

DAFTAR PUSTAKA

- Abbas, S.M. 2013. The influence of biostimulant on the growth and on the biochemical composition of *Vicia faba* cv. *giza 3* beans. *Romanian biotechnological letters*. 18 (2), 8061-8068.
- Agung, I. G. A. M. S., & Diara, I. W. 2019. Biostimulants enhanced seedling root growth and bulb yields of true seed shallots (*Allium cepa* var *aggregatum* l.). *International journal of environment, agriculture and biotechnology* (IJEAB). 4(3).
- Agustian, N. & Lusi, M. 2010. Rhizobakteria penghasil fitohormon iaa pada rhizosfir tumbuhan semak karamunting, titonia, dan tanaman pangan. *Jurnal solum*. 7 (1): 49-60.
- Ahmad, M., Munir, M., Ahmad, I., & Yousuf M. 2011. Evaluation of bread wheat genotypes for salinity tolerance under saline field conditions. *Afr j biotechnol*. 10:4086–4092.
- Ahmad, P., Ashraf, M., Hakeem, K.L., Azooz M.M, Rasool S, Chandna R, & Akram NA. 2014. Potassium starvation-induced oxidative stres and antioxidant defense responses in *Brassica juncea*. *J Plant Interact*. 9(1):1–9.
- Ahmed, N., Ahmad, F., Ullah, M. A., Bot, P. J., Abid, M., Javaid, Q., & Ali, M. A. 2011. Impact of boron fertilization on dry matter production and mineral constitution of irrigated cotton. *Pak. J. Bot*, 43(6), 2903–2910. <https://www.researchgate.net/publication/236136228>
- Amanah, D. M., & S. M. Putra. 2018. Pengaruh biostimulan terhadap toleransi kekeringan dan pertumbuhan tanaman tebu varietas kidang kencana di rumah kaca. *Menara perkebunan*. 86(1):46-55
- Amin, A. A., Gharib, F. A. E., El-Awadi, M., & Rashad, E. S. M. 2011. Physiological response of onion plants to foliar application of putrescine and glutamine. *Scientia horticulturae*, 129(3): 353–360. <https://doi.org/10.1016/j.scienta.2011.03.052>
- Amin, A. A., Gharib, F. A. E., El-Awadi, M., & Rashad, M. E. Sherbeny. (2011). Physiological response of onion plants to foliar application of putrescine and glutamine. *Scientia Horticulturae*, 129(3), 353–360. <https://doi.org/10.1016/j.scienta.2011.03.052>
- Anggia H., Lawalata, I. J., & H. Kesaulya. 2020. Pengaruh konsentrasi biostimulan berbahan aktif *Bacillus subtilis* dan waktu pemberian terhadap pertumbuhan dan produksi bawang merah (*Allium ascalonicum* l.). *jurnal budidaya pertanian*. 16 (2): 132-139.
- Arora A, Sairam RK, & Srivastava GC. 2002. Oxidative stres and antioxidative sistems in plants. *Curr sci*. 82:1227–1238.
- Arshad, M. & W.T. Frankenberger, Jr. 1993. Microbial production of plant growth regulators. p. 307-347. In F.B. Meeting, Jr. (Ed.). *Soil microbial ecology. Applications in agricultural and environmental management*. Marcel Dekker, Inc. New York.

- Aslam, M. Travis, R.L. & Rains, D.W. 2001. Differential effect of amino acids on nitrate uptake and reduction systems in barley roots. *Plant Sci.* 160: 219–228.
- Asra, R., Samarlina, A., & Silalahi, M. 2020. *Hormon tumbuhan* (I. Jatmoko, Ed.). UKI Press.
- Azri. 2019. Pengaruh biostimulan dan varietas terhadap pertumbuhan dan produksi bawang merah di lahan gambut. *Jurnal pertanian agros.* 21 (1): 19-28.
- Barea, J. M., Navarro, E., & Montoya, E. 1976. Production of plant growth regulators by rhizosphere phosphate-solubilizing bacteria. *J appl bacterial.* 40(2):129-134. Doi: 10.1111/j.1365-2672.1976.tb04161.x. PMID: 1270366.
- Basavaraj, P., & Chetan, H. T. 2018. Foliar fertilization of nutrients. *Marumegh.* 3(1).
- Berbara R.L.L & García A.C. 2014. Humic substances and plant defense metabolism. In: Ahmad P, Wani MR, editors. *Physiological mechanisms and adaptation strategies in plants under changing environment*. New York (NY): Springer Science+Business Media.1: 297–319.
- Boy, R., Indradewa, D., Putra, E.T.S., and Kurniasih, B. 2020. Drought-induced production of reactive oxygen species and antioxidants activity of four local upland rice cultivars in Central Sulawesi, Indonesia. *Biodiversitas*, 21(6), pp. 2555-2565.
- BPS. 2020. Produksi Tanaman Sayuran 2020. [Badan Pusat Statistik \(bps.go.id\)](https://www.bps.go.id/).
- BPS. 2021. Luas panen tanaman sayuran menurut provinsi dan jenis tanaman. https://www.bps.go.id/indikator/indikator/view_data_pub/0000/api_pub/bXNVb1pmZndqUDhKWEIUSjhZRitidz09/da_05/1.
- Britikov EA. 1975. The biological role of proline. *Science. Moscow.* 1–88.
- Bulgari, R., Cocetta, G., Trivellini, A., Vernieri, P., & Ferrante, A. 2015. Biostimulants and crop responses: A review. *Biological agriculture and horticulture*, 31(1), 1–17. <https://doi.org/10.1080/01448765.2014.964649>
- Calvo, P. L. Nelson, & J.W. Kloepper. 2014. Agricultural uses of plant biostimulants. *Plant soil.* 383: 3– 41. <https://doi.org/10.1007/s11104-014-2131-8>
- Campbell, N. A., Reece, J.B., and L. G. Mitchell. 2003. *Biologi*. Alih bahasa, Wasmen Manalu. Erlangga: Jakarta.
- Carillo, P., Colla, G., Fusco, G. M., Dell'Aversana, E., El-Nakhel, C., Giordano, M., Pannico, A., Cozzolino, E., Mori, M., Reynaud, H., Kyriacou, M. C., Cardarelli, M., & Roupheal, Y. 2019. Morphological and physiological responses induced by protein hydrolysate-based biostimulant and nitrogen rates in greenhouse spinach. *Agronomy*, 9(8). <https://doi.org/10.3390/agronomy9080450>
- Cetin, A. K., Agirman, N., & Cetin, A. K. 2015. Effects of nitrogen starvations on cell growth, protein and lipid amount of *Chlorella vulgaris*. *Fresenius Environmental Bulletin*, 24(11). <https://www.researchgate.net/publication/292801132>
- CJ Bio. 2019. Amiboost and Ferami. <https://www.cjbio.net/en/products/amiboostFerami.do#>.

