

DAFTAR PUSTAKA

- Abbott, L.K., Robson, A.D., 1984. Formation of external hyphae in soil by four species of vesicular-arbuscular mycorrhizal fungi. *New Phytol.* 99, 245–255.
- Agustin W.,Ilyas S.,Budi S.W., Anas I., Suwarno F.C., 2010. Inokulasi Fungi Mikoriza Arbuskula (FMA) dan Pemupukan P untuk Meningkatkan Hasil dan Mutu Benih Cabai (*Capsicum annuum* L). Departemen Agronomi dan Hortikultura, Fakultas Pertanian, Institut Pertanian Bogor. *J. Agron. Indonesia* 38 (3): 218 – 224
- Ahalya, N. Ramachandra, T., Kanamadi, R., 2003. Biosorption of heavy metals, *Res. J. Chem. Environ.* 7, 71-78.
- Aitken R.L, Dickson T, Hailes K.J, Moody P.W. 1999 . Response of field-grown maize to applied magnesium in acidic soils in north-eastern Australia, *Aust. J. Agvic. Res.* 50. 191-198.
- Akiyama, K., Matsuzaki, K., Hayashi, H., 2005. Plant sesquiterpenes induce hyphal branching in arbuscular mycorrhizal fungi. *Nature* 435, 824–7. doi:10.1038/nature03608
- Allen, M.F., Swenson, W., Querejeta, J.I., Warburton E., L.M., Treseder, K.K., 2003. Ecology of mycorrhizae: a conceptual framework for complex interactions among plants and fungi. *Annu. Rev. Phytopathol.* 41, 271–303. doi:10.1146/annurev.phyto.41.052002.095518
- Alzueta, I., Abeledo, L.G., Mignone, C.M., Miralles, D.J., 2012. Differences between wheat and barley in leaf and tillering coordination under contrasting nitrogen and sulfur conditions. *Eur. J. Agron.* 41, 92–102.
- Andersson, I. 2008. Catalysis and regulation in Rubisco. *Journal of Experimental Botany* 59, 1555-1568.
- Andrews, M., Sprent, J.I., Raven ,J.A., Eady, P.E., 1999. Relationships between shoot to root ratio,growth and leaf soluble protein concentration of *Pisum sativum*, *Phaseolus vulgaris* and *Triticum aestivum* under different nutrient deficiencies. *Plant Cell and Environment* 22, 949-958
- Antunes, P.M., Lehmann, A., Hart, M.M., Baumecker, M., Rillig, M.C., 2012. Long-term effects of soil nutrient deficiency on arbuscular mycorrhizal communities. *Funct. Ecol.* 26, 532e540. <https://doi.org/10.1111/j.1365-2435.2011.01953.x>.
- Armengaud P.,Sulpice R., Miller A.J,Stitt M., Amtmann A.,Gibon Y., 2009. Multilevel analysis of primary metabolism provides new insights into the role of potassium nutrition for glycolysis and nitrogen assimilation in *Arabidopsis* roots, *Plant Physiol.* 150 .P. 772–785

- Audet, P., Charest, C. 2006. Effects of AM colonization on “wild tobacco” plants grown in zinc-contaminated soil. *Mycorrhiza* 16, 277–83. doi:10.1007/s00572-006-0045-x
- Auge', R. M. 2001. Water relations, drought and VA mycorrhizal symbiosis. *Mycorrhiza*, 11, 3–42.
- Auge', R. M. 2004. Arbuscular mycorrhizae and soil/plant water relations. *Canadian Journal of Soil Science*, 84, 373–381.
- Aulakh M.S and Aulakh N.S., 2005. Interactions of nitrogen with other nutrients and water: effect on crop yield and quality, nutrient use efficiency, carbon sequestration, and environmental pollution. *Adv Agron* 2005, 86:341-409
- Averill, C., Bhatnagar, J.M., Dietze, M.C., Pearse, W.D., Kivlin, S.N., 2019. Global imprint of mycorrhizal fungi on whole-plant nutrient economics. *Proc. Natl Acad. Sci. U.S.A.* 116 (46), 23163_23168.
- Azanza F., Tadmor Y, Klein B.P. 1996. QTL influencing chemical and sensory characteristics of eating quality in sweet corn. *Genome*, 39, 40-50
- Bago B . 2000. Putative sites for nutrient uptake in arbuscular mycorrhizal fungi. *Plant Soil* 226 : 263–274
- Bago, B., Pfeffer, P.E., Abubaker, J., Jun, J., Allen, J.W., Brouillette, J., Douds, D.D., Lammers, P.J., Shachar-hill, Y., 2003. Carbon Export from Arbuscular Mycorrhizal Roots Involves the Translocation of Carbohydrate as well as Lipid 131, 1496–1507. doi:10.1104/pp.102.007765.labeling
- Bago, B., Zipfel, W., Williams, R.M., Jun, J., Arreola, R., Lammers, P.J., Pfeffer, P.E., Shachar-Hill, Y., 2002. Translocation and Utilization of Fungal Storage Lipid in the Arbuscular Mycorrhizal Symbiosis. *Plant Physiol.* 128, 108–124. doi:10.1104/pp.010466
- Bahram, M., Hildebrand, F., Forslund, S. K., Anderson, J. L., Soudzilovskaia, N. A., Bodegom, P. M., & Huerta-Cepas, J. 2018. Structure and function of the global topsoil microbiome. *Nature*, 560(7717), 233–237
- Baptista P, Tavares RM, Neto TL. 2011. Signaling in ectomycorrhizal symbiosis establishment. In: Rai M dan Varma A, editor. *Diversity and Biotechnology of Ectomycorrhizae*. Portugal (PT). Springer
- Barber, S.A., 1995. *Soil nutrient bioavailability: a mechanistic approach*, second ed. John Wiley and Sons, New York, NY.
- Battie-Laclau P., Laclau J.P., Beri C., Mietton L., Muniz M.R.A., Arenque B.C., Piccolo M.D.C., Jordan-Meille L., Bouillet J.P., Nouvellon Y., 2014. Photosynthetic and anatomical responses of *Eucalyptus grandis* leaves to potassium and sodium supply in a field experiment, *Plant Cell Environ.* 37.P. 70–81

- Begum, H., Ahanger, M.A., Su, Y., Lei, Y., Mustafa, N.S.A., Ahmad, P., Zhang, L., 2019. Improved drought tolerance by AMF inoculation in maize (*Zea mays*) involves physiological and biochemical implications. *plants.* 8, 579. <https://doi.org/10.3390/plants8120579>
- Begum, Y. A., & Deka, S. C., 2019. Chemical profiling and functional properties of dietary fibre rich inner and outer bracts of culinary banana flower. *Journal of Food Science & Technology.* <https://doi.org/10.1007/s13197-019-04000-4>
- Ben-Asher, J., Garcia, Y.G.A, Hoogenboom, G., 2008. Effect of high temperature on photosynthesis and transpiration of sweet corn (*Zea mays* L. var. *rugosa*). *Photosynthetica.* 46, 595-603.
- Bender, S. F., Plantenga, F., Neftel, A., Jocher, M., Oberholzer, H.R., Kohl, L., Giles, M., Daniell, T.J., Van der Heijden, M.G.A., 2014. Symbiotic relationships between soil fungi and plants reduce N₂O emissions from soil. *The ISME Journal* 8, 1336-1345.
- Bing, Y., Ketterings, Q., Czymbek, K., Albers, C.X., Herendeen, N., Cherney, J., Mikkelsen, R., 2011. Nutrient Management Spear Program, <http://nmsp.cals.cornell.edu>
- Bingham, M.A., Simard, S.W., 2011. Do mycorrhizal network benefits to survival and growth of interior Douglas-fir seedlings increase with soil moisture stress? *Ecology and evolution* 1, 306e316.
- Blankenship R.E .,2014. Molecular Mechanisms of Photosynthesis, 2nd Edn. John Wiley and Sons, Chichester,UK
- Bolan, N.S., Arulmozhiselvan, K., Paramasivam, P., 2006. Magnesium. In: Lal R, ed. Encyclopedia of Soil Science, Vol. 2; Taylor & Francis Group, New York, United States
- Bonan, G. 2015. Ecological climatology. Concepts and applications. Cambridge. Cambridge University Press
- Bonfante, P., Anca, I.A., 2009. Plants, mycorrhizal fungi, and bacteria: a network of interactions. *Annu. Rev. Microbiol.* 63, 363–383.
- Bonte, D., Juvik J. 1990. Characterization on sugary-1 (su-1) sugary enhancer (se) kernels in segregating sweet corn populations., *Journal of the American Society for Hort. Science*,115: 153-157
- Borie, F., Rubio, R., Morales,A., 2008. Arbuscular Mycorrhizae Fungi And Soil Agregation. Universidad de La Frontera. Casilla 54-D-Temuco. Corresponding author: fborie@ufro.cl. *J. Soil Sc. Plant Nutr.* 8 (2) 2008 (9-18)
- BPP Pertanian., 2020. Rekomendasi Pupuk N, P, Dan K Spesifik Lokasi Untuk Tanaman Padi, Jagung Dan Kedelai Pada Lahan Sawah (Per Kecamatan). Badan Penelitian Dan Pengembangan Pertanian. Kementerian Pertanian. 415 Hal

- Briskind, P., Pooler, J., 1983. Role of magnesium in plasma membrane ATPase of red beet . *Plant Physiol*, 71 P: 969-971.
- Brundrett, M C., Tedersoo, L., 2018. Evolutionary history of mycorrhizal symbioses and global host plant diversity. *New Phytol*. 220, 1108–1115.
- Brundrett, M.C., N. Bouger, B. Dells, T. Grove, And N. Malajczuk. 1996. Working with Mycorrhizas in Forestry and Agriculture. ACIAR. Canberra.
- Brzezowski, P., Richter, A.S., Grimm, B., 2015. Regulation And Function Of Tetrapyrrole Biosynthesis In Plants And Algae. *Biochim. Biophys. Acta* 1847(9), 968-985
- Bücking H., Liepold E., Ambilwade P., 2012. The Role Of The Mycorrhizal Symbiosis In Nutrient Uptake Of Plants And The Regulatory Mechanisms Underlying These Transport Processes. Intech, Rijeka
- Bücking, H., Kafle, A., 2015. Role Of Arbuscular Mycorrhizal Fungi In The Nitrogen Uptake Of Plants: Current Knowledge And Research Gaps. *Agronomy* 5, 587–612.
- Budi S.W., Kemala I.F., Turjaman M. 2014. Pemanfaatan Fungi Mikoriza Arbuskula (FMA) Dan Arang Tempurung Kelapa Untuk Meningkatkan Pertumbuhan Semai Gmelina arborea Roxb. Dan Ochroma bicolor Rowlee. di persemaian. *J.Silvikultur Trop* 5 (1): 24-32
- Budiwanto, S., 2014. Metode Statistika untuk Analisis Data Bidang Keolahragaan, Malang: Universitas Negeri Malang
- Cai, J., Chen, L., Qu, H., Lian, J., Liu, W., Hu, Y., Xu, G., 2012. Alteration Of Nutrient Allocation And Transporter Genes Expression In Rice Under N, P, K, and Mg deficiencies. *Acta Physiologiae Plantarum* 34, 939-946.
- Cakmak I . 2013. Magnesium In Crop Production, Food Quality And Human Health. *Plant and Soil* 368, 1–4. doi:10.1007/s11104-013-1781-2
- Cakmak I and Yazici A.M., 2010. Magnesium: a forgotten element in crop production, Better Vol. 94, 23-25; International Plant Nutrition Institute (IPNI).
- Cakmak, I., Hengeler, C., Marschner, H., 1994a. Changes in phloem export of sucrose in leaves in response to phosphorus, potassium and magnesium deficiency in bean plants. *Journal of Experimental Botany* 45, 1251-1257.
- Cakmak, I., Hengeler, C., Marschner, H., 1994b. Partitioning of Shoot and Root Dry Matter and Carbohydrates in Bean Plants Suffering from Phosphorus, Potassium and Magnesium Deficiency. *Journal of Experimental Botany* 45, 1245-1250.
- Cakmak,I ., E.A. Kirkby. 2008. Role of magnesium in carbon partitioning and alleviating photooxidative damage, *Physiol. Plant*. 133 : 692–704.

