DAFTAR PUSTAKA

Adrianto, Umar, H., & Toknok, B. (2015). Pola Penyebaran Pohon Gofasa (Vitex cofassus Reinw . Ex Blume) di Kawasan Tahura Palu. *Warta Rimba*, *3*(2), 15–20.

Agus, C., Wulandari, D., Primananda, E., Hendryan, A., & Harianja, V. (2017). The Role of Soil Amendment on Tropical Post Tin Mining Area in Bangka Island Indonesia for Dignified and Sustainable Environment and Life. *IOP Conference Series: Earth and Environmental Science*, *83*(1), 1–8. https://doi.org/10.1088/1755-1315/83/1/012030

Aji, I. M. L., Sutriono, R., & Diansyah, A. (2020). Pematahan Dormansi Benih Aren (Arenga pinnata (wurmb.) Merr.) pada Tingkat Kemasakan yang Berbeda Menggunakan Metode Perendaman. *Jurnal Belantara*, *3*(1), 12–24. https://doi.org/10.29303/jbl.v3i1.111

Akbar, M., Chohan, S. A., Yasin, N. A., Ahmad, A., Akram, W., & Nazir, A. (2023). Mycorrhizal Inoculation Enhanced Tillering in Field Grown Wheat, Nutritional Enrichment and Soil Properties. *PeerJ*, *11*, 1–23. https://doi.org/10.7717/peerj.15686

Alfariza, Sriwulan, & Purnomo, E. (2021). Angka Lempeng Total Bakteri Tanah Pada Lahan Reklamasi Tambang Batu Kapur. *Prosiding Seminar Nasional Penelitian Dan Pengabdian Masyarakat*, *6*(1), 366–370. https://informatika.unirow.ac.id/prosiding/index.php/SNasPPM/article/view/921

Alghofar, W. A., Purnamaningsih, S. L., & Damanhuri. (2017). Pengaruh Suhu Air dan Lama Perendaman terhadap Perkecambahan dan Pertumbuhan Bibit Sengon (Paraserianthes falcartaris L. Nielsen). *Jurnal Produksi Tanaman*, *5*(10), 1639–1644.

Aljawasim, B. ker D., Khaeim, H. M., & Manshood, M. A. (2020). Assessment of Arbuscular Mycorrhizal Fungi (Glomus spp.) as Potential Biocontrol Agents Against Damping-off Disease Rhizoctonia Solani on Cucumber. *Journal of Crop Protection*, *9*(1), 141–147.

Allo, M. K. (2016). Kondisi Sifat Fisik dan Kimia Tanah pada Bekas Tambang Nikkel serta Pengaruhnya Terhadap Pertumbuhan Trengguli dan Mahoni. *Jurnal Hutan Tropis*, *4*(2), 207–217.

Anggreiny, Y., Nazip, K., & Santri, D. J. (2017). Identifikasi Fungi Mikoriza Arbuskula (FMA) pada Rhizosfir Tanaman di Kawasan Revegetasi Lahan Penambangan Timah di Kecamatan Merawang Kabupaten Bangka dan Sumbangannya pada Pembelajaran Biologi SMA. *Prosiding Seminar Nasional Pendidikan IPA 2017*, 391–403.

Ansiga, R. E., Rumambi, A., Kaligis, D., Mansur, I., & Kaunang, W. (2017). Eksplorasi Fungi Mikoriza Arbuskula (FMA) pada Rizosfir Hijauan

Pakan. *Jurnal Zootek*, *37*(1), 167–178.

Aprillia, D., Riniarti, M., & Bintoro, A. (2019). Aplikasi Ektomikoriza pada Media Tanam Bekas Tambang Kapur untuk Membantu Pertumbuhan Mangium (Acacia mangium). *Jurnal Sylva Lestari*, *7*(3), 332–341.

Asyi'ah, S., Adelina, E., & Made, U. (2019). Pengaruh Suhu Air Panas dan Lama Perendaman Giberelin Terhadap Pematahan Dormansi Palem Putri (Veitchia merrilli). *Agrotekbis*, *7*(6), 712–720.

Ayuningtyas, V. K., Tahir, M., & Same, M. (2017). Pengaruh Waktu Perendaman dan Konsentrasi Giberelin (GA3) pada Pertumbuhan Benih Cemara Laut (Casuarina equisetifolia L.). *Jurnal Agro Industri Perkebunan*, *5*(1), 29–38.

Begum, N., Qin, C., Ahanger, M. A., Raza, S., Khan, M. I., Ashraf, M., Ahmed, N., & Zhang, L. (2019). Role of Arbuscular Mycorrhizal Fungi in Plant Growth Regulation: Implications in Abiotic Stress Tolerance. *Frontiers in Plant Science*, *10*(1068), 1–15. https://doi.org/10.3389/fpls.2019.01068

Berger, F., & Gutjahr, C. (2021). Factors Affecting Plant Responsiveness to Arbuscular Mycorrhiza. *Current Opinion in Plant Biology*, *59*, 1–9. https://doi.org/10.1016/j.pbi.2020.101994

Berruti, A., Lumini, E., Balestrini, R., & Bianciotto, V. (2016). Arbuscular Mycorrhizal Fungi as Natural Biofertilizers: Let's Benefit from Past Successes. *Frontiers in Microbiology*, *6*, 1–13. https://doi.org/10.3389/fmicb.2015.01559

Bhat, R. A., Dervash, M. A., Mehmood, M. A., Skinder, B. M., Rashid, A., Bhat, J. I. A., Singh, D. V., & Lone, R. (2017). Mycorrhizae: A Sustainable Industry for Plant and Soil Environment. In A. Varma, R. Prasad, & N. Tuteja (Eds.), *Mycorrhiza - Nutrient Uptake, Biocontrol, Ecorestoration: Fourth Edition* (Fourth). Springer International Publishing AG. https://doi.org/10.1007/978-3-319-68867-1

Bi, Y., Wang, X., Cai, Y., & Christie, P. (2021). Arbuscular Mycorrhizal Colonization Increased Above- Belowground Feedback of Maize In a Degraded Coal Mining Area Soil By Increasing The Photosynthetic Carbon Assimilation And Allocation of Mazie. *Research Square*, 1–18.

Bisht, V. K., Uniyal, R. C., Pathak, J. M., & Dhutra, S. B. (2021). Seeds of Azadirachta indica A . Juss : Orthodox or Recalcitrant? *Iranian Journal of Science and Technology, Transactions A: Science*, 1989–1991. https://doi.org/10.1007/s40995-021-01062-y

Brundrett, M., Bougher, N., Dell, B., Grove, T., & Nalajczuk, N. (1996). *Working with Mycorrhiza in Forestry anf Agriculture* (P. Lynch (ed.)). The Australian Centre for International Agricultural Research, Australia.

Budi, S. W., Maharani, P., Sukendro, A., & Wibowo, C. (2020). The Role of

MycoSilvi, Lime, and Compost on The Growth of Balsa (Ochroma bicolor Rowlee.) Seedling in Post Silica Sand Mine Media. *Journal of Sylva Indonesiana*, *03*(01), 28–39.

Carillo, P., Kyratzis, A., Kyriacou, M. C., Dell'Aversana, E., Fusco, G. M., Corrado, G., & Rouphael, Y. (2020). Biostimulatory Action of Arbuscular Mycorrhizal Fungi Enhances Productivity, Functional and Sensory Quality in 'Piennolo del Vesuvio' Cherry Tomato Landraces. *Agronomy*, *10*(911), 1–20. https://doi.org/10.3390/agronomy10060911

Chandra, J., Dubey, M., Varghese, B., Sershen, & Keshavkant, S. (2021). Towards Understanding the Basis of Desiccation-induced Oxidative Stress in Recalcitrant Seeds: The Case of Madhuca latifolia Roxb. *South African Journal of Botany*, *142*, 100–105. https://doi.org/10.1016/j.sajb.2021.06.012

Choi, J., Summers, W., & Paszkowski, U. (2018). Mechanisms Underlying Establishment of Arbuscular Mycorrhizal Symbioses. *Annual Review of Phytopathology*, *56*, 135–160. https://doi.org/10.1146/annurev-phyto-080516-035521

Christofer, F., Sari, S. P., Sapulette, K., Anggayni, M., Hutagalung, E., & Irawati, W. (2022). Mikorizoremediasi : Asosiasi Fungi Mikoriza Arbuskula dalam Meningkatkan Kemampuan Penyerapan Logam pada Tanaman Hiperakumulator di Lahan Pertambangan. *Jurnal Teknologi Lingkungan*, *23*(1), 118–125.

Das, D., Paries, M., Hobecker, K., Gigl, M., Dawid, C., Lam, H. M., Zhang, J., Chen, M., & Gutjahr, C. (2022). Phosphate Starvation Response Transcription Factors Enable Arbuscular Mycorrhiza Symbiosis. *Nature Communications*, *13*(477), 1–12. https://doi.org/10.1038/s41467-022-27976-8

Dastogeer, K. M. G., Zahan, M. I., Tahjib-Ul-Arif, M., Akter, M. A., & Okazaki, S. (2020). Plant Salinity Tolerance Conferred by Arbuscular Mycorrhizal Fungi and Associated Mechanisms: A Meta-Analysis. *Frontiers in Plant Science*, *11*(588550), 1–22. https://doi.org/10.3389/fpls.2020.588550

Delvian, & Hartanto, A. (2022). Short Communication: Occurrence of Arbuscular Mycorrhizal Fungi Associated with Casuarina equisetifolia in Saline Ssandy Environment, North Sumatra, Indonesia. *Biodiversitas*, *23*(5), 2520–2525. https://doi.org/10.13057/biodiv/d230532

Djamhuri, E., Yuniarti, N., & Purwani, H. D. (2012). Viabilitas Benih dan Pertumbuhan Awal Bibit Akasia Krasikarpa (Acacia crassicarpa A. Cunn. Ex Benth.) dari Lima Sumber Benih di Indonesia. *Jurnal Silvikultur Tropika*, *03*(03), 187–195.

Doubková, P., Suda, J., & Sudová, R. (2012). The Symbiosis with Arbuscular Mycorrhizal Fungi Contributes to Plant Tolerance to

Serpentine Edaphic Stress. *Soil Biology and Biochemistry*, *44*, 56–64. https://doi.org/10.1016/j.soilbio.2011.09.011

Doubková, P., Vlasáková, E., & Sudová, R. (2013). Arbuscular Mycorrhizal Symbiosis Alleviates Drought Stress Imposed on Knautia arvensis Plants in Serpentine Soil. *Plant Soil*, *370*, 149–161. https://doi.org/10.1007/s11104-013-1610-7

Ekawati, Mansur, I., & Dewi, P. (2016). Pemanfaatan Kompos dan Mikoriza Arbuskula pada Longkida (Nauclea orientalis) di Tanah Pasca Tambang Nikel PT. Antam Pomalaa. *Jurnal Silvikultur Tropika*, *07*(1), 1–7.

Erfandi, D., Rachman, A., & Agus, F. (2019). Rehabilitasi Lahan Bekas Tambang Timah untuk Pertanian. In F. Agus, Y. Soelaeman, & M. Anda (Eds.), *Petunjuk Teknis Rehabilitasi Lahan Bekas Tambang untuk Pertanian* (pp. 5–18). Badan Penelitian dan Pengembangan Pertanian, Jakarta.

Faddoul, Z., Jamai, H., Gabardi, S. El, Chliyeh, M., Selmaoui, K., Touhami, A. O., Benkirane, R., & Douira, A. (2020). Mycorrizal Status of Wheat (Triticum Aestivum and Triticum Durum) Cultivated in North West of Morocco. *Plant Archives*, *20*(2), 4139–4157.

Gayatri, G. P., Kumar, K. G. A., Nair, P. S., Deth, G. S. K., & Baiju, K. V. (2021). Dynamics of Water and Abscisic Acid During Embryogeny and Embryo Drying in the Recalcitrant Seeds of Vateria indica L. *Journal of Plant Growth Regulation*. https://doi.org/10.1007/s00344-020-10274-2

Gea, D. T. Y., Haryati, & Ginting, J. (2018). Pengaruh Suhu Air dan Lama Perendaman pada Dua Tingkat Kematangan Buah terhadap Perkecambahan Benih Sirsak (Annona muricata Linn). *Jurnal Agroekoteknologi FP USU*, *6*(3), 501–507.