- Colla, G., Rouphael, Y., Canaguier, R., Svecova, E., Cardarelli, M., 2014. Biostimulant action of a plant-derived protein hydrolysate produced through enzymatic hydrolysis. *Front. Plant Sci.* 5, 448.
- Cozzolino, E., Mola, I. D., Ottaiano, L., EL-Nakhel, C., Rouphael, Y., & M. Mori. 2021. Foliar application of plant-based biostimulants improve yield and upgrade qualitative characteristics of processing tomato. *Italian journal of agronomy.* 16:1825.
- Cvikrova, M., Gemperiova, L., Martincova, O., Vancova, R. 2013. Effect of drought and combined drought and heat stres on polyamine metabolism in proline over producing tobacco plants. *Plant Physiology and Biochemistry.* 73:7-15.
- Dinastph Lampung. 2019. Cara budidaya bawang merah (*Allium ascalonicum* L.). <https://www.dinastph.lampungprov.go.id/detail-post/cara-budidaya-bawang-merah-allium-ascalonicum-l>.
- Direktorat Hortikultura. 2021. Diagnosa kebutuhan konsumsi, luas tanam, luas panen, dan produksi bawang merah. http://horti.pertanian.go.id/simantab/pola_tanam
- Direktorat sayuran dan tanaman obat. 2017. Pedoman budidaya bawang merah menggunakan biji. <http://horti.pertanian.go.id/simantab/assets/docstatic/BUDIDAYA/PEDOMAN%20BUDIDAYA%20BAMER%202017%20FIX.pdf>.
- Drobek, M., M. Frac, & J. Cybulska. 2019. Plant biostimulants: importance of the quality and yield of horticultural crops and the improvement of plant tolerance to abiotic stres- A review. *Agronomy.* 9 (335):1-18.
- Du, Z.Y., Wang, Q.H., Liu, F.C., Ma, H.L., Ma, B.Y., & Malhi, S.S. 2013. Movement of phosphorus in a calcareous soil as affected by humic acid. *Pedosphere.* 23: 229-235.
- Duhamel, M., & Vandenkoornhuyse, P. 2013. Sustainable agriculture: Possible trajectories from mutualistic symbiosis and plant neodomestication. *Trends in Plant Science.* 18(11), 597–600. <https://doi.org/10.1016/j.tplants.2013.08.010>
- Dwitama, F., Rugayah., Rini M. V., & K. Hendarto. 2020. Pengaruh pemberian biostimulan terhadap pertumbuhan dan hasil tanaman tomat (*Lycopersicum esculentum* Mill.). *Jurnal agrotek tropika.* 8(3):501-509.
- Era P. B. 2020. Pertumbuhan dan kandungan fitokimia tanaman rosella (*Hibiscus sabdariffa* L.) varietas roselindo 2 hasil perlakuan biostimulan. *Skripsi. Fakultas biologi. Universitas Gadjah Mada.*
- Ertani, A. Sambo, P. Nicolletto, Santagata, S. Schiavon, M & Nardi, S. 2015. The use of organic biostimulants in hot pepper plants to help how low input sustainable agriculture. *Chemical and biological technologies in agriculture.* 2(11):7.

