

DAFTAR PUSTAKA

- Ahmad, P. (2016). *Water Stress and Crop Plants: A Sustainable Approach*.
- Alghabri, F., & Zahid Ihsan, M. (2018). *Effects Of Drought Stress On Growth, Grain Filling Duration, Yield And Quality Attributes Of Barley (Hordeum Vulgare L.)*. 47(3).
- Ali, Mohammad Mudhor., Parawita Dewanti., Tri Handoyo., dan Tri Ratnasari. (2022). Pengaruh Cekaman Kekeringan Terhadap Pertumbuhan dan Produksi Tanaman Padi Hitam Varietas Jeliteng. *Jurnal Agrikultura*, 33 (3): 247-256.
- Anggraini, Novita., Eny Faridah, & Spto Indrioko. (2015). Pengaruh Cekaman Kekeringan Terhadap Perilaku Fisiologis Dan Pertumbuhan Bibit Black Locust (Robinia pseudoacacia). *Jurnal Ilmu Kehutanan*, 9(1):40-56.
- Badih., Sugiyanto Saleh., Fetty Dwi Rahmayanti. (2021). Pengaruh Komposisi Pupuk Organik Terhadap Pertumbuhan Dan Hasil Tanaman Sawi Pagoda (Brassica narinosa L.). *Jurnal Agrisia*, 13(2) :20-40.
- Bharath, Pulimamidi., Shashibhushan Gahir., and Agepati S. Raghavendra. (2014). Abscisic Acid-Induced Stomatal Closure: An Important Component of Plant Defense Against Abiotic and Biotic Stress. *Frontiers in Plant Science*, 12 : (1-18).
- Basu, S., Ramegowda, V., Kumar, A., & Pereira, A. (2016). Plant adaptation to drought stress. *F1000Research* (5).
- Basyah, B., Zakaria, S., & Efendi, E. (2020). Differences of Water Status and Relationship with Roots Growth and Yield of Rice under Water Stress. *Systematic Reviews in Pharmacy*, 11(8), 611–618.
- Bista, D. R., Heckathorn, S. A., Jayawardena, D. M., Mishra, S., & Boldt, J. K. (2018). Effects of drought on nutrient uptake and the levels of nutrient-uptake proteins in roots of drought-sensitive and -tolerant grasses. *Plants*, 7(2).
- Blessing, C. H., Werner, R. A., Siegwolf, R., & Buchmann, N. (2015). Allocation dynamics of recently fixed carbon in beech saplings in response to increased temperatures and drought. *Tree Physiology*, 35(6).
- Cahyo, A. N., Murti, R. H., & Putra, E. T. S. (2020). Dampak Kekeringan Terhadap Proses Fisiologis, Pertumbuhan, Dan Hasil Tanaman Karet (Hevea brasiliensis Mill. Arg.). *Warta Per karetan*, 39(1): 57–72.
- Casey Barickman, T., Kopsell, D. A., & Sams, C. E. (2014). Abscisic Acid Increases Carotenoid and Chlorophyll Concentrations in Leaves and Fruit of Two Tomato Genotypes. *J. AMER. SOC. HORT. SCI*, 139(3).

- Chater, C. C. C., Caine, R. S., Fleming, A. J., & Gray, J. E. (2017). Origins and evolution of stomatal development. *Plant Physiology*, 174(2).
- Chater, C. C. C., Oliver, J., Casson, S., & Gray, J. E. (2014). Putting The Brakes On: Abscisic Acid As A Central Environmental Regulator Of Stomatal Development. *New Phytologist*, 202(2): 376–391.
- Chen, T., Li, G., Islam, M. R., Fu, W., Feng, B., Tao, L., & Fu, G. (2019). Abscisic acid synergizes with sucrose to enhance grain yield and quality of rice by improving the source-sink relationship. *BMC Plant Biology*, 19(1).
- Dacosta Y. O., & Daningsih E. (2022). Ketebalan Daun dan Laju Transpirasi Pada Tanaman Hias Dikotil. *Jurnal Ilmu Pertanian Indonesia*, 27(1): 40-47.