George, N. P., & Ray, J. G. (2023). The Inevitability of Arbuscular Mycorrhiza for Sustainability in Organic Agriculture-A Critical Review. *Frontiers in Sustainable Food Systems*, *7*(1124688), 1–23. https://doi.org/10.3389/fsufs.2023.1124688

Ghaida, S. H., Wasis, B., & Budi, S. W. (2020). Application of Arbuscular Mycorrhizal Fungi and Soil Ameliorant on the Growth of Leucaena leucocephala in Limestone Post-mining Soil Media. *Jurnal Manajemen Hutan Tropika*, *26*(3), 282–290. https://doi.org/10.7226/JTFM.26.3.282

Goto, B. T., Silva, G. A. da, Assis, D. M. A. De, Silva, D. K. A., Souza, R. G., Ferreira, A. C. A., Jobim, K., Mello, C. M. A., Vieira, H. E. E., Maia, L. C., & Oehl, F. (2012). Intraornatosporaceae (Gigasporales), A New Family with Two New Genera and Two New Species. *Mycotaxon*, *119*, 117–132.

Habte, M., & Manjunath, A. (1991). Categories of Vesicular-Arbuscular Mycorrhizal Dependency of Host Species. *Mycorrhiza*, *1*(1), 3–12. https://doi.org/10.1007/BF00205896

Haj Sghaier, A., Tarnawa, Á., Khaeim, H., Kovács, G. P., Gyuricza, C., & Kende, Z. (2022). The Effects of Temperature and Water on the Seed Germination and Seedling Development of Rapeseed (Brassica napus L.). *Plants*, *11*(2819), 1–18. https://doi.org/10.3390/plants11212819

Hamdan, A. M., Rahmi, R., Hafidz, A., & Rispalman. (2021). Future Direction of Au Agromining on How to Solve Artisanal and Small Scale Gold Mining Problems. *Journal of Degraded and Mining Lands Management*, *8*(4), 2971–2984. https://doi.org/10.15243/JDMLM.2021.084.2971

Haruna, N., Wardiyati, T., Maghfoer, M. D., & Handayanto, E. (2018). Fitoremediasi Lahan yang Mengalami Cekaman Logam Berat Nikel dengan Menggunakan Tumbuhan Endemik Belimbing Bajo (Sarcotheca celebica Veldk). *Journal Tabaro*, *2*(2), 239–246.

Hasibuan, O., Tjakratmadja, J. H., & Sunitiyoso, Y. (2021). Finding Workable and Mutually Beneficial Solutions to Eradicate Illegal Gold Mining. *Bisnis & Birokrasi: Jurnal Ilmu Administrasi Dan Organisasi*, *28*(2), 106–117. https://doi.org/10.20476/jbb.v28i2.1239

Hayati, N., Bisjoe, A. R. H., & Wakka, A. K. (2019). Analisis Tataniaga Kayu Bitti (Vitex cofassus) di Kabupaten Bulukumba Sulawesi Selatan. *Buletin Eboni*, *1*(1), 21–31. https://doi.org/10.20886/buleboni.5446

Herawati, A., Syamsiyah, J., Mujiyo, Rochmadtulloh, M., Susila, A. A., & Romadhon, M. R. (2021). Mycorrhizae and a Soil Ameliorant on Improving the Characteristics of Sandy Soil. *Journal of Soil Science and Agroclimatology*, *18*(1), 73–80.

Hirfan. (2016). Strategi Reklamasi Lahan Pasca Tambang. *Pena Teknik: Jurnal Ilmiah Ilmu-Ilmu Teknik*, *1*(1), 101–108. https://doi.org/10.51557/pt_jiit.v1i1.48

Husna. (2015). Potensi Fungi Mikoriza Arbuskula (FMA) Lokal dalam Konservasi Ex-Situ Jenis Terancam Punah Kayu Kuku [Pericopsis mooniana (Thw.) Thw.]. In *Sekolah Pascasarjana Institut Pertanian Bogor*. Institut Pertanian Bogor.

Husna, Budi, R. S. W., Mansur, I., & Kusmana, C. (2016). Growth and Nutrient Status of Kayu Kuku [Pericopsis mooniana (Thw.) Thw] with Mycorrhiza in Soil Media of Nickel Post Mining Site. *Pakistan Journal of Biological Sciences*, *19*(4), 158–170. https://doi.org/10.3923/pjbs.2016.158.170

Husna, Mahmud, A., Tuheteru, F. D., Arif, A., Albasri, Basrudin, Nurdin, W.

R., & Karepesina, S. (2020). Pengaruh Skarifikasi dan Lama Penyimpanan Benih terhadap Viabilitas Benih Kayu Kuku (Pericopsis mooniana [Thw] Thw.). *Jurnal Kehutanan Indonesia Celebica*, *1*(December), 31–40.

Husna, Tuheteru, F. D., & Arif, A. (2017). Arbuscular Mycorrhizal Fungi and Plant Growth on Serpentine Soils. In Q.-S. Wu (Ed.), *Arbuscular Mycorrhizas and Stress Tolerance of Plants* (pp. 293–303). Springer Nature Singapore. https://doi.org/10.1007/978-981-10-4115-0_12

Husna, Tuheteru, F. D., & Arif, A. (2018). Arbuscular Mycorrhizal Fungi Symbiosis and Conservation of Endangered Tropical Legume Trees. *Springer International Publishing*, 465–486. https://doi.org/10.1007/978-3-319-75910-4_19

Husna, Tuheteru, F. D., & Arif, A. (2020). The Potential of Arbuscular Mycorrhizal Fungi to Conserve Kalappia celebica, an Endangered Endemic Legume on Gold Mine Tailings in Sulawesi, Indonesia. *Journal of Forestry Research*. https://doi.org/10.1007/s11676-020-01097-8

Husna, Tuheteru, F. D., Arif, A., & Solomon. (2019). Improvement of Early Growth of Endemic Sulawesi Trees Species Kalappia celebica by Arbuscular Mycorrhizal Fungi in Gold Mining Tailings. *IOP Conf. Series: Earth and Environmental Science*, *394*, 1–5. https://doi.org/10.1088/1755-1315/394/1/012069

Husnain, Asmarhansyah, & Agus, F. (2019). Pendahuluan. In F. Agus, Y. Soelaeman, & M. Anda (Eds.), *Petunjuk Teknis Rehabilitasi Lahan Bekas Tambang untuk Pertanian* (pp. 1–3). Badan Penelitian dan Pengembangan Pertanian, Jakarta.

Ingraffia, R., Amato, G., Frenda, A. S., & Giambalvo, D. (2019). Impacts of Arbuscular Mycorrhizal Fungi on Nutrient Uptake, N2 Fixation, N Transfer, and Growth in a Wheat/Faba Bean Intercropping System. *PLoS ONE*, *14*(3), 1–16. https://doi.org/10.1371/journal.pone.0213672

Ingraffia, R., Amato, G., Sosa-Hernández, M. A., Frenda, A. S., Rillig, M. C., & Giambalvo, D. (2020). Nitrogen Type and Availability Drive Mycorrhizal Effects on Wheat Performance, Nitrogen Uptake and Recovery, and Production Sustainability. *Frontiers in Plant Science*, *11*(760), 1–12. https://doi.org/10.3389/fpls.2020.00760

Irawan, U. S., Arbainsyah, Ramlan, A., Putranto, H., & Afifudin, S. (2020). Buku Manual Persemaian dan Pembibitan Tanaman Hutan. In *Operasi Wallacea Terpadu*. Operasi Wallacea Terpadu. https://elti.yale.edu/sites/default/files/rsource_files/buku_manual_persemaian_dan_pembibitan_tanaman_hutan

Irianto, R. S. B. (2015). Pengaruh Fungi Mikoriza Arbuskular terhadap Pertumbuhan Pulai Hitam (Alstonia angustiloba Miq.) di Persemian dan Lapangan. *Jurnal Penelitian Hutan Dan Konservasi Alam*, *12*(2),

233–242. https://doi.org/10.20886/jphka.2015.12.2.233-242

Jiang, F., Zhang, L., Zhou, J., George, T. S., & Feng, G. (2021). Arbuscular Mycorrhizal Fungi Enhance Mineralisation of Organic Phosphorus by Carrying Bacteria Along their Extraradical Hyphae. *New Phytologist*, *230*, 304–315. https://doi.org/10.1111/nph.17081

Junaidi, & Ahmad, F. (2021). Pengaruh Suhu Perendaman Terhadap Pertumbuhan Vigor Biji Kopi Lampung (Coffeacanephora). *Jurnal Inovasi Penelitian*, *2*(7), 1911–1916.

Kadir, M., Clarita, I. R., Syatrawati, & Sagita, N. A. (2020). Perkecambahan, Perakaran dan Pertumbuhan Hipokotil Benih Kopi Arabika Varietas Catuai pada Aplikasi Berbagai Konsentrasi Giberelin (GA3). *Jurnal Agroplantae*, *9*(2), 95–104.

Kemen LHK, L. (2020). *Vademecum Kehutanan Indonesia*. Kemen-LHK. Jakarta.

Keti, N., Nugroho, Y., & Bakri, S. (2022). Pengaruh Suhu Air dan Lama Perendaman terhadap Perkecambahan Bibit Sengon Buto (Enterolobium cyclocarpum). *Jurnal Sylva Scienteae*, *05*(2), 243–250.

Khullar, S., & Reddy, M. S. (2020). Arsenic Toxicity and Its Mitigation in Ectomycorrhizal Fungus Hebeloma cylindrosporum Through Glutathione Biosynthesis. *Chemosphere*, *240*, 1–8. https://doi.org/10.1016/j.chemosphere.2019.124914

Koobonye, M., Maule, B. V, & Mogotsi, K. (2018). Mechanical Scarification and Hot Water Treatments Enhance Germination of Leucaena leucocephala (Lam.) Seeds. *Livestock Research for Rural Development*, *30*(1).

Krisnayanti, B. D. (2018). ASGM Status in West Nusa Tenggara Province, Indonesia. *Journal of Degraded and Mining Lands Management*, *5*(2), 1077–1084. https://doi.org/10.15243/jdmlm.2018.052.1077

Kurniahu, H., Sriwulan, & Andriani, R. (2018). Pemberian PGPR Indigen untuk Pertumbuhan Kacang Tanah (Arachis hypogaea L.) Varietas Lokal Tuban pada Media Tanam Bekas Tambang Kapur. *Agrovigor*, *11*(1), 52–57.

Kurniaty, R. (2010). Atlas Benih Tanaman Hutan Indonesia Jilid I. In Nurhasybi, H. D. P. Kartiko, M. Zanzibar, D. J. Sudrajat, A. A. Pramono, Buharman, Sudrajat, & Suhariyanto (Eds.), *Balai Penelitian Teknologi Perbenihan Tanaman Kehutanan* (3rd ed., Vol. 4, Issue 3).

Kurniawan, A. (2018). Pengaruh Lama Perendaman dan Konsentrasi Hormon GA3 terhadap Vigor dan Viabilitas Benih Jati di Persemaian. *Jurnal Agrotek Indonesia*, *3*(1), 22–28.

Kurniawan, E. (2013). Teknik Pembibitan Gofasa (Vitex cofassus Reinw). *Info Teknis Eboni*, *10*(1), 58–67.

Kusuma, A., Riniarti, M., & Sunaryanti. (2018). Penambahan Bahan Pembenah Tanah untuk Mempercepat Kolonisasi Ektomikoriza dan Pertumbuhan Damar Mata Kucing (Shorea javanica). *Jurnal Sylva Lestari*, *6*(1), 16–23.

Kusuma, M., Payung, D., & Rahmawati, N. (2019). Uji Daya Kecambah Benih Akasia (Acacia mangium Willd) di Desa Teluk Kepayang Kecamatan Kusan Hulu Kabupaten Tanah Bumbu Kalimantan Selatan. *Jurnal Sylva Scienteae*, *02*(1), 175–183.

Lamare, R. E., & Singh, O. P. (2017). Changes in Soil Quality in Limestone Mining Area of Meghalaya, India. *Nature Environment and Pollution Technology*, *16*(2), 545–550.

Lanfranco, L., & Bonfante, P. (2023). Lessons from Arbuscular Mycorrhizal Fungal Genomes. *Current Opinion in Microbiology*, *75*, 1–9. https://doi.org/10.1016/j.mib.2023.102357

Lehmann, A., Leifheit, E. F., Feng, L., Bergmann, J., Wulf, A., Rillig, M. C., Berlin, F. U., & Biologie, I. (2022). Microplastic Fiber and Drought Effects on Plants and Soil are Only Slightly Modified by Arbuscular Mycorrhizal Fungi. *Soil Ecology Letters*, *4*(1), 32–44.