- Cavagnaro, T.R., 2008. The role of arbuscular mycorrhizas in improving plant zinc nutrition under low soil zinc concentrations: a review. *Plant Soil* 304, 315–325
- Ceglarek, F. 2002. Szczegółowa uprawa roślin rolniczych - morfologia i biologia roślin. Wyd.Akad. Podl. Siedlce
- Cerrudo, A., di Matteo, J.A., Fernandez, E., Robles, M., Pico Olmedo, L., Andrade, F.H., 2013. Yield components of maize as affected by short shading periods and thinning. *Crop Pasture Sci.* 64, 580–587.
- Chagnon, P. L., F. Rineau, and C. Kaiser. 2016. Mycorrhizas across scales: a journey between genomics, global patterns of biodiversity and biogeochemistry. *New Phytologist* 209:913-916
- Chalot, M., Blaudez, D., Brun, A., 2006. Ammonia: a candidate for nitrogen transfer at the mycorrhizal interface. *Trends in Plant Science* 11, 263–266.
- Chen, J., Li, L.G., Liu, Z.H., Yuan, Y.J., Guo, L.L., Mao, D.D., Tian, L.F., Chen, L.B., Luan, S., Li, D.P., 2009. Magnesium transporter AtMGT9 is essential for pollen development in *Arabidopsis*. *Cell Res* 2009, 19:887-898
- Chen, M. 2014. Chlorophyll modifications and their spectral extension in oxygenic photosynthesis. *Annual Review of Biochemistry*, 83, 317–340
- Chen, Y.L., Xiao, C.X., Wu, D.L., Xia, T.T., Chen, Q.W., Chen, F.J., Mi, G.H., 2015. Effects of nitrogen application rate on grain yield and grain nitrogen concentration in two maize hybrids with contrasting nitrogen remobilization efficiency. *Eur. J. Agron.* 62, 79–89.
- Chen, Z.C ., W.T.Peng ., J. Li ., H. Liao . 2017. Functional dissection and transport mechanism of magnesium in plants. Root Biology Center, Fujian Agriculture and Forestry University, Fujian, Fuzhou 350002, China. National Natural Science Foundation of China (No. 31672218). <http://dx.doi.org/10.1016/j.semcd.2017.08.005>
- Chern, E.C., Tsai, D.W., Ogunseitan, O. A., 2007. Deposition of Glomalin-Related Soil Protein and Sequestered Toxic Metals into Watersheds. *Environ. Sci. Technol.* 41, 3566–3572. doi:10.1021/es0628598
- Cole, F.X., Schimmel, P.R., 1970. Isoleucyl transfer ribonucleic acid synthetase. The role of magnesium in amino acid activation. *Biochemistry* 9, 3143-3148.
- Conn, S.J., Conn, V., Tyerman, S.D., Kaiser, B.N., Leigh, R.A., Gillham, M., 2011. Magnesium transporters, MGT2/MRS2-1 and MGT3/MRS2-5, are important for magnesium partitioning within *Arabidopsis thaliana* mesophyll vacuoles. *New Phytologist* 190, 583-594.
- Cornejo, P., Meier, S., Borie, G., Rillig, M.C., Borie, F., 2008. Glomalin-related soil protein in a Mediterranean ecosystem affected by a copper smelter and its

- contribution to Cu and Zn sequestration. *Sci. Total Environ.* 406, 154–60. doi:10.1016/j.scitotenv.2008.07.045
- Corrêa, A., Cruz, C., Ferrol, N., 2015. Nitrogen and carbon/nitrogen dynamics in arbuscular mycorrhiza: the great unknown. *Mycorrhiza* 25, 499–515.
- Coskun D., D.T. Britto D.T., H.J. Kronzucker H.J., 2017. The nitrogen-potassium intersection: membranes, metabolism, and mechanism, *Plant, Cell Environ.* 40.p. 2029–2041.
- Croce, R., and van Amerongen, H., 2014. Natural strategies for photosynthetic light harvesting. *Nature Chemical Biology*, 10, 492–501
- Croft H and Chen J.M., 2018. Leaf Pigment Content. University of Toronto, Toronto, ON, Canada. Elsevier Inc. All rights reserved.p. 117-138
- Dahlia. 2001. *Fisiologi Tumbuhan*. Malang: Jurusan Pendidikan Biologi FMIPA. Universitas Negeri Malang. 116 hal
- Dawson T.E., 1998. Fog in the California redwood forest: ecosystem inputs and use by plants, *Oecologia* 117 ; 476–485
- De Mita, S., Streng, A., Bisseling, T., and Geurts, R. 2014. Evolution of a symbiotic receptor through gene duplications in the legume-rhizobium mutualism. *New Phytol* 201:961-972
- de Novais, C. B., W. L. Borges, E. da Conceic, ão Jesus, O. J. Saggin Júnior, J. O. Siqueira. 2014. Inter- and intraspecific functional variability of tropical arbuscular mycorrhizal fungi isolates colonizing corn plants. *Applied Soil Ecology* 76:78– 86
- Dechen A.R., Carmello Q.A.C., Monteiro F.A, Nogueiro R.C., 2015. Role of magnesium in food production: an overview, *Crop Pasture Sci.* 66 . 1213.
- Dei H. K., 2017. Assessment Of Maize (*Zea mays*) As Feed Resource For Poultry. *Poult. Sci.* 1, P: 1–32.
- Delavaux, C.S., Smith-Ramesh, L.M., Kuebbing, S.E ., 2017. Beyond nutrients: A meta analysis of the diverse effects of arbuscular mycorrhizal fungi on plants and soils. Yale University, School of Forestry and Environmental Studies, 195 Prospect Street, New Haven CT 06511. doi:10.1002/ecy.1892
- Demidchik, V., Davenport, R.J., Tester, M., 2002. Nonselective cation channels in plants. *Annual Review of Plant Biology* 53, 67-107.
- Dewi, A.I.R. 2007. Peran, Prospek dan Kendala Dalam Pemanfaatan Endomikoriza. Jurusan Budidaya Pertanian, Program Studi Agronomi, UNPAD : Jatinangor

- Dietz, S., von Bülow J., Beitz E., Nehls U., 2011. The aquaporin gene family of the ectomycorrhizal fungus *Laccaria bicolor*: lessons for symbiotic functions. *New Phytol* 190:927–940
- Ding Y., Luo W., Xu G., 2006. Characterisation of magnesium nutrition and interaction of magnesium and potassium in rice, *Ann. Appl. Biol.* 149 .P. 111–123.
- Ding Y., Chang C., Luo W., Wu Y., Ren X., Wang P., Xu G., 2008. High potassium aggravates the oxidative stress induced by magnesium deficiency in rice leaves, *Pedosphere* 18 .P. 316–327.
- Dodd, J.C., Boddington, C.L., Rodriguez, A., Gonzalez-Chavez, C., Mansur, I .2000. Mycelium of arbuscular mycorrhizal fungi (AMF) from different genera: form, function and detection. *Plant Soil* 226:131–151
- Dongoran, D. 2009. Respon Pertumbuhan Dan Produksi Tanaman Jagung Manis (*Zea mayz saccharata* Sturt) Terhadap Pemberian Pupuk Cair TNF Dan Pupuk Kandang Ayam. Skripsi. Fakultas Pertanian Universitas Sumatera Utara. Medan. 73 Hal
- Douds, D.D., D.O. Wilson., R.Seidel., C. Ziegler-Ulsh. 2016. A Method To Minimize The Time Needed For Formation Of Mycorrhizas in Sweet Corn Seedlings For Outplanting Using AM Fungus Inoculumproduced On-Farm. USDA-ARS Eastern Regional Research Center 600, E. Mermaid Lane, Wyndmoor, PA 19038, United States. *Scientia Horticulturae* 203 (2016) 62–68
- Dunn M.L., Jain, V., Klein, B.P., 2014. Stability Of Key Micronutrients Added To Fortified Maize Flours And Corn Meal. *Ann. N. Y. Acad. Sci.* 1312 (1) P : 15–25. <https://doi.org/10.1111/nyas.12310>
- 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., Millard P., 2016. In situ $^{13}\text{CO}_2$ pulse labelling of field-grown eucalypt trees revealed the effects of potassium nutrition and throughfall exclusion on phloem transport of photosynthetic carbon, *Tree Physiol.* 36 (1) P : 6–21.
- Epstein, E. 1972. Mineral Nutrition of Plants: Principles and Perspectives. John Wiley and Sons, Inc. Toronto. 412p
- Ester J.J., Bracken M.E.S., Cleland E.E., Gruner D.S., Harpole W.S., Hillebrand H., Ngai J.T., Seabloom E.W., Shurin J.B., Smith J.E., 2007. Global analysis of nitrogen and phosphorus limitation of primary producers in freshwater, marine and terrestrial ecosystems. *Ecol Lett* 2007, 10:1135-1142
- Facelli, E., S. E. Smith, and F. A. Smith. 2009. Mycorrhizal symbiosis- overview and new insights into roles of arbuscular mycorrhizas in agro-and natural ecosystems. *Australian Plant Pathology* 38:338-344

- Fagbemigun, Taiwo, K., Fagbemi O.D., Otitoju, O., Mgbachiuzor, E., Igwe C.C. 2014. "Pulp and Paper-Making Potential of Cornhusk". Lagos-Nigeria International Journal of Agri Science Vol. 4(4): 209-213
- Fageria V.D., 2001. Nutrient interactions in crop plants. *J Plant Nutr* 2001, 24:1269-1290
- Farhat N., Elkhouni A., Zorrig W., Smaoui A., Abdelly C., Rabhi M., 2016. Effects of magnesium deficiency on photosynthesis and carbohydrate partitioning, *Acta Physiol. Plant.* 38 ; 145.
- Farhat N., Rabhi M., Falleh H., Lengliz K., Smaoui A., Abdelly C., Lachaal M., Bouraoui N. K., 2013. Interactive effects of excessive potassium and Mg deficiency on safflower, *Acta Physiol. Plant.* 35 .P. 2737–2745, <https://doi.org/10.1007/s11738-013-1306-x>
- Farhat, N., A. Elkhouni., W. Zorrig . 2016. Effects of magnesium deficiency on photosynthesis and carbohydrate partitioning. *Acta Physiol Plant*;38: 1–10
- Farzaneh, M., Vierheilig, H., Lossl, A., Kaul, H.P., 2011. Arbuscular mycorrhiza enhances nutrient uptake in chickpea. *Plant. Soil. Environ.* 57 (10), 465_470
- Farzaneh, M., Wichmann, S., Vierheilig, H., Kaul, H.P., 2009. The Effects Of Arbuscular Mycorrhiza And Nitrogen Nutrition On Growth Of Chickpea And Barley. *Pflanzenbauwissenschaften* 13 (1), 15_22.
- Faust F and Schubert S ., 2016. Protein Synthesis Is The Most Sensitive Process When Potassium Is Substituted By Sodium In The Nutrition Of Sugar Beet (*Beta vulgaris*). *Plant Physiol Biochem* 107: 237–247
- Felczyński, K., Bąkowski J. Michalik H. 1999. Czynniki wpływające na jakość plonu i wartość odświeżającej kukurydzy cukrowej. *Ogrodnicztwo*, 3, 18-22
- Fellbaum, C.R., Gachomo E.W., Beesetty Y., Choudhari S., Strahan G.D., Pfeffer P.E., Kiers E.T., Bücking H., 2012a. Carbon availability triggers fungal nitrogen uptake and transport in arbuscular mycorrhizal symbiosis. *Proc Natl Acad Sci USA* 109:2666–2671
- Fellbaum, C.R., Mensah J.A., Pfeffer P.E., Kiers E.T., Bücking H., 2012b. The role of carbon in fungal nutrient uptake and transport: implications for resource exchange in the arbuscular mycorrhizal symbiosis. *Plant Signal Behav* 7:1509–1512
- Fernández, V., Sotiropoulos, T., Brown, P. 2013. Foliar Fertilization - Scientific Principles and Field Practices. International Fertilizer Industry Association (IFA), Paris, France.
- Ferrol, N., C. A. Aguilar., J.P. Tienda., 2018. Arbuscular Mycorrhizas As Key Players In Sustainable Plant Phosphorus Acquisition: An overview on the mechanisms involved. Departamento de Microbiología del Suelo y Sistemas Simbióticos,

Estación Experimental del Zaidín, CSIC, C. Profesor Albareda 1, 18008, Granada, Spain

- Ferrol, N., Tamayo, E., Vargas, P., 2016. The heavy metal paradox in arbuscular mycorrhizas: from mechanisms to biotechnological applications. *J. Exp. Bot.* 67 (22), P.6253–6265.
- Field K.J., Cameron D.D., Leake J.R., Tille S., Bidartondo M.I., Beerling D.J., 2012. Contrasting arbuscular mycorrhizal responses of vascular and non-vascular plants to a simulated Palaeozoic CO₂ decline. *Nat Commun.* 3:835.
- Fikrinda., Syafruddin., Sufardi ., Sriwati R. 2016. Keanekaragaman Fungi Mikoriza Arbuskula Di Rizosfer Beberapa Varietas Jagung Pada Inseptol. Fakultas Pertanian Universitas Syiah Kuala
- Filion, M., St-Arnaud, M., & Fortin, J. A. 1999. Direct interaction between the arbuscular mycorrhizal fungus *Glomus intraradices* and different rhizosphere microorganisms. *New Phytologist*, 141, 525–533.
- Fischer, E.S., Lohaus, G., Heineke, D., Heldt, H.W., 1998. Magnesium deficiency results in accumulation of carbohydrates and amino acids in source and sink leaves of spinach. *Physiologia Plantarum* 102, 16-20.
- Frank B. 2005. On the nutritional dependence of certain trees on root symbiosis with belowground fungi. *Mycorrhiza* 15, 267–275. (Translation of Frank's original 1885 paper)
- Friese, C.F., Allen, M.F., 1991. Mycological Society of America The Spread of VA Mycorrhizal Fungal Hyphae in the Soil : Inoculum Types and External Hyphal Architecture. *Mycological Soc. Am.* 83, 409–418.
- Fusseder, A., 1987. The longevity and activity of the primary root of maize. *Plant Soil* 101, 257–265.
- Gardner, P., Franklin, B. R., Pearce., Mitchell R.L., 1991. *Fisiologi Tanaman Budidaya*. Terjemahan oleh Herawati ,Susilo. Universitas Indonesia. Jakarta
- Gebert, M., Meschenmoser, K., Svidova, S., Weghuber, J., Schweyen, R., Eifler, K., Lenz, H., Weyand, K., Knoop, V., 2009. A root-expressed magnesium transporter of the MRS2/MGT gene family in *Arabidopsis thaliana* allows for growth in low-Mg²⁺ environments. *Plant Cell* 21, 4018-4030.
- Genre, A., Chabaud, M., Faccio, A., Barker, D.G., Bonfante, P., 2008. Prepenetration apparatus assembly precedes and predicts the colonization patterns of arbuscular mycorrhizal fungi within the root cortex of both *Medicago truncatula* and *Daucus carota*. *Plant Cell* 20, 1407–20. doi:10.1105/tpc.108.059014
- George, E. 2000. Nutrient uptake. In: Kapulnik Y, Douds DD (eds) *Arbuscular mycorrhizas:physiology and function*. Kluwer, Dordrecht, pp 307–343