- Fajriyah, Noor. 2017. Kiat sukses budidaya bawang merah. Bio genesis: Yogyakarta.
- Fan, X., Gordon-Weeks, R., Shen, Q., & Miller, A. J. 2006. Glutamine transpor and feedback regulation of nitrate reductase activity in barley roots leads to changes in cytosolic nitrate pools. *Journal of experimental botany*. 57(6), 1333–1340. <https://doi.org/10.1093/jxb/erj110>
- Francesca, S., Arena, C., Hay Mele, B., Schettini, C., Ambrosino, P., Barone, A., & Rigano, M. M. (2020). The use of a plant-based biostimulant improves plant performances and fruit quality in tomato plants grown at elevated temperatures. *Agronomy*, 10(3), 363. <https://doi.org/10.3390/agronomy10030363>
- Frioni, T., VanderWeide, J., Palliotti, A., Tombesi, S., Poni, S., & P. Sabbatini. 2021. Foliar vs soil application of *Ascophyllum nodosum* extracts to improve grapevine water stres tolerance. *scientia horticulturae*. 277:109807.
- García AC, Berbara RLL, Farías LP, Izquierdo FG, Hernández OL, Campos RH, & Castro RN. 2012. Humic acids of vermicompost as an ecological pathway to increase resistance of rice seedlings to water stres. *Afr j biotechnol*. 11:3125–3134
- Gardner, F. P., Brent, P., & Goger, L. M. 1991. The physiology of cultivated plants (Susilo, Ed.). Universitas Indonesia Press.
- Gill SS, & Tuteja N. 2010. Reactive oxygen species and antioxidant machinery in abiotic stres tolerance in crop plants. *Plant Physiol Biochem*. 48:909–930.
- González-Fontes, A., Herrera-Rodríguez, M. B., Martín-Rejano, E. M., Navarro-Gochicoa, M. T., Rexach, J., & Camacho-Cristóbal, J. J. (2016). Root responses to boron deficiency mediated by ethylene. *Frontiers in Plant Science*, 6. <https://doi.org/10.3389/fpls.2015.01103>
- Göring H, & Thien BH. 1979. Influence of nutrient deficiency on proline accumulation in the cytoplasm of *Zea mays* L. seedlings. *Biochem physiol pflanz*. 174(1):9–16
- Grabowska, A., Kunicki, E., Sękara, A., Kalisz, A., & Wojciechowska, R. 2012. The effect of cultivar and biostimulant treatment on the carrot yield and its quality. *Vegetable crops research bulletin*. 77, 37–48. <https://doi.org/10.2478/v10032-012-0014-1>
- Gujjar, R. S., Banyen, P., Chuekong, W., Worakan, P., Roytrakul, S., & Supaibulwatana, K. (2020). A synthetic cytokinin improves photosynthesis in rice under drought stres by modulating the abundance of proteins related to stomatal conductance, chlorophyll contents, and rubisco activity. *Plants*, 9(9), 1–21. <https://doi.org/10.3390/plants9091106>
- Guo, H., Pu, X., Jia, H., Zhou, Y., Ye, G., Yang, Y., Na, T., & Wang, J. 2022. Transcriptome analysis reveals multiple effects of nitrogen accumulation and metabolism in the roots, shoots, and leaves of potato (*Solanum tuberosum* L.). *BMC Plant Biology*. 22. <https://doi.org/10.1186/s12870-022-03652-3>
- Halpern, M., Bar-Tal, A., Ofek, M., Minz, D., Muller, T., & Yermiyahu, U. (2015). The use of biostimulants for enhancing nutrient uptake. In *Advances in*

Agronomy (Vol. 130, pp. 141–174). Academic Press Inc.
<https://doi.org/10.1016/bs.agron.2014.10.001>

- Hariyanti, D. B., Makhziah., & N. Triani. 2021. Respon pertumbuhan dan hasil tanaman jagung ungu (*Black aztec*) akibat pemberian biostimulan asam humat dan ekstrak rumput laut. *Jurnal agrohitia*. 6(2): 201-209.
- Hattalaibessy, A., Lawalata, I. J., & H. Kesaulya. 2020. Pengaruh konsentrasi biostimulan berbahan aktif *Bacillus subtilis* dan waktu pemberian terhadap pertumbuhan dan produksi bawang merah (*Allium ascalonicum* L.). *Jurnal Budidaya Pertanian*. 16(2):132-139.
- Havlin, J. L., Beaton, J. D., Tisdale, S. L., & Nelson, W. L. 2005. Soil fertility and fertilizer. Upper saddle river: Pearson Prentice Hall.
- Hayat, S., Hayat, Q., Alyemeni, M. N., Wani, A. S., Pichtel, J., & Ahmad, A. 2012. Role of proline under changing environments: A review. In *Plant Signaling and Behavior*. 7(11). <https://doi.org/10.4161/psb.21949>
- Hidangmayum, A., & R. Sharma. 2017. Effect of different concentrations of commercial seaweed liquid extract of *Ascophyllum nodosum* as a plant bio stimulant on growth, yield and biochemical constituents of onion (*Allium cepa* L.). *Journal of Pharmacognosy*. 6(4):658-663.
- Hua QX, Li JY, Zhou JM, Wang HY, Du CW, & Chen XQ. 2008. Enhancement of phosphorus solubility by humic substances in ferrosols. *Pedosphere* 18: 533-538.
- Indar, L. D., Sulistyaningsih, E., & B. Kurniasih. 2021. Tanggapan pertumbuhan dan hasil bawang merah (*Allium cepa* L. *Aggregatum* group) terhadap aplikasi asam salisilat dan biosilika pada kondisi cekaman kekeringan. Tesis. Universitas Gadjah Mada. Yogyakarta.
- Iqbal, N., Umar, S., & N. A. Khan. 2015. Nitrogen availability regulates proline and ethylene production and alleviates salinity stres in mustard (*Brassica juncea*). *Journal of Plant Physiology*. 178. 84-91
- Jazilah, S., Sunarto, & N. Farid. 2007. Respon tiga varietas bawang merah terhadap dua macam pupuk kandang dan empat dosis pupuk anorganik. *Jurnal Penelitian dan Informasi Pertanian (Agrin)*. 11(1).
- Jardin, D. P. 2015. Plant biostimulants: Definition, concept, main categories and regulation. *Scientia Horticulturae*. 196, 3–14.
<https://doi.org/10.1016/j.scienta.2015.09.021>
- Jardin, D. P., 2012. The science of plant biostimulants-a bibliographic analysis. Contract 30-CE0455515/00-96, ad hoc Study on bio-stimulants products.
- Jones, D. L., & Darrah, P. R. 1993. Influx and efflux of amino acids from *Zea mays* L. roots and their implication for N nutrition and the rhizosphere. *Plant Nutrition*. 91–94.
- Kauffman, G.L., Kneivel, D.P., & Watschke, T.L. 2007. Effects of a biostimulant on the heat tolerance associated with photosynthetic capacity, memberane

