

## DAFTAR PUSTAKA

- Alexieva, V., Sergiev, I. Mapelli, S. & Karanov, E. 2001. The effect of drought and ultraviolet radiation on growth and stress markers in pea and wheat. *Plant, Cell and Environment*. 24(12) : 1337–1344 p.
- Ali, M., Jensen, C.R., Mogensen, V.O., Andersen, M.N. dan Henson, I.E. 2005. Root signalling and osmotic adjustment during intermittent soil drying sustain grain yield of field grown wheat. *Field Crops Research* 62:35- 52.
- Anjum, S.A., Xie, X., Wang, L., Saleem, M.F., Man, C., Lei, W. 2011. Morphological, Physiological and Biochemical Responses of Plants to Drought Stress. *Jurnal Review : African Journal of Agricultural Research*. 6(9): 2026-2032 p.
- Anwar, H. & Endang Iriani. 2011. Teknologi Perbanyak Bibit Bawang Merah. Online: <http://jateng.litbang.deptan.go.id> diakses tanggal 28 Februari 2020.
- Anyia, A.O. dan Herzog, H. 2004. Water-use efficiency, leaf area and leaf gas exchange of cowpeas under mid-season drought. *European Journal of Agronomy* 20:327-339.
- Ariska, N. & Diah, R., 2017. Pengaruh Ketersediaan Air Berbeda Terhadap Pertumbuhan Dan Hasil Tiga Kultivar Bawang Merah (*Allium cepa* L.). *Jurnal Agrotek Lestari*. 4(2).
- Ashraf, M. & M.R. Foolad. 2007. Roles of Glycine Betaine and Proline in Improving Plant Abiotic Stress Resistance. *Environ. Exp. Bot* 59: 206–216 p.
- Azmi, N. S. A. 2011. Effects Of Calcium And Copper On Lignin Biosynthesis And Suppression Of *Ganoderma boninense* Infection In Oil Palm. Tesis. Universitas Putra Malaysia, Malaysia.
- Babu V.R. & D.V.M. Rao. 1983. Water stress adaptation in the groundnut (*Arachis hypogaea* L) foliar characteristics and adaptation to moisture stress. *Plant Physiol. and Biochem*. 10:64–80.
- Badan Penelitian & Pengembangan Hortikultura. 2016. Pupuk dan Pemupukan pada Budidaya Bawang Merah. Kementerian Pertanian. Jakarta.
- Badan Pusat Statistik. 2020. 6-4-2020. Luas Panen, Produksi Bawang Merah. [www.bps.go.id/getfile.php](http://www.bps.go.id/getfile.php).
- Balai Penelitian Tanah. 2005. Petunjuk Teknis Analisis Kimia Tanah, Tanaman, Air dan Pupuk. Badan Penelitian dan Pengembangan Pertanian Departemen Pertanian.

Balai Penelitian Tanaman Sayuran. 2018. Bawang Merah Varietas Bima Brebes. Kementerian Pertanian. Jakarta.

Bates, L.S., R. P. Waldren & I. D. Teare. 1973. Rapid determination of free proline for water stress studies. *Plant and Soil*, 39: 205-207 p.

Biehler, K. & Fock, H. 1996. Evidence for the contribution of the Mehler 1] peroxidase reaction in dissipating excess electrons in drought-stressed wheat. *Plant physiology*. 112(1): 265–272.

Blum, A. 2005. Drought resistance, water-use efficiency and yield potential - Are they compatible, dissonant, or mutually exclusive? *Australian Journal of Agricultural Research* 56:1159-1168.

Bray, E. A. 2001. Plant Response to Water-Deficit Stress. *Encyclopedia of Life Sciences*. Nature Publishing Group: 1-5 p.

Cakmak, I. 2014. Major Functions Of Calcium and Magnesium in Crop Plants. In: V.D.M. Benites, A.D.O, Junior (Eds.). *Technology Innovation For a Sustainable Tropical*. World Fertilizer Congress of CIEC, Rio de Janeiro.