- George, E., Marschner, H., Jakobsen, I., 1995. Role of arbuscular mycorrhizal fungi in uptake of phosphorus and nitrogen from soil. Critical Reviews in Biotechnology 15, 257–270.
- Gerendás, J., H. Führs. 2013. The significance of magnesium for crop quality, Plant Soil. 368 :101–128.
- Giasson, P., Jaouich, A., Gagné, S., Moutoglou, P., 2005. Arbuscular mycorrhizal fungi involvement in zinc and cadmium speciation change and phytoaccumulation, Remediation 15, 75-81.
- Gniazdowska A and Rychter A.M., 2000. Nitrate uptake by bean (*Phaseolus vulgaris* L.) roots under phosphate deficiency. Plant Soil 2000, 226:79-85
- Gobert, A., Plassard, C., 2008. The beneficial effect of mycorrhizae on N utilization by the host-plant: myth or reality? In: Varma, A., (Ed.), Mycorrhiza. Springer-Verlag, Berlin, pp. 209–240.
- Gohre, V., Paszkowski, U., 2006. Contribution of the arbuscular mycorrhizal symbiosis to heavy metal phytoremediation. Planta 223, 1115-1122.
- Goltapeh E.M., Danesh Y.Z., Prasad R., Varma A., 2008. Mycorrhizal fungi: what we know and what should we know In : Varma A, editor. Mycorrhiza: State of the Art, Genetics and Molecular Biology, EcoFunction, Biotechnology, Eco-Physiology, Structure and Systematics. India (IN). Springer
- González-Chávez, M.C., Carrillo-González, R., Wright, S.F., Nichols, K. a, 2004. The role of glomalin, a protein produced by arbuscular mycorrhizal fungi, in sequestering potentially toxic elements. Environ. Pollut. 130, 317–23. doi:10.1016/j.envpol.2004.01.004
- Govindarajulu, M., Pfeffer, P.E., Jin, H., Abubaker, J., Douds, D.D., Allen, J.W., Bücking, H., Lammers, P.J., Shachar-Hill, Y., 2005. Nitrogen transfer in the arbuscular mycorrhizal symbiosis. Nature 435, 819–23. doi:10.1038/nature03610
- Gransee, A., Führs, H., 2013. Magnesium mobility in soils as a challenge for soil and plant analysis, magnesium fertilization and root uptake under adverse growth conditions. Plant and Soil 368, 5-21.
- Grelet, G.-A., Meharg, A.A., Duff, E.I., Anderson, I.C., Alexander, I.J., 2009. Small genetic differences between ericoid mycorrhizal fungi affect nitrogen uptake by *Vaccinium*. New Phytologist 181, 708–718
- Groisman, E.A., Hollands, K., Kriner, M.A., Lee, E. -J., Park, S. -Y., Pontes, M.H., 2013. Bacterial Mg²⁺ Homeostasis, Transport, and Virulence. Annual Review of Genetics 47, 625 –646. <https://doi.org/10.1146/annurev-genet-051313-051025>
- Grzebisz W., 2011. Magnesium-food and human health, J Elem. 16 .P. 299-323

- Grzebisz, W., 2013. Crop response to magnesium fertilization as affected by nitrogen supply. *Plant and Soil* 368, 23-39.
- Guo, W. 2017. Magnesium Homeostasis Mechanisms And Magnesium Use Efficiency In Plants. Zhejiang Sci-Tech University, Hangzhou, Zhejiang, China. *Plant Macronutrient Use Efficiency*. Chapter 11 : 197-213
- Guo, W., H.Nazim ., Z. Liang ., D. Yang . 2015. Magnesium deficiency in plants: An urgent realistic problem. College of Life Science, Zhejiang Sci-Tech University, Xiasha Campus, Hangzhou, 310018, China. *The Crop Journal*
- Gwirtz, J.A., and Garcia-Casal, M.N., 2014. Processing Maize Flour And Corn Meal Food Products. *Ann. N. Y. Acad. Sci.* 1312, P: 66–75. <https://doi.org/10.1111/nyas.12299>.
- Hadi, S. 1994. —Taksonomi dan Biologi Mikoriza. Laporan Program Pelatihan Biologi dan Bioteknologi Mikorizal. Vol. II. Seameo Biotrop. Bogor. Hal. 21-40
- Hall, D.O. and Rao K.K., 1987. Photosynthesis. New Studies in Biology Series No. 37. Edward Arnold (Publishers) Ltd
- Han, M., Wei, W., Wei-H.W., Yi W. 2016. Potassium Transporter KUP7 Is Involved in K⁺ Acquisition and Translocation in Arabidopsis Root under K⁺-Limited Conditions. State Key Laboratory of Plant Physiology and Biochemistry (SKLPPB), College of Biological Sciences, National Plant Gene Research Centre (Beijing), China Agricultural University, Beijing 100193, China
- Handayani K. D., 2003. Pertumbuhan dan Produksi Beberapa Varietas Jagung (*Zea mays* L.) pada Populasi yang Berbeda dalam Sistem Tumpang Sari dengan Ubi Kayu (*Manihot esculenta* Crantz). Skripsi: Departemen Budidaya Pertanian, Fakultas Pertanian, Institut Pertanian Bogor
- Handayanto, A. dan Hairiah. 2007. Biologi Tanah, landasan Pengelolaan Tanah Sehat. Pustaka Adipura : Yogyakart
- Hanstein, S .2011. Changes in cytosolic Mg levels can regulate the activity of the plasma membrane H-ATPase in maize. *Biochem J* 435:93–101
- Hao, Z., Xie, W., Jiang, X., Wu, Z., Zhang, X., Chen, B., 2019. Arbuscular mycorrhizal fungus improves rhizobium *glycyrrhiza* seedling symbiosis under drought stress. *Agronomy* 9 (10), 572
- Harahap L.H. , Hanafiah A.S., Guchi H. 2018. Efektifitas Pemberian Mikoriza Terhadap Serapan Hara N dan P Tanaman Karet (*Hevea brasiliensis* Muell. Arg.) Pada Lahan Dengan Cekaman KekeringanYang Telah Diberi Bahan Organik Di Desa Aek GodangKecamatan Hulu SihapasKabupaten Padang LawasUtara.

Program Studi Agroekoteknologi Fakultas Pertanian USU Medan 20155.
JurnalAgroekoteknologi FP USU. Vol.6.No.1, (23): 167- 173

Hardenburg, R.E., Watada A.E. 1986. The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks. U.S. Dept. Agric. Handbook 66.

Harizamry. 2017.Tanaman Jagung Manis. Penebar Swadaya. Jakarta

Hawkesford, M., Horst, W., Kichey, T., Lambers, H., Schjoerring, J., Møller, I.S., White, P., 2012. Functions of macronutrients. In: Marschner, P. (Ed.), Marschner's Mineral Nutrition of Higher Plants, 3rd ed. Academic Press, London.

Hawkins, H.J., George, E., 1999. Effect of plant nitrogen status on the contribution of arbuscular mycorrhizal hyphae to plant nitrogen uptake. *Physiologia Plantarum* 105, 694–700

He H., Jin X., Ma H., Deng Y., Huang J., Yin L., 2020. Changes of plant biomass partitioning, tissue nutrients and carbohydrates status in magnesiumdeficient banana seedlings and remedy potential by foliar application of magnesium, *Sci. Hortic.* 268 .P. 109377.

Heijden van der, G., Legout, A., Midwood, A. J., Craig, C. A., Pollier, B., Ranger, J., Dambrine, E. 2013. Mg and Ca root uptake and vertical transfer in soils assessed by an in situ ecosystem- scale multi-isotopic (^{26}Mg & ^{44}Ca) tracing experiment in a beech stand (Breuil-chenue, France). *Plant and Soil*, 369, 33–45

Helber N., Wippel K., Sauer N., Schaarschmidt S., Hause B., Requena N., 2011. A versatile monosaccharide transporter that operates in the arbuscular mycorrhizal fungus *Glomus* sp is crucial for the symbiotic relationship with plants. *Plant Cell* 23:3812–3823.

Herlina, 2011. Kajian Variasi Jarak Dan Waktu Tanam Jagung Manis dalam Sistem Tumpang Sari Jagung Manis (*Zea mays saccharata* Sturt) dan Kacang Tanah (*Arachis hypogea* L). Artikel Program Pasca Sarjana Universitas Andalas. Padang

Hermans, C., Bourgis, F., Faucher, M., Strasser, R.J., Delrot, S., Verbruggen, N., 2005. Magnesium deficiency in sugar beets alters sugar partitioning and phloem loading in young mature leaves. *Planta* 220, 541-549.

Hermans, C., Johnson, G.N., Strasser, R.J., Verbruggen, N., 2004. Physiological characterisation of magnesium deficiency in sugar beet: acclimation to low magnesium differentially affects photosystems I and II. *Planta* 220, 344-355.

Hermans, C., Verbruggen, N. 2005. Physiological characterization of Mg deficiency in *Arabidopsis thaliana*. *Journal of Experimental Botany* 56, 2153-2161.

Hermans, C., Vuylsteke, M., Coppens, F., Craciun, A., Inze, D., Verbruggen, N., 2010a. Early transcriptomic changes induced by magnesium deficiency in

Arabidopsis thaliana reveal the alteration of circadian clock gene expression in roots and the triggering of abscisic acidresponsive genes. New Phytologist 187, 119-131.

Hermans, C., Vuylsteke, M., Coppens, F., Cristescu, S.M., Harren, F.J.M., Inze, D., Verbruggen, N., 2010b. Systems analysis of the responses to long-term magnesium deficiency and restoration in *Arabidopsis thaliana*. New Phytologist 187, 132-144.

Hermans, C., S.J., Conn, J., Chen, Q., Xiao, N., Verbruggen. 2013. An update on magnesium homeostasis mechanisms in plants, Metallomics. 5 : 1170–1183.

Hidayati, N. 2009. Efektivitas Pupuk Hayati pada berbagai Lama Simpan terhadap Pertumbuhan Tanaman Padi (*Oryza sativa*) dan Jagung (*Zea mays*). Skripsi. Departemen Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Institut Pertanian Bogor. Bogor

Hidema J, Makino A, Kurita Y, Mae T, Ojima K. 1992. Changes in the levels of chlorophyll and light-harvesting chlorophyll a/b protein of PSII in rice leaves aged under different irradiances from full expansion through senescence. Plant and Cell Physiology 33: 1209–1214

Hochholdinger, F., Woll, K., Sauer, M., Dembinsky, D., 2004. Genetic dissection of root formation in maize (*Zea mays*) reveals root-type specific developmental programmes. Ann. Bot. 93, 359–368.

Horie T., Brodsky D.E., Costa A., Kaneko T., Lo Schiavo F., Katsuhara M., Schroeder J.I., 2011. K⁺ Transport by the OsHKT2;4 Transporter from Rice with Atypical Na⁺ Transport Properties and Competition in Permeation of K⁺ over Mg²⁺ and Ca²⁺ Ions, Plant Physiol. 156 (2011) 1493–1507.

Hu W., Yang J., Meng Y., Wang Y., Chen B., Zhao W., Oosterhuis D.M., Zhou Z., 2015. Potassium application affects carbohydrate metabolism in the leaf subtending the cotton (*Gossypium hirsutum* L.) boll and its relationship with boll biomass, Field Crops Res. 179 (2015) 120–131.

Huang J.H., Xu J., Ye X., Luo T.Y., Ren L.H., Fan G.C., Qi Y.P., Li Q., Ferrarezi R.S., Chen L.S., 2019. Magnesium deficiency affects secondary lignification of the vascular system in *Citrus sinensis* seedlings, Trees Struct. Funct. 33 .P. 171–182,<https://doi.org/10.1007/s00468-018-1766-0>.

Humphreys, C. P., Franks, P. J., Rees, M., Bidartondo, M. I., Leake, J. R., & Beerling D. J. 2010. Mutualistic mycorrhiza-like symbiosis in the most ancient group of land plants. Nature communications, 1, 103

Igamberdiev A.U., and Kleczkowski L.A., 2015. Optimization of ATP synthase function in mitochondria and chloroplasts via the adenylate kinase equilibrium, Frontiers of Plant Science 6 .P. 10

- Indriani P., Mansyur N., Susilawati I., Islami Z.R . 2011. Peningkatan Produktivitas Tanaman Pakan Melalui Pemberian Fungi Mikoriza Arbuskula (FMA). Jurnal Pastura. 1:27-30.
- Irfan, M. 1999. Respon Tanaman Jagung (*Zea mays L.*) terhadap Pengolahan Tanah dan Kerapatan Tanam pada Tanah Andisol dan Ultisol. Pasca Sarjana Universitas Sumatera Utara, Medan. Hal. 7, 13.
- Ito, G.M., And Brewbaker J.L. 1991. Genetic Analysis Of Pericarp Thickness In Progenies Of Eight Corn Hybrids. *J.Am.Soc.Hort.Sci.*, 116(6): 1072-1077
- Jackson, L.E., Burger, M., Cavagnaro, T.R., 2008. Roots, nitrogen transformations, and ecosystem services. *Ann Rev. Plant Biol.* 59, 341–363.
- Jafarikouhini N., Kazemeini S.A., Sinclair T.R., 2020. Sweet corn nitrogen accumulation, leaf photosynthesis rate, and radiation use efficiency under variable nitrogen fertility and irrigation. Crop and Soil Sciences Department, North Carolina State University, Raleigh, NC 27695-7620, USA. *Field Crops Research* 257. 107913. <https://doi.org/10.1016/j.fcr.2020.107913>
- Jákli B., Tavakol E., Tränkner M., Senbayram M., Dittert K., 2017. Quantitative limitations to photosynthesis in K deficient sun flower and their implications on water-use efficiency, *J. Plant Physiol.* 209 .P. 20–30
- Jakli M.H., Trankner M., Bell R.W., Chen L., 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, *Front. Plant Sci.* 10 .P. 1–15, <https://doi.org/10.3389/fpls.2019.00766>.
- Jakobsen I., Abbott L.K., Robso A.D., 1992 External hyphae of vesicular– arbuscular mycorrhizal fungi associated with *Trifolium subterraneum L.* 1. Spread of hyphae and phosphorus inflow into roots. *New Phytol* 1992, 120:371-380.
- Jakobsen, I. 1995. Transport of phosphorous and carbon in VA mycorrhiza. In: Varma, A., Hock, B. (Eds.), *Mycorrhiza Structure, Function, Molecular Biology and Biotechnology*. Springer-Verlag, Berlin, pp. 297–542.
- Jakobsen, I., and Rosendahl L., 1990. Carbon flow into soil and external hyphae from roots of mycorrhizal cucumber plants. *New Phytol* , 115:77-83.
- Jalonen, R., Nygren, P., Sierra, J., 2009. Transfer of nitrogen from a tropical legume tree to an associated fodder grass via root exudation and common mycelial networks *Plant. cell & environment* 32, 1366e1376.
- Jansa J and Kohout P. 2019. Ecology of mycorrhizas in the anthropocene. Institute of Microbiology, Czech Academy of Sciences, Víde_nsk_a 1083
- Jansson S. 1994. The light-harvesting chlorophyll a/b-binding proteins, *Biochim Biophys. Acta* 1184.p. 1-19.