thermos stability, and polyphenol production of perennial rygrass. Crop Sci. 47:261-267.

- Kementerian Pertanian. 2021. Basis data konsumsi pangan. - [KONSUMSI | Kementan \(pertanian.go.id\)](https://kementan.pertanian.go.id/).
- Kesaulya. H. 2015. Bioprospek rizobakteria asal kentang (*solanum tuberosum* l.) var. hartapel sebagai pemacu pertumbuhan tanaman. Disertasi. Universitas Hasannudin, Makassar.
- Khan, A. S., Ahmad, B., Jaskani, M. J., Ahmad, R., Malik, A. U., Khan, A. S., Ahmad, B., Jaskani, M. J., And, A. †, & Malik, A. U. 2012. Foliar application of mixture of amino acids and seaweed (*Ascophylum nodosum*) extract improve growth and physico-chemical properties of grapes. International Journal of Agriculture & Biology. 14(3). 383–388. <http://www.fspublishers.org>
- Khan, S., Yu, H., Li, Q., Gao, Y., Sallam, B. N., Wang, H., Liu, P., & Jiang, W. (2019). Exogenous application of amino acids improves the growth and yield of lettuce by enhancing photosynthetic assimilation and nutrient availability. *Agronomy*, 9(5). <https://doi.org/10.3390/agronomy9050266>
- Kielland, K. 1994. Amino acid absorption by arctic plants: implications for plant nutrition and nitrogen cycling amino acid absorption by arctic plants: implications for plant nutrition and nitrogen cycling1. In ecology. 75(8).
- Klokić, I., Koleska, I., Hasanagić, D., Murtić, S., Bosancić, B., & V. Todorović. 2020. Biostimulants' influence on tomato fruit characteristics at conventional and low-input NPK regime. *Acta agriculturae Scandinavica, section B-soil & plant science*. 70(3):233-240.
- Kocira, S. 2019. Effect of amino acid biostimulant on the yield and nutraceutical potential of soybean. *Chilean Journal of Agricultural Research*. 79(1), 17–25. <https://doi.org/10.4067/S0718-58392019000100017>
- Kociraa, A., Kocira, S., Swieca, M., Zlotekc, U., Jakub, A., & K. Kapela. 2017. Effect of foliar application of a nitrophenolate–based biostimulant on the yield and quality of two bean cultivars. *Scientia Horticulturae*. 214:76-82
- Koleška, V., Hasanagić, D., Todorovića, V., Murtić, S., Klokić, I., Parađiković, N., & B. Kukavica. 2017. Biostimulant prevents yield loss and reduces oxidative damage in tomato plants grown on reduced NPK nutrition. *Journal of plant interactions*. 12(1):209-218.
- Kordatzaki, G., Katsenios, N., Giannoglou, M., Andreou, V., Chanioti, S., Katsaros, G., Savvas, D., & A. Efthimiadou. 2022. Effect of foliar and soil application of plant growth promoting bacteria on kale production and quality characteristics. *Scientia Horticulturae*. 301. 111094.
- Kou, E., Huang, X., Zhu, Y., Su, W., Liu, H., Sun, G., Chen, R., Hao, Y., & Song, S. (2021). Crosstalk between auxin and gibberellin during stalk elongation in flowering Chinese cabbage. *Scientific Reports*, 11(1). <https://doi.org/10.1038/s41598-021-83519-z>