Campbell, NA., Reece, JB., Mitchell LG. 2003. *Biologi*. Wasmen M, Penerjemah: Safitri A, Simarmata L, Hardani HW, editor. Jakarta (ID): Erlangga. Terjemahan dari *Biology*. Ed ke-5.

Combs J. H., S. I. Long, & J. Scurlock. 1985. Technique in bioproductivity and photosynthesis. *Pratley Journal* 1: 223-225 p.

Cvikrova, M., Gemperlova, L., Martincova, O., Vancova, R. 2013. Effect of Drought and Combined Drought and Heat Stress on Polyamine Metabolism in Proline Over Producing Tobacco Plants. *Plant Physiology and Biochemistry*. 73: 7-15 p.

Direktorat Jendral Pengolahan & Pemasaran Hasil Pertanian. 2006. Pasca Panen dan Pengolahan dan Pemasaran Hasil Bawang Merah. Kementerian Pertanian.

Djukri. 2009. Regulasi ion kalsium ( $\text{Ca}^{2+}$ ) dalam tanaman untuk menghadapi cekaman lingkungan. *Prosiding Seminar Nasional Penelitian, Pendidikan dan Penerapan MIPA*. Yogyakarta.

Easterwood, G. W. 2002. Calcium's Role in Plant Nutrition. *Fluid Journal*.

Faroka, R. F., Seminar, B. K., & Muljono, P. 2011. Pengaruh Adopsi Teknologi PHSL (Pemupukan Hara Spesifik Lokasi) Berbasis Pertanian Presisi Terhadap Pendapatan Petani Padi Di Desa Jembungan, Kabupaten Boyolali, Jawa Tengah, 11(1), 147–173 p

- Farooq, M.; Wahid, A.; Kobayashi, N.; Fujita, D.; Basra, S. M. A. 2009. Review article Plant drought stress: effects , mechanisms and management. *Agronomy for Sustainable Development*, 29(1), 185–212.
- Firmino, H. D. S. Abreu, A. M. Nascimento, R. P. W. Pereira, M. B. O. Monteiro, E. L. Sousa & J. M. Maeda. 2003. Lignification of *Solanum gilo* Raddi induced by calcium nutrition. *Recebido para publicacao* 10(2) : 105 p, ago./dez. 2003.
- Foyer, C. H. & Noctor, G. 2005. Oxidant and antioxidant signaling in plants: a reevaluation of the concept of oxidative stress in a physiological context. *Plant, Cell and Environment*. 28 : 1056–1071.
- Foyer, C.H & G. Noctor. 2000. Oxygen Processing in Photosynthesis: Regulation and Signaling. *New Phytologist*. 146 (3) : 59 – 388 p.
- Gafur, M. A. & E.T.S. Putra. 2019. Kontribusi Kalsium Terhadap Aktivitas Fisiologis Dan Pertumbuhan Bibit Kelapa Sawit (*Elaeis guineensis* Jacq.) Terekspos Cekaman Kekeringan. Diunduh dari <http://etd.repository.ugm.ac.id/>
- Gardner, F. P., R. Brent Pearce & Goger L Mitchell. 1991. *The Physiology of Cultivated Plants (Fisiologi Tanaman Budidaya, Terjemahan H. Susilo)*. Universitas Indonesia Press, Jakarta : 421 p.
- Gardner, F. P., R.B. Pearce, & R.L. Mitchell. 1991. *Fisiologi tanaman budidaya*. Universitas Indonesia Press.
- Ghoname A., A.M. El-Bassiony, G.S. Riad, & M.M.H.Abd El-Baky. 2007. Reducing Onion Bulbs Flaking and Increasing Bulb Yield and Quality by Potassium and Calcium Application. *Australian Journal of Basic and Applied Sciences*, 1(4): 610-618 p.
- Giannopolitis CN & Ries SK. 1977. Superoxide Dismutases. *Plant Physiology* 59(2) : 309 p.
- Gilroy, S., M. D. Fricker, N. D. Read and A.J. Trewavas. 1991. Role of calcium in signal transduction of *Commelina* guard cells. *Plant Cell* 3 : 333-344 p.
- Haider, M.S., Zhang, C., Kurjogi, M.M., Pervaiz, T., Zheng, T., Zhang, CB., Lide, C., Shangguan, L., Fang, F. 2017. Insights Into Grapevine Defense Response Against Drought as Revealed by Biochemical, Physiological and RNA-Seq Analysis. *Sci Rep*. 7 : 17 p.
- Hamim, K., Ashri., Miftahudin. & Triadi. 2008. Analysys of Water Status, Proline and Antioxidant Enzymes of Drought Sensitive Tolerant and Wild Line Soybean. *Agrivita*. 30 (3) : 201-210 p.