Lei, K., Pan, H., & Lin, C. (2016). A Landscape Approach Towards Ecological Restoration and Sustainable Development of Mining Areas. *Ecological Engineering*, *90*, 320–325. https://doi.org/10.1016/j.ecoleng.2016.01.080

Lestari, D. A. (2019). Tehnik Penyimpanan Benih Rekalsitran: Mesua ferrea L. dan Swinglea glutinosa (Blanco) Merr. *Jurnal Perbenihan Tanaman Hutan*, *7*(1), 33–44.

Limpitlaw, D., & Briel, A. (2014). Post-Mining Land Use Opportunities in Developing Countries. *Journal of the Southern African Institute of Mining and Metallurgy*, *114*(11), 899–903.

Lopang, A. I., Yusran, Umar, H., & Taiyeb, A. (2020). Pertumbuhan Semai Ketapang (Terminalia catappa L.) pada Berbagai Dosis Fungi Mikoriza Arbuskular. *Jurnal Warta Rimba*, *8*(2), 150–161.

Mamani, G., Soto, H. C., Mateo, S. L. C., Sahley, C. T., Alonso, A., & Linares-Palomino, R. (2018). Substrate, Moisture, Temperature and Seed Germination of The Threatened Endemic Tree Eriotheca vargasii (Malvaceae). *Revista De Biologia Tropical*, *66*(3), 1162–1170.

Mangungsong, A., Soemarsono, & Zudri, F. (2019). Pemanfaatan Mikroba Tanah dalam Pembuatan Pupuk Organik serta Peranannya terhadap Tanah Aluvial dan Pertumbuhan Bibit Tanaman Kakao. *Jurnal Agronomi Indonesia*, *47*(3), 318–325.

Melpiany, Bachtiar, B., Paembonan, S. A., & Larekeng, S. H. (2020). The Effect of Betel Leaves as The Soak Solution for Bitti (Vitex cofassus) Seeds Germination. *IOP Conference Series: Earth and Environmental*

Science, *575*(1), 1–9. https://doi.org/10.1088/1755-1315/575/1/012023

Millang, S., Bachtiar, B., & Makmur, A. (2011). Awal Pertumbuhan Pohon Gaharu (Gyrinops sp.) Asal Nusa Tenggara Barat di Hutan Pendidikan Universitas Hasanuddin. *Jurnal Hutan Dan Masyarakat*, *6*(2), 117–123.

Miransari, M. (2017). Arbuscular Mycorrhizal Fungi and Heavy Metal Tolerance in Plants. In Q.-S. Wu (Ed.), *Arbuscular Mycorrhizas and Stress Tolerance of Plants* (pp. 147–161). Springer Nature Singapore. https://doi.org/10.1007/978-981-10-4115-0_7

Mitra, D., Rad, K. V., Chaudhary, P., Ruparelia, J., Sagarika, M. S., Boutaj, H., Mohapatra, P. K. Das, & Panneerselvam, P. (2021). Involvement of Strigolactone Hormone in Root Development, Influence and Interaction with Mycorrhizal Fungi in Plant: Mini-review. *Current Research in Microbial Sciences*, *2*, 1–9. https://doi.org/10.1016/j.crmicr.2021.100026

Moreno-Jiménez, E., Leifheit, E. F., Plaza, C., Feng, L., Bergmann, J., Wulf, A., Lehmann, A., & Rillig, M. C. (2022). Effects of Microplastics on Crop Nutrition in Fertile Soils and Interaction with Arbuscular Mycorrhizal Fungi. *Journal of Sustainable Agriculture and Environment*, *1*, 66–72. https://doi.org/10.1002/sae2.12006

Morton, J. B. (2022). *International Culture Collection of (Vesicular) Arbuscular Mycorrhizal (INVAM) - West Virginia University*. Invam. https://invam.wvu.edu/methods/mycorrhizae/staining-roots%0Ahttp://invam.wvu.edu/

Mukrimin, M., Gusmiaty, G., & Patandean, H. (2021). Ability of Rhizosphere Fungi Isolated from Swietenia mahagoni Litter to Produce Organic Matter-Degradating Enzymes. *IOP Conference Series: Earth and Environmental Science*, *807*, 1–9. https://doi.org/10.1088/1755-1315/807/2/022030

Mukrimin, M., Musdalifah, N., Larekeng, S. H., Sultan, S., & Christita, M. (2021). Fungal Diversity Inhabiting Tissues of Ebony (Diospyros celebica Bakh.) in Urban Forest. *IOP Conference Series: Earth and Environmental Science*, *886*, 1–16. https://doi.org/10.1088/1755-1315/886/1/012031

Muryati, S., Mansur, I., & Budi, S. W. (2017). Aplikasi Fungi Mikoriza Arbuskula pada Bibit Desmodium ovalifolium di Lahan Pasca Tambang. *Jurnal Perbenihan Tanaman Hutan*, *5*(1), 35–50.

Nadeem, S. M., Khan, M. Y., Waqas, M. R., Binyamin, R., Akhtar, S., & Zahir, Z. A. (2017). Arbuscular Mycorrhizas : An Overview. In Q.-S. Wu (Ed.), *Arbuscular Mycorrhizas and Stress Tolerance of Plants* (pp. 1–24). Springer Nature Singapore. https://doi.org/10.1007/978-981-10-4115-0_1

Nanjundappa, A., Bagyaraj, D. J., Saxena, A. K., Kumar, M., & Chakdar, H. (2019). Interaction Between Arbuscular Mycorrhizal Fungi and Bacillus spp. in Soil Enhancing Growth of Crop Plants. *Fungal Biology and Biotechnology*, *6*(23), 1–10. https://doi.org/10.1186/s40694-019-0086-5

Natawijaya, D., & Sunarya, Y. (2018). Percepatan Pertumbuhan Benih Aren (Arenga pinnata (Wurmb.) Merr.) Melalui Perendaman dan Pelukaan biji. *Jurnal Siliwangi*, *4*(1), 1–5.

Noya, M., Riry, J., & Lesilolo, M. (2018). Pengaruh Media dan Periode Simpan Terhadap Viabilitas Benih Cengkeh Tuni (Syzygium aromaticum L.). *Jurnal Budidaya Pertanian*, *14*(2), 97–104. https://doi.org/10.30598/jbdp.2018.14.2.97

Nurcholis, M., Yudiantoro, D. F., Haryanto, D., & Mirzam, A. (2017). Heavy Metals Distribution in the Artisanal Gold Mining Area in Wonogiri. *Indonesian Journal of Geography*, *49*(2), 133–144. https://doi.org/10.22146/ijg.15321

Nurhasybi, Sudrajat, D. J., & Suita, E. (2019). *Kriteria Bibit Tanaman Hutan Siap Tanam : Untuk Pembangunan Hutan dan Rehabilitasi Lahan* (I. Z. Siregar & N. Mindawati (eds.); Cetakan 1). PT. Penerbit IPB Press.

O'Dell, R. E., & Rajakaruna, N. (2011). Intraspecific Variation, Adaptation, and Evolution. In S. Harrison & N. Rajakaruna (Eds.), *Serpentine : The Evolution and Ecology of a Model System* (pp. 97–138). The Regents of the University of California, California.

Oehl, F., Sieverding, E., Palenzuela, J., Ineichen, K., & Silva, G. A. da. (2011). Advances in Glomeromycota Taxonomy and Classification. *Ima Fungus*, *2*(2), 191–199.

Pimprikar, P., & Gutjahr, C. (2018). Transcriptional Regulation of Arbuscular Mycorrhiza Development. *Plant and Cell Physiology*, *59*(4), 678–695. https://doi.org/10.1093/pcp/pcy024

Pratiwi, Narendra, B. H., & Mulyanto, B. (2020). Soil Properties Improvement and Use of Adaptive Plants for Land Rehabilitation of Post Tin Mining Closure in Bangka Island, Indonesia. *Biodiversitas*, *21*(2), 505–511. https://doi.org/10.13057/biodiv/d210211

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. *Jurnal Penelitian Kehutanan Wallacea*, *5*(1), 37–46.

Priyono, N., Susilowati, & Romadhon, M. R. (2021). Pengaruh Suhu dan KNO3 terhadap Perkecambahan Benih dan Hubungan Variabel Agronomi Aksesi Aren dalam Mapanget. *Jurnal Agrica Akstensia*, *15*(1), 8–12.

Puccio, G., Ingraffia, R., Mercati, F., Amato, G., Giambalvo, D., Martinelli, F., Sunseri, F., & Frenda, A. S. (2023). Transcriptome Changes Induced by Arbuscular Mycorrhizal Symbiosis in Leaves of Durum Wheat (Triticum durum Desf.) Promote Higher Salt Tolerance. *Scientific Reports*, *13*(116), 1–14. https://doi.org/10.1038/s41598-022-26903-7

Pujiastuti, E., & Sudrajat, D. J. (2017). Uji Vigor untuk Menduga Perkecambahan Benih dan Munculnya Semai Normal Acacia mangium di Persemaian. *Jurnal Perbenihan Tanaman Hutan*, *5*(2), 81–94. https://doi.org/10.20886/bptpth.2017.5.2.81-94

Putri, A. A., Budiman, Kalsum, U., & Miska, M. E. E. (2021). Pengaruh Perlakuan Pematahan Dormansi terhadap Kemampuan Perkecambahan Benih Aren (Arenga pinnata Merr.). *Jurnal Pertanian Presisi*, *5*(2), 147–159.

Rahmaniah, Erhaka, M. E., & Heiriyani, T. (2018). Aplikasi Perlakuan Fisik untuk Mematahkan Dormansi terhadap Perkecambahan Benih dan Pertumbuhan Bibit Aren (Arenga pinnata Merr .). *Jtam Agroekotek View*, *1*(2), 1–8.

Redecker, D., Schüßler, A., Stockinger, H., Stürmer, S. L., Morton, J. B., & Walker, C. (2013). An Evidence-Based Consensus for the Classification of Arbuscular Mycorrhizal Fungi (Glomeromycota). *Mycorrhiza*, *23*, 515–531. https://doi.org/10.1007/s00572-013-0486-y

Reinhardt, D., Roux, C., Corradi, N., & Di Pietro, A. (2020). Lineage-Specific Genes and Cryptic Sex: Parallels and Differences between Arbuscular Mycorrhizal Fungi and Fungal Pathogens. *Trends in Plant Science*, *20*(20), 11–13. https://doi.org/10.1016/j.tplants.2020.09.006

Ren, F., Kovalchuk, A., Mukrimin, M., Liu, M., Zeng, Z., Ghimire, R. P., Kivimäenpää, M., Holopainen, J. K., Sun, H., & Asiegbu, F. O. (2018). Tissue Microbiome of Norway Spruce Affected by Heterobasidion-Induced Wood Decay. *Microbial Ecology*. https://doi.org/10.1007/s00248-018-1240-y

Rini, M. V., Yansyah, M. P., & Arif, M. A. S. (2022). The Application of Arbuscular Mycorrhizal Fungi Reduced the Required Dose of Compound Fertilizer for Oil Palm (Elaeis Guineensis Jacq.) in Nursery. *IOP Conference Series: Earth and Environmental Science*, *1012*, 1–7. https://doi.org/10.1088/1755-1315/1012/1/012011

Rola, K., Rożek, K., Chowaniec, K., Błaszkowski, J., Gielas, I., Stanek, M., Wietrzyk-Pełka, P., Węgrzyn, M., Fałowska, P., Dziurowicz, P., Nicia, P., Bejger, R., Zadrożny, P., Pliszko, A., Zalewska-Gałosz, J., & Zubek, S. (2023). Vascular Plant and Cryptogam Abundance as Well as Soil Chemical Properties Shape Microbial Communities in the Successional Gradient of Glacier Foreland Soils. *Science of the Total Environment*, *860*, 1–14. https://doi.org/10.1016/j.scitotenv.2022.160550

Rori, H. F., Rampe, H. L., & Rumondor, M. (2018). Uji Viabilitas dan Vigor Biji Sirsak (Annona muricata L.) setelah Aplikasi Kalium Nitrat (KNO3). *Jurnal Ilmiah Sains*, *18*(2), 80–84.

Rosas-Moreno, J., Walker, C., Duffy, K., Krüger, C., Krüger, M., Robinson, C. H., & Pittman, J. K. (2023). Isolation and Identification of Arbuscular Mycorrhizal Fungi from an Abandoned Uranium Mine and their Role in Soil-to-Plant Transfer of Radionuclides and Metals. *Science of the Total Environment*, *876*, 1–13. https://doi.org/10.1016/j.scitotenv.2023.162781

Rosita, I., B, S. W., & Wulandari, A. S. (2017). Efektivitas Fungi Mikoriza Arbuskula dan Pupuk P terhadap Pertumbuhan Bibit Leda (Eucalyptus deglupta Blume) di Media Tanah Pasca Tambang. *Jurnal Silvikultur Tropika*, *08*(2), 96–102.