- Dewi, S.M., Y. Yuwariah., W.A. Qosim., D. Ruswandi. (2019). Pengaruh Cekaman Kekeringan Terhadap Hasil Dan Sensitivitas Tiga Genotip Jawawut. *Jurnal Kultivasi*, 18 (3): 933-941.
- Eko, Djoko Hadi Susilo. (2015). Identifikasi Nilai Konstanta Bentuk Daun Untuk Pengukuran Luas Daun Metode Panjang Kali Lebar Pada Tanaman Hortikultura Di Tanah Gambut. *Anterior Jurnal*, 14 (2):139-146.
- Emenecker, R. J., & Strader, L. C. (2020). Auxin-abscisic acid interactions in plant growth and development. *Biomolecules*, 10(2).
- Finkelstein, Ruth. (2013). Abscisic Acid Synthesis and Response. *The Arabidopsis book*, (11): 1-36.
- Gai Z., Wang Y., Ding Y., Qian W., Qiu C., Xie H., Sun L., Jiang Z., Ma Q., Wang L., and Ding Z. Exogenous Abscisic Acid Induces The Lipid And Flavonoid Metabolism Of Tea Plants Under Drought Stress. *Sci Rep.*10(1):12275.
- Grondin, A., Mauleon, R., Vadez, V., & Henry, A. (2016). Root Aquaporins Contribute To Whole Plant Water Fluxes Under Drought Stress In Rice (*Oryza sativa* L.). *Plant Cell and Environment*, 39(2): 347–365.
- Grondin, A., Rodrigues, O., Verdoucq, L., Merlot, S., Leonhardt, N., & Maurel, C. (2015). Aquaporins contribute to ABA-triggered stomatal closure through OST1-mediated phosphorylation. *Plant Cell*, 27(7): 1945–1954.
- Guo, W., Nazim, H., Liang, Z., & Yang, D. (2016). Magnesium deficiency in plants: An urgent problem. *Crop Journal*, 4(2): 83–91.
- Hageman, A., & Van Volkenburgh, E. (2021). Sink Strength Maintenance Underlies Drought Tolerance In Common Bean. *Plants* 10(3): 1–12.
- Hailemichael, G., Catalina, A., González, M. R., & Martin, P. (2016). Relationships between Water Status, Leaf Chlorophyll Content and Photosynthetic Performance in Tempranillo Vineyards. *S. Afr. J. Enol. Vitic*, 37(2).

- Hauer-Jákli, M., & Tränkner, M. (2019). Critical Leaf Magnesium Thresholds And The Impact Of Magnesium On Plant Growth And Photo-Oxidative Defense: A Systematic Review And Meta-Analysis From 70 Years Of Research. In *Frontiers in Plant Science* (10).
- Herger, A., Dünser, K., Kleine-Vehn, J., & Ringli, C. (2019). Leucine-Rich Repeat Extensin Proteins and Their Role in Cell Wall Sensing. *Current Biology*, 29(17):851–858.
- Hocking, B., Tyerman, S. D., Burton, R. A., & Gilliam, M. (2016). Fruit calcium: Transport and physiology. *Frontiers in Plant Science*, (7).
- Hossain, M. M., Lam, H. M., & Zhang, J. (2015). Responses In Gas Exchange And Water Status Between Drought-Tolerant And -Susceptible Soybean Genotypes with ABA application. *Crop Journal*, 3(6): 500–506.
- Hsu, P. K., Dubeaux, G., Takahashi, Y., & Schroeder, J. I. (2021). Signaling Mechanisms In Abscisic Acid-Mediated Stomatal Closure. *Plant Journal*, 105(2): 307–321.
- Hughes, J., Hepworth, C., Dutton, C., Dunn, J. A., Hunt, L., Stephens, J., Waugh, R., Cameron, D. D., & Gray, J. E. (2017). Reducing stomatal density in barley improves drought tolerance without impacting on yield. *Plant Physiology*, 174(2): 776–787.