- Hamim. 2003. Will the Increasing Atmosphere CO<sub>2</sub> Concentration Change the Effect of Drought on C<sub>3</sub> and C<sub>4</sub> Species. University of Essex. Colchester. UK
- Harnowo, D. 1993. Respon Tanaman Kedelai Terhadap Pemupukan Kalium dan Cekaman Kekeringan pada Fase Reproduksi. IPB. Bogor : 27 p.
- Harry, I., Pambudi, T., & Yahya, S. 2016. Pengaturan Jumlah Pelepah untuk Kapasitas Produksi Optimum Kelapa Sawit, Bul. Agrohorti : 4(1), 46–55 p.
- Harun, M. H. 1997. Proline accumulation in the leaves of water stressed oil palm (*Elaeis guineensis* Jacq.) seedlings. *Elaeis*. 9(2) : 93–9.
- Heath, R. L. & Packer, L. 1968. Photoperoxidation in isolated chloroplasts of fatty acid peroxidation chlorophyll. *Archives of biochemistry and biophysics*. 126 : 189–198 p.
- Hong-bo, S., Wei-yi, S., & Li-ye, C. 2008. Advances of Calcium Signals Involved in Plant Antidrought, *Bio Essays*, 331 : 587–596 p.
- Huang B. and Eissenstat D.M., 2000. Root plasticity in exploiting water and nutrient heterogeneity. *Plant-Environment Interactions* (Ed. R.E. Wilkinson). Dekker Press, New York, USA.
- Iannuci, A., M. Russo, L., Arena, N., Di Fonzo. & P. Martiniello, 2002. Water Deficit Effects on Osmotic Adjustment and Solute Accumulation in Leaves of Annual Clovers. *Euro J. Agron*. 16 : 111-122 p.
- Irawan, B. 2016. Dampak El-Nino dan La-Nina terhadap Produksi Padi dan Palawija. (in PDF from internet). 51 p.
- Irfansyah & Lutfi. 2019. Pertumbuhan dan Produksi Dua Varietas Bawang Merah pada Beberapa Frekuensi Penyiraman di Rumah Kaca. Repositori Institusi USU.
- Islami, T & W. H. Utomo, 1995. Hubungan tanah, air dan tanaman. IKIP Semarang Press. 297 p.
- Jie, G., Ge, W., Hai-tao, C. & Shi, S. Q. 2012. Effects of in situ deposited calcium carbonate nanoparticles on tensile performance of single bamboo fibers and their composites. *Proceedings of the 55th International Convention of Society of Wood Science and Technology*. Beijing, CHINA. 1–9.
- Kusuma, A.A., Khardinata, E.H., & Bangun, M.K. 2013. Adaptasi Beberapa Kultivar Bawang Merah (*Allium ascolanicum* L.) pada Dataran Rendah dengan Pemberian Pupuk Kandang & NPK. *Jurnal Online Agroteknologi* 1 (4) : 908-919 p.