- Koukounaras, A., Tsouvaltzis, P., & Siomos, A. 2013. Effect of root and foliar application of amino acids on the growth and yield of greenhouse tomato in different fertilization levels. *Food Agric* , 11, 644–648.
- Kuswardhani. 2016. Sehat tanpa obat dengan bawang merah-bawang putih. Rapha Publishing.
- Lakitan, B. 1997. Dasar-dasar klimatologi. Raja Grafindo Persada.
- Li, Q., Liu, Y., Pan, Z., Xie, S., & Peng, S. A. (2016). Boron deficiency alters root growth and development and interacts with auxin metabolism by influencing the expression of auxin synthesis and transpor genes. *Biotechnology and Biotechnological Equipment*, 30(4), 661–668. <https://doi.org/10.1080/13102818.2016.1166985>
- Liu, X. quan, Chen, H. yun, Ni, Q. xue, & Lee Kyu, S. 2008. Evaluation of the role of mixed amino acids in nitrate uptake and assimilation in leafy radish by using 15n-labeled nitrate. *Agricultural sciences in China*. 7(10), 1196–1202. [https://doi.org/10.1016/S1671-2927\(08\)60164-9](https://doi.org/10.1016/S1671-2927(08)60164-9)
- Lubis, S.K. 2007. Aplikasi suhu dan aliran panas tanah. Universitas Sumatera. Medan.
- Maeda, H., & Dudareva, N. (2012). The shikimate pathway and aromatic amino acid biosynthesis in plants. In *Annual Review of Plant Biology* (Vol. 63, pp. 73–105). <https://doi.org/10.1146/annurev-arplant-042811-105439>
- Mahajan, G.M. 2014. Effect of foliar application of seaweed extract and plant growth regulators on growth, productivity and quality of soybean *Glycine max* L. Merrill. submitted as Thesis. Jabalpur, India. Jawaharlal Nehru Krishi Vishwa Vidyalaya.
- Mannino, G., Campobenedetto, C., Vigliante, I., Contartese, V., Gentile, C., & Berteau, C. M. 2020. The application of a plant biostimulant based on seaweed and yeast extract improved tomato fruit development and quality. *Biomolecules*. 10(12), 1–19. <https://doi.org/10.3390/biom10121662>
- Mano, Y., & Nemoto, K. (2012). The pathway of auxin biosynthesis in plants. *Journal of Experimental Botany*, 63(8), 2853–2872. <https://doi.org/10.1093/jxb/ers091>
- Mansyur, N. I., Pudjiwati, E. H., & Murti Laksono, A. 2021. Pupuk dan pemupukan (Z. Hanum, Ed.). Syiah Kuala University Press.
- Maramis, F. 2010. Pengaruh kombinasi tanah grumosol dengan tanah regosol dan takaran pupuk kandang terhadap pertumbuhan dan hasil bawang merah. Tesis. Universitas Gadjah Mada. Yogyakarta
- Marhoon, I. A., & Abbas, M. K. 2015. Effect of foliar application of seaweed extract and amino acids on some vegetatif and anatomical characters of two sweet pepper (*Capsicum annuum* L.) cultivars. *International journal of research studies in agricultural sciences (IJRSAS)*. 1(1), 35–44. <https://www.researchgate.net/publication/316091424>
- Marschner H. 1995. Mineral Nutrition of higher plants. 2nd Edition. Academic Press, London, UK.

- Marschner, H. 2002. Mineral nutrition of higher of plants. 2nd Edition. Academic Press, London.
- Marschner, H. 2011. mineral nutrition of higher plants (*3rd ed.*). Elsevier.
- Miller, A. J., Fan, X., Shen, Q., & Smith, S. J. 2007. Amino acids and nitrate as signals for the regulation of nitrogen acquisition. *Journal of Experimental Botany*. 59(1), 111–119. <https://doi.org/10.1093/jxb/erm208>
- Mitra, G. N. 2015. Regulation of nutrient uptake by plants. <https://doi.org/10.1007/978-81-322-2334-4>.
- Mola, I., Cozzolino, E., Ottaiano, L., Nocerino, S., Roupheal, Y., Colla, G., El-Nakhel, C., & Mori, M. 2020. Nitrogen use and uptake efficiency and crop performance of baby spinach (*Spinacia oleracea* L.) and Lamb's Lettuce (*Valerianella locusta* L.) grown under variable sub-optimal N regimes combined with plant-based biostimulant application. *Agronomy*, 10. <https://doi.org/10.3390/agronomy10020278>
- Moussa, H. R. & S. M. Abdel Aziz. 2008. Comparative response of drought tolerant and drought sensitive maize genotypes to water stres. *Australian Journal of Crop Science Southern Cross Journals*. 1(1):31-36.
- Munawar, A. 2011. Kesuburan tanah dan nutrisi tanaman. IPB Press, Bogor.
- Nadya A. K. 2020. Pengaruh biostimulan terhadap pertumbuhan dan kandungan fitokimia pada tanaman rosela (*Hibiscus sabdariffa* L.) varietas roselindo 1. Skripsi. Fakultas biologi. Universitas Gadjah Mada.
- Naeem, M., Ansari, A. A., & Gill, S. S. 2017. Essential plant nutrients: uptake use efficiency and management.
- Napitupulu, D., & L. Winarto. 2010. Pengaruh pemberian pupuk N dan K terhadap pertumbuhan dan produksi bawang merah. *J horti*. 20(1):27-35.
- Navarro-León, E., López-Moreno, F. J., Borda, E., Marín, C., Sierras, N., Blasco, B., & Ruiz, J. M. 2022. Effect of l-amino acid-based biostimulants on nitrogen use efficiency (NUE) in lettuce plants. *Journal of the Science of Food and Agriculture*, 102(15), 7098–7106. <https://doi.org/10.1002/jsfa.12071>
- Noli, Z. A., Suwirnen., Izmiarti., Oktavia, R., & P. Aliyyanti. 2021. Respon padi gogo (*Oryza sativa* L.) terhadap pemberian biostimulan dari ekstrak rumput laut *padina minor*. *Jurnal Ilmiah Biologi*. 9(2):412-419.
- Owen, A. G., & Jones, D. L. (2001). Competition for amino acids between wheat roots and rhizosphere microorganisms and the role of amino acids in plant N acquisition. *Soil Biology & Biochemistry*, 33, 651–657. www.elsevier.com/locate/soilbio
- Oza, Sriyuni. 2020. Pertumbuhan dan hasil tanaman padi gogo (*Oryza sativa* L.) dengan pemberian ekstrak rumput laut *padina minor* dan *Sargassum cristaefolium* dengan penambahan asam amino sebagai biostimulan. Masters Thesis, Universitas Andalas.