- Javot, H., Penmetsa, R.V., Breuillin F., Bhattacharai K.K., Noor R.D., Gomez S.K., Zhang Q., Cook D.R., Harrison M.J., 2011. *Medicago truncatula* mptf4 mutants reveal a role for nitrogen in the regulation of arbuscule degeneration in arbuscular mycorrhizal symbiosis. *Plant J* 68:954–965
- Jayanti W., Edy., Alimuddin S., 2019 Tanggap Tanaman Jagung Terhadap Sumber Benih Dari Panjang Tongkol Berbeda Dan Pemangkasan Daun Di Bawah Tongkol. Mahasiswa dan Dosen Program Studi Agroteknologi, Universitas Muslim Indonesia, Makassar. *Jurnal AGrotekMAS*
- Jezeck, M. 2016. Magnesium deficiency in maize and effectiveness of nutrient supply through MgSO₄ leaf application. Dissertation. Submitted for the Doctoral Degree awarded by the Faculty of Agricultural and Nutritional Sciences of the Christian-Albrechts-Universität Kiel. 146 p.
- Jezeck, M., Geilfus, C.M., Bayer, A., Muhling, K.H. 2015. Photosynthetic capacity, nutrient status, and growth of maize (*Zea mays* L.) upon MgSO₄ leaf-application. *Plant Sci* 5:781–791
- Jilani, M.S., Burki, T., Waseem, K., 2010. Effect of nitrogen on growth and yield of radish. *J. Agric. Res.* 48 (2), 219–225.
- Jin, H., Pfeffer, P.E., Douds, D.D., Piotrowski, E., Lammers, P.J., Shachar-Hill, Y., 2005. The uptake, metabolism, transport and transfer of nitrogen in an arbuscular mycorrhizal symbiosis. *The New Phytologist* 168, 687–696.
- Johnsen, A.R., Wick, L.Y., Harms, H., 2005. Principles of microbial PAH degradation in soil. *Environ. Pollut.* 133, 71–84. doi: 10.1016/j.envpol.2004.04.015
- Joner, E., van Aarle, I.M., Vosatka, M .2000. Phosphatase activity of extra-radical arbuscular mycorrhizal hyphae: a review. *Plant Soil* 226:199–210
- Kafid, M., Aini, L.Q. dan Prasetya, B. 2015. Peran mikoriza arbuskula dan bakteri *Pseudomonas fluorescens* dalam meningkatkan serapan P dan pertumbuhan tanaman jagung pada andisol. *Jurnal Tanah dan Sumberdaya Lahan* 2(2):191–197.
- Karley A.J and White P.J.,2009. Moving cationic minerals to edible tissues: potassium, magnesium, calcium, *Curr. Opin. Plant Biol.* 12 .p. 291-298.
- Karti,P.D.M.H., 2004. Pengaruh Penggunaan Bakteri Penambat Nitrogen, Cendawanmikoriza Arbuskula Dan Penambahan Bahan Organik Pada *Stylosanthes guyanensis*.*Med.Petern.*27: 63-68
- Keymer. A, Pimprikar. P. Wewer. V, Huber. C, Brands. B, Bucerius. S.L, Delaux. P.M, Klingl. V, Lahaye. E.V.R.P, Wang T.L, Eisenreich. W, Dormann.P , Parniske. M, Caroline Gutjahr. C ., 2017. Lipid transfer from plants to arbuscular mycorrhiza fungi. *eLife*. 33 Hal.

- Khalid, M., Yadav, B.K., Yadav, M.P., 2015. Studies on the effect of integrated nutrient management on growth and yield attributes of radish (*Raphanus sativus* L.). *Ann. Horticult.* 8 (1), 81–83.
- Khan, A.G. 2005. Role of soil microbes in rhizospheres of plant growing on trace metal contaminated soils in phytoremediation. *Journal of Trace Elements in Medicine and Biology* 18: 355-364
- Khumaida N dan Sopandie D. 2009. Kloning Dan Identifikasi Gen Fitokrom (Phy) Pada Kedelai Untuk Adaptasi Terhadap Cekaman Intensitas Cahaya Rendah Melalui Mekanisme Penghindaran. Staf pengajar pada bagian Bioteknologi Tanaman , Departemen AGH Faperta IPB
- Kiers, E.T., Duhamel M., Beesetty Y., Mensah J.A., Franken O., Verbruggen E., Fellbaum C.R., Kowalchuk G.A., Hart M.M., Bago A., 2011. Reciprocal rewards stabilize cooperation in the mycorrhizal symbiosis. *Science*, 333(6044), 880-882
- Kirkby, E.A., Mengel, K., 1976. The role of magnesium in plant nutrition. *Zeitschrift Fur Pflanzenernahrung Und Bodenkunde*, 209-222.
- Klironomos, J. N. 2000. Host specificity and functional diversity among arbuscular mycorrhizal fungi. In C. R Bell, M. Brylinski, & P. Johnson-Green (Eds.), *Microbial biosystems: New frontiers. Proceedings of the 8th international symposium of microbial ecology* (pp. 845–851). Halifax: Atlantic Canada Society for Microbial Ecology.
- Kobae, Y., Hata, S., 2010. Dynamics of periarbuscular membranes visualized with a fluorescent phosphate transporter in arbuscular mycorrhizal roots of rice. *Plant Cell Physiol.* 51, 341–53. doi:10.1093/pcp/pcq013 Koide RT, Kabir Z .2000. Extraradical hyphae of the mycorrhizal fungus *Glomus intraradices* can hydrolyse organic phosphate. *New Phytol* 148:511–517
- Kobayashi, N.I., Saito, T., Iwata, N., Ohmae, Y., Iwata, R., Tanoi, K., Nakanishi, T.M., 2013. Leaf senescence in rice due to magnesium deficiency mediated defect in transpiration rate before sugar accumulation and chlorosis. *Physiologia Plantarum* 148, 490-501.
- Koch M., Busse M., Naumann M., Jákli B., Smit I., Cakmak I., Hermans, C., Pawelzik E., 2019. Differential effects of varied potassium and magnesium nutrition on production and partitioning of photoassimilates in potato plants, *Physiol. Plant.* 166 .P. 921–935
- Kohlmeier, S., Smits, T.H.M., Ford, R.M., Keel, C., Harms, H., Wick, L.Y., 2005. Taking the Fungal Highway: Mobilization of Pollutant-Degrading Bacteria by Fungi. *Environ. Sci. Technol.* 39, 4640–4646. doi:10.1021/es047979z
- Kosuta, S., Chabaud, M., Lougnon, G., Gough, C., Denarie, J., Barker, D.G., Becard, G., 2003. A diffusible factor from Arbuscular mycorrhizal fungi induces

- symbiosisspecific MtENOD11 expression in roots of *Medicago truncatula*. *Plant Physiolgy* 131, 952–962.
- Kosuta, S., Hazeldine, S., Sun, J., Miwa, H., Morris, R.J., Downie, J.A., Oldroyd, G.E.D., 2008. Differential and chaotic calcium signatures in the symbiosis signaling pathway of legumes. *Proc.s Nat. Acad. Sci. U.S.A.* .105, 9823–9828.
- Koswara, J. 1986. Budidaya jagung manis (*Zea mays saccharata*) Bahan kursus budidaya jagung manis dan jagung merang. Fakultas Pertanian. IPB, Bogor.
- Koswara, S. 2009. Teknologi Pengolahan jagung. <Http://www.ebookpangan.com>
- Krishna K. 2014. Maize Agroecosystem. Agroecosystems: Soils, Climate, Crops, Nutrient Dynamics, and Productivity, 37-51.
- Kruczek, A. 1996. NawoŚenie kukurydzy cukrowej. Kukurydza – Wyd. spec. – Kukurydza cukrowa, 2(7): 14-15
- Kucey, R.M.N., Paul E.A., 1982. Carbon flow, photosynthesis, and N₂ fixation in mycorrhizal and nodulated faba beans (*Vicia faba L.*) *Soil Biol Biochem* 14:407–412
- Kulvadee, T., Chowladda, T. 1997. Effect of harvesting period on yield and quality of canned whole kernel sweet corn. *Food*, 27(4): 248-254
- Kunicki, E. 2001. Effect of crop starting method and plant pruning on yielding of sweet corn. *Veg. Crops Res. Bull.*, 54(1): 43-47
- Kunicki, E.2003. Uprawa kukurydzy cukrowej. Wyd. Plantpress, Kraków
- Kusaba, M., Ito, H., Morita, R., Iida, S., Sato, Y., Fujimoto, M., Kawasaki, S., Tanaka, R., Hirochika, H., Nishimura, M., Tanaka, A., 2007. Rice Non-Yellow Coloring 1 is involved in light-harvesting complex II and grana degradation during leaf senescence. *Plant Cell* 19(4), 1362-1375
- Lakitan B. 2007. Dasar-dasar fisiologi tumbuhan. Raja Grafindo Persada. Jakarta.
- Lamakoma C.R., Patty J.R., Amba M. 2019. Pengaruh Pupuk Organik Cair dan Pupuk Majemuk Terhadap Pertumbuhan dan Produksi Jagung Ketan (*Zea mays var. ceratina*). Program Studi Agroteknologi, Fakultas Pertanian, Universitas Pattimura. *Jurnal Budidaya Pertanian* Vol. 15(2): 127-133. DOI: 10.30598/jbdp.2019.15.2.127
- Landi, M., Tattini, M., Gould, K.S., 2015. Multiple functional roles of anthocyanins in plantenvironment interactions. *Environmental and Experimental Botany* 119, 4-17.
- Lasa, B., Frechilla, S., Aleu, M., González-Moro, B., Lamsfus, C., Aparicio-Tejo, P.M. 2000. Effects of low and high levels of magnesium on the response of

- sunflower plants grown with ammonium and nitrate. *Plant Soil* 225 (1), 167–174
- Lazcano, C., Barrios-Masias, F.H., Jackson, L.E., 2015. Arbuscular mycorrhizal effects on plant water relations and soil greenhouse gas emissions under changing moisture regimes. *Soil Biology & Biochemistry* 74, 184-192.
- Lenz, H., Dombinov, V., Dreistein, J., 2013. Magnesium deficiency phenotypes upon multiple knockout of *Arabidopsis thaliana* MRS2 clade B genes can be ameliorated by concomitantly reduced calcium supply. *Plant Cell Physiol*;54:1118–31.
- Leung, H.M., Ye, Z.H., Wong, M.H., 2006. Interactions of mycorrhizal fungi with *Pteris vittata* (As hyperaccumulator) in As-contaminated soils. *Environ. Pollut.* 139, 1–8. doi:10.1016/j.envpol.2005.05.009
- Li C.P., Qi Y.P., Zhang J., Yang L.T., Wang D.H., Ye X., Lai N.W., Tan L.L., Lin D., Chen L.S., 2017. Magnesium-deficiency-induced alterations of gas exchange, major metabolites and key enzymes differ among roots, and lower and upper leaves of *Citrus sinensis* seedlings, *Tree Physiol.* 37 (11) (2017) 1564–1581
- Li H., Chen Z., Zhou T., Liu Y., Raza S., Zhou J., 2018. Effects of high potassium and low temperature on the growth and magnesium nutrition of different tomato cultivars, *Hort. Sci.* 53 710–714.
- Li J., Yokosho K., Liu S., Cao H.R., Yamaji N., Zhu X.G., Liao H., Ma J.F., Chen Z.C., 2020. Diel magnesium fluctuations in chloroplasts contribute to photosynthesis in rice, *Nat. Plants* 6: 848 – 859 <https://doi.org/10.1038/s41477-020-0686-3>
- Li, J., Huang, Y., Tan, H., Yang, X., Tian, L., Luan, S., Chen, L., Li, D., 2015. An endoplasmic reticulum magnesium transporter is essential for pollen development in *Arabidopsis*. *Plant Sci* 2015, 231:212- 220
- Li, L.G., Sokolov, L.N., Yang, Y.H., Li, D.P., Ting, J., Pandy, G.K., Luan, S., 2008. A mitochondrial magnesium transporter functions in *Arabidopsis* pollen development. *Mol Plant* 2008, 1:675-685
- Li, X.L., Christie, P., 2001. Changes in soil solution Zn and pH and uptake of Zn by arbuscular mycorrhizal red clover in Zn-contaminated soil. *Chemosphere* 42,201–207.
- Li, Y., Liu, X., Zhuang, W., 2000. Advances in magnesium nutritional physiology in plants, *Journal of Fujian Agriculture and Forestry University (Natural Science Edition)*, 29.1 (2000) 74-80
- Lin D.C., and Nobel P.S., 1971. Control of photosynthesis by Mg²⁺, *Arch. Biochem. Biophys.* 145 (1971) 622-632.