- Hussain, S., Saleem, M. F., Iqbal, J., Ibrahim, M., Atta, S., Ahmed, T., & Rehmani, M. I. A. (2014). Exogenous application of abscisic acid may improve the growth and yield of sunflower hybrids under drought. *Pakistan Journal of Agricultural Sciences*, 51(1).
- Ilma, N. L. (2022). *Pengaruh Cekaman Kekeringan dan Aplikasi Hormon Asam Absisat (ABA) Terhadap Morfologi, Anatomi, dan Pertumbuhan Tanaman Sawi Hijau (Brassica juncea L.)*. Universitas Diponegoro.
- ITIS (Integrated Taxonomic Information System). (2023). Diakses pada tanggal 10 April 2023. <https://www.gbif.org/>.
- Jalakas, P., Merilo, E., Kollist, H., & Brosché, M. (2018). *ABA-mediated regulation of stomatal density is OST1-independent*.
- Jiang, Z., Zhu, H., Zhu, H., Tao, Y., Liu, C., Liu, J., Yang, F., Li, M. Exogenous ABA Enhances the Antioxidant Defense System of Maize by Regulating the AsA-GSH Cycle under Drought Stress. *Sustainability*, 14 (3071):1-15.
- Kholidin, Moh., Abdul Rauf., Henry N Barus. (2016). Respon Pertumbuhan Dan Hasil Tanaman Sawi (*Brassica juncea L.*) Terhadap Kombinasi Pupuk Organik, Anorganik Dan Mulsa Di Lembah Palu. *e-J. Agrotekbis*, 4 (1) :1- 7.

- Kim, Y., Chung, Y. S., Lee, E., Tripathi, P., Heo, S., & Kim, K.-H. (2020). Root Response to Drought Stress in Rice (*Oryza sativa* L.). *International Journal of Molecular Sciences*, 21(4):1-22.
- Kinanti, Namira., Dwi Haryono., Adia Nugraha. (2018). Analisis Pendapatan Usahatani Sayuran Di Kecamatan Sumberejo Kabupaten Tanggamus. *JIIA*, 6 (4): 437-444.
- Koentjoro, Yonny., F. Deru Dewanti., Sukendah. (2020). Kandungan Asam Absisat dan Kalium Sebagai Indikator Cekaman Kekeringan pada Kedelai. Seminar Nasional Magister Agroteknologi Fakultas Pertanian UPN “Veteran” Jawa Timur. *NST Proceedings*: 139-147
- Kukk, M., Räm, O., Tulva, I., Söber, J., Lõhmus, K., & Söber, A. (2015). Elevated Air Humidity Modulates Bud Size And The Frequency Of Bud Break In Fast-Growing Deciduous Trees: Silver Birch (*Betula pendula* Roth.) and hybrid aspen (*Populus tremula* L. × *P. tremuloides* Michx.). *Trees - Structure and Function*, 29(5): 1381–1393.
- Le Hir, R., Castelain, M., Chakraborti, D., Moritz, T., Dinant, S., & Bellini, C. (2017). AtbHLH68 Transcription Factor Contributes To The Regulation Of ABA Homeostasis And Drought Stress Tolerance in *Arabidopsis thaliana*. *Physiologia Plantarum*, 160(3): 312–327.
- Li, S., Liu, S., Zhang, Q., Cui, M., Zhao, M., Li, N., Wang, S., Wu, R., Zhang, L., Cao, Y., & Wang, L. (2022). The interaction of ABA and ROS in plant growth and stress resistances. *Frontiers in Plant Science* (13).
- Liu, H., Shen, J., Yuan, C., Lu, D., Acharya, B. R., Wang, M., Chen, D., & Zhang, W. (2021). The Cyclophilin ROC3 Regulates ABA-Induced Stomatal Closure and the Drought Stress Response of *Arabidopsis thaliana*. *Frontiers in Plant Science*, 12.