Roy, R. N., & Saha, B. (2019). Plants Response to Heavy Metal Stress. In W. Dai (Ed.), *Stress Physiology of Woody Plants* (p. 297). CRC Press.

Rumahorbo, A. S. R., Duryat, & Bintoro, A. (2020). Pengaruh Pematahan Masa Dormansi melalui Perendaman Air dengan Stratifikasi Suhu terhadap Perkecambahan Benih Aren (Arenga pinnata). *Jurnal Sylva Lestari*, *8*(1), 77–84.

Rusli, Ferry, Y., Hafif, B., & Wardiana, E. (2016). Keefektifan Pembenah Tanah, Pemupukan, dan Mikoriza untuk Pertumbuhan Tanaman Karet di Lahan Bekas Tambang Timah. *J.TIDP*, *3*(3), 175–184.

Savary, R., Dupuis, C., Masclaux, F. G., Mateus, I. D., Rojas, E. C., & Sanders, I. R. (2020). Genetic Variation and Evolutionary History of a Mycorrhizal Fungus Regulate the Currency of Exchange in Symbiosis with the Food Security Crop Sassava. *ISME Journal*, *14*, 1333–1344. https://doi.org/10.1038/s41396-020-0606-6

Saxena, B., Shukla, K., & Giri, B. (2017). Arbuscular Mycorrhizal Fungi and Tolerance of Salt Stress in Plants. In Q.-S. Wu (Ed.), *Arbuscular Mycorrhizas and Stress Tolerance of Plants* (pp. 67–97). Springer Nature Singapore. https://doi.org/10.1007/978-981-10-4115-0_4

Schaefer, D. A., Gui, H., Mortimer, P. E., & Xu, J. (2021). Arbuscular Mycorrhiza and Sustainable Agriculture. *Circular Agricultural Systems*, *1*(6), 1–7. https://doi.org/10.48130/cas-2021-0006

Schüßler, A., & Walker, C. (2010). The Glomeromycota: A Species List with New Families and New Genera. *The Royal Botanic Garden Kew*. http://www.arbuscular-mycorrhiza.net/species_infos/higher_taxa/funneliformis_claroideoglomus_rhizophagus_redeckera.pdf

Schüßler, A., & Walker, C. (2019). Archaeospora ecuadoriana sp. nov. from a Mountainous Biodiversity Hotspot Area in Ecuador, and Transfer of Palaeospora spainiae to Archaeospora, as A. spainiae

comb. nov. *Mycorrhiza*. https://doi.org/10.1007/s00572-019-00913-2

Serghi, E. U., Kokkoris, V., Cornell, C., Dettman, J., Stefani, F., & Corradi, N. (2021). Homo- and Dikaryons of the Arbuscular Mycorrhizal Fungus Rhizophagus irregularis Differ in Life History Strategy. *Frontiers in Plant Science*, *12*(715377), 1–15. https://doi.org/10.3389/fpls.2021.715377

Sharma, S., Prasad, R., Varma, A., & Sharma, A. K. (2017). Glycoprotein Associated with Funneliformis coronatum, Gigaspora margarita and Acaulospora scrobiculata Suppress the Plant Pathogens In vitro. *Asian Journal of Plant Pathology*, *11*(4), 199–202. https://doi.org/10.3923/ajppaj.2017.199.202

Shi, Z., Zhang, J., Lu, S., Li, Y., & Wang, F. (2020). Arbuscular Mycorrhizal Fungi Improve the Performance of Sweet Sorghum Grown in a Mo-Contaminated Soil. *Journal of Fungi*, *6*(44), 1–14. https://doi.org/10.3390/jof6020044

Sidhu, G. P. S., Bali, A. S., & Bhardwaj, R. (2019). Use of Fungi in Mitigating Cadmium Toxicity in Plants. In *Cadmium Toxicity and Tolerance in Plants: From Physiology to Remediation*. Elsevier Inc. https://doi.org/10.1016/B978-0-12-814864-8.00016-4

Simanjuntak, H. (2021). Paradigma Rehabilitasi dan Reklamasi Kawasan Hutan. In *Nas Media Pustaka. Yogyakarta*.

Sinclair, G., Charest, C., Dalpé, Y., & Khanizadeh, S. (2014). Influence of Colonization by Arbuscular Mycorrhizal Fungi on Three Strawberry Cultivars Under Salty Conditions. *Agricultural and Food Science*, *23*, 146–158. https://doi.org/10.23986/afsci.9552

Siregar, I. Z., Muharam, K. F., Purwanto, Y. A., & Sudrajat, D. J. (2020). Seed Germination Characteristics in Different Storage Time of Gmelina arborea Treated with Ultrafine Bubbles Priming. *Biodiversitas*, *21*(10), 4558–4564. https://doi.org/10.13057/biodiv/d211013

Sitepu, M. E., Sari, W. P., & Dwipa, I. (2021). Exploration and Identification of Arbuscular Mycorrhizal Fungi (AMF) in the Rhizosphere of Cocoa (Theobroma cacao. L) in West Sumatra. *Indonesian Journal of Crop Science*, *4*(1), 17–22. http://jerami.faperta.unand.ac.id/index.php/Jerami-JIJCS/article/view/103%0Ahttp://jerami.faperta.unand.ac.id/index.php/Jerami-JIJCS/article/download/103/52

Sonter, L. J., Moran, C. J., Barrett, D. J., & Soares-Filho, B. S. (2014). Processes of Land Use Change in Mining Regions. *Journal of Cleaner Production*, *xxx*, 1–8. https://doi.org/10.1016/j.jclepro.2014.03.084

Souza, T. (2015). *Handbook of Arbuscular Mycorrhizal Fungi*. Springer International Publishing Switzerland.

Stürmer, S. L., & Siqueira, J. O. (2011). Species Richness and Spore Abundance of Arbuscular Mycorrhizal Fungi Across Distinct Land Uses in Western Brazilian Amazon. *Mycorrhiza*, *21*, 255–267. https://doi.org/10.1007/s00572-010-0330-6

Stürmer, S. L., Stürmer, R., & Pasqualini, D. (2013). Taxonomic Diversity and Community Structure of Arbuscular Mycorrhizal Fungi (Phylum Glomeromycota) in Three Maritime Sand Dunes in Santa Catarina State, South Brazil. *Fungal Ecology*, *6*, 27–36. https://doi.org/10.1016/j.funeco.2012.10.001

Sudrajat, D. J., Yuniarti, N., Nurhasybi, Syamsuwida, D., Danu, Pramono, A. A., & Putri, K. P. (2017). *Bunga Rampai Karakteristik dan Prinsip Penanganan Benih Tanaman Hutan Berwatak Intermediet dan Rekalsitran* (I. Z. Siregar & N. Mindawati (eds.); Cetakan 1, Issue 1). PT. Penerbit IPB Press.

Suhartanto, R., Suharsi, T. K., Rustam, E., & Sudrajat, D. J. (2018). Perbaikan Vigor Benih Jabon Putih Setelah Penyimpanan 4,5 Tahun Menggunakan Iradiasi Sinar Gamma. *Jurnal Perbenihan Tanaman Hutan*, *6*(2), 145–158.

Suita, E. (2019). Pematahan Dormansi dan Metode Uji Viabilitas Benih Lamtoro (Leucaena leucocephala Lam. de Wit.). *Jurnal Penelitian Hutan Tanaman*, *16*(2), 59–72. https://doi.org/10.20886/jpht.2019.16.2.59-72

Suparno, A., Prabawardani, S., Nisa, D. K., & Ruimassa, R. R. (2023). Identification of Arbuscular Mycorrhizal Fungi Associated with Arabica coffee Root (Coffea arabica) in the Arfak Mountains Region of West Papua, Indonesia. *Biodiversitas*, *24*(6), 3207–3213. https://doi.org/10.13057/biodiv/d240614

Surahman, M., Murniati, E., & Nisya, F. N. (2012). Pengaruh Tingkat Kemasakan Buah, Metode Ekstraksi Buah, Metode Pengeringan, Jenis Kemasan, dan Lama Penyimpanan pada Mutu Benih Jarak Pagar (Jatropha curcas). *Jurnal Imu Pertanian Indonesia*, *18*(2), 73–78.

Suryati, T. (2017). Studi Fungi Mikoriza Arbuskula di Lahan Pasca Tambang Timah Kabupaten Bangka Tengah. *Jurnal Teknologi Lingkungan*, *18*(1), 45–53.

Susanti, A., Hidayat, R., & Prasetjono, H. (2018). Implementasi Mikoriza sebagai Sarana Pengetahuan Konservasi Mandiri Lahan Marginal di Kecamatan Kabuh Kabupaten Jombang. *Jurnal Agroradix*, *1*(2), 9–17.

Susanti, T., Utami, W., & Amimi, D. (2018). The Negative Impact of Illegal Gold Mining on The Environmental Sector in Batang Asai, Jambi. *Journal of Environment and Sustainability*, *2*(3), 128–143. https://doi.org/10.22515/sustinere.jes.v2i3.43

Susilowati, A., Dalimunthe, A., Rachmat, H. H., Elfianti, D., Sinambela, P. Y., Ginting, I. M., & Larengkeng, S. H. (2020). Morphology and Germination of the Candlenut Seed (Aleurites moluccana) from Samosir Island-North Sumatra. *IOP Conference Series: Earth and Environmental Science*, *454*, 1–5. https://doi.org/10.1088/1755-1315/454/1/012156

Susilowati, E., Riniarti, M., & Rini, M. V. (2019). Asosiasi Glomus sp. dan Gigaspora margarita pada Bibit Aquilaria malaccensis. *Menara Perkebunan*, *87*(2), 104–110.

Szada-Borzyszkowska, A., Krzy, J., Rusinowski, S., Sitko, K., & Pogrzeba, M. (2022). Field Evaluation of Arbuscular Mycorrhizal Fungal Colonization in Miscanthus × giganteus and Seed-Based Miscanthus Hybrids Grown in Heavey-Metal-Polluted Areas. *Plants*, *11*(1216), 1–15.

Tak, S. S., Mansur, I., & Pamoengkas, P. (2018). Efektivitas Fungi Mikoriza Arbuskula Indigenous Terhadap Pertumbuhan Stek Pucuk Gosale (Syzygium Malaccense (L.) Merr & L.M Perry). *Jurnal Silvikultur Tropika*, *9*(3), 211–216. https://doi.org/10.29244/j-siltrop.9.3.211-216

Tamin, R. P., & Puri, S. R. (2020). Efektifitas Fungi Mikoriza Arbuskula (FMA) dan Pupuk NPK terhadap Pertumbuhan Bibit Malapari (Pongamia pinnata (L.) Pierre) pada Tanah Ultisol. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, *4*(1), 50–58.

Tornando, H., Hudi, F. A., Prasetyo, L. B., & Santosa, D. A. (2018). Soil Microbial Population and Soil Enzyme Activity on Various Reclamation Area of PT Bukit Asam in South Sumatera. *Biotropia*, *25*(3), 193–201.

Toubali, S., Ait-El-Mokhtar, M., Boutasknit, A., Anli, M., Ait-Rahou, Y., Benaffari, W., Ben-Ahmed, H., Mitsui, T., Baslam, M., & Meddich, A. (2022). Root Reinforcement Improved Performance, Productivity, and Grain Bioactive Quality of Field-Droughted Quinoa (Chenopodium quinoa). *Frontiers in Plant Science*, *13*(860484), 1–20. https://doi.org/10.3389/fpls.2022.860484

Tree, G., & Group, S. (2019). *Vitex cofassus*. *8235*.