- Liu.p., Hu.C.P., Dong.S.T., Wang.K.J. 2003 . The comparison of sugar components in the developing grains of sweet corn and normal corn. Agricultural Sciences in China., 2: 3, 258-264
- López-Pedrosa, A., González-Guerrero, M., Valderas, A., Azcón-Aguilar, C., Ferrol, N., 2006. GintAMT1 encodes a functional high-affinity ammonium transporter that is expressed in the extraradical mycelium of *Glomus intraradices*. Fungal genetics and biology: FG and B 43, 102–110.
- Lourdes G.C.M., Stephane D., Maryline C.S., 2021. Impact of increasing chromium (VI) concentrations on growth, phosphorus and chromium uptake of maize plants associated to the mycorrhizal fungus *Rhizophagus irregularis* MUCL 41833. Instituto de Investigaciones en Cs. Agrarias de Rosario (IICAR, CONICET-UNR), Facultad de Cs Agrarias, Universidad Nacional de Rosario, Campo Exp. Villarino, Zavalla, 2123, Argentina.
<https://doi.org/10.1016/j.heliyon.2020.e05891>
- Loveless AR. 1991. Prinsip-prinsip biologi tumbuhan untuk daerah tropik. Gramedia. Jakarta
- Luginbuehl L.H, Menard G.N, Kurup S, Van Erp H., Radhakrishnan G.V, Breakspear A, Giles E. D. Oldroyd, Eastmond P.J .,2017. Fatty acids in arbuscular mycorrhizal fungi are synthesized by the host plant. Science 356, 1175–1178.
- Lundqvist T and Schneider G. 1991. Crystal structure of activated ribulose-1,5-bisphosphate carboxylase complexed with its substrate, ribulose-1,5-bisphosphate, J. Biol. Chem. 266 .P. 12604-12611
- Lynd L.R., P.J. Weimer, W.H. van Zyl WH and I.S. Pretorius. 2002. Microbial Cellulose Utilization: Fundamentals and Biotechnology. Microbiol. Mol. Biol. Rev. 66(3):506-577.
- Maguire M.E., and Cowan J.A., 2002. Magnesium chemistry and biochemistry. Department of Pharmacology, Case Western Reserve University, Cleveland, OH 44106-4965, USA. BioMetals 15: 203–210
- Mansfeld-Giese, K., Larsen, J., & Bodker, L. 2002. Bacterial populations associated with mycelium of the arbuscular mycorrhizal fungus *Glomus intraradices*. FEMS Microbiology Ecology, 41, 133–140.
- Mao, D., Chen, J., Tian, L., Liu, Z., Yang, L., Tang, R., Li, J., Lu, C., Yang, Y., Shi, J., Chen, L., Li, D., Luan, S., 2014. Arabidopsis Transporter MGT6 Mediates Magnesium Uptake and Is Required for Growth under Magnesium Limitation. Plant Cell 26, 2234-2248.
- Marschner, H. 2012. Mineral Nutrition of Higher Plants, 3rd Edn. Academic press. London. UK

- Masdar, M. Karim, B. Rusman, N. Hakim, Helmi. 2006. Tingkat hasil dan komponen hasil sistem intensifikasi padi (SRI) tanpa pupuk organik di daerah curah hujan tinggi. JIPI. 8:126-131.
- Mastur. 2015. Sinkronisasi Source dan Sink untuk Peningkatan Produktivitas Biji pada Tanaman Jarak Pagar. Balai Penelitian Tanaman Pemanis dan Serat . Malang. Buletin Tanaman Tembakau, Serat & Minyak I ndustri 7(1), April 2015:52–68
- Masuda T., 2008. Recent overview of the Mg branch of the tetrapyrrole biosynthesis leading to chlorophylls. Photosynth Res 96: 121–143
- Mathur, S., Sharma, M.P., Jajoo, A., 2018. Improved photosynthetic efficacy of maize (*Zea mays*) plants with arbuscular mycorrhizal fungi (AMF) under high temperature stress. J Photochem Photobiol B. 180, 149–154. <https://doi.org/10.1016/j.jphotobiol.2018.02.002>
- Mattjik,A. A., dan Sumertajaya, I, M. 2002. Perancangan Percobaan dengan Aplikasi SAS dan Minitab. Bogor. IPB Press. 276 Hal
- McHoul, J. 2006. Magnesium - the forgotten nutrient. Agronomist & Arable Farmer, 21.
- Meier, S., Borie, F., Bolan, N., Cornejo, P., 2012. Phytoremediation of Metal-Polluted Soils by Arbuscular Mycorrhizal Fungi. Crit. Rev. Environ. Sci. Technol. 42, 741–775. doi:10.1080/10643389.2010.528518
- Mengutay M.,Ceylan Y., Kutman U.B.,Cakmak I., 2013. Adequate magnesium nutrition mitigates adverse effects of heat stress on maize and wheat, Plant Soil 368 : 57–72, <https://doi.org/10.1007/s11104-013-1761-6>.
- Mensah, J.A., Koch, A.M., Antunes, P.M., Kiers, E.T., Hart, M., Bücking, H., 2015. High functional diversity within species of arbuscular mycorrhizal fungi is associated with differences in phosphate and nitrogen uptake and fungal phosphate metabolism. Mycorrhiza 25, 533–546.
- Metson, A.J., Brooks, J.M., 1975. Magnesium in New Zealand soils. II. Distribution of exchangeable and "reserve" magnesium in the main soil groups. New Zealand Journal of Agricultural Research 18, 317-335.
- Mikkelsen R. 2010. Soil and fertilizer magnesium. Better Crops 94, 26–28
- Mikola, P., 1980. Tropical Mycorrhiza Research. Clarendon Press Oxford, New York. p. 215
- Millar, N.S., Bennett, A.E., 2016. Stressed out symbionts: hypotheses for the influence of abiotic stress on arbuscular mycorrhizal fungi. Oecologia 182, 625–641. <https://doi.org/10.1007/s00442-016-3673-7>.
- Miransari, M., Bahrami, H.A., Rejali, F., Malakouti, M.J., 2008. Using arbuscular mycorrhiza to reduce the stressful effects of soil compaction on wheat (*Triticum aestivum L.*) growth. Soil Biol. Biochem. 40, 1197–1206.

- Miransari, M., Bahrami, H.A., Rejali, F., Malakouti, M.J., Torabi, H., 2007. Using arbuscular mycorrhiza to reduce the stressful effects of soil compaction on corn (*Zea mays* L.) growth. *Soil Biol. Biochem.* 39, 2014–2026.
- Miransari, M., H.A. Bahrami., F. Rejali., M.J. Malakouti . 2009. Effects of soil compaction and arbuscular mycorrhiza on corn (*Zea mays* L.) nutrient uptake. Department of Soil Science, College of Agricultural Sciences, Shahed University, P.O. Box: 18151/159, Tehran, Iran. *Soil & Tillage Research* 103 (2009) 282–290
- Miyata,K., Kozaki, T., Kouzai, Y., Ozawa, K., Ishii, K., Asamizu, E., Okabe, Y., Umehara, Y., Miyamoto, A., Kobae, Y., et al. 2014. The Bifunctional Plant Receptor, OsCERK1, Regulates Both Chitin-Triggered Immunity and Arbuscular Mycorrhizal Symbiosis in Rice. *Plant Cell Physiol.* 55:1864-1872
- Mockler, T.C., Yang, H., Yu, X., Parikh, D., Cheng, Y., Dolan, S., Lin, C., 2003. Regulation of photoperiodic flowering by *Arabidopsis* photoreceptors. *Proc. Natl. Acad. Sci. U. S. A.* 100, 2140–2145. <https://doi.org/10.1073/pnas.0437826100>
- Muneer, M.A., Wang, P., Zhang, J., Li, Y., Munir, M.Z., Ji, B., 2020. Formation of Common Mycorrhizal Networks Significantly Affect Plant Biomass and Soil Properties of the Neighboring Plants under Various Nitrogen Levels *Microorganisms*, vol. 8, p. 230
- Munkvold, L., Kjøller, R., Vestberg, M., Rosendahl, S., Jakobsen, I., 2004. High functional diversity within species of arbuscular mycorrhizal fungi. *New Phytol.* 164, 357–364. doi:10.1111/j.1469-8137.2004.01169.x
- Munns, R., Cramer, G.R., 1996. Is coordination of leaf and root growth mediated by abscisic acid. *Plant Soil* 185, 33–49.
- Musyayyadah, H.A dan Vonnisa M., 2019. Analisa Pola Temperatur Udara Permukaan di Sumatera Barat Tahun 1980 – 2017. Jurusan Fisika Universitas Andalas. *Jurnal Fisika Unand* Vol. 8, No. 1
- Nakano-Hylander, A., Olsson, P.A., 2007. Carbon allocation in mycelia of arbuscular mycorrhizal fungi during colonisation of plant seedlings. *Soil Biol. Biochem.* 39, 1450e1458.
- Nasielski J., Earl H., Deen B., 2019. Which plant traits are most strongly related to post silking nitrogen uptake in maize under water and/or nitrogen stress?,*JournalofPlanPhysiology*,doi:<https://doi.org/10.1016/j.jplph.2019.153059>
- Nguyen, H.H., Maneepong, S., Suranilpong, P., 2016. Nutrient uptake and fruit quality of Pummelo as influenced by ammonium, potassium, magnesium, zinc application. *J. Agric. Sci.* 8 (1), 100–109

- Nichols, K.A., 2003. Characterization of glomalin a glycoprotein produced by Arbuscular mycorrhizal fungi. University of Maryland.
- Nikolic, M., and Pavlovic, J. 2018. Plant Responses To Iron Deficiency And Toxicity And Iron Use Efficiency In Plants, In Plant Micronutrient Use Efficiency, eds. M.A. Hossain, T. Kamiya, D.J. Burritt, L.-S. Phan Tran & T. Fujiwara. 1st edition ed: Elsevier/Academic Press), 55-69
- Nouet, C., Motte, P., Hanikenne, M., 2011. Chloroplastic and mitochondrial metal homeostasis. Trends Plant Sci. 16, 395–404
- Noverta, Y. 2008. Analisis Vegetasi,Karakteristik Tanah Dan Kolonisasi Fungi Mikoriza Arbuskula (FMA) Pada Lahan Bekas Tambang Timah Di Pulau Bangka [tesis]. Bogor (ID): Institut Pertanian Bogor
- Novizan. 2002. Petunjuk Pemupukan yang Efektif. Agromedia Pustaka. 114 hal
- Nugroho K.W dan Fitria Yuliasmara. 2012. Penggunaan Metode Scanning untuk engukuran LuasDaun Kakao. Pusat Penelitian Kopi dan Kakao Indonesia, Jl. PB. Sudirman 90 Jember.
- Nuning A.S., Syafruddin., Roy E., Sri S., 2007 . Morfologi Tanaman dan Fase Pertumbuhan Jagung. (Online). Tersedia <http://pustaka.litbang.deptan.go.id/bppi/subyek/konten/jagung.php> subyek ID = C .diakses (26 mei 2021).
- Nurhayati. 2012. Infektivitas mikoriza pada berbagai jenis tanaman inang dan beberapa jenis sumber inokulum. Jurnal Floratek 7:25-31.
- Nuridayati, S.S., Prasetya B., Kurniawan S., 2019. Perbanyak Berbagai Jenis Mikoriza Arbuskula Di Berbagai enis Tanaman Inang. Jurusan Tanah, Fakultas Pertanian, Universitas Brawijaya, Jl. Veteran, Malang 65145. Jurnal Tanah dan Sumberdaya Lahan Vol 6 No 2 : 1375-1385
- Oda, K., Kamiya, T., Shikanai, Y., Shigenobu, S., Yamaguchi, K., Fujiwara, T., 2016. The *Arabidopsis* Mg Transporter, MRS2-4, is Essential for Mg Homeostasis Under Both Low and High Mg Conditions. *Plant & Cell Physiology* 57, 754-763.
- Okiobe, S.T., J. Augustin., I. Mansour., S.D. Veresoglou., 2018. Disentangling direct and indirect effects of mycorrhiza on nitrous oxide activity and denitrification. *Soil Biology and Biochemistry*. Freie Universität Berlin, Institut für Biologie, Berlin, Germany. SBB 7453
- Oldroyd, G.E.D. 2013. Speak, friend, and enter: signalling systems that promote beneficial symbiotic associations in plants. *Nat Rev Microbiol* 11:252-263
- Oliveira, E.M.M., Ruiz, H.A., Alvarez V, V.H., Ferreira, P.A., Costa, F.O., Almeida, I.C.C., 2010. Nutrient supply by mass flow and diffusion to maize plants in response to soil aggregate size and water potential. *Revista Brasileira de*

Ciêncie do Solo 34, 317-328. doi: <https://doi.org/10.1590/S0100-06832010000200005>.

- Oliverio, A. M., Geisen, S., Delgado-Baquerizo, M., Maestre, F. T., Turner, B. L., & Fierer, N. 2020. The globalscale distributions of soil protists and their contributions to belowground systems. *Science Advances*, 6(4), eaax8787
- Orłowski, M. 2000. Polowa uprawa warzyw. Kukurydza cukrowa, 383-386
- Oswald, O., Martin, T., Dominy, P.J., Graham, I.A., 2001. Plastid redox state and sugars: Interactive regulators of nuclear-encoded photosynthetic gene expression. *Proceedings of the National Academy of Sciences of the United States of America* 98, 2047-2052.
- Oyewole, B.O., O.J. Olawuy., A.C. Odebode., M.A. Abiala. 2017. Influence of Arbuscular mycorrhiza fungi (AMF) on drought tolerance and charcoal rot disease of cowpea. National Horticultural Research Institute, Ibadan, Nigeria. Elsevier. *Biotechnology Reports* 14 : 8–15
- Pardamean, M. 2014. Mengelola Kebun dan Pabrik Kelapa Sawit secara Profesional. Penebar Swadaya. Jakarta.
- Parniske, M., 2005. Cue for the branching connection. *Nature* 435, 750–751.
- Peng W.T, Qi W.L., Nie M.M.,Xiao Y.B.,Liao H.,Chen Z.C.,2020 Magnesium supports nitrogen uptake through regulating NRT2.1/2.2 in soybean, *Plant Soil* 457 .P. 97–111
- Peraudeau, S., Lafarge, T., Roques, S., Quinones, C.O., Clement-Vidal, A., Ouwerkerk, P.B.F., Jeroen Van Rie,J., Fabre,D., Jagadish.,S.V.K, Dingkuhn, M., 2015. Effect of carbohydrates and night temperature on night respiration in rice. *J. Ex. Bot.* 66, 3931– 3944.
- Pérez-Tienda, J., Valderas, A., Camañes, G., García-Agustín, P., Ferrol, N., 2012. Kinetics of NH₄⁺ uptake by the arbuscular mycorrhizal fungus Rhizophagus irregularis. *Mycorrhiza* 22, 485–491
- Permanasari, I., Dewi, K.M., Irfan, M. dan Arminudin, A.T., 2016. Peningkatan efisiensi pupuk fosfat melalui aplikasi mikoriza pada kedelai. *Jurnal Agroternologi* 6(2):23-30
- Petrov, A.S., Bernier, C.R., Hsiao, C., Okafor, C.D., Tannenbaum, E., Stern, J., Gaucher, E., Schneider, D., Hud, N.V., Harvey, S.C., Williams, L.D. 2012. RNA-Magnesium-Protein Interactions in Large Ribosomal Subunit. *Journal of Physical Chemistry B* 116, 8113-8120.
- Pettigrew W.T., 2008. Potassium influences on yield and quality production for maize, wheat, soybean and cotton, *Physiol. Plant.* 133 ; 670–681.

