

DAFTAR PUSTAKA

- [ACGIH] American Conference of Governmental Industrial Hygienist. 2020. Documentation of the TLVs and BEIs, 7th Ed. Cincinnati: ACGIH Worldwide.
- Alavo, T. B. C., Abagli, A. Z., Tégbéssou, K. J. C., & Dunphy, G. B. 2011. Kaolin potential for the integrated management of *Aphis gossypii* Glov. (Homoptera: Aphididae) on cotton. Archives of Phytopathology and Plant Protection. 44(8), 764-770.
- Aprianti, F. R., Hidayat, Y., & Dono, D. 2022. Pengaruh ukuran partikel sulfur terhadap mortalitas, pertumbuhan dan perkembangan ulat grayak jagung *Spodoptera frugiperda* J. E. Smith (Lepidoptera: Noctuidae). Agrikultura. 32(3), 257- 265.
- Bakrim, A. A., Maria, F., Sayah, R., Lafont., & Takvorian, N. 2008. Ecdysteroids in spinach (*Spinacia oleracea* L.): Biosynthesis, transport and regulation of levels. Plant Physiology and Biochemistry. 46(10), 844-854.
- Bhusal, S., & Chapagain, E. 2020. Threats of fall armyworm (*Spodoptera frugiperda*) incidence in Nepal and it's integrated management-a review. Journal of Agriculture and Natural Resources. 3(1), 345-359.
- Boaventura, D., Martin, M., Pozzebon, A., MotaSanchez, D., & Nauen, R. 2020. Monitoring of target-site mutatuins conferring insecticide resistance in *Spodoptera frugiperda*. Insects. 11(8), 545-560.
- Borkakati, R. N., Venkatesh, M. R., Saikia D. K., & Bora, S. S. 2019. A brief review on food recognition by insects: use of sensory and behavioural mechanisms. Journal of Entomology and Zoology Studies. 7(3), 574-579.
- Busato, G. R., Grützmacher, A. D., Garcia, M. S., Giolo, F.P., Zotti, M. J., & Bandeira J. M. 2005. Exigências térmicas e estimativa do número de gerações dos biótipos “milho” e “arroz” de *Spodoptera frugiperda*. Pesqui Agropec Bras. 40(4), 329–335.
- [CABI] Centre for Agriculture and Bioscience International. 2019. *Spodoptera frugiperda* (fall armyworm) (internet). (diacu 2021 September 15). Tersedia dari: <https://www.cabi.org/ISC/fallarmyworm>.
- Chapman, R. F. 1998. The Insects: Structure and Function. Cambridge: Cambridge University Press.
- Cholifah, N., Widyaningrum, P., & Indriyanti, D. R. 2012. Pertumbuhan, viabilitas dan produksi kokon ulat sutera yang diberi pakan buatan berpengawet. Biosantifikasi. 4(1), 47–52.
- Constanski, K. C., Zorzetti, J., Santoro, P.H., Hoshino, A. T., & Neves, P. M. O. J. 2016. Inert powders alone or in combination with neem oil for controlling *Spodoptera eridania* and *Spodoptera frugiperda* (Lepidoptera: Noctuidae) larvae. Semina: Ciencias Agrarias. 37(4), 1801-1810.
- Chung, H., & Carroll, S. B. 2015. Wax, sex and the origin of species: Dual roles of insect cuticular hydrocarbons in adaptation and mating. Bioessays. 37(7), 822-830.
- Delvita, H., Djamasim D., & Ramli. 2015. Pengaruh variasi temperatur kalsinasi terhadap karakteristik kalsium karbonat (CaCO_3) dalam cangkang keong sawah (*Pila ampullacea*) yang terdapat di Kabupaten Pasaman. Pillar of Physics. 6(1), 17–24.

- Dickinson, B. C., Meadows, C. M., & Witman, E. D. 1941. Sulfur as a stomach insecticide. *Journal of Entomology and Zoology Studies.* 6(6), 219-221.
- Direktorat Jenderal Tanaman Pangan. 2018. Petunjuk Teknis Pengamatan dan Pelaporan Organisme Pengganggu Tumbuhan dan Dampak Perubahan Iklim (OPT-DPI). Jakarta: Kementerian Pertanian.