- Li S and Liu F (2021) Exogenous Abscisic Acid Priming Modulates Water Relation Responses of Two Tomato Genotypes With Contrasting Endogenous Abscisic Acid Levels to Progressive Soil Drying Under Elevated CO₂. *Front. Plant Sci.* (12) : 1-16.
- López-Arredondo, D. L., Leyva-González, M. A., González-Morales, S. I., López-Bucio, J., & Herrera-Estrella, L. (2014). Phosphate nutrition: Improving low-phosphate tolerance in crops. *Annual Review of Plant Biology*, 65: 95–123.
- Luo, X., Xu, J., Zheng, C., Yang, Y., Wang, L., Zhang, R., Ren, X., Wei, S., Aziz, U., Du, J., Liu, W., Tan, W., & Shu, K. (2023). Abscisic acid Inhibits Primary Root Growth By Impairing ABI4-Mediated Cell Cycle And Auxin Biosynthesis. *Plant Physiology*, 191(1): 265–279.

- Mahlare, M. S., Lewu, M. N., Lewu, F. B., & Bester, C. (2023). Cyclopia subternata Growth, Yield, Proline And Relative Water Content In Response To Water Deficit stress. *Water SA*, 49(1): 64–72.
- Malhotra, H., Vandana, Sharma, S., & Pandey, R. (2018). Phosphorus Nutrition: Plant Growth In Response To Deficiency And Excess. *Plant Nutrients and Abiotic Stress Tolerance* : 171–190.
- Martin-StPaul, N., Delzon, S., & Cochard, H. (2017). Plant resistance to drought depends on timely stomatal closure. *Ecology Letters*, 20(11): 1437–1447.
- Mehtab, Muhammad Aslam., Muhammad Waseem., Bello Hassan Jakada., Eyalira Jacob Okal., Zuliang Lei., Hafiz Sohaib Ahmad Saqib., Wei Yuan., Weifeng Xu., and Qian Zhang. (2022) Mechanisms of Abscisic Acid-Mediated Drought Stress Responses in Plants. *Int. J. Mol.* 23(1084): 1-21.
- Moshelion, M., Halperin, O., Wallach, R., Oren, R., & Way, D. A. (2015). Role of aquaporins in determining transpiration and photosynthesis in water-stressed plants: Crop water-use efficiency, growth and yield. *Plant Cell and Environment*, 38(9): 1785–1793.
- Murayama, D., Tani, M., Ikeda, S., Palta, J. P., Pelpolage, S. W., Yamauchi, H., & Koaze, H. (2017). Effects of Calcium Concentration in Potato Tuber Cells on the Formation of Cross-Links between Pectin Molecules by Ca²⁺. *American Journal of Potato Research*, 94(5): 524–533.
- Nada, Aisyah Widyasari., Rosi Widarawati., Slamet Rohadi Suparto., Risqa Naila Khusna Syarifah. (2022). Kajian Fisiologi Tanaman Sawi Pagoda (*Brassica rapa L. ssp. Narinosa*) dengan Berbagai Media Tanam dan Konsentrasi Pupuk Organik Cair Sampah Sayur. *Vegetalika*, 11 (4) : 329-341.
- Nurjanaty, Netty., Riza Linda., Mukarlina. 2019. Pengaruh Cekaman Air Dan Pemberian Pupuk Daun Terhadap Pertumbuhan Tanaman Sawi (*Brassica juncea L.*). *Protobiont*, 8 (3) : 6 – 11.
- Orimoloye, I.R., Belle, J.A., Orimoloye, Y.M., Olusola, A.O., Ololade, O.O. (2022) Drought: A Common Environmental Disaster. *Atmosphere*, 13: 111.
- Patane, Christina., Salvatore L. Cosentino., Daniela Romano., and Stefania Toscano. (2022). Relative Water Content, Proline, and Antioxidant Enzymes in Leaves of Long Shelf-Life Tomatoes under Drought Stress and Rewatering. *Plants*, 11 : 3045.