- Phillips, H. R., Guerra, C. A., Bartz, M. L., Briones, M. J., Brown, G., Crowther, T. W., & Orgiazzi, A. 2019. Global distribution of earthworm diversity. *Science*, 366(6464), 480–485.
- Pilon-Smits, E., 2005. Phytoremediation. *Annu. Rev. Plant Biol.* 56, 15–39. doi: 10.1146/annurev.arplant.56.032604.144214
- Pinedo-Rilla, C., Aleu, J., Collado, I. G., 2009. Pollutants biodegradation by fungi. *Curr. Org. Chem.* 13, 1194–1214.
- Piotrowski, J. S., Denich, T., Klironomos, J. N., Graham, J. M., & Rillig, M. C. 2004. The effects of arbuscular mycorrhizae on soil aggregation depend on the interaction between plant and fungal species. *New Phytologist*, 164, 365–373.
- Pratama E.Y dan Susanto S. 2019. Pengaruh Nisbah Jumlah Daun Terhadap Kualitas Buah Jeruk Pamelo (*Citrus maxima* (Burm.) Merr.). Departemen Agronomi dan Hortikultura, Fakultas Pertanian, Institut Pertanian Bogor. *Bul. Agrohorti* 7(1) : 25-30
- Pratama, A.J dan A.N. Laily. 2015. Analisis Kandungan Klorofil Gandasuli (*Hedychium gardnerium* Shepard ex Ker-Gawl) Pada Tiga Daerah Perkembangan Daun Yang Berbeda. Prosiding Seminar Nasional Konservasi dan Pemanfaatan Sumber Daya Alam Pendidikan Biologi, Pendidikan Geografi, Pendidikan Sains, PKLHFKIP UNS 2015: 216-219
- Prayudyaningsih, R., Sari R. 2016. Aplikasi Fungi Mikoriza Arbuskula (FMA) dan Kompos Untuk Meningkatkan Pertumbuhan Semai Jati (*Tectona grandis* Linn f) Pada Media Tanah Bekas Tambang Kapur. Balai Penelitian Kehutanan Makassar. *Jurnal Penelitian Kehutanan Wallacea* Vol. 5: 37- 46
- Prober, S. M., Leff, J. W., Bates, S. T., Borer, E. T., Firn, J., Harpole, W. S., & Cleland, E. E. 2015. Plant diversity predicts beta but not alpha diversity of soil microbes across grasslands worldwide. *Ecology Letters*, 18(1), 85–95.
- Průšová A., 2016. Light on phloem transport an MRI approach. PhD thesis, Wageningen University, Wageningen, NL. P; 130
- Pujianto. 2001. Pemanfaatan Jasad Mikro, Jamur Mikoriza dan Bakteri Dalam Sistem Pertanian Berkelanjutan Di Indonesia. Makalah Falsafah Sains Program Pasca Sarjana Institut Pertanian Bogor. Bogor. 15 hal.
- Pulungan, A.S. 2015. Biodiversity of Mikoriza in Red Pepper Rhizosphere. *Jurnal Biosains*, 1(3), 125-129
- Purin, S., Rillig, M.C., 2007. The arbuscular mycorrhizal fungal protein glomalin: Limitations, progress, and a new hypothesis for its function. *Pedobiologia* (Jena). 51, 123–130. doi:10.1016/j.pedobi.2007.03.002
- Purwono dan R. Hartono. 2008. Bertanam Jagung Unggul. Penebar Swadaya. Jakarta.

Purwono, L dan Purnamawati. 2007. Budidaya Tanaman Pangan. Penerbit Agromedia. Jakarta.

Puspadewi, S., Sutari W., Kusumiyati . 2016. Pengaruh konsentrasi pupuk organik cair (POC) dan dosis pupuk N, P, K terhadap pertumbuhan dan hasil tanaman jagung manis (*Zea mays* L. var *Rugosa Bonaf*) kultivar Talenta. Department of Crop Science, Padjadjaran University. Jurnal Kultivasi Vol. 15

Puspitasari H.M., Yunus A., Harjoko D . 2018. Dosis Pupuk Fosfat Terhadap Pertumbuhan Dan Hasil Beberapa Jagung Hibrida. Mahasiswa Program Studi Agroteknologi Fakultas Pertanian UNS, Surakarta. Agrosains 20(2): 34-39

Putriyaveetil, S., van Oort, B., and Kirchhoff, H. 2017. Surface charge dynamics in photosynthetic membranes and the structural consequences. Nat. Plants. 3:17020. doi: 10.1038/nplants.2017.20

Putra I.A dan Hanum H., 2018. Kajian Antagonisme Hara K, Ca Dan Mg pada Tanah Inceptisol yang Diaplikasi Pupuk Kandang, Dolomit dan Pupuk KCl terhadap Pertumbuhan Jagung Manis (*Zea mays saccharata* L.). Mahasiswa Pasca Sarjana Program Doktor Ilmu Pertanian Fakultas Pertanian, Universitas Sumatera Utara, Jalan Prof. A. Sofyan No. 3 Kampus USU, Medan 20155. Journal of Islamic Science and Technology Vol. 4, No.1

Qaderi, J., Malekoti, M.J., 2000. Efek of the method and time application of magnesium sulfate and fertilizer containing low levels nutriens on yield ang improvement of wheat quality of rain. J.Soil & Water sci. 14 (1). 26-35

Rahayu. N., dan A.K. Akbar. 2003. Pemanfaatan Mikoriza dan Bahan Organik dalam Rangka Reklamasi Lahan Pasca Penambangan. Karya Tulis Ilmiah. Fakultas Pertanian Universitas Tanjung Pura. Pontianak.

Rahman, M., Hossain, M.A., Ali, M.E., Anik, M.F.A., Alam, F., 2019. Effects of arbuscular mycorrhizal fungi, rhizobium and phosphorus on mungbean (*Vigna radiata*) in saline soil. Bangladesh J. Agric. Res. 44 (1), 153_165.

Rajiman ,. 2020. Pengantar Pemupukan. Penerbit Deepublish. Yogyakarta. 142 hal

Rajtor, M and Piotrowska-Seget, Z ,. 2016. Prospects for arbuscular mycorrhizal fungi (AMF) to assist in phytoremediation of soil hydrocarbon contaminants. Department of Microbiology, Faculty of Biology and Environmental Protection, University of Silesia, Jagiello_nksa Street 28, 40-032, Katowice, Poland. Chemosphere 162 (2016) 105e116

Ramadhan M.F., Hidayat C.,Hasani S., 2015. Pengaruh Aplikasi Ragam Bahan Organik Dan Fma Terhadap Pertumbuhan Dan Hasil Tanaman Cabai (*Capsicum Annum* L.) Varietas Landung Pada Tanah Pasca Galian C. Jurusan Agroteknologi UIN Sunan Gunung Djati Bandung. Jurnal Agro Vol. 2, No. 2

- Rasouli-Sadaghiani, M.H., Barin, M., Khodaverdiloo, H., Moghaddam, S.S., Damalas, C.A., Kazemalilou, S., 2019 Arbuscular mycorrhizal fungi and rhizobacteria promote growth of Russian knapweed (*Acroptilon repens* L.) in a Cd-contaminated soil. *J. Plant. Growth Regul.* 38 (1), 113–121.
- Raven, J.A., Edwards, D., 2001. Roots: evolutionary origins and biogeochemical significance. *J. Exp. Bot.* 52, 381e401.
- Ravnskov, S., Larsen, J., Olsson, P.A., Jakobsen, I. 1999. Effect of various organic compounds on growth and phosphorus uptake of an arbuscular mycorrhizal fungus. *New Phytol* 141:517–524
- Reid J.D., and Hunter C.N., 2004. Magnesium-dependent ATPase activity and cooperativity of magnesium chelatase from *Synechocystis* sp. PCC6803. *J Biol Chem* 279: 26893–26899
- Restiana. 2012. Pengaruh pyraclostrobin terhadap pertumbuhan, produksi dan kandungan amilosa biji jagung (*Zea mays* L.). Skripsi. Departemen Agronomi Dan Hortikultura. Fakultas Pertanian. Institut Pertanian Bogor. Jawa Barat. Indonesia. 69 Hal
- Reynolds, H.L., Hartley, A.E., Vogelsang, K.M., Bever, J.D., Schultz, P.A., 2005. Arbuscular mycorrhizal fungi do not enhance nitrogen acquisition and growth of old-field perennials under low nitrogen supply in glasshouse culture. *The New Phytologist* 167, 869–880.
- Rich MK, Nouri E, Courty P-E, Reinhardt D. 2017. Diet of arbuscular mycorrhizal fungi: Bread and butter? *Trends Plant Sci*;22:652–60.
- Ridwan. 2010. Dasar-dasar Statistika. Bandung. Alfabeta. 2010. 273 Hal
- 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. *Commun Soil Sci Plant Anal* 2017, 48:1895-1920
- Rifianto, A dan M. Syukur. 2013. Jagung Manis. Penebar Swadaya : Jakarta. 130 hal.
- Rillig, M. C. 2004a. Arbuscular mycorrhizae and terrestrial ecosystem processes. *Ecology Letters* 7:740-754.
- Rillig, M. C. 2004b. Arbuscular mycorrhizae, glomalin, and soil aggregation. *Canadian Journal of Soil Science*:355-363.
- Rillig, M. C., C. A. Aguilar-Trigueros, J. Bergmann, E. Verbruggen, S. D. Veresoglou, and A. Lehmann. 2015. Plant root and mycorrhizal fungal traits for understanding soil aggregation. *New Phytologist* 205:1385-1388
- Rillig, M. C., Lutgen, E. R., Ramsey, P. W., Klironomos, J. N., & Gannon, J. E. 2005. Microbiota accompanying different arbuscular mycorrhizal fungal isolates influence soil aggregation. *Pedobiologia*, 49, 251–259.

- Rillig, M. C., Mummey, D. L., Ramsey, P. W., Klironomos, J. N., & Gannon, J. E., 2006. Phylogeny of arbuscular mycorrhizal fungi predicts community composition of symbiosis-associated bacteria. *FEMS Microbiology Ecology*, 57(3), 389–395.
- Rillig, M. C., Wright, S. F., & Eviner, V. 2002. The role of arbuscular mycorrhizal fungi and glomalin in soil aggregation: Comparing effects of five plant species. *Plant and Soil*, 238, 325–333.
- Rillig, M.C., Mummey, D.L., 2006. Mycorrhizas and soil structure. *New Phytol.* 171, 41– 53. doi:10.1111/j.1469-8137.2006.01750.x
- Rini, M.V., Lita, A., Arif, M.A.S., 2020. Daya Infeksi Dan Efektivitas Fungi Mikoriza Arbuskular Gigaspora margarita Pada Tanaman Jagung Dengan Masa Simpan Yang Berbeda. Jurusan Agronomi dan Hortikultura Fakultas Pertanian Universitas Lampung. *J. Agrotek Tropika*. ISSN 2337-4993. Vol. 8, No. 3: 453-459
- Rini, M.V., Susilowati, E., Riniarti, M., and Lukman, I. 2020. Application of Glomus sp. and a mix of Glomus sp. with Gigaspora sp. In improving the agarwood (*Aquilaria malaccensis* Lamk.) seedling growth in Ultisol soil. *IOP Conference series Earth and Environmental Science* 449 012004
- Rissler H.M., Collakova E., DellaPenna D., WhelanJ., Pogson B.J. 2002. Chlorophyll biosynthesis. Expression of a second chl I gene of magnesium chelatase in *Arabidopsis* supports only limited chlorophyll synthesis, *Plant Physiol* 128 .P. 770-779
- Rockwell N.C., Yi-Shin Su, and J. Clark Lagarias. 2006. Phytochrome Structure and Signaling Mechanisms. Section of Molecular and Cellular Biology, University of California, Davis, California 95616 ; P 837-858
- Rubatzky, V.E. dan M. Yamaguchi. 1998. *Fisiologi Tumbuhan*. Alih Bahasa : Diah R. Lukman dan Sumaryono. ITB Bandung. 343 Hal.
- Saddique, M.A.B., Ali, Z., Khan, A.S., Rana, I.A., Shamsi, I.H., 2018. Inoculation with the endophyte *Piriformospora indica* significantly affects mechanisms involved in osmotic stress in rice. *Rice* 11, 34.
- Saia, S., Benítez, E., García-Garrido, J.M., Settanni, L., Amato, G., Giambalvo, D., 2014. The effect of arbuscular mycorrhizal fungi on total plant nitrogen uptake and nitrogen recovery from soil organic material. *The Journal of Agricultural Science* 152, 370–378.
- Saini, I., Yadav, K., Aggarwal, A., 2019. Response of arbuscular mycorrhizal fungi along with *Trichoderma viride* and *Pseudomonas fluorescens* on the growth, biochemical attributes and vase life of *Chrysanthemum indicum* J. *Environ. Biol.* 40 (2), 183_191

- Salisbury, F. B. and C. W. Ross. 1992. Plant Physiology. 4th Edition. Terjemahan : Diah R. Lukman dan Sumaryono. Fisiologi Tumbuhan. Jilid
- Salunkhe, D. K., And Kadam, S.S. 1998. Sweet Corn. Handbook of vegetable science and technology, production, composition, storage and processing. New York: Marcel Dekker, 742 p. ISBN 0-8247-0105-4.
- Sangabriel-Conde, w., I. E. Maldonado- Mendoza, M. E. Mancera-López, J. D. Cordero-Ramírez, D. Trejo-Aguilar, dan S. Negrete-Yankelevich. 2015. Glomeromycota associated with Mexican native maize landraces in Los Tuxtlas, Mexico Applied Soil Ecology 87 : 63–71
- Santos-González, J.C., Finlay, R.D., Tehler, A., 2007. Seasonal dynamics of arbuscular mycorrhizal fungal communities in roots in a seminatural grassland. Appl. Environ. Microbiol. 73, 5613–23. doi:10.1128/AEM.00262-07
- Saputra B., Lindra R., Lovadi I. 2015. Jamur Mikoriza Vesikular Arbuskular (FMA) pada Tiga Jenis Tanah Rhizosfer Tanaman Pisang Nipah (*Musa paradisiaca L. var. nipah*) di Kabupaten Pontianak. Jurnal Protobiont. 1:160-169.
- Sari S., Kumastuti A., Indrawati W. 2017. Identifikasi Fungi Mikoriza Arbuskular (FMA) Tanaman Leguminosa Secara Mikroskopis Pada Lahan Olah Tanah Konservasi Musim Tanam Ke 29. Jurnal Penelitian Pertanian Terapan. Jurusan Tanaman Perkebunan. Politeknik Negeri Lampung. 17:40-49.
- Sari, R.R., dan D. Ermavitalini. 2014. Identifikasi Mikoriza dari Lahan Desa Cabbiya Pulau Poteran, Sumenep Madura. Jurnal Sains dan Seni Pomits 3(2) , 2337-3520
- Sasli I dan Ruliansyah A. 2012. Pemanfaatan Mikoriza Arbuskula Spesifik Lokasi Untuk Efesiensi Pemupukan Pada Tanaman Jagung Di Lahan Gambut Tropis. Fakultas Pertanian Tanjung Pura. Pontianak. Agrovigor vol.5 No.2
- Sasmitamihardja, D. and A.H. Siregar. 1996. Fisiologi Tumbuhan. Proyek Pendidikan Akademik Dirjen Dikti. Depdikbud. Bandung. pp 253-281.
- Sato R., Ito H., Tanaka A., 2015. Chlorophyll b degradation by chlorophyll b reductase under high-light conditions. Photosynth Res 126: 249–259
- Sato T., Shimoda Y., Matsuda K., Tanaka A., Ito .., 2017. Mg-dechelation of chlorophyll a by Stay - Green activates chlorophyll b degradation through expressing Non - Yellow Coloring 1 in *Arabidopsis thaliana*. Institute of Low Temperature Science, Hokkaido University, N19W8, Sapporo, 060-0819, Japan <https://doi.org/10.1016/j.jplph.2018.01.010>
- Schaarschmidt S., Roitsch T., Hause B., 2006. Arbuscular mycorrhiza induces gene expression of the apoplastic invertase LIN6 in tomato (*Lycopersicon esculentum*) roots. J Exp Bot 57:4015–4023