- Estrada-Aguilar, A., Sánchez-Manzano, R. M., Martínez-Ibarra, J. A., Camacho, A. D., Márquez-Navarro, A., & Nogueda-Torres, B. 2012. Larvicidal activity of micronized aqueous suspension of calcium hydroxide against *Aedes aegypti* and *Culex quinquefasciatus* (Diptera: Culicidae). *Parasitology Research.* 110(3), 1091–1095.
- [FAO] Food and Agriculture Organization of the United Nations & [CABI] Centre for Agriculture and Bioscience International. 2019. Community - Based Fall Armyworm (*Spodoptera frugiperda*) Monitoring, Early Warning and Management. Training of Trainers Manual, First Edition. 112 pp. Licence: CC BY-NC-SA 3.0 IGO.
- [FAOSTAT] Food and Agriculture Organization of the United Nations Statistics. 2021. Crops and livestock products: yield (internet). (diacu 2023 Juli 01). Tersedia dari: <http://www.fao.org/faostat>.
- Glenn, D. M., & Puterka, G. J. 2010. Particle films: A new technology for agriculture. *Horticultural Reviews.* 31(1), 1-44.
- Glenn, D. M., Puterka, G. J., Vandarzwet, T., Byers, R. E., & Feldhake, C. 1999. Hydophobic particle films: A new paradigm for suppression of arthropod pests and plant disieases. *Journal of Economic Entomology.* 92(4), 759-771.
- Goussain, M. M., Moraes, J. C., Carvalho, J. G., Nogueira, N. L., & Rossi, M.L. 2002. Efeito da aplicação de silício em plantas de milho no desenvolvimento biológico da lagarta-do-cartucho *Spodoptera frugiperda* (J. E. Smith) (Lepidoptera: Noctuidae). *Neotrop Entomol.* 31(2), 305-310.
- Haq, I. U., Zhang, K., Ali, S., Majid, M., Ashraf, H. J., Khurshid, A., Inayat, R., Li, C., Gou, Y., Al-Ghamdi, A. A., S. Elshikh, M., Kubik, S., & Liu, C. 2022. Effectiveness of silicon on immature stages of the fall armyworm [*Spodoptera frugiperda* (J. E. Smith)]. *Journal of King Saud University.* 34(6), 1-9.
- Harvey, D. 2000. Modern Analytical Chemistry. New York: McGraw-Hill Comp.
- Hassanali, A., & Bentley, M. D. 1987. Comparison of Insect Antifeedant Activities of Some Limonoids. In: Natural Pesticides from The Neem Tree (*Azadirachta indica* A. Juss) and Other Tropical Plants. Nairobi, Kenya: Proceeding of The Third Internasional Neem Conference 10-15 July 1986.
- Herhayulika, W., Hidayat, Y., & Susanto, A. 2021. Pengaruh ukuran partikel kaolin terhadap mortalitas, pertumbuhan, dan perkembangan ulat grayak jagung. *Jurnal Penelitian Saintek.* 26(2), 109-121.
- Hermawan, W., Kajiyama, S., Tsukuda, R., Fujisaki, K., Kobayashi, A., and Nakasaji, F. 1994. Antifeedan and antioviposition activities of the fractions of extract from a tropical plant, *Andrographis paniculata* (Acanthaceae), against the diamondback moth, *Plutella xylostella* (Lepidoptera: Yponomeutidae). *Appl. Entomol. Zool.* 29(4), 533-538.
- Hidayanti, Y., & Asri, M. T. 2019. Pertumbuhan ulat grayak *Spodoptera litura* (Lepidoptera:Noctuidae) pada pakan alami dan pakan buatan dengan sumber protein berbeda. *LenteraBio.* 8(1), 44-49.

- [ITIS] Integrated Taxonomic Information System. 2019. Taxonomic hierarchy: *Spodoptera frugiperda* (internet). (diacu 2021 November 01). Tersedia dari: <https://www.itis.gov>.
- Jamar, L., Song, J., Fauche, F., Choi, J., & Lateur, M. 2017. Effectiveness of lime sulphur and other inorganic fungicides against pear scab as affected by rainfall and timing application. *Journal of Plant Diseases and Protection.* 124(4), 383–391.
- Kalshoven, L. G. E. 1981. *The Pest of Crops in Indonesia*. Revised and Translated By P.A. Van der laan. Jakarta: PT. Ichtiar Baru-Van Hoeve.
