104/pp.18.01250>
- Zhang, J., Zhao, N., Liu, C., Yang, H., Li, M., Yu, G., Wilcox, K., Yu, Q., & He, N. (2018). C:N:P stoichiometry in China's forests: From organs to ecosystems. *Functional Ecology*, 32(1), 50–60. <https://doi.org/10.1111/1365-2435.12979>
- Zhang, N., Han, L., Xu, L., & Zhang, X. (2018). Ethephon seed treatment impacts on drought tolerance of kentucky bluegrass seedlings. *HortTechnology*, 28(3), 319–326. <https://doi.org/10.21273/HORTTECH03976-18>
- Zhang, T. Y., Li, F. C., Fan, C. M., Li, X., Zhang, F. F., & He, J. M. (2017). Role and interrelationship of MEK1-MPK6 cascade, hydrogen peroxide and nitric oxide in darkness-induced stomatal closure. *Plant Science*, 262, 190–199. <https://doi.org/10.1016/j.plantsci.2017.06.010>

- Zhang, X., & Kondragunta, S. (2006). Estimating forest biomass in the USA using generalized allometric models and MODIS land products. *Geophysical Research Letters*, 33(9), 1–5. <https://doi.org/10.1029/2006GL025879>
- Zhang, Y., & Dai, M. (2022). Analysis of the Cooling and Humidification Effect of Multi-Layered Vegetation Communities in Urban Parks and Its Impact. *Atmosphere*, 13(12), 1–13. <https://doi.org/10.3390/atmos13122045>
- Zhang, Y., Liu, A., Zhang, X., & Huang, S. (2018). Effects of shading on some morphological and physiological characteristics of begonia semperflorens. *Pakistan Journal of Botany*, 50(6), 2173–2179.
- Zhang, Z., Lv, Y., & Pan, H. (2013). Cooling and humidifying effect of plant communities in subtropical urban parks. *Urban Forestry and Urban Greening*, 12(3), 323–329. <https://doi.org/10.1016/j.ufug.2013.03.010>
- Zheng, L., Huang, F., Narsai, R., Wu, J., Giraud, E., He, F., Cheng, L., Wang, F., Wu, P., Whelan, J., & Shou, H. (2009). Physiological and transcriptome analysis of iron and phosphorus interaction in rice seedlings. *Plant Physiology*, 151(1), 262–274. <https://doi.org/10.1104/pp.109.141051>
- Zhou, B., Wang, J., Guo, Z., Tan, H., & Zhu, X. (2006). A simple colorimetric method for determination of hydrogen peroxide in plant tissues. *Plant Growth Regulation*, 49, 113–118. <https://doi.org/10.1007/s10725-006-9000-2>
- Zhou, J., Li, P. P., Wang, J. Z., & Fu, W. (2019). Growth, photosynthesis, and nutrient uptake at different light intensities and temperatures in lettuce. *HortScience*, 54(11), 1925–1933. <https://doi.org/10.21273/HORTSCI14161-19>
- Zhou, X., Tan, Z., Zhou, Y., Guo, S., Sang, T., Wang, Y., & Shu, S. (2022). Physiological mechanism of strigolactone enhancing tolerance to low light stress in cucumber seedlings. *BMC Plant Biology*, 22(1), 1–17. <https://doi.org/10.1186/s12870-021-03414-7>
- Zhu, L., Li, Z., & Ketola, T. (2011). Biomass accumulations and nutrient uptake of plants cultivated on artificial floating beds in chinas rural area. *Ecological Engineering*, 37(10), 1460–1466. <https://doi.org/10.1016/j.ecoleng.2011.03.010>