- Schellenbaum L, Muller J, Boller T, Wiemken A, Schuepp H (1998) Effects of drought on nonmycorrhizal and mycorrhizal maize: changes in the pools of non-structural carbohydrates, in the activities of invertase and trehalase, and in the pools of amino acids and imino acids. *New Phytol* 138:59–66
- Schmied, J., Hedtke, B., Grimm, B., 2011. Overexpression of HEMA1 encoding glutamyl tRNA reductase. *J. Plant Physiol.* 168(12), 1372-1379.
- Schock, I., Gregan, J., Steinhauser, S., Schweyen, R., Brennicke, A., Knoop, V., 2000. A member of a novel *Arabidopsis thaliana* gene family of candidate Mg²⁺ ion transporters complements a yeast mitochondrial group II intron-splicing mutant. *Plant Journal* 24, 489-501.
- Schottler, M.A., Toth, S.Z., 2014. Photosynthetic complex stoichiometry dynamics in higher plants: environmental acclimation and photosynthetic flux control. *Front. Plant Sci.* 5, 188
- Senbayram, M., Gransee. A., Wahle, V., Thiel, H., 2015. Role of magnesium fertilisers in agriculture: plant-soil continuum. *Crop & Pasture Science* 66, 1219-1229.
- Setiadi, Y dan A., Setiawan. 2011. Studi Status Fungi Mikoriza Arbuskula di Areal Rehabilitasi Pasca Penambangan Nikel (Studi Kasus PT INCO Tbk. Sorowako, Sulawesi Selatan). Departemen Silvikultur, Fakultas Kehutanan IPB. *Jurnal Silvikultur Tropika* Vol. 03 No. 01, Hal. 88 – 95
- Setiadi, Y. 1989. Pemanfaatan Mikoriza dalam Kehutanan. PAU. Bogor 103 p
- Shah, M.A. 2014. Mycorrhizas: Novel Dimensions in the Changing World. Department of Botany. University of Kashmir. Srinagar, Jammu and Kashmir, India. DOI 10.1007/978-81-322-1865-4
- Shah, M. A., Reshi, Z., & Damase, K. 2009a. Arbuscular mycorrhizal status of some Kashmir Himalayan alien invasive plants. *Mycorrhiza*, 20, 67–72.
- Shah, M. A., Reshi, Z., & Damase, K. 2009b. Plant invasion induced shift in Glomalean spore density and diversity. *Tropical Ecology*, 51(2S), 317–323.
- Shah, M. A., Reshi, Z., & Rashid, I. 2008a. Mycorrhizal source and neighbour identity differently influence *Anthemis cotula* L. invasion in the Kashmir Himalaya, India. *Applied Soil Ecology*, 40, 330–337.
- Shah, M. A., Reshi, Z., & Rashid, I. 2008b. Mycorrhizosphere mediated Chamomile invasion in the Kashmir Himalaya, India. *Plant and Soil*, 312, 219–225.
- Shalygo, N., Czarnecki, O., Peter, E., Grimm, B., 2009. Expression of chlorophyll synthase is also involved in feedback-control of chlorophyll biosynthesis. *Plant Mol. Biol.* 71(4), 425 -436
- Shaul, O. 2002. Magnesium transport and function in plants: the tip of the iceberg. *BioMetals* 15, 309-323.

- Shaul, O., Hilgemann, D.W., de-Almeida-Engler, J., Van Montagu M., Inz, D., Galili, G., 1999. Cloning and characterization of a novel Mg²⁺/H⁺ exchanger. *EMBO Journal* 18, 3973–3980.
- Shi, W., Muthurajan, R., Rahman, H., Selvam, J., Peng, S., Zou, Y., Jagadish, S.V.K, 2013. Source–sink dynamics and proteomic reprogramming under elevated night temperature and their impact on rice yield and grain quality. *New Phytol.* 197, 825–837.
- Simanungkalit, R.D.M. 2003. Teknologi Jamur Mikoriza Arbuskuler: Produksi Inokulan dan Pengawasan Mutunya. Program dan Abstrak Seminar dan Pameran: Teknologi Produksi dan Pemanfaatan Inokulan EndoEktomikoriza untuk Pertanian, Perkebunan, dan Kehutanan. 16 September 2003. pp 11
- Simanungkalit, R.D.M., 1994. Potensi Mikoriza Vesikula Arbuskula Dalam Peningkatan Produktifitas Tanaman Pangan. Laporan Program Pelatihan Biologi dan Bioteknologi, Bogor
- Simonne E., Simonne A., Boozer R. 1999. Yield, ear characteristics, and consumer acceptance of selected white sweet corn varieties in the southeastern United States. *Hort. Technology*. Vol. 9(2), 289-293
- Singh B., Sharma, D.K., Kumar R., Gupta A., 2009. Controlled release of the fungicide thiram from starch–alginate–clay based formulation. Department of Chemistry, Himachal Pradesh University, Shimla, 171005, India. *Applied Clay Science* 45 P. 76–82
- Six, J., Bossuyt, H., Degryze, S., & Denef, K. 2004. A history of research on the link between (micro) aggregates, soil biota, and soil organic matter dynamics. *Soil and Tillage Research*, 79, 7–31.
- Smith F., Smith S.A., 2015. How harmonious are arbuscular mycorrhizal symbioses? Inconsistent concepts reflect different mindsets as well as results. *New Phytol.* 205, 1381–1384.
- Smith S.E and Read D.J., 2008. *Mycorrhiza Symbiosis*. 3rd edition. Academic Press, San Diego, CA. 787 pages
- Smith S.E., Read D.J. 2010 *Mycorrhizal Symbiosis*. edn 3. London. Academic Press
- Smith, R.L., Banks, J.L., Snavely, M.D., Maguire, M.E., 1993. Sequence and topology of the C or A magnesium transport systems of *Salmonella typhimurium* and *Escherichia coli*: identification of a new class of transport protein. *J Biol Chem* 1993;268:14071.
- Smith, S.E. and Smith, F.A., 2012. Fresh perspectives on the roles of arbuscular mycorrhizal fungi in plant nutrition and growth. *Mycologia* 104, 1–13

- Smith, S.E., Smith, F.A., 2011. Roles of arbuscular mycorrhizas in plant nutrition and growth: new paradigms from cellular to ecosystem scales. *Annual Review of Plant Biology* 62, 227–250.
- Smith, S.E., Smith, F.A., and Jakobsen, I. 2003. Mycorrhizal fungi can dominate phosphate supply to plants irrespective of growth responses. *Plant physiology* 133:16-20.
- Smith, S. E., and Read. D. J., 1997. *Mycorrhizal Symbiosis*. Second Edition. Academic Press. Harcourt Brace & Company Publisher, London. pp. 32- 79
- Snyder, F.W., G.E. Carlson. 1993. Selecting for partitioning of photosynthetic products in corps. *Jurnal Advances in Agronomy*.37:47-69
- Strullu-Derrien, C., Marc-Andre., Selosse., Kenrick, P., and Martin, F.M. 2018. The Origin And Evolution Of Mycorrhizal Symbiosis: From Palaeomycology To Phylogenomics. *New Phytologist* 220: 1012-1030.
- Su J., Liu B, Liao J., Yang Z., Lin C., Oka Y. 2017. Coordination of cryptochrome and phytochrome signals in the regulation of plant light responses, *Agronomy* 7 (2017) 25, <http://dx.doi.org/10.3390/agronomy 7010025>
- Suh, J.S. 2005. Application of VA mycorrhizae and phosphate solubilizers as biofertilizers in Korea. FNCA Joint Workshop on Mutation Breeding and Biofertilizer China 20-23
- Sujana, I.P dan I.N.L.S Pura . 2015. Pengelolaan Tanah Ultisol Dengan Pemberian Pembelah Organik Biochar Menuju Pertanian Berkelanjutan. Staff Pengajar Fakultas Pertanian Universitas Mahasaraswati Denpasar. Arimeta: Jurnal Pertanian Berbasis Keseimbangan Ekosistem . vol : 05
- Suk S.L., Sang H.Y. 1999. Sugars, soluble solids and flavor of sweet, super sweet and waxy corns during grain filling. *Korean Journal of Crop Science*, 44(3), 267-272
- Sun Y., Yang R., Li L., Huang J., 2017. The magnesium transporter MGT10 is essential for chloroplast development and photosynthesis in *Arabidopsis thaliana*, *Mol. Plant.* 10 (12) (2017 Dec 4) 1584–1587.
- Suprapto, 1997. *Bercocok Tanam Jagung*. Penebar swadaya, Jakarta.
- Sutoro, Soelaeman, T., dan Iskandar. 1988. *Budidaya Tanaman Jagung dalam Jagung*. Badan Litbang Pertanian. Puslitbangtan Bogor. hlm: 49- 65
- Szpaar, D., And Dregiew, D. 1999. *Corn*. Uzhebno-prakticheskoe guide to growing corn. Minsk.
- Szymanek ,M., B. Dobrzański jr., I. Niedzió³ka., R. Rybczyñski. 2006. *Sweet Corn Harvest and Technology Physical Properties and Quality*. Centre of

Excellence Agrophysics for Applied Physics in Sustainable Agriculture. B. Dobrzański Institute of Agrophysics Polish Academy of Sciences. P. 227

- Szymanek, M., Niedziółka I., Dobrzański B. jr. 2004 . Właściwości fizyczne ziarna kukurydzy cukrowej w aspekcie jego mechanicznego odcinania. *Acta Agroph.*, 107: 77
- Tadmor Y., Tracy W.F., Yousef G.G., Juvik J.A. 2001. Low phytic acid1-1 does not affect sugar metabolism in sugary 1 kernels. *Maydica*, 46: 1, 11-19.
- Tanaka, R., Kobayashi, K., Masuda, T., 2011. Tetrapyrrole Metabolism in *Arabidopsis thaliana*. *Arabidopsis Book* 9, e0145.
- Teste, F.P., Simard, S.W., Durall, D.M., Guy, R.D., Berch, S.M., 2010. Net carbon transfer between *Pseudotsuga menziesii* var. *glaucia* seedlings in the field is influenced by soil disturbance. *J. Ecol.* 98, 429e439.
- Teste, F.P., Simard, S.W., Durall, D.M., Guy, R.D., Jones, M.D., Schoonmaker, A.L., 2009. Access to mycorrhizal networks and roots of trees: importance for seedling survival and resource transfer. *Ecology* 90, 2808e2822
- Tewari, R.K., Kumar P, Sharma, P.N., 2006. Magnesium deficiency induced oxidative stress and antioxidant responses in mulberry plants. *Scientia Horticulturae* 108, 7-14.
- Tewari, R.K., Kumar, P., Tewari, N., Srivastava, S., Sharma, P.N., 2004. Macronutrient deficiencies and differential antioxidant responses - influence on the activity and expression of superoxide dismutase in maize. *Plant Science* 166, 687-694.
- Thomas, J.R. dan Nelson, J.K., 1990. *Research Methods in Physical Activity*, 2nd edition, Illinois: Human Kinetics Books Publishers, Inc
- Tikkanen, M., Aro, E.M., 2012. Thylakoid protein phosphorylation in dynamic regulation of photosystem II in higher plants. *Biochim. Biophys. Acta* 1817, 232–238
- Tillman, A. D., H. Hartadi, S. Reksohadiprodjo, S. Prawirokusumo dan S. Lebdosoekojo.. 1989. *Ilmu Makanan Ternak Dasar*. Gajah Mada University Press, Yogyakarta
- Tisserant, E., Kohler, A., Dozolme-Seddas, P., Balestrini, R., Benabdellah, K., Colard, A., et al., 2012. The transcriptome of the arbuscular mycorrhizal fungus *Glomus intraradices* (DAOM 197198) reveals functional tradeoffs in an obligate symbiont. *The New Phytologist* 193, 755–769.
- Tobing, M.P.L, Ginting, O. Ginting, S dan R.K Damanik, 1995. *Agronomi Tanaman Makanan I*. Fakultas Pertanian Universitas Sumatera Utara, Medan.
- Toharmat T. 1985. Kebutuhan mineral makro untuk produksi susu pada sapi perah laktasi dihubungkan dengan kondisi faalnya [skripsi]. Bogor (ID): Institut Pertanian Bogor.