- Pamungkas, P. B., Purwaningsih, O., & Suseyo, H. B. 2020. Pengaruh kompos rumput laut dan azolla terhadap pertumbuhan dan hasil bawang merah. *Jurnal Vegetalika*. 9(3): 500-511.
- Pangestuti, R., Sulistyaningsih, E., Kurniasih, B., & Murti, R. H. 2022. *Agregasi umbi dan produktivitas bawang merah (*Allium cepa* L. agregatum group) asal biji* [Disertasi, Universitas Gadjah Mada]. <http://etd.repository.ugm.ac.id/penelitian/detail/218787>
- Paradiković, N., Vinković, T., Vinković Vrček, I., Žuntar, I., Bojić, M., & Medić-Šarić, M. 2011. Effect of natural biostimulants on yield and nutritional quality: An example of sweet yellow pepper (*Capsicum annuum* L.) plants. *Journal of the Science of Food and Agriculture*, 91(12), 2146–2152. <https://doi.org/10.1002/jsfa.4431>
- Patten, C. L., & Glick, B. R. 1996. Bacterial biosynthesis of indole-3-acetic acid. www.nrcresearchpress.com
- Permadi, A. H., A. Wasito & E. Sumiati. 1989. Morfologi dan pertumbuhan kentang. Balai penelitian hortikultura, Lembang.
- Popko, M., Michalak, I., Wilk, R., Gramza, M., Chojnacka, K., & Górecki, H. 2018. Effect of the new plant growth biostimulants based on amino acids on yield and grain quality of winter wheat. *Molecules*, 23(2). <https://doi.org/10.3390/molecules23020470>
- Prabowo, R. I., & Eka, T. S. P. 2014. Improvement physiological activities and yield of banana plant (*Musa paradisiaca*) with mineral nutrition management. Seminar Umum Jurusan Budidaya Pertanian UGM.
- Prawiranata, W., Harran. S., & Tjondronegoro, P. 1981. Dasar-dasar fisiologi tumbuhan. Departemen Botani. Fakultas Pertanian, Institut Pertanian Bogor, Bogor.
- Priyono, J., Mansur, M. M., & Baharudin, A. B. (2021). *Evaluasi efisiensi serapan unsur hara esensial melalui daun dalam rangka pengembangan teknologi pemupukan yang tepat untuk usaha tani di lahan sub optimal*. Project Report. LPPM Unram, Mataram [Unpublished].
- Pujiasmanto, B. 2020. Peran dan manfaat hormon tumbuhan: contoh kasus paclobutrazol untuk penyimpanan benih. Yayasan Kita Menulis.
- Purnamasari, I., Sulistyaningsih, E., & A. Purwantoro. 2022. Tanggapan pertumbuhan dan hasil bawang merah (*Allium cepa* L. *Aggregatum* group) terhadap pemberian kalsium pada kondisi cekaman kekeringan. Tesis. Universitas Gadjah Mada. Yogyakarta.
- Putra, S. M., Susanti, P., Amanah, D. M., Umahati, B. K., Pardali, S. J., & D. Santoso. 2017. Pengaruh biostimulan terhadap pertumbuhan vegetatif tanaman tebu varietas PSJT-941. *Menara Perkebunan*. 85(1):37-43.
- Raab TK, & Terry N. 1995. Carbon, nitrogen, and nutrient interactions in *Beta vulgaris* L. as influenced by nitrogen source. *Plant Physiol*. 107:575–584.