- Pitaloka, Dyah. (2017). Hortikultura: Potensi, Pengembangan Dan Tantangan. *FTIKA Unira Malang*, 1(1): 1-4.
- Purnomo, Setyawan., Gusfan Halik., Yeny Dhokhikah., Radiah Ulil Absari., Anindya Salsa. 2021. Penilaian Bencana Kekeringan dan Strategi Penyediaan Air Bersih di Wilayah Utara Kabupaten Lumajang. *Jurnal Teknik Pengairan*, 12(2) : 92-103.

- Puryati, Dwi., Susinah Kuntadi., Teguh Iman Basuki. (2018). Manajemen Usaha Budidaya Tanaman Hortikultura Dalam Polybag (Tanaman Hortikultura Modern). *Jurnal Dharma Bhakti Ekuitas*, 3(1) : 277-281.
- Qi, J., Song, C. P., Wang, B., Zhou, J., Kangasjärvi, J., Zhu, J. K., & Gong, Z. (2018). Reactive oxygen species signaling and stomatal movement in plant responses to drought stress and pathogen attack. *Journal of Integrative Plant Biology*, 60(9): 805–826.
- Rahayu R. S., Poerwanto R., Efendi D., & Widodo W. D. (2020). Cekaman Kekeringan Berat Mempengaruhi Keberhasilan Induksi Bunga Jeruk Keprok Madura. *Jurnal Hortikultura Indonesia*, 11(1): 13-23.
- Ranti, M. A. D., N. N. Suryani dan I K. M. Budiasa. (2017). Pengaruh Pemberian Kadar Air Berbeda Terhadap Pertumbuhan Dan Produksi Hijauan Tanaman Indigofera zollingeriana. *Tropika*, 5(1):55-60.
- Reni, Lanna Gustianty., Teddy Geaka Husni Saragih. (2020). Tanggap Tanaman Sawi Pagoda (*Brassica narinosa* L.) Terhadap Media Tanam Dan Pupuk NPK Pada Pipa Paralon. *Prosiding Seminar Nasional Multidisiplin Ilmu Universitas Asahan ke-4*: 1037-1050.
- Rusmini., Daryono., Nur Hidayat., Heriad Daud Salusu., Husmul Beze., Yulianto. (2021). Pertumbuhan dan Produksi Sawi Pagoda Hidroponik dengan Konsentrasi Ab Mix dan Monitoring Berbasis Android. *Jurnal Penelitian Pertanian Terapan*, 21 (3): 270-277.
- Rodriguez, R. E., Debernardi, J. M., & Palatnik, J. F. (2014). Morphogenesis of simple leaves: Regulation of leaf size and shape. *Wiley Interdisciplinary Reviews: Developmental Biology*, 3(1): 41–57.
- Shinohara, T., & Leskovar, D. I. (2014). Effects Of ABA, Antitranspirants, Heat And Drought Stress On Plant Growth, Physiology And Water Status Of Artichoke Transplants. *Scientia Horticulturae*, 165, 225–234.
- Setyo, Dwi Rini., Budiarjo., Indra Gunawan., Radi Hidayat Agung., dan Rina Munazar. (2020). Mekanisme Respon Tanaman Terhadap Cekaman Kekeringan. *Berita Biologi*, 19(3B): 373-384.
- Sellamuthu, R., Dhanarajan, A., & Marimuthu, R. (2022). Influence Of Exogenous Abscisic Acid On Morpho-Physiological And Yield Of Maize (*Zea mays* L.) Under Drought Stress. *Plant Science Today*, 9(2): 288–300.
- Song, Nio Ai. (2012). Evolusi Fotosintesis Pada Tumbuhan. *Jurnal Ilmiah Sains*, 12(1):28-34.
- Song, Nio Ai., dan Patricia Torey. (2013). Karakter morfologi akar sebagai indikator kekurangan air pada tanaman. *Jurnal Bioslogos*, 3(1):31-39.