Triani, N. (2021). Pengaruh Penyimpanan Benih Terhadap Daya Berkecambah Benih Leci (Litchi chinensis, Sonn.). *Jurnal Teknologi Terapan*, *5*(1), 346–352. https://doi.org/10.33379/gtech.v5i1.681

Tuheteru, F. D., Arif, A., Husna, Mansur, I., Tuheteru, E. J., Jusniar, Basrudin, Albasri, Hadijah, M. H., & Karepesina, S. (2020). Arbuscular Mycorrhizal Fungal Inoculation Improves Nauclea orientalis L. Growth and Phosphorus Uptake in Gold Mine Tailing Soil Media. *Journal of Degraded and Mining Lands Management*, *7*(3), 2193–2200. https://doi.org/10.15243/jdmlm

Tuheteru, F. D., Arif, A., Widiastuti, E., & Rahmawati, N. (2017). Serapan Logam Berat oleh Fungi Mikoriza Arbuskula Lokal pada Nauclea orientalis L. dan Potensial untuk Fitoremediasi Tanah Serpentine. *Jurnal Ilmu Kehutanan*, *11*, 76–84. https://jurnal.ugm.ac.id/jikfkt

Tuheteru, F. D., Husna, & Albasri. (2020). Simbiosis Fungi Mikoriza Arbuskula dengan Tumbuhan Adaptif pada Lahan Pascatambang Emas. *Talenta Conference Series: Agricultural and Natural Resources (ANR)*, *03*(1), 63–66. https://doi.org/10.32734/anr.v3i1.835

Tuheteru, F. D., Husna, Albasri, Arif, A., Kramadibrata, K., & Soka, G. (2020). Composition and Diversity of Arbuscular Mycorrhizal Fungi Spore Associated with Different Land-Use Types in Tropical Gold Mine. *Journal of Degraded and Mining Lands Management*, *8*(1), 2503–2512. https://doi.org/10.15243/jdmlm

Tuheteru, F. D., Husna, & Arif, A. (2011). Respon Pertumbuhan dan Ketergantungan Albizzia saponaria (LOUR.) Miq terhadap Inokulasi Fungi Mikoriza Arbuskula Lokal Sulawesi Tenggara pada Media Tanah Pascatambang Nikel. *Berita Biologi*, *10*, 605–611.

Tuheteru, F. D., Kusmana, C., Mansur, I., & Iskandar. (2015). Response of Lonkida (Nauclea orientalis L.) Towards Mycorrhizal Inoculum in Waterlogged Condition. *Biotropia*, *22*(1), 61–71. https://doi.org/10.11598/btb.2015.22.1.416

Tuheteru, F. D., & Wu, Q. (2017). Arbuscular Mycorrhizal Fungi and Tolerance of Waterlogging Stress in Plants. In Q.-S. Wu (Ed.), *Arbuscular Mycorrhizas and Stress Tolerance of Plants* (pp. 43–66). Springer Nature Singapore. https://doi.org/10.1007/978-981-10-4115-0_3

Ubaidillah, Zulaiha, A. V., & Dianita, R. (2020). Seed Physical Scarification and Growing Media on Vigor of Moringa oleifera. *Pastura*, *9*(2), 94–97.

van Creij, J., Auxier, B., An, J., Wijfjes, R. Y., Bergin, C., Rosling, A., Bisseling, T., Pan, Z., & Limpens, E. (2023). Stochastic Nuclear Organization and Host-dependent Allele Contribution in Rhizophagus irregularis. *BMC Genomics*, *24*(53), 1–19. https://doi.org/10.1186/s12864-023-09126-6

Vitis, M. De, Hay, F. R., Dickie, J. B., Trivedi, C., Choi, J., & Fiegener, R. (2020). Seed Storage : Maintaining Seed Viability and Vigor for Restoration Use. *Restoration Ecology*, *28*(S3), 249–255. https://doi.org/10.1111/rec.13174

Wahab, A., Muhammad, M., Munir, A., Abdi, G., Zaman, W., Ayaz, A., Khizar, C., & Reddy, S. P. P. (2023). Role of Arbuscular Mycorrhizal Fungi in Regulating Growth, Enhancing Productivity, and Potentially Influencing Ecosystems under Abiotic and Biotic Stresses. *Plants*, *12*(3102), 1–40. https://doi.org/10.3390/plants12173102

Wang, L., Zhang, L., George, T. S., & Feng, G. (2022). A Core Microbiome in the Hyphosphere of Arbuscular Mycorrhizal Fungi has Functional Significance in Organic Phosphorus Mineralization. *New Phytologist*, 1–15. https://doi.org/10.1111/nph.18642

Weng, W., Yan, J., Zhou, M., Yao, X., Gao, A., Ma, C., Cheng, J., & Ruan, J. (2022). Roles of Arbuscular mycorrhizal Fungi as a Biocontrol Agent in the Control of Plant Diseases. *Microoganisms*, *10*(1266), 1–16.

Widarawati, R., Haryanto, T. A. D., & Rahayuniati, R. F. (2022). Respon Perkecambahan Biji Aren Terhadap Larutan Pupuk Organik Cair dan Waktu Perendaman. *Kultivasi*, *21*(2), 159–165. https://doi.org/10.24198/kultivasi.v21i2.36437

Widiyatmoko, R., Wasis, B., & Prasetyo, L. B. (2017). Analisis Pertumbuhan Tanaman Revegetasi di Lahan Bekas Tambang Silika Holcim Educational Forest Cibadak, Sukabumi, Jawa Barat. *Jurnal Pengelolaan Sumberdaya Alam Dan Lingkungan*, *7*(1), 79–88.

Wu, Q.-S., & Zou, Y.-N. (2017). Arbuscular Mycorrhizal Fungi and Tolerance of Drought Stress in Plants. In Q.-S. Wu (Ed.), *Arbuscular Mycorrhizas and Stress Tolerance of Plants* (pp. 25–41). Springer Nature Singapore. https://doi.org/10.1007/978-981-10-4115-0_9

Wu, S., Zhang, X., Huang, L., & Chen, B. (2019). Arbuscular Mycorrhiza and Plant Chromium Tolerance. *Soil Ecology Letters*, *1*(3–4), 94–104. https://doi.org/10.1007/s42832-019-0015-9

Wulandari, A. S., & Farzana, A. R. (2020). Mutu Fisik dan Teknik Pematahan Dormansi Benih Kayu Kuku (Pericopsis mooniana (Thw.) Thw.). *Jurnal Silvikultur Tropika*, *10*(3), 199–205. https://doi.org/10.29244/j-siltrop.11.3.199-205

Xie, X., Lai, W., Che, X., Wang, S., Ren, Y., Hu, W., Chen, H., & Tang, M. (2022). A SPX Domain-Containing Phosphate Transporter from Rhizophagus irregularis Handles Phosphate Homeostasis at Symbiotic Interface of Arbuscular Mycorrhizas. *New Phytologist*, *234*, 650–671. https://doi.org/10.1111/nph.17973

Yadav, M. K., Kumar, R., Sahu, R., & Singh, R. B. (2018). Standardization of Seed Protectants for Improving the Seed Quality of Pigeonpea (Cajanus cajan L.) Seed Under the Ambient Storage. *International Journal of Chemical Studies*, *6*(4), 1985–1990.

Yafur, F. N., Rumetor, S. D., & Yoku, O. (2019). Pengaruh Suhu Rendaman dan Media Tumbuh terhadap Daya Kecambah Benih dan Pertumbuhan Tanaman Indigofera zollingeriana. *Cassowary*, *2*(2), 176–192. https://doi.org/10.30862/casssowary.cs.v2.i2.31

Yang, H., Zhou, J., Feng, J., Zhai, S., Chen, W., Liu, J., & Bian, X. (2019). Ditch-buried Straw Return: A Novel Tillage Practice Combined with

Tillage Rotation and Deep Ploughing in Rice-wheat Rotation Systems. In *Advances in Agronomy* (1st ed., Vol. 154). Elsevier Inc. https://doi.org/10.1016/bs.agron.2018.11.004

Yuarsah, I., Handayani, E. P., Rakhmiati, & Yatmin. (2017). Restoration of Soil Physical and Chemical Properties of Abandoned Tin- Mining in Bangka Belitung Islands. *Journal of Tropical Soils*, *22*(1), 21–28. https://doi.org/10.5400/jts.2017.v22i1.21-28

Yunus, F., Lambui, O., & Suwastika, I. N. (2017). Kelimpahan Mikroorganisme Tanah pada Sistem Perkebunan Kakao (Theobroma cacao L.) Semi Intensif dan Non Intensif. *Natural Science: Journal of Science and Technology*, *6*(3), 194–205. https://doi.org/10.22487/25411969.2017.v6.i3.9192

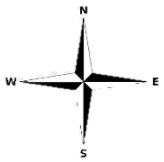
Yuwono, S. B., Alawiyah, A., Riniarti, M., & Dermiyati, D. (2021). Revegetation of Critical Land with Gaharu (Aquilaria malaccensis) under Various Ameliorants Application. *Journal of Tropical Soils*, *26*(1), 19–28. https://doi.org/10.5400/jts.2021.v26i1.19-28

Zhang, M., Shi, Z., Lu, S., & Wang, F. (2023). AMF Inoculation Alleviates Molybdenum Toxicity to Maize by Protecting Leaf Performance. *Journal of Fungi*, *9*(479), 1–15.

Husna. (2015). *Budi Daya dan Konservasi Kayu Kuku*. Cetakan 1. IPB Press. Bogor. Indonesia.

LAMPIRAN

Lampiran 1. Layout Penelitian Tahap 1



A1W3.1	A4W3.1	A4W3.3	A4W1.1	A2W2.1	A3W3.2	A2W0.3	A1W1.1
A4W1.2	A0W2.3	A5W2.3	A1W3.3	A3W1.2	A2W3.3	A1W2.3	A0W0.3
A1W0.3	A4W0.3	A0W0.1	A1W12	A2W2.2	A0W3.1	A5W0.1	A5W2.1
A3W1.1	A1W3.2	A1W2.2	A5W3.3	A3W2.3	A5W2.2	A0W3.3	A4W2.3
A2W0.1	A0W1.2	A5W3.1	A0W2.1	A3W3.3	A4W0.1	A1W2.1	A3W1.3
A3W0.3	A1W1.3	A0W1.3	A3W0.1	A4W3.2	A5W3.2	A2W0.2	A4W1.3
A0W2.2	A0W1.1	A2W2.3	A5W0.3	A3W0.2	A1W0.3	A2W3.1	A2W1.1
A4W2.1	A5W1.3	A2W3.2	A5W1.2	A3W2.2	A4W0.2	A4W2.2	A2W1.3
A3W3.1	A1W0.1	A0W3.2	A3W2.1	A0W0.2	A2W1.2	A5W0.2	A5W1.1

Keterangan :

- Faktor pertama (A) perendaman air

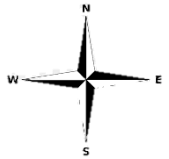
A0 : Tanpa perendaman (kontrol) A3 : 70ºC
A1 : 30ºC A4 : 90ºC
A2 : 50ºC A5 : 90ºC (ditiriskan 24 jam)

- Faktor kedua (W) lama penyimpanan

W0 : 0 minggu (kontrol) W2 : 2 minggu
W1 : 1 minggu W3 : 3 minggu)

- Tiga kali ulangan
- Masing-masing unit percobaan menggunakan 30 benih
- Jarak antar perlakuan = ± 2.5 cm

Lampiran 2. Layout Penelitian Tahap 2



I			
D0M1K1	D1M3K2	D3M3K3	D2M3K1
D0M1K2	D1M3K3	D3M3K0	D2M3K0
D0M1K3	D1M3K1	D3M3K2	D2M3K2
D0M1K0	D1M3K0	D3M3K1	D2M3K3

II			
D0M3K1	D3M3K0	D1M1K2	D2M2K1
D0M3K0	D3M3K1	D1M1K1	D2M2K0
D0M3K2	D3M3K2	D1M1K0	D2M2K3
D0M3K3	D3M3K3	D1M1K3	D2M2K2

III			
D2M1K2	D3M3K1	D0M3K2	D1M2K0
D2M1K0	D3M3K2	D0M3K1	D1M2K2
D2M1K1	D3M3K0	D0M3K0	D1M2K3
D2M1K3	D3M3K3	D0M3K3	D1M2K1

D0M2K0	D1M2K3	D3M2K0	D2M1K0
D0M2K2	D1M2K2	D3M2K2	D2M1K1
D0M2K1	D1M2K1	D3M2K3	D2M1K3
D0M2K3	D1M2K0	D3M2K1	D2M1K2

D0M2K0	D3M2K3	D1M3K3	D2M3K0
D0M2K2	D3M2K1	D1M3K1	D2M3K1
D0M2K1	D3M2K0	D1M3K2	D2M3K3
D0M2K3	D3M2K2	D1M3K0	D2M3K2

D2M2K1	D3M1K1	D0M1K3	D1M1K1
D2M2K3	D3M1K3	D0M1K1	D1M1K2
D2M2K2	D3M1K2	D0M1K2	D1M1K0
D2M2K0	D3M1K0	D0M1K0	D1M1K3

D0M3K1	D1M1K3	D3M1K3	D2M2K0
D0M3K2	D1M1K1	D3M1K0	D2M2K1
D0M3K0	D1M1K2	D1M1K1	D2M2K2
D0M3K3	D1M1K0	D3M1K2	D2M2K3

D0M1K3	D3M1K2	D1M2K2	D2M1K0
D0M1K2	D3M1K0	D1M2K1	D2M1K1
D0M1K1	D3M1K3	D1M2K0	D2M1K2
D0M1K0	D3M1K1	D1M2K3	D2M1K3

D2M3K2	D3M2K1	D0M2K2	D1M3K0
D2M3K1	D3M2K0	D0M2K0	D1M3K2
D2M3K0	D3M2K3	D0M2K3	D1M3K1
D2M3K3	D3M2K2	D0M2K1	D1M3K3

Keterangan :