- Kazama, H., Oohata, Y., Takanashi, T., Tokoro, M., Ishiguri, Y., Mori, N., & Yoshinaga, N. 2020. Inhibitory substances contained in calcium carbonate wettable powder on the oviposition of the peach fruit moth, *Carposina sasakii*. *Journal Pestic Sci.* 45(1), 16-23.
- Keeping, M. G., & Kvedaras, O. L. 2008. Silicon as a plant defence against insect herbivory: response to massey, ennos and hartley. *Journal Animal Ecology.* 77(3), 631-633.
- Kementerian Kesehatan RI. 2012. Pedoman Penggunaan Insektisida (Pestisida) dalam Pengendalian Vektor. Jakarta: Kementerian RI.
- Kementerian Pertanian. 2019. Pengenalan Fall Armyworm (*Spodoptera frugiperda* J. E. Smith) Hama Baru pada Tanaman Jagung di Indonesia. Jakarta: Balai Penelitian Tanaman Serealia. 64 p.
- Knight, A. L., Unruh, T. R., Christianson, B. A., Puterka, G. J., & Glenn, D. M. 2000. Effects of a kaolin-based particle film on obliquebanded leafroller (Lepidoptera: Tortricidae). *Journal of Economic Entomology.* 93(3), 744–749.
- Kojongian, I. Y., Rumokoy, L. J. M. & Pinaria, B. A. N. 2022. Respons hama *Spodoptera litura* F. terhadap pestisida botanos *Cymbopogon nardus* L Rendl., *Pangium edule* Reinw., dan *Syzygium aromaticum* L. pada tanaman *Brassica olearacea* L. *Jurnal Transdisiplin Pertanian.* 5(1), 267-276.
- Kresnawaty, I., Budiani, A., Wahab, A., & Darmono, T. W. 2010. Aplikasi biokaolin untuk perlindungan buah kakao dari serangan PBK, *Helopeltis* spp, dan *Phytophthora palmivora*. *Menara Perkebunan.* 78(1), 25-31.
- Kumela, K., Simiyu, J., Sisay, B., Likhayo, P., Mendesil, E., Gohole, L., & Tefera, T. 2018. Farmers' knowledge, perceptions, and management practices of the new invasive pest, fall armyworm (*Spodoptera frugiperda*) in Ethiopia and Kenya. *International Journal of Pest Management.* 65(1), 1-9.
- Kundra. 1981. Pestisida dan Kegunaannya. Bandung: Fakultas Pertanian Universitas Padjadjaran.
- Lailiyah, Q., Baqiyah, M., & Darminto, D. 2012. Pengaruh temperatur dan laju aliran gas CO₂ pada sintesis kalsium karbonat presipitat dengan metode bubbling. *Jurnal Sains dan Seni ITS.* 1(1), 6-10.
- Li, Y., Leng, C. M., Hu, D., Wu, J. X., & Li, Y. P. 2019. Effects of host plants on growth, development and fecundity of *Plutella xylostella* L. *Acta Agriculturae Boreali-occidentalis Sinica.* 28(1), 475-480.
- Lourenço, M. F. C., Rosa, A. J., Siqueira, A. P. S., Lucas, S. A., Almeida, A. C. S., Jesus, F. G., & Cunha, P. C. R. 2017. Induction of resistance to fall armyworm (*Spodoptera frugiperda*) (Lepidoptera: Noctuidae) in transgenic

- and conventional corn plants. Australian Journal of Crop Science. 11(09), 1176-1180.
- Lukman, A. 2009. Peran hormon dalam metamorfosis serangga. Biospecies. 2(1), 42-45.
- Maharani, Y., Dewi, V. K., Puspasari, L. T., Rizkie, L., Hidayat, Y., & Dono, D. 2019. Cases of fall armyworm *Spodoptera frugiperda* J. E. Smith (Lepidoptera: Noctuidae) attack on maize in Bandung, Garut and Sumedang District, West Java. CROPSAVER - Journal of Plant Protection. 2(1), 38-46.
- Mardiana, Y., Salbiah, D., Laoh, J. H. 2015. Penggunaan beberapa konsentrasi Beauveria bassiana Vuillemin lokal untuk mengendalikan *Maruca testulalis* geyer pada tanaman kacang panjang (*Vigna sinensis* L.). Jurnal Online Mahasiswa. 2(1), 1-11.