- Laanemets, K., Brandt, B., Li, J., Merilo, E., Wang, Y., Keshwani, M. M., Taylor, S. S., Kollist, H. & Schroeder, J. I. 2013. Calcium-Dependent and Independent Stomatal Signaling Network and Compensatory Feedback Control of Stomatal Opening Via Ca<sup>2+</sup> Sensitivity Priming. *Plant Physiology*. 163(2) : 504–513 p.
- Levitt, J. 1980. Respon of Plants to Environmental Stress. 2nd Edition Vol. 2. Academic Press Inc. New York
- Li, X., Schmid, B., Wang, F., & Paine. 2016. Net assimilation rate determines the growth rates of 14 species of subtropical forest trees. *PLoS ONE*, 11(3), 1–13.
- Lifardi. 2012. [hortikultura.litbang.deptan.go.id/ .../Makalah](http://hortikultura.litbang.deptan.go.id/.../Makalah) Balitsa “ Revitalisasi sumberdaya penelitian dan pengembangan Balitsa untuk meningkatkan kualitas dan daya saing produk : 1-17 p.
- Lipiec, J., Doussan, C., Nosalewicz, A., & Kondracka, K. 2013. Effect of drought and heat stresses on plant growth and yield : a review \*\*. *International Agrophysic*. Vol. 27, 463–477.
- MacLaughein, S. B. & Wimmer, R. Calcium physiology and terrestrial ecosystem processes, *tansley Review* n. 104, *New Physiol*. n. 142, p. 373-417, 1999.
- Marschner, H. 1995. Mineral Nutrition of Higher Plants. Second Edition. Acad. Press. London
- Marschner, H. 2002. Mineral Nutrition of Higher Plants. Academic, London.
- Melo, E. F., Fernandes-Brum, F.J. Pereira, E. M. De Castro & A. Chalfun- Junior. 2014. Anatomical and Physiological Modifications in Seedlings of *Coffea arabica* Cultivar Siriema Under Drought Conditions. *Cienc. Agrotec Lavras* 38 : 25-33 p.
- Misna & Diana, K. 2016. Aktivitas antibakteri ekstrak kulit bawang merah terhadap bakteri *Staphylococcus aureus*. *GALENKA Journal of Pharmacy* 2 (2):138-144 p.
- Mubiyanto, B. M. 1997. Tanggapan Tanaman Kopi terhadap Cekaman Air. *Warta Puslit Kopi dan Kakao* 13. *Hortikultura*. 2 : 83-95 p.
- Nikju, M. B. 2017. Review Article. Influence of drought stress on molecular responses on crop plants. *Chemistry Research Journal* 2(3), 80–84.
- Nurjanani. 2016. Adaptasi Beberapa Varietas Unggul Baru Bawang Merah di Lahan Suboptimal Kabupaten Jeneponto. *Prosiding Seminar Nasional Inovasi Teknologi Pertanian* : 922 – 927 p.