- Main plot/faktor pertama perbandingan media (D) (tanah pascatambang : kompos padat : tanah mineral)

D0 = 1 : 0 : 0 (control)
D1 = 2 : 1 : 1
D2 = 1 : 2 : 1 dan
D3 = 3 : 1 : 1

- Sub plot/faktor kedua jenis (M) dan dosis FMA (K)

M1 = *Glomus coronatum*;
M2 = *Glomus claroideum*;
M3 = Campuran (M1+M2)

K0 = 0 gram
K1 = 5 gram;
K2 = 10 gram;
K3 = 15 gram

M1K0 = *G. coronatum*, 0 gram
M1K1 = *G. coronatum*, 5 gram
M1K2 = *G. coronatum*, 10 gram
M1K3 = *G. coronatum*, 15 gram
M2K0 = *G. claroideum*, 0 gram
M2K1 = *G. claroideum*, 5 gram
M2K2 = *G. claroideum*, 10 gram
M2K3 = *G. claroideum*, 15 gram
M3K0 = Campuran, 0 gram
M3K1 = Campuran, 5 gram
M3K2 = Campuran, 10 gram
M3K3 = Campuran, 15 gram

- Tiga kali ulangan
- Dua unit tanaman
- Jarak antar ulangan = ± 20 cm
- Jarak antar perlakuan = ± 10 cm

Lampiran 3. Analisis Tanah Pascatambang (Sebelum Penelitian)

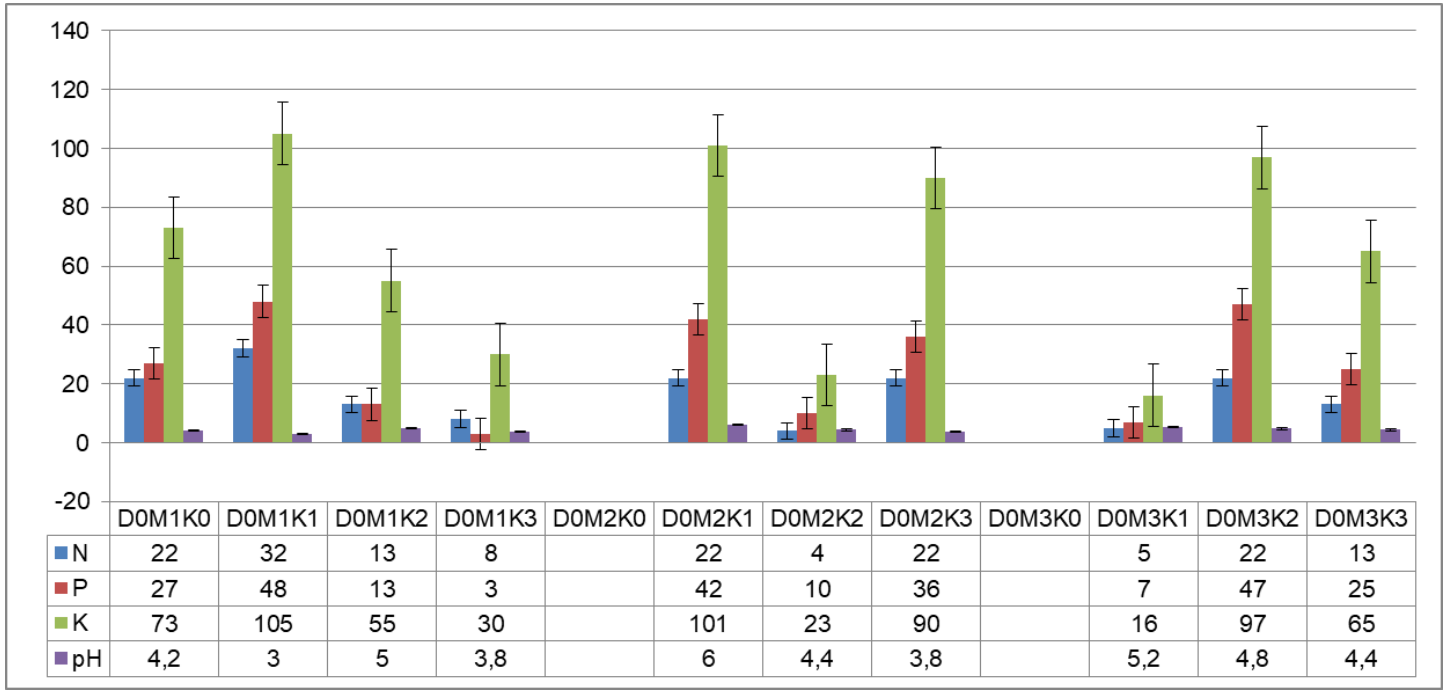
PT. CITRA LAMPIA MANDIRI
NICKEL MINING PROJECT
QAQC - LAB & PREPARATION

No	DATE ANALIST	SAMPLE CODE	HOLE ID	METER			Ni (%)	Fe (%)	Co (%)	Mn (%)	SiO (%)	MgO (%)	Al2O3 (%)	REMARKS
1	19/Jul/2022 13:33	DKA-907-03	DKA-907	2	-	3	0,32	41,24	0,10	0,32	7,78	0,10	15,14	
2	19/Jul/2022 13:38	DKA-907-04	DKA-907	3	-	4	0,28	39,38	0,09	0,25	9,33	0,12	17,21	
3	19/Jul/2022 13:43	DKA-907-05	DKA-907	4	-	5	0,38	46,77	0,13	0,63	6,85	0,02	15,68	
4	19/Jul/2022 13:48	DKA-907-06	DKA-907	5	-	6	0,51	52,01	0,16	1,06	5,66	0,02	11,20	
5	19/Jul/2022 13:53	DKA-907-07	DKA-907	6	-	7	0,54	40,51	0,12	0,50	12,63	0,87	11,11	

Media	N	P	K	pH	Kelembaban	Ket.
Tanah mineral	2	1	4	5,9	1	
Tanah Pasca-Tambang	4	4	15	5,4	>8	

Lampiran 4. Analisis Media Tanam (Setelah Penelitian)

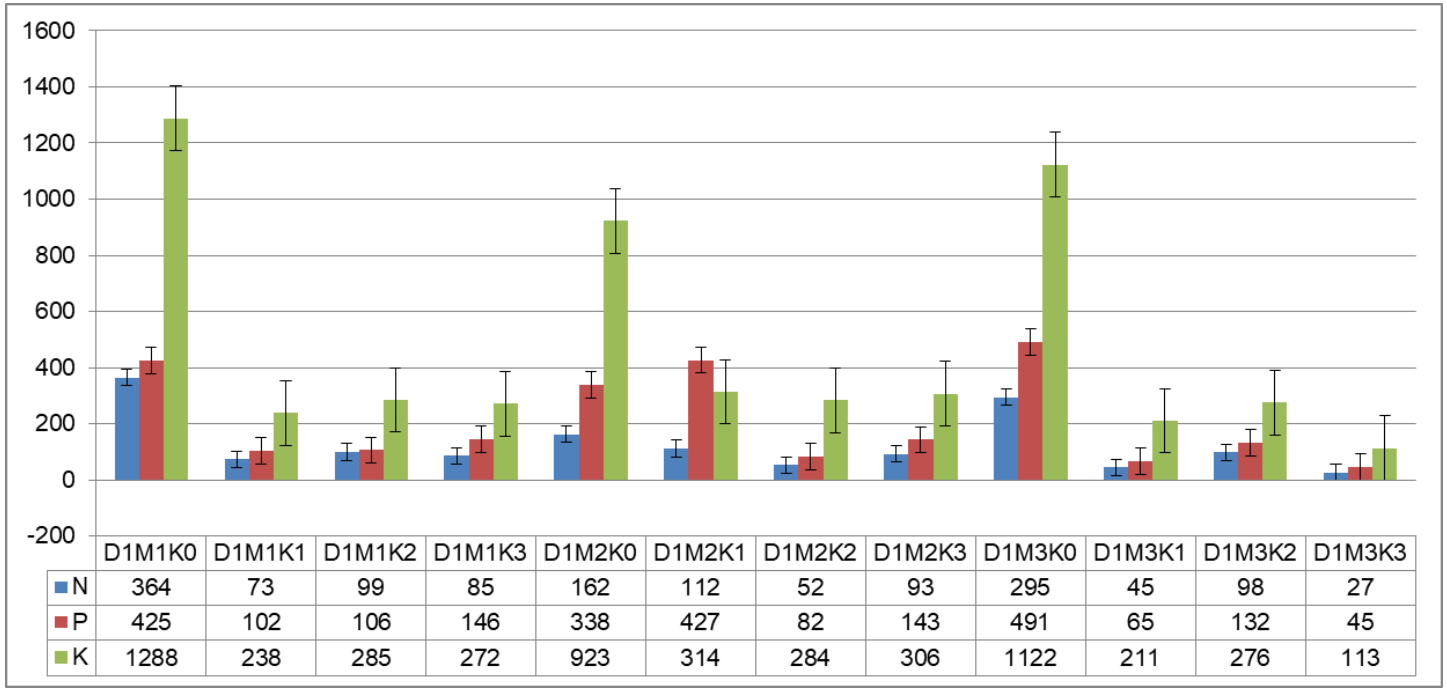
Perbandingan (1 : 0 : 0)



	D0M1K0	D0M1K1	D0M1K2	D0M1K3	D0M2K0	D0M2K1	D0M2K2	D0M2K3	D0M3K0	D0M3K1	D0M3K2	D0M3K3
N	22	32	13	8		22	4	22		5	22	13
P	27	48	13	3		42	10	36		7	47	25
K	73	105	55	30		101	23	90		16	97	65
pH	4,2	3	5	3,8		6	4,4	3,8		5,2	4,8	4,4

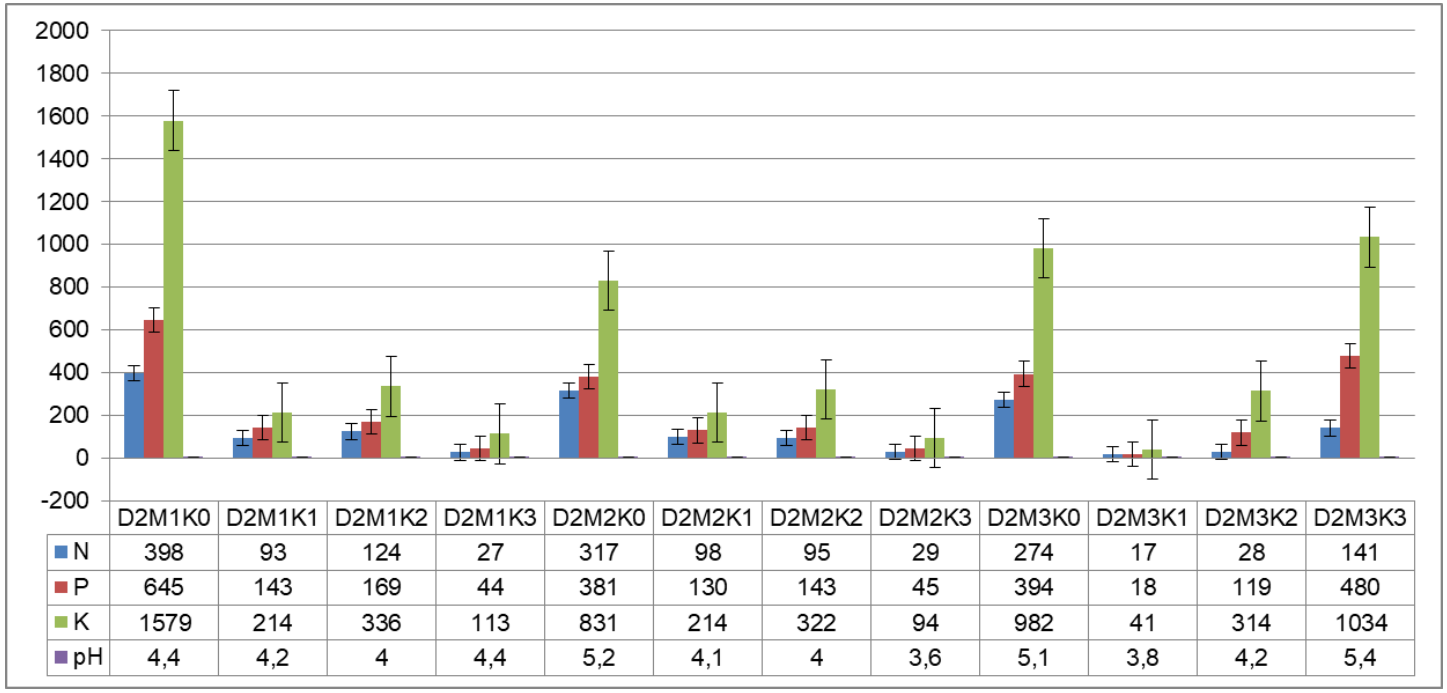
PERLAKUAN	D0M1K0	D0M1K1	D0M1K2	D0M1K3	D0M2K0	D0M2K1	D0M2K2	D0M2K3	D0M3K0	D0M3K1	D0M3K2	D0M3K3
Kelembaban	>8	>8	>8	>8		>8	7,5	>8		5,4	>8	>8