- Rabinowitch, H.D., & J.L. Brewster. 1990. Onions and allied crops: botany, physiology and genetics (1st ed). CRC Press
- Rahayu, E., & B. V Nur. 2004. Bawang Merah. Penebar Swadaya: Jakarta.
- Rai, V. K. 2002. Role of amino acids in plant responses to streses. *Biologia Plantarium*, 45(4), 481–487.
- Rainbird, R. M., Thorne, J. H., & Hardy, R. W. F. (1984). Role of amides, amino acids, and ureides in the nutrition of developing soybean seeds. *Plant Physiol*, 74, 329–334. <https://academic.oup.com/plphys/article/74/2/329/6079296>
- Rajiman. 2012. Pemanfaatan ampas kelapa dalam budidaya bawang merah pada tanah regosol. Informasi perkembangan teknologi terapan pertanian. Jakarta. *Jurnal Teknologi* (2):50-65.
- Raven JA, & Smith FA. 1976. Nitrogen assimilation and transpor in vascular land plants in relation to intracellular pH regulation. *New Phytol*. 76:415–431.
- Rosmarkam & Yuwono. 2002. Ilmu kesuburan tanah. PT Kanisius: Yogyakarta
- Russo R.O., & G. P. Berlyn. 1990. The use of organic biostimulants to help low input sustainable agriculture. *J Sustain Agric*. 1:19-38.
- Saban, R., Kesaulya, H., & J. I. Nendissa. 2018. Pengaruh aplikasi biostimulan terhadap pertumbuhan dan produksi tanaman sawi (*Brassica juncea* L.). *Jurnal Budidaya Pertanian*. 14(1):41-46.
- Salisbury, J. W., & Ross. 1995. Fisiologi Tumbuhan Jilid 2. Bandung: ITB
- Sauer, M., Robert, S., & Kleine-Vehn, J. 2013. Auxin: Simply complicated. *Journal of Experimental Botany*, 64(9), 2565–2577. <https://doi.org/10.1093/jxb/ert139>
- Schmidt, R. E. 1992. Biostimulants. *Grounds Maintenance* 1992. 27, 38–56.bi
- Shahi, S., & Srivastava, M. (2018). Influence of foliar application of manganese on growth, pigment content, and nitrate reductase activity of *Vigna radiata* (L.) R. Wilczek under salinity. *Journal of Plant Nutrition*, 41(11), 1397–1404. <https://doi.org/10.1080/01904167.2018.1454470>
- Shalaby, T. A., & El-Ramady, H. 2014. Effect of foliar application of bio-stimulants on growth, yield components, and storability of garlic (*Allium sativum* L.). *Australian Journal of Crop Science*, 8(2), 271–275. <https://www.researchgate.net/publication/260603191>
- Sharma, H. S. S., Fleming, C., Selby, C., Rao, J. R., & Martin, T. 2014. Plant biostimulants: A review on the processing of macroalgae and use of extracts for crop management to reduce abiotic and biotic streses. *Journal of Applied Phycology*, 26(1), 465–490. <https://doi.org/10.1007/s10811-013-0101-9>
- Shehata, S. M., Abdel-Azem, Heba. S., El-Yazied, A. A., & El-Gizawy, A. M. 2011. Effect of foliar spraying with amino acids and seaweed extract on growth chemical constitutes, yield and its quality of celeriac. *European journal of scientific research*, 58(2), 257–265. <https://www.researchgate.net/publication/273121527>

- Singh, M., Singh, V. P., & S. M. Prasad. 2016. Responses of photosynthesis, nitrogen and proline metabolism to salinity stress in *Solanum lycopersicum* under different levels of nitrogen supplementation. *Plant Physiology and Biochemistry*. 109. 72-83
- Sinulingga, M., & Darmanti, S. 2007. Kemampuan mengikat air oleh tanah pasir yang diperlakukan dengan tepung rumput laut *Gracilaria verrucosa*. <http://www.worldagroforestry.org/>
- Sitompul, S. M. & Guritno, B. 1995. Analisis pertumbuhan tanaman. UGM Press: Yogyakarta
- Suliasih, S., Widawati, & Muharam, A. 2010. Aplikasi pupuk organik dan bakteri pelarut fosfat untuk meningkatkan pertumbuhan tanaman tomat dan aktivitas mikroba tanah. *J. Hort* 20 (3): 241-246.
- Sumarni, N. R. R., & R. S Basuki. 2012. Respon pertumbuhan, hasil umbi dan serapan hara NPK tanaman bawang merah terhadap berbagai dosis pemupukan NPK pada tanah Alluvial. *J Horti*. 22(4):366-375.
- Sumiati, E. & Gunawan, D. O. 2007. Aplikasi pupuk hayati mikoriza untuk meningkatkan efisiensi serapan unsur hara NPK serta pengaruhnya terhadap hasil dan kualitas umbi bawang merah. *J Hortikultura*. 17(1).
- Supraja, K. V., Behera, B., & P. Balasubramanian. 2020. Efficacy of microalgal extracts as biostimulants through seed treatment and foliar spray for tomato cultivation. *Industrial Crops & Products*. 151. 112453
- Sutton M, Howard C and Erisman J. 2011. The european nitrogen assessment: sources, effects and policy perspectives. Cambridge Univ Press, New York, p. 612
- Sutton, M. A., Howard, C. M., Erisman, J. W. Jan W., Billen, G., Bleeker, A., Grennfelt, P., van Grinsven, H., & Grizzetti, B. 2008. The european nitrogen assessment: sources, effects, and policy perspectives. Cambridge University Press.
- Syukur. 2005. Penyerapan boron oleh tanaman jagung di pantai bugel dalam kaitannya dengan tingkat frekuensi penyiraman dan pemberian bahan organik. *Ilmu tanah dan lingkungan*, 5.
- Taiz, L. W., & Zeiger, E. T. 2002. *Plant physiology*, 3rd Edition. Sinaur Associates Inc.
- Tan, Z.X., Lal, R., & Wiebe, K.D. 2005. Global soil nutrient depletion and yield reduction. *J Sustain Agric*. 26:123–146.
- Tanou G, V Ziogas & A Molassiotis. 2017. Foliar nutrition, biostimulants and prime-like dynamics in fruit tree physiology: new insights on and old topic. *Plant Nutrition: Frontiers in Plant Sci* 8(75), 1-9.
- Tarek, A., & Hassan, El-R. 2017. Foliar application from plant nutrition to biofortification. *Env Biodiv Soil Security*. 1, 71-83.
- Teixeira, W. F., Fagan, E. B., Soares, L. H., Soares, J. N., Reichardt, K., & Neto, D. D. 2018. Seed and foliar application of amino acids improve variables of

nitrogen metabolism and productivity in soybean crop. *Frontiers in Plant Science*, 9. <https://doi.org/10.3389/fpls.2018.00396>