- Nurwahyuni, E. & E.T.S. Putra. 2019. Kontribusi Kalsium Pada Aktivitas Biokimia Dan Pertumbuhan Bibit Kelapa Sawit (*Elaeis guineensis* Jacq.) Tercekam Kekeringan. Diunduh dari <http://etd.repository.ugm.ac.id/>
- Palareti, G., Legnani, C., Cosmi, B., Antonucci, E., Erba, N., Poli, D., Testa, S., & Toso, A. 2016. Comparison between different D-Dimer cutoff values to assess the individual risk of recurrent venous thromboembolism: Analysis of results obtained in the DULCIS study. *International Journal of Laboratory Hematology*, 38 (1) : 42–49 p
- Pangaribuan, D.H. 2001. Pengaruh Waktu Cekaman Air Terhadap Produksi Bawang Merah. *J. Pen. Pengb. Wil. Lahan Kering*, 23(2) : 94-97 p.
- Peltzer, D., Dreyer, E. & Polle, A. 2002. Differential temperature dependencies of antioxidative enzymes in two contrasting species: *Fagus sylvatica* and *Coleus blumei*. *Plant Physiology and Biochemistry*. 40(2) : 141–150.
- Permadi, A. H., A. Wasito dan E. Sumiati. 1989. *Morfologi dan Pertumbuhan Kentang*. Balai Penelitian Hortikultura, Lembang.
- Proklamasiningsih, E., D.P. Irfan, R. Diah, & P.S. Retno. 2012. Laju Fotosintesis dan Kandungan Klorofil Kedelai pada Media Tanam Masam dengan Pemberian Garam Allumunium. *Agrotrop* 2 (1) : 17-24 p.
- Pujiswanto, H. 2015. Kajian mekanisme dan efektivitas asam asetat sebagai herbisida pada gulma tanaman jagung. Disertasi. Program Pascasarjana. Fakultas Petanian. UGM. Yogyakarta.
- Putrasamedja, S. & Suwandi. 1996. *Kultivar Bawang Merah di Indonesia*. Balai Penelitian Tanaman Sayuran. Bandung. 15 p.
- Rachmah, C., Moch. Nawawi & Koesriharti. 2017. Pengaruh Aplikasi Pupuk Kalsium ( $\text{CaCO}_3$ ) dan Giberelin Terhadap Pertumbuhan, Hasil, dan Kualitas Buah pada Tanaman Tomat (*Lycopersicon esculentum* Mill.). *Jurnal Produksi Tanaman*. 5 (3) : 515 – 520 p.
- Rahayuningsih, S. E. A, D. Indradewa, E. Sulistyaningsih & A. Maas, 2017. The tolerance of photosynthesis of some maize cultivars. (*Zea mays* L.) to waterlogging at different stages of growth. *International Journal on Advance Science Engineering Information Technology*. 7 (4).
- Reddy, A. S. N. 2001. Review Calcium: Silver Bullet in Signaling. *Plant Science*. 160 : 381–404 p.
- Salisbury, F.B. dan C. W. Ross. 1995. *Fisiologi tumbuhan*. Jilid 2. ITB Bandung.



Sari, N.Y. & E.T.S. Putra. 2019. Kontribusi Kalsium Pada Perubahan Karakter Anatomi Bibit Kelapa Sawit (*Elaeis guineensis* Jacq.) Tercekam Kekeringan. Diunduh dari <http://etd.repository.ugm.ac.id/>

SAS Institute Inc. 1990. SAS/STAT Users Guide. SAS Publishing, North Caroline.

Sekhon H.S., Singh G., Sharma P., and Bains T.S., 2010. Water Use Efficiency Under Stress Environments In: Climate Change and Management of Cool Season Grain Legume Crops (Eds S.S. Yadav, D.L. Mc Neil, R. Redden, and S.A. Patil). Springer Press, Dordrecht-Heidelberg-London-New York

Sharma, P., Jha, A. B., Dubey, R S. & Pessarakli, M. 2012. Reactive Oxygen Species , Oxidative Damage and Antioxidative Defense Mechanism in Plants Under Stressful Conditions. Journal of Botany. 2016 : 1-26 p.

Shukla, N., Awasthi, R. P., Rawat, A. L., Rawat, J. K. L. & Kumar, J. 2012. Biochemical and physiological responses of rice (*Oryza sativa* L.) as influenced by *Trichoderma harzianum* under drought stress. Plant Physiology and Biochemistry. 54 : 78–88.

Singh, A., Aggarwal, N., Aulakh, G.S. & Hundal, R.K. 2012. Ways to maximize the water use efficiency in field. Greener Journal of Agricultural Sciences 2 (4) : 108-129 p.

Sirait, C.R. 2016. Pengaruh Pemberian Ekstrak Jintan Hitam (*Nigella sativa*) terhadap Kadar MDA Serum Tikus Sprague Dawley Setelah Diberikan Paparan Asap Rokok. Karya Tulis Ilmiah Fakultas Kedokteran Universitas Diponegoro.

Sitompul, S. M dan B. Guritno. 1995. Analisis Pertumbuhan Tanaman. Gadjah Mada University Press. Yogyakarta.

Smirnoff, N. 1995. Metabolic Flexibility in Relation to the Environment. Bios Scientific Publishers. Oxford 1-16 p.

Song, Nio & Banyo, Yunia. 2011. Konsentrasi Klorofil Daun Sebagai Indikator Kekurangan Air Pada Tanaman. Jurnal Ilmiah Sains 11 (2) : 169-170 p.