- Megasari, D., & Khoiri, S. 2021. Tingkat serangan ulat grayak tentara *Spodoptera frugiperda* JE Smith (Lepidoptera: Noctuidae) pada pertanaman jagung di Kabupaten Tuban. Jawa Timur Indonesia. Agrovigor: Jurnal Agroekoteknologi. 14(1), 1-5.
- Megasari, D., Putra, I. L. I., Martina, N. D., Aulia Wulanda, A., & Khotimah, K. 2022. Biologi *Spodoptera frugiperda* JE Smith pada beberapa jenis pakan di laboratorium. Agrovigor: Jurnal Agroekoteknologi. 15(1), 63–67.
- Miller, J. R., & Strickler, K. L. 1984. Finding and Accepting Host Plant. In: Bell WJ & Carde RT (eds.), Chemical Ecology of Insects. Sunderland: Sinauer Associates Inc Publishers.
- Morsi, G. M. A. 2021. Study the effect of two mineral compounds for controlling the peach fruit fly, *Bactrocera zonata*, saunders on mango groves in egypt. Journal of Plant Protection and Pathology. 2(1), 71–76.
- Nagaratna, W., Kalleshwaraswamy, C. M., Dhananjaya, B. C., Sharanabasappa., & Prakash, N. B. 2022. Effect of silicon and plant growth regulators on the biology and fitness of fall armyworm *Spodoptera frugiperda* a recently invaded pest of maize in India. Silicon. 14(3), 783-793.
- Nagoshi, R. O. D. N., Silvie, P., Meagher, R. L., & Lopez, J. 2007. Identification and comparison of fall armyworm (Lepidoptera: Noctuidae) host strains in Brazil, Texas, and Florida. Annals of The Entomological Society of America. 100(3), 394– 402.
- [NCBI] National Center for Biotechnology Information. 2022. PubChem compound summary for cid 10112 (Internet). (diacu 2022 Juli 15). Tersedia dari: <https://pubchem.ncbi.nlm.nih.gov/compound>.
- Nickel, E. H. 1995. The definition of a mineral. Mineralogical Journal. 17(7), 346-349.
- Nonci, N., Kalqutny, S. H., Mirsam, H., Muis, A., Azrai, M., & Aqil, M. 2019. Pengenalan Fall Armyworm (*Spodoptera frugiperda* J.E. Smith) Hama Baru pada Tanaman Jagung di Indonesia. Maros: Balai Penelitian Tanaman Serealia.
- Oguh, C. E., Okpaka, C. O., Ubani, C. S., Okekeaji, U., Joseph, P. S., & Amadi, E. U. 2019. Natural pesticides (biopesticides) and uses in pest management- a critical review. Asian Journal of Biotechnology and Genetic Engineering. 2(3), 1-18.

- Pangihutan, J. C., Dono, D., & Hidayat, Y. 2022. The potency of minerals to reduce oriental fruit fly infestation in chili fruits. *PeerJ.* 10(8), 1-14.
- Pereira, P., Nascimento, A. M., de Souza, B. H. S., & Penaflor, M. F. G. V. 2021. Silicon supplementation of maize impacts fall armyworm colonization and increases predator attraction. *Neotrop Entomol.* 50(4), 654-661.
- Prager, S. M., Lewis, O. M., Vaughn, K., & Nansen, C. 2013. Oviposition and feeding by *Bactericera cockerelli* (Homoptera: Psyllidae) in response to a solar protectant applied to potato plants. *Crop Protection.* 45(1), 57-62.
- Prasanna, B. M., Huesing, J. E., Eddy, R., & Peschke, V. M. 2018. Fall Armyworm in Africa: A Guide for Integrated Pest Management, First Edition. Mexico: CDMX CIMMYT.
- Prijono, D. 1999. Prospek dan Strategi Pemanfaatan Insektisida Alami Dalam PHT. Bahan Pelatihan Pengembangan dan Pemanfaatan Insektisida Alami. Bogor: Pusat Kajian PHT Institut Pertanian Bogor.