- Tomasz K., Anna G., Włodzimierz K., 2012. Effect of magnesium nutrition of onion (*Allium cepa* L.). Part I. yielding and nutrient status, *Ecol. Chem. Eng. S* 19 (2012) 97–105.
- Tracy, W. F. 1994. Sweet corn. In: A. R. Halleuer (Ed.) *Specialty corns*. USA: CRC Press Inc
- Tran, B.T.T., Watts-Williams, S.J., Cavagnaro, T.R., 2019. Impact of an arbuscular mycorrhizal fungus on the growth and nutrition of fifteen crop and pasture plant species. *Funct. Plant Biol.* 46, 732–742. <https://doi.org/10.1071/FP18327>
- Trankner M., and Jaghdani S.J., 2019. Minimum magnesium concentrations for photosynthetic efficiency in wheat and sunflower seedlings, *Plant Physiol. Biochem.* 144 .P. 234–243, <https://doi.org/10.1016/j.plaphy.2019.09.040>.
- Trankner M., Jakli B., Tavakol E., Geilfus C.M., Cakmak I., Ditttert K., Senbayram M., 2016. Magnesium deficiency decreases biomass water-use efficiency and increases leaf water-use efficiency and oxidative stress in barley plants. *Plant Soil* 406: 409-423
- Tränkner, M., Tavakol, E., and Jákli B., 2018. Functioning of potassium and magnesium in photosynthesis, photosynthate translocation and photoprotection. *Physiol. Plant.* 163, 414–431. doi: 10.1111/ppl.12747
- Trimanda, O., Syarfrudin., Syamsudin. 2018 . The effect of dosage of mycorrhizal fertilizer on growth and yield of some varieties of chilli (*Capsicum annuum* L.) on Inceptisol Krueng Raya Aceh Besar. Department of Post Graduate Agroecotechnology, Syiah Kuala University, Aceh, Indonesia. International Journal of Agronomy and Agricultural Research (IJAAR). Vol. 13, No. 1, p. 46-54
- Trotta, A., Falaschi, P., Cornara, L., Minganti, V., Fusconi, A., Drava, G., Berta, G., 2006. Arbuscular mycorrhizae increase the arsenic translocation factor in the As hyperaccumulating fern *Pteris Vittata* L. *Chemisphere* 65, 74-81.
- Urbanova, M., Snajdr, J., & Baldrian, P. 2015. Composition of fungal and bacterial communities in forest litter and soil is largely determined by dominant trees. *Soil Biology and Biochemistry*, 84, 53–64.
- Van Den Hoogen, J., Geisen, S., Routh, D., Ferris, H., Traunspurger, W., Wardle, D. A., & Bardgett, R. D. 2019. Soil nematode abundance and functional group composition at a global scale. *Nature*, 572(7768), 194–198.
- van der Heijden, M. G. A., Klironomos, J. N., Ursic, M., . 1998. Mycorrhizal fungal diversity determines plant biodiversity, ecosystem variability and productivity. *Nature*, 396, 69–72
- van der Mescht A., de Ronde J.A., Rossouw F.T., 1999. Chlorophyll fluorescence and chlorophyll content as a measure of drought tolerance in potato. *Vegetable and*

Ornamental Plant Institute, ARC-Roodeplaat, Private Bag X293, Pretoria, 0001, South Africa

- Veit B, Schmidt R.J., Hake S., Yanofsky M.F., 1993. Maize Floral Development: New Genes and Old Mutants. *The Plant Cell* 5:1205-15.
- Verbruggen, N., Hermans, C., 2013. Physiological and molecular responses to magnesium nutritional imbalance in plants. *Plant and Soil* 368, 87-99.
- Veresoglou, S.D., Chen, B., Rillig, M.C., 2012b. Arbuscular mycorrhiza and soil nitrogen cycling. *Soil Biology & Biochemistry* 46, 53-62
- Vodnik, D., Grćman, H., Maćek, I., van Elteren, J.T., Kovačević, M., 2008. The contribution of glomalin - related soil protein to Pb and Zn sequestration in polluted soil. *Sci. Total Environ.* 392, 130–136. doi: 10.1016/j.scitotenv.2007.11.016
- Vollbrecht E and Schmidt R ., 2009. Development if the Inflorescences. In: Bennetzen J, Hake S, *Handbook of Maize: Its Biology*. New York: Springer
- Waligóra H. 2002 . Kukurydza cukrowa i moŚliwości jej uprawy w Polsce. Wieś Jutra, 6
- Walker C.F., and Weinstein J.D., 1994. The magnesium-insertion step of chlorophyll biosynthesis is a two-stage reaction, *Biochem. J.* 299 .p. 277-284.
- Wang H., and Wang H. 2014. Phytochrome Signaling: Time To Tighten Up The Loose Ends. Mol. Plant. Biotechnology Research Institute, Chinese Academy of Agriculture Science, Beijing doi: 10.1016/j.molp.2014.11.021.
- Wang, Y., Huang, J., Gao, Y., 2012. Arbuscular mycorrhizal colonization alters subcellular distribution and chemical forms of cadmium in *Medicago sativa* L. and resists cadmium toxicity. *PLoS One* 7. <https://doi.org/10.1371/journal.pone.0048669>
- Warisno. 2005. Budidaya Jagung manis Hibrida. Yogyakarta: Kanisius.
- Waters B.M., 2011. Moving magnesium in plant cells: commentary, *New Phytol.* 190 .P. 510–513.
- Waters, M.T., Gutjahr, C., Bennett, T., and Nelson, D.C. 2017. Strigolactone Signaling and Evolution. *Annu Rev Plant Biol* 68:291-322.
- Wen, Z., Li, Hongbo, Shen, Q., Tang, X., Xiong, C., Li, Haigang, Pang, J., Ryan, M.H., Lambers, H., Shen, J., 2019. Tradeoffs among root morphology, exudation and mycorrhizal symbioses for phosphorusacquisition strategies of 16 crop species. *New Phytol.* 223, 882–895. <https://doi.org/10.1111/nph.15833>

- Wick, A.F., Haus, N.W., Sukkariyah, B.F., Haering, K.C., Daniels, W.L., 2011. Remediation of PAH-contaminated soils and sediments: a literature review. Virginia Tech, 1-102.
- Widyati E. 2013. Dinamika Komunitas Mikroba Di Rizosfir dan Kontribusinya Terhadap Pertumbuhan Tanaman Hutan. Jurnal Tekno Hutan Tanaman. 6:55–64
- Wilkinson S.R., Welch R.M., Mayland H.F., Grunes D.L., 1990. Magnesium in plants: uptake, distribution, function, and utilization by man and animals. In: Sigel H, Sigel A (eds) Metal Ions in Biological Systems. Marcel Dekker Inc, New York, pp 33–56
- Willis, A., Rodrigues, B.F., Harris, P.J.C., 2013. The Ecology of Arbuscular Mycorrhizal Fungi. CRC. Crit. Rev. Plant Sci. 32, 1–20. doi:10.1080/07352689.2012.683375
- Willows R.D., 2003. Biosynthesis of chlorophylls from protoporphyrin IX, Nat. Prod. Rep. 20 .p. 327-341
- Wirahadikusumah, M. 1985. Biokimia: metabolisme, energi, karbohidrat, dan lipid. Penerbit ITB. Bandung. pp 96-118.
- Wong A.D., Juvik J.A. 1994. Shrunken2 sweet corn yield and the chemical components of quality. J. Amer. Soc. Hort. Sci., 119: 747-755
- Wu, S., Zhang, X., Huang, L., Chen, B., 2019. Arbuscular mycorrhiza and plant chromium tolerance. Soil Ecol. Lett. 1,94 – 104 . <https://doi.org/10.1007/s42832 - 019 - 0015 - 9>
- Wulfsohn D and Nyengaard J.R., 1999. Simple stereological procedure to estimate the number and dimensions of root hairs. Department of Agricultural and Bioresource Engineering, University of Saskatchewan, 57 Campus Drive, Saskatoon, SK S7N 5A9, Canada. Plant and Soil 209: 129–136
- Xiao J.X., Yin Hu C.Y., Chen Y.Y., Yang B., Hua J., 2014. Effects of low magnesium and an arbuscular mycorrhizal fungus onthe growth, magnesium distribution and photosynthesis of two citruscultivars. Provincial Key Laboratory for the Conservation and Utilization of Important Biological Resources in Anhui, Colleges of Life Sciences, Anhui NormalUniversity, No.1 Beijing East Road, Wuhu, Anhui 241000, People's Republic of China. Scientia Horticulturae .177, 14–20
- Xu J., Liu Y., Jian Liu., Cao M., Wang J., Lan H., Xu Y., Lu Y., Pan G., Rong T. 2012. The Genetic Architecture of Flowering Time and Photoperiod Sensitivity in Maize as Revealed by QTL Review and Meta Analysis. Maize Research Institute, Sichuan Agricultural University, Wenjiang 611130, Sichuan, China

- Xu, X. F., Wang, B., Lou, Y., Han, W.J., Lu, J.Y., Li, D.D., Li, L.G., Zhu, J., Yang, Z.N., 2015. Magnesium Transporter 5 plays an important role in Mg transport for male gametophyte development in Arabidopsis. *Plant J* 2015, 84:925-936.
- Yang G.H., Yang L.T., Jiang H.X., Li Y., Wang P., Chen L.S., 2012. Physiological impacts of magnesium-deficiency in Citrus seedlings: photosynthesis, antioxidant system and carbohydrates, *Trees Struct. Funct.* 26 .P. 1237–1250, <https://doi.org/10.1007/s00468-012-0699-2>.
- Yang N., Jiang J., Xie H., Bai M., Xu Q., Wang X., Yu X., Chen Z., Guan Y., 2017. Metabolomics reveals distinct carbon and nitrogen metabolic responses to magnesium deficiency in leaves and roots of Soybean [Glycine max (Linn.) Merr.]. *Front Plant Sci* 8: 1–12
- Yang Y.S., Guo X.X., Liu H.F., Liu G.Z., Liu W.M., Ming B., Xie R.Z., Wang K.R., Hou P., Li S.K., 2021. The effect of solar radiation change on the maize yield gap from the perspectives of dry matter accumulation and distribution. The Key Laboratory of Oasis Eco-agriculture, Xinjiang Production and Construction Corps/College of Agronomy, Shihezi University, Shihezi 832003, P.R.China. *Journal of Integrative Agriculture*, 20(2): 482–493
- Yanto N. 2020. Respon Pertumbuhan Dan Produksi Tanaman Jagung Manis (*Zea mays saccharata* Sturt) Pada Sistem Tanam Dengan menggunakan Pupuk NPK Majemuk. Skripsi. Fakultas Pertanian Universitas Muhammadiyah Palembang.
- Ye K., Tang Y., Fu D., Chen T., Li M . 2021. Effect of magnesium oxide pretreatment on the delignification and enzymatic hydrolysis of corncob. National Engineering Laboratory of Textile Fiber Materials and Processing Technology, Zhejiang Sci-Tech University, Hangzhou, 310018, China. <https://doi.org/10.1016/j.indcrop.2020.113170>
- Ye X., Chen X.F., Deng C.L, Yang L.T., Lai N.W., Guo J.X., Chen L.S., 2019. Magnesiumdeficiency effects on pigments, photosynthesis and photosynthetic electron transport of leaves, and nutrients of leaf blades and veins in Citrus sinensis seedlings, *Plants* 8 .p. 389.
- Youlu, B., Jiyun,J., Liping, Y. 2004. Application prospects of soil Available magnesium in China and its application status with magnesium fertilizer. *Soil and Fertilizer*, 2 : 3-5
- Yousaf M., Bashir S., Raza H., Shah A.N., Iqbal J., Arif M., Bukhari M.A ., Muhammad S., Hashim S., Alkahtani J., Alwahibi M.S., Hu C., 2021. Role of nitrogen and magnesium for growth, yield and nutritional quality of radish. Department of Soil and Environmental Sciences, Faculty of Agriculture, Ghazi University, Dera Ghazi Khan 32200, Pakistan. *Saudi Journal of Biological Sciences*. <https://doi.org/10.1016/j.sjbs.2021.02.043>

- Yuan, W., Yuan, S., Wang, Q., Gan, C., Liu, Y., Mei, S., 2014. Effect of different amount of N-fertilizers on growth, root yield and nitrate content of white radishes in Southern China. *J. Food Agric. Environ.* 12 (1), 302–304
- Yusuf M. 2016. Pengaruh Pupuk Kandang Ayam Dan Kalium Terhadap Laju Tumbuh Relatif dan Laju Asimilasi Bersih Jagung Manis (*Zea mays saccharata Sturt*). Program Studi Agroekoteknologi, Fakultas Pertanian, Universitas Malikussaleh. *Jurnal Agrium* 13(1), Maret 2016. Hlm. 20-23
- Zaki, M.K., Rahmat, A., Pujiasmanto, B., 2020. Organic amendment and fertilizer effect on soil chemical properties and yield of maize (*Zea mays L.*) in rainfed condition. *Walailak J. Sci. Technol. (WJST)* 17 (1), 11_17.
- Zhang F.L., NIU X.K., Zhang Y.M., Xie R.Z., Liu X., LI S.K., and Gao S.J., . 2013. Studies on the Root Characteristics of Maize Varieties of Different Eras. Key Laboratory of Crop Growth Regulation, Science and Technology Department of Hebei Province/College of Agronomy, Agricultural University of Hebei, Baoding 071001, P.R.China. *Journal of Integrative Agriculture* , 12(3): 426-435
- Zhang, X., Wang, L., Ma, F., Shan, D., 2015. Effects of arbuscular mycorrhizal fungi on N₂O emissions from rice paddies. *Water, Air, & Soil Pollution* 226, 222-232.
- Zhang, X.W., Dong, W.T., Sun, J.H., Feng, F., Deng, Y.W., He, Z.H., Oldroyd, G.E.D., and Wang, E.T. 2015. The receptor kinase CERK1 has dual functions in symbiosis and immunity signalling. *Plant J* 81:258-267
- Zhou B., Zhou Z., Ding J., Zhang X., Mu C., Wu Y., Gao J., Song Y., Wang S., Ma J., Li X., Wang R., Xia Z., Chen J., Wu J.. 2018. Combining Three Mapping Strategies to Reveal Quantitative Trait Loci and Candidate Genes for Maize Ear Length. *The Plant Genom*
- Zhou, J.L., 1999. Zn biosorption by Rhizophorus arrhizus and other fungi, *Appl. Microbiol.Biotechnol.* 51, 686-693.
- Zörb, C., Senbayram, M., Peiter, E., 2014. Potassium in agriculture-status and perspectives. *J. Plant Physiol.* 171, 656–669.
- Zuroidah, I.R., 2011. Pengaruh Pemberian Cendawan Mikoriza Arbuskular (CMA) terhadap Karakteristik Anatomi Daun dan Kadar Klorofil Tanaman Kacang Koro Pedang (*Canavalia ensiformis* L.). Program Studi Biologi, Fakultas Sains dan Biologi, Universitas Airlangga, Surabaya