- Silaen, Srinatalia. (2021). Pengaruh Transpirasi Tumbuhan Dan Komponen Didalamnya. *Agroprimatch*, 5(1): 14-20.
- Sulistiana, Susi., dan Ludivica Endang Setijorini. (2016). Akumulasi Timbal (Pb) Dan Struktur Stomata Daun Puring (*Codiaeum variegatum* Lam. Blume). *Jurnal Agrosains dan Teknologi*, 1(2):9-22.
- Supriyanto, Bambang. (2013). Pengaruh Cekaman Kekeringan Terhadap Pertumbuhan Dan Hasil Padi Gogo Lokal Kultivar Jambu (*Oryza sativa* Linn). *Jurnal AGRIFOR*, 12 (1): 77-82.
- Tiyas, Hardiyanti Ning., Sundahri., Setiyono., Gatot Subroto. (2018). Effect of Hormone Concentration and frequency of administration of Gibberellins on Growth and Yield of Tomato Fruit. *Journal Of Agricultural Science And Agriculture Enigineering*, 1(2): 104-115.
- Traas, J. (2019). Organogenesis At The Shoot Apical Meristem. In *Plants*, 8 : (1).
- Vadez, V., Kholova, J., Medina, S., Kakker, A., & Anderberg, H. (2014). Transpiration Efficiency: New Insights Into An Old Story. *Journal of Experimental Botany*, 65(21): 6141–6153).
- Verma, G., Srivastava, D., Tiwari, P., & Chakrabarty, D. (2019). *ROS Modulation in Crop Plants Under Drought Stress. Reactive Oxygen, Nitrogen and Sulfur Species in Plants* : 311–336.
- Wang, M., Lee, J., Choi, B., Park, Y., Sim, H. J., Kim, H., & Hwang, I. (2018). Physiological And Molecular Processes Associated With Long Duration of ABA Treatment. *Frontiers in Plant Science*, 9.
- Wang, P., & Grimm, B. (2015). Organization of Chlorophyll Biosynthesis and Insertion Of Chlorophyll Into The Chlorophyll-Binding Proteins In Chloroplasts. *Photosynthesis Research*, 126(2): 189–202.
- Wang, X., Guo, C., Peng, J., Li, C., Wan, F., Zhang, S., Zhou, Y., Yan, Y., Qi, L., Sun, K., Yang, S., Gong, Z., & Li, J. (2019). ABRE-BINDING FACTORS Play A Role In The Feedback Regulation of ABA Signaling By Mediating Rapid ABA Induction of ABA co-receptor genes. *New Phytologist*, 221(1): 341–355.
- Wang, Z., Su, G., Li, M., Ke, Q., Kim, S. Y., Li, H., Huang, J., Xu, B., Deng, X. P., & Kwak, S. S. (2016). Overexpressing Arabidopsis ABF3 Increases Tolerance To Multiple Abiotic Stresses And Reduces Leaf Size In Alfalfa. *Plant Physiology and Biochemistry*, 109: 199–208.
- Widyati, Enny. (2016). Peranan Fitohormon Pada Pertumbuhan Tanaman Dan Implikasinya Terhadap Pengelolaan Hutan. *Galam*, 2(1):11-22.

- Yang, X.; Jia, Z.; Pu, Q.; Tian, Y.; Zhu, F.; Liu, Y. ABA Mediates Plant Development and Abiotic Stress via Alternative Splicing. *Int. J. Mol. Sci.* 23 (3796) :1-14.
- Yuandara, Tiffany Tanjung., Ir. Darmansyah, MP. (2021). Pengaruh Penggunaan ZPT ALAMI Dan Buatan Terhadap Pertumbuhan Setek Tanaman Delima (*Punica granatum L.*). *Jurnal Hortuscoler*, 2(1) : 6-13.
- Zhao, B., Liu, Q., Wang, B., & Yuan, F. (2021). Roles of Phytohormones and Their Signaling Pathways in Leaf Development and Stress Responses. *Journal of Agricultural and Food Chemistry*, 69(12): 3566–3584.

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