Tewari RK, Kumar P, & Sharma PN. 2007. Oxidative stres and antioxidant responses in young leaves of mulberry plants under nitrogen, phosphorus or potassium deficiency. *J Integr Plant Biol*. 49:313– 322.

Thorat, J. C., & More, A. L. 2022. The Effect of Chemical Fertilizers on Environment and Human Health. *International Journal of Scientific Development and Research*, 7(2). www.ijdsr.org

Tilaye, A., Walelign, W., & Hussien, M. B. 2018. Effects of seedling age and rates of phosphorus fertilizer on growth and yield performance of onion (*Allium cepa* L.) under irrigation at Alage, Central Rift Valley of Ethiopia. *African Journal of Plant Science*, 12(9), 215–226. <https://doi.org/10.5897/ajps2018.1694>

Tome, V. D., Pandjaitan, C., & Neunufa, N. 2021. Kajian beberapa tingkat cekaman kekeringan terhadap pertumbuhan dan hasil bawang merah lokal NTT. *Partner*, 2, 311–316.

Tsouvaltzis, P., Kasampali, D. S., Aktsoglou, D. C., Barbayiannis, N., & Siomos, A. S. 2020. Effect of reduced nitrogen and supplemented amino acids nutrient solution on the nutritional quality of baby green and red lettuce grown in a floating sistem. *Agronomy*, 10(7). <https://doi.org/10.3390/agronomy10070922>

Ulfa, Amelia. 2017. Pengaruh biostimulan terhadap bakteri penambat nitrogen dalam upaya meningkatkan produktivitas tanaman padi gogo. Thesis, Universitas Brawijaya.

Voet, D., & Voet, J.D. 2006. *Fundamental of biochemistry life at the moleculat level*. Second edition. John Willey and Sons. Inc. New York.

Wahyuni, S., Yusup, C. A., Eris, D. D., Putra, S. M., Mulyatni, A. S., Siswanto, & Priyono. 2019. Peningkatan hasil dan penekanan kejadian penyakit pada jagung manis (*Zea mays* var. Bonanza) dengan pemanfaatan biostimulan berbahan kitosan. *Menara Perkebunan*. 87(2):131-139.

Wang, D., Deng, X., Wang, B., Zhang, N., Zhu, C., Jiao, Z., Li, R., & Shen, Q. 2019. Effects of foliar application of amino acid liquid fertilizers, with or without *Bacillus amyloliquefaciens* SQR9, on cowpea yield and leaf microbiota. *PLoS ONE*, 14(9). <https://doi.org/10.1371/journal.pone.0222048>

Wang, M., Zheng, Q., Shen, Q., & Guo, S. (2013). The critical role of potassium in plant stres response. *International Journal of Molecular Sciences*, 14(4), 7370–7390. <https://doi.org/10.3390/ijms14047370>

Widiastutik, Y., Rianto, H., & Historiawati. 2018. Pengaruh komposisi dosis pupuk urea, sp-36, kcl dan pupuk organik cair nasa terhadap hasil tanaman bawang merah (*Allium cepa* fa. *ascalonicum*, L.). *Jurnal Ilmu pertanian tropika dan subtropika*. 3(2):61-65

Yakhin, O. I., Lubyantov, A. A., Yakhin, I. A., & Brown, P. H. 2017. Biostimulants in plant science: A global perspective. *frontiers in Plant Science*, 7. <https://doi.org/10.3389/fpls.2016.02049>

- Zhang, X., Huang, G., Bian, X., & Zhao, Q. (2013). Effects of root interaction and nitrogen fertilization on the chlorophyll content, root activity, photosynthetic characteristics of intercropped soybean and microbial quantity in the rhizosphere. *Plant Soil Environ*, 59(2), 80–88.
- Zhao, Y. 2014. Auxin Biosynthesis. The *Arabidopsis* Book, 12, e0173. <https://doi.org/10.1199/tab.0173>
- Zodape, S. T., Gupta, A., Bhandari. S.C., Rawat, U. S., Chaudhary, D. R., Eswaran, K., & J. Chikara. 2011. Foliar application of seaweed sap as biostimulant for enhancement of yield and quality of tomato (*Lycopersicon esculentum* Mill.). *Journal of Scientific & Industrial Research*. 70: 215-219.
- Zörb, C., Senbayram, M., & Peiter, E. (2014). Potassium in agriculture - Status and perspectives. *Journal of Plant Physiology*, 171(9), 656–669. <https://doi.org/10.1016/j.jplph.2013.08.008>