Perbandingan (2 : 1 : 1)



PERLAKUAN	D1M1K0	D1M1K1	D1M1K2	D1M1K3	D1M2K0	D1M2K1	D1M2K2	D1M2K3	D1M3K0	D1M3K1	D1M3K2	D1M3K3
pH	4	<3	3	<3	5	<3	4,3	3,2	5,8	4	3	3
Kelembaban	>8	>8	>8	>8	>8	>8	>8	>8	>8	>8	>8	>8

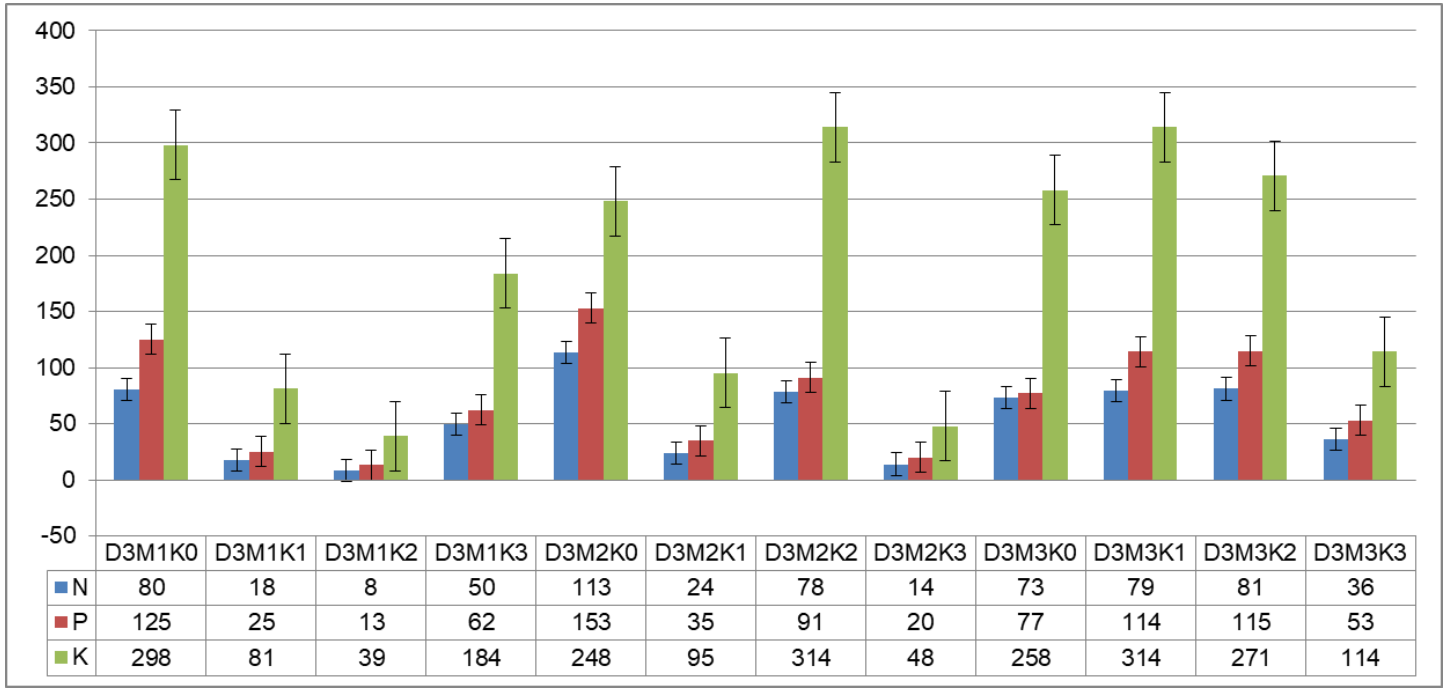
Perbandingan (1 : 2 : 1)



	D2M1K0	D2M1K1	D2M1K2	D2M1K3	D2M2K0	D2M2K1	D2M2K2	D2M2K3	D2M3K0	D2M3K1	D2M3K2	D2M3K3
N	398	93	124	27	317	98	95	29	274	17	28	141
P	645	143	169	44	381	130	143	45	394	18	119	480
K	1579	214	336	113	831	214	322	94	982	41	314	1034
pH	4,4	4,2	4	4,4	5,2	4,1	4	3,6	5,1	3,8	4,2	5,4

PERLAKUAN	D2M1K0	D2M1K1	D2M1K2	D2M1K3	D2M2K0	D2M2K1	D2M2K2	D2M2K3	D2M3K0	D2M3K1	D2M3K2	D2M3K3
Kelembaban	>8	>8	>8	>8	>8	>8	6	>8	>8	6	>8	>8

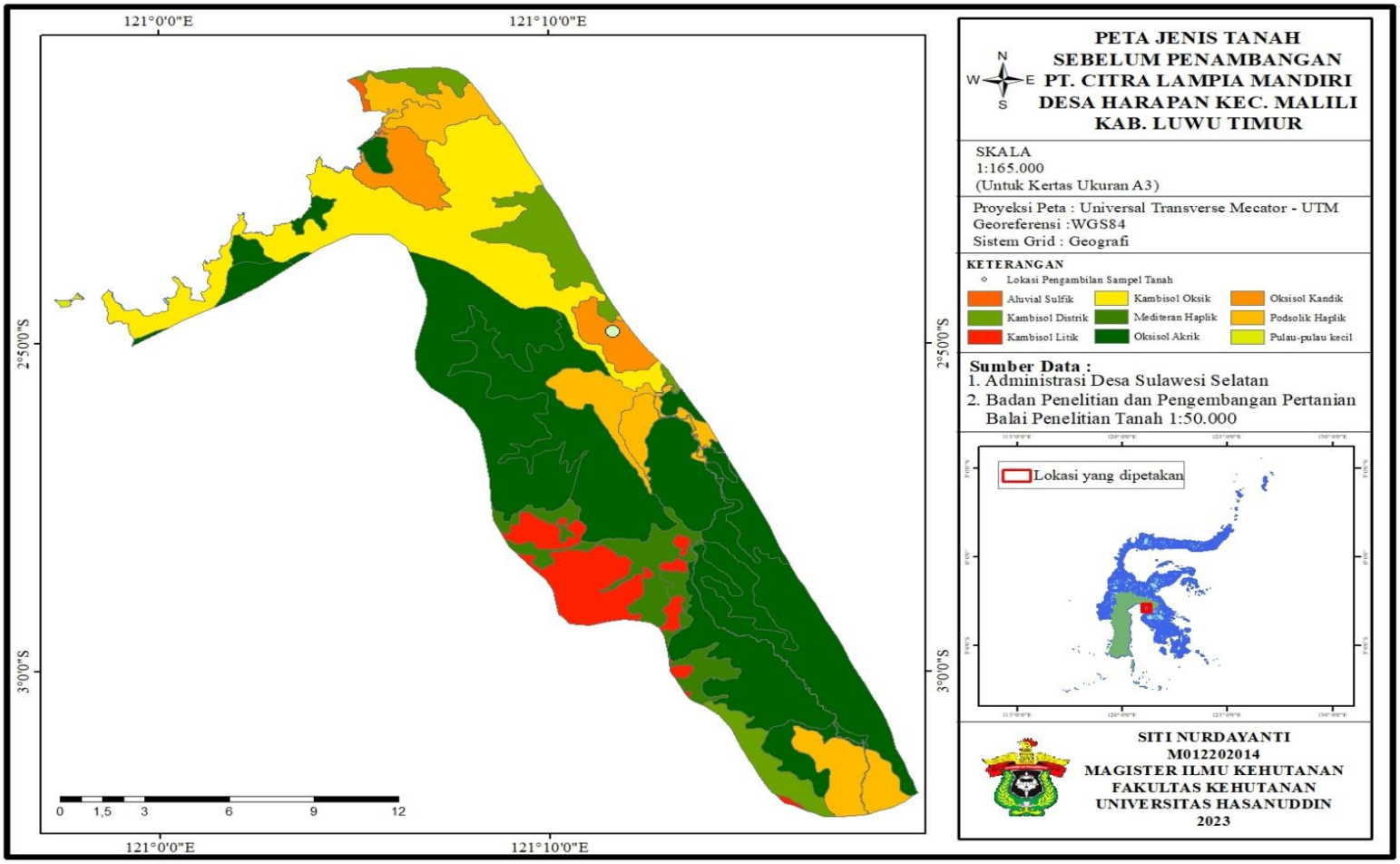
Perbandingan (3 : 1 : 1)



	D3M1K0	D3M1K1	D3M1K2	D3M1K3	D3M2K0	D3M2K1	D3M2K2	D3M2K3	D3M3K0	D3M3K1	D3M3K2	D3M3K3
N	80	18	8	50	113	24	78	14	73	79	81	36
P	125	25	13	62	153	35	91	20	77	114	115	53
K	298	81	39	184	248	95	314	48	258	314	271	114

PERLAKUAN	D3M1K0	D3M1K1	D3M1K2	D3M1K3	D3M2K0	D3M2K1	D3M2K2	D3M2K3	D3M3K0	D3M3K1	D3M3K2	D3M3K3
pH	4	3,2	3,5	<3	3,4	3,8	3	3,4	3	<3	3,8	4
Kelembaban	>8	>8	>8	>8	>8	>8	>8	>8	>8	>8	>8	>8

Lampiran 5. Peta Jenis Tanah sebelum Penambangan PT. Citra Lampia Mandiri Desa Harapan, Kec. Malili, Kab. Luwu Timur



Lampiran 6. Analisis Sidik Ragam Tahap 1

Persentase Kecambah Benih

SK	DB	JK	KT	F. Hitung		F. Tabel	
						0,05	0,01
A	5	30464,95	6092,99	127,77	**	2,41	3,43
W	3	1808,87	602,96	12,64	**	2,80	4,22
AW	15	5180,58	345,37	7,24	**	1,88	2,44
Galat	48	2288,95	47,69				
Total	71	39743,4					
KK = 18,81							

Daya Kecambah Benih

SK	DB	JK	KT	F. Hitung		F. Tabel	
						0,05	0,01
A	5	29582,1	5916,42	111,45	**	2,41	3,43
W	3	1741,81	580,6	10,94	**	2,80	4,22
AW	15	5783,77	385,58	7,26	**	1,88	2,44
Galat	48	2548,14	53,09				
Total	71	39655,8					
KK = 20.07							

Rata-rata Waktu Berkecambah

SK	DB	JK	KT	F. Hitung		F. Tabel	
						0,05	0,01
A	5	7692,06	1538,41	294,44	**	2,41	3,43
W	3	353,48	117,83	22,55	**	2,80	4,22
AW	15	1878,66	125,24	23,97	**	1,88	2,44
Galat	48	250,8	5,22				
Total	71	10175					
KK = 11,35							

Rata-rata Benih Berkecambah per Hari

SK	DB	JK	KT	F. Hitung		F. Tabel	
						0,05	0,01
A	5	1,74	0,35	130,91	**	2,41	3,43
W	3	0,1	0,03	12,72	**	2,80	4,22
AW	15	0,3	0,02	7,46	**	1,88	2,44
GALAT	48	0,13	0,002				
TOTAL	71	2,26					
KK = 18,56							