Song, W. Y., Zhang, Z. B., Shao, H. B., Guo, X. L., Cao, H. X., Zhao, H. B., Fu, Z. Y. & Hu, X. J., 2008. Relationship Between Calcium Decoding Elements and Plant Abiotic-Stress Resistance. International Journal of Biological Sciences. 4(2) : 116–125 p.

Sullivan, D.M., B.D. Brown., C.C. Shock., D.A. Horneck., R.G. Stevens., G.Q. Pelter., & E.B.G. Feibert. 2001. Nutrient Management for Onions in the Pasific Northwest. A Pasific Northwest Extension Publication. 28 p.

- Sumarni, N. & Hidayat, A. 2005. Budidaya Bawang Merah. Balai Penelitian Tanaman Sayuran. Bandung. 22p
- Sunkar, R. 2010. Plant Stress Tolerance, Methods and Protocols. Human Press. Springer. New York.
- Sutarya, R. & G. Grubben. 1995. Pedoman Bertanam Sayuran Dataran Rendah. Gadjah Mada University Press. Prosea Indonesia – Balai Penelitian Hortikultura Lembang. 264 p.
- Swasono, F. D. H. 2012. Karakteristik Fisiologi Toleransi Tanaman Bawang Merah Terhadap Cekaman Kekeringan di Tanah Pasir Pantai .Jurnal AgriSains 3 (4) : 88-103 p.
- Taiz, L. & E. Zeiger. 1991. Plant Physiology. The Benjamin/Cumming Pub. Co. Inc. New York
- Taiz, L. & E. Zeiger. 2002. Plant physiology. 3rd edition. Sinauer Associates Inc. Annals of Botany, 88 : 355-360 p.
- Tardieu, F. 2000. Drought persepction by plants do cells of droughted plants experiences water stress The diversity of adaptation in the wide. Plant Gowth Regulation 20: 93-104.
- Tjitrosoepomo, G. 1993. Taksonomi Umum. Gadjah Mada University Press. Yogyakarta. 216 p.
- Tondokusumo, P.W. 2016. Memahami La Nina, Dampaknya bagi Produksi Tanaman Pangan, dan Adaptasinya. Faperta Unsoed
- Tripathy, B. C., & Oelmüller, R. 2012. Reactive Oxygen Species Generation & Signaling in Plants. Plant Signaling & Behavior, 7 (12) : 1621-1633 p.
- Tuteja, N. & S. Mahajan. 2007. Further Characterization of Calcineurin B-Likeprotein and Its Interacting Partner CBL-Interacting Protein Kinase from Pisum sativum. Plant Signaling Behavior 2 (5): 358–36 p.
- Waluyo, N. & R. Sinaga. 2015. Bawang Merah yang dirilis oleh Balai Penelitian Tanaman Sayuran. IPTEK No. 5. Balai Penlitian Tanaman Sayuran (Balitsa). Bandung
- White, P. J. & M. R. Broadley. 2003. Calcium in Plants. Annals of Botany. 92 (4) : 487–511 p.
- Widayati, E. 2019. Oksidasi Biologi, Radikal Bebas, dan Antioxidant. FK Unissula Semarang





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**TANGGAPAN PERTUMBUHAN DAN HASIL BAWANG MERAH (*Allium cepa* L. *Aggregatum* group)  
TERHADAP PEMBERIAN**

**KALSIUM PADA KONDISI CEKAMAN KEKERINGAN**

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Zewdu, J.N International Journal of Irrigation and Water Management Volume. 7 p.. 2014.  
Impact of Irrigation and Nitrogen Levels on Bulb Yield, Nitrogen Uptake and  
Water Use Value of Shallot (*Allium cepa* var. *ascalonicum* Baker).

Zhu, J. K. 2016. Abiotic Stress Signaling and Responses in Plants. Cell, 167(2), 313–  
324. <https://doi.org/10.1016/j.cell.2016.08.029>