- Purba, T. Z. S., Damanik, M. M. B., & Lubis, K. S. 2017. Dampak pemberian pupuk TSP dan pupuk kandang ayam terhadap ketersediaan dan serapan fosfor serta pertumbuhan tanaman jagung pada tanah inceptisol kwala bekala. *Jurnal Agroekoteknologi.* 5(3), 638 – 643.
- Puterka, G. J., Glenn, D. M., & Pluta, R. C. 2005. Action of particle films on the biology and behavior of *Pear psylla* (Homoptera: Psyllidae). *Journal of Economic Entomology.* 98(6), 1-6.
- Puterka, G. J., Reinke, M., Luvisi, D., Ciomperik, M. A., Bartels, D., Wendel, L., Glenn, D. M. 2003. Particle film, surround WP, effects on glassy-winged sharpshooter behavior and its utility as a barrier to sharpshooter infestations in grape. *Plant Health Progress.* 4(1), 1-8.
- Ramadhan, R. A. M., & Nurhidayah, S. 2022. Bioaktivitas ekstrak biji Annona muricata L. terhadap *Spodoptera frugiperda* J. E. Smith (Lepidoptera:Noctuidae). *Jurnal Agrikultura.* 33(1), 97-105.
- Ramirez, G. A., Puentes, P. G., & Restrepo, D. H. 2018. Evaluation of the effect of foliar application of kaolin clay and calcium carbonate on population of *Diaphorina citri* (Hemiptera: Liviidae) in tahiti lime. *Crop Protection.* 109(1), 62-71.
- Rwomushana, I., Bateman, M., Beale, T., Beseh, P., Cameron, K., Chiluba, M., Clottey, V., Davis, T., Day, R., Early, R., Godwin, J., Gonzalez-Moreno, P., Kansiime, M., Kenis, M., Makale, F., Mugambi, I., Murphy, S., Nunda, W., Phiri, N., Pratt, C., & Tambo, J. 2018. Fall Army Worm: Impacts and Implications for Africa. Wallingford UK: CABI.
- Sa'diyah, N. A., Purwani, K. I., dan Wijayanti, L. 2013. Pengaruh ekstrak daun bintaro (*Cerbera odollam*) terhadap perkembangan ulat grayak (*Spodoptera litura* F.). *Jurnal Sains dan Seni POMITS.* 2(2), 2337-3520.
- Salerno, G., Rebora, M., Piersanti, S., Saitta, V., Kovalev, A., Gorb, E., & Gorb, S. 2021. Reduction in insect attachment caused by different nanomaterials used as particle films (kaolin, zeolite, calcium carbonate). *Sustainability.* 13(15), 8250-8263.
- Sari, K. K. 2020. Viral hama invasif ulat grayak (*Spodoptera frugiperda*) ancam panen jagung di Kabupaten Tanah Laut Kalsel. *Jurnal Proteksi Tanaman Tropika.* 3(03), 244–247.

- Schaub, B., & Kroschel, J. 2018. Developing a biocontrol strategy to protect stored potato tubers from infestation with potato tuber moth species in the andean region. *Journal of Applied Entomology*. 142(7), 78–88.
- Sharanabasappa, C., Kalleswaraswamy, M. S., Maruti & Pavithra, H. B. 2018. Biology of invasive fall army worm *Spodoptera frugiperda* (J.E. Smith) (Lepidoptera: Noctuidae) on maize. *Indian Journal of Entomology*. 80(3), 540-543.
- Simanjuntak, C. L., Sumiartha, K., Yuliadhi, K. A., & Supartha, W. 2022. Insidensi serangan dan perkembangan populasi hama invasif, *Spodoptera frugiperda* (J. E Smith) (Lepidoptera: Noctuidae) pada tanaman jagung dan sorgum di Bali. *Agrotrop : Journal on Agriculture Science*. 12(1), 1-14.
- Sisay, B. 2019. Fall armyworm, *Spodoptera frugiperda* infestations in east Africa: assessment of damage and parasitism. *Insect*. 195(10), 1-10.
- Smith, R. F., & McLeod, G. F. 1943. Alfalfa butterfly control with sulphur dusts 1, 2, 3. *Journal of Economic Entomoloy*. 36(5), 665-671.
- Smitha, M. S., & Mathew, M. P. 2010. Management of root mealybugs, *Geococcus* spp., in banana CV. Nendran. *Pest Management in Horticultural Ecosystems*. 