Indeks Vigor

SK	DB	JK	KT	F. Hitung		F. Tabel	
						0,05	0,01
A	5	143,85	28,77	284,09	**	2,41	3,43
W	3	9,95	3,32	32,74	**	2,80	4,22
AW	15	42,47	2,83	27,96	**	1,88	2,44
Galat	48	4,86	0,1				
Total	71	201,13					
KK = 11,26							

Lampiran 7. Analisis Sidik Ragam Tahap 2

Tinggi Tanaman

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	9,47	4,73	1,79	tn	3,10	4,85
D	3	8688,29	2896,09	1092,16	**	2,71	4,01
Blok*D	6	19,65	3,27	1,24	tn	2,20	3,01
M	11	4509,94	409,99	154,61	**	1,90	2,46
D*M	33	1542,31	46,74	17,62	**	1,57	1,89
Galat	88	233,35	2,65				
Total	143	15003					
KK			8,53				

Diameter Tanaman

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	0,013	0,0067	0,21	tn	3,10	4,85
D	3	93,65	31,22	987,39	**	2,71	4,01
Blok*D	6	0,071	0,012	0,37	tn	2,20	3,01
M	11	43,76	3,98	125,82	**	1,90	2,46
D*M	33	9,6	0,29	9,21	**	1,57	1,89
Galat	88	2,78	0,031				
Total	143	149,88					
KK			6,32				

Jumlah Daun

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	39,35	19,67	3,96	*	3,10	4,85
D	3	5179,5	1726,5	347,32	**	2,71	4,01
Blok*D	6	51,21	8,53	1,72	tn	2,20	3,01
M	11	3307,55	300,69	60,49	**	1,90	2,46
D*M	33	2144,17	64,97	13,07	**	1,57	1,89
Galat	88	437,44	4,97				
Total	143	11159,22					
KK			12,84				

Berat Kering Pucuk

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	0,0077	0,0039	1,44	tn	3,10	4,85
D	3	111,89	37,3	13877,5	**	2,71	4,01
Blok*D	6	0,0053	0,00089	0,33	tn	2,20	3,01
M	11	65,15	5,92	2203,84	**	1,90	2,46
D*M	33	32,12	0,97	362,21	**	1,57	1,89
Galat	88	0,24	0,0027				
Total	143	209,42					
KK			3,37				

Berat Kering Akar

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	0,0083	0,0041	1,65	tn	3,10	4,85
D	3	25,18	8,39	3330,82	**	2,71	4,01
Blok*D	6	0,0205	0,0034	1,36	tn	2,20	3,01
M	11	15,81	1,44	570,52	**	1,90	2,46
D*M	33	6,55	0,2	78,79	**	1,57	1,89
Galat	88	0,22	0,0025				
Total	143	47,8					
KK			5,55				

Berat Kering Total

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	0,031	0,015	2,07	tn	3,10	4,85
D	3	235,7	78,57	10443,4	**	2,71	4,01
Blok*D	6	0,045	0,0075	1	tn	2,20	3,01
M	11	143,53	13,05	1734,45	**	1,90	2,46
D*M	33	54,35	1,65	218,94	**	1,57	1,89
Galat	88	0,66	0,0075				
Total	143	434,32					
KK			3,55				

Nisbah Pucuk Akar

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	0,07	0,035	0,33	tn	3,10	4,85
D	3	26,81	8,94	84,77	**	2,71	4,01
Blok*D	6	0,42	0,071	0,67	tn	2,20	3,01
M	11	19,74	1,79	17,02	**	1,90	2,46
D*M	33	14,87	0,45	4,27	**	1,57	1,89
Galat	88	9,28	0,105				
Total	143	71,19					
KK			22,17				

Indeks Mutu Bibit

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	0,0047	0,0023	3,73	*	3,10	4,85
D	3	2,36	0,79	1255,58	**	2,71	4,01
Blok*D	6	0,0024	0,0004	0,64	tn	2,20	3,01
M	11	0,94	0,085	136,6	**	1,90	2,46
D*M	33	0,32	0,0096	15,41	**	1,57	1,89
Galat	88	0,055	0,00063				
Total	143	3,68					
KK			10,27				

Indeks Kekokohan Bibit

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	0,64	0,32	1,34	tn	3,10	4,85
D	3	227,67	78,89	316,27	**	2,71	4,01
Blok*D	6	2,88	0,48	2	tn	2,20	3,01
M	11	135,41	12,31	51,3	**	1,90	2,46
D*M	33	60,18	1,82	7,6	**	1,57	1,89
Galat	88	21,11	0,24				
Total	143	447,91					
KK			7,84				

Kolonisasi FMA

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	506,31	253,16	531	**	3,10	4,85
D	3	16524,1	5508,03	115,45	**	2,71	4,01
Blok*D	6	1513,13	252,19	5,29	**	2,20	3,01
M	11	40540,85	3685,53	77,25	**	1,90	2,46
D*M	33	22650,3	686,37	14,39	**	1,57	1,89
Galat	88	4198,37	47,71				
Total	143	85933,07					
KK			14,71				

Efek Inokulasi Mikoriza

SK	DB	JK	KT	F.Hitung		F.Tabel	
						0,05	0,01
Blok	2	1,98	0,99	1,21	tn	3,10	4,85
D	3	60215,09	20071,7	24432,3	**	2,71	4,01
Blok*D	6	29,27	4,88	5,94	**	2,20	3,01
M	11	106122,98	9647,54	11743,5	**	1,90	2,46
D*M	33	36842,56	1116,44	1358,99	**	1,57	1,89
Galat	88	72,29	0,82				
Total	143	203284,18					
KK			1,99				

Lampiran 8. Data Suhu dan Kelembaban Penelitian Tahap 2

Hari/Tanggal	Minggu ke-N	Pengukuran ke-N	Suhu			Kelembaban			Ket.
			Pagi	Siang	Sore	Pagi	Siang	Sore	
24 November 2022	0	1	39ºC	41ºC	28ºC	46%	46%	70%	
08 Desember 2022	2	2	34ºC	48ºC	32ºC	60%	42%	65%	
22 Desember 2022	4	3	31ºC	46ºC	29ºC	64%	44%	71%	
05 Januari 2023	6	4	24ºC	24ºC	24ºC	80%	83%	85%	
19 Januari 2023	8	5	26ºC	39ºC	29ºC	70%	52%	66%	
02 Februari 2023	10	6	25ºC	31ºC	29ºC	71%	61%	65%	
16 Februari 2023	12	7	24ºC	25ºC	28ºC	76%	79%	74%	
02 Maret 2023	14	8	31ºC	34ºC	33ºC	66%	61%	60%	
16 Maret 2023	16	9	29ºC	43ºC	34ºC	63%	49%	60%	

Lampiran 9. Data Intensitas Cahaya Penelitian Tahap 2

Hari/Tanggal	Minggu ke-N	Pengukuran ke-N	Intensitas Cahaya (Max)			Intensitas Cahaya (Min)			Ket.
			Pagi	Siang	Sore	Pagi	Siang	Sore	
24 November 2022	0	1	25,77 kLux	3,54 kLux	4,69 kLux	13,72 kLux	3,41 kLux	3999 Lux	
			19,97 kLux	3,30 kLux	4,32 kLux	16,46 kLux	2,85 kLux	3999 Lux	
			19,33 kLux	2,87 kLux	4,35 kLux	14,00 kLux	2,05 kLux	2509 Lux	
08 Desember 2022	2	2	26,34 kLux	21,55 kLux	4,18 kLux	23,01 kLux	23,10 kLux	3860 Lux	
			23,20 kLux	22,03 kLux	3519 Lux	15,84 kLux	21,84 kLux	3480 Lux	
			21,69 kLux	23,12 kLux	3654 Lux	20,74 kLux	20,04 kLux	3227 Lux	
22 Desember 2022	4	3	16,39 kLux	36,92 kLux	274,1 Lux	12,61 kLux	32,76 kLux	98,1 Lux	
			16,81 kLux	36,11 kLux	118,1 Lux	13,82 kLux	29,97 kLux	85,1 Lux	
			17,90 kLux	39,30 kLux	118,1 Lux	13,56 kLux	27,63 kLux	104,8 Lux	
05 Januari 2023	6	4	1372 Lux	3251 Lux	3554 Lux	1376 Lux	2862 Lux	2047 Lux	
			1268 Lux	2614 Lux	3361 Lux	1189 Lux	1944 Lux	2794 Lux	
			1102 Lux	2662 Lux	3323 Lux	1017 Lux	1760 Lux	2968 Lux	
19 Januari 2023	8	5	14,59 kLux	38,29 kLux	6,16 kLux	11,46 kLux	35,70 kLux	5,84 kLux	
			14,01 kLux	36,64 kLux	5,92 kLux	13,06 kLux	36,04 kLux	5,73 kLux	
			14,27 kLux	38,66 kLux	5,41 kLux	13,32 kLux	33,92 kLux	4,81 kLux	
02 Februari 2023	10	6	10,51 kLux	10,44 kLux	2974 Lux	9,36 kLux	9,22 kLux	2582 Lux	
			8,99 kLux	10,84 kLux	2588 Lux	8,77 kLux	10,31 kLux	2623 Lux	
			9,10 kLux	10,74 kLux	2573 Lux	5,95 kLux	9,51 kLux	2448 Lux	
16 Februari 2023	12	7	6,05 kLux	9,25 kLux	3835 Lux	5,79 kLux	8,74 kLux	3355 Lux	
			6,02 kLux	9,09 kLux	2469 Lux	5,76 kLux	7,97 kLux	2348 Lux	

Hari/Tanggal	Minggu ke-N	Pengukuran ke-N	Intensitas Cahaya (Max)			Intensitas Cahaya (Min)			Ket.
			Pagi	Siang	Sore	Pagi	Siang	Sore	
			5,90 kLux	9,22 kLux	2388 Lux	5,55 kLux	7,04 kLux	2169 Lux	
02 Maret 2023	14	8	15,97 kLux	17,71 kLux	6,32 kLux	3999 Lux	15,69 kLux	5,72 kLux	
			18,21 kLux	22,08 kLux	6,21 kLux	10,36 kLux	18,17 kLux	5,73 kLux	
			15,59 kLux	20,87 kLux	6,26 kLux	10,80 kLux	16,15 kLux	4,70 kLux	
16 Maret 2023	16	9	16,98 kLux	31,97 kLux	10,66 kLux	10,11 kLux	26,20 kLux	8,61 kLux	
			17,40 kLux	29,59 kLux	11,58 kLux	12,05 kLux	25,00 kLux	8,78 kLux	
			15,49 kLux	30,67 kLux	10,80 kLux	10,74 kLux	28,31 kLux	4,64 kLux	

Lampiran 10. Dokumentasi Tahapan Penelitian

Tahap 1

A

B

C

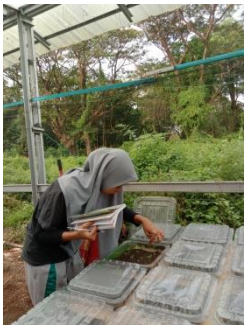
D

E

F

G

H



I

J

K

Keterangan : (A) lokasi pengambilan media kecambah; (B) sterilisasi media; (C) benih Bitti setelah diekstraksi; (D) pengukuran suhu air rendaman; (E) - (F) penaburan benih; (G) - (H) benih yang berkecambah; (I) penghitungan jumlah kecambah; (J) - (K) pemeliharaan dan pengamatan.

Tahap 2

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

AA

AB

Keterangan : (A) inoculum FMA yang digunakan; (B) penimbangan FMA; (C) wadah untuk perbandingan media tanam; (D) persiapan media tanam; (E) - (G) proses penyapihan dan pemberian FMA; (H) pelabelan; (I) penyiraman semai; (J) - (N) pengukuran tinggi, diameter, jumlah daun, suhu, kelembaban dan intensitas cahaya; (O) pembongkaran tanaman; (P) pemilihan akar segar dan sehat; (Q) pengovenan pucuk dan akar tanaman; (R) penimbangan biomassa tanaman; (S) - (U) pembuatan larutan untuk kolonisasi; (V) penggantian larutan pada akar; (W) - (X) pemilihan akar untuk pengamatan dibawah mikroskop; (Y) pengamatan kolonisasi; (Z) - (AB) pemeliharaan semai.

Lampiran 11. Hama dan Penyakit yang Menyerang Semai Bitti Selama Penelitian










Lampiran 12. Performa Pertumbuhan Semai Bitti 16 MST

All D0

D1M1

D1M2

D1M3

D2M1

D2M2

D2M3

D3M1

D3M2

D3M3

D0M1

D0M2

D0M3

D1M1

D1M2

D1M3

D2M1

D2M2

D2M3

D3M1

D3M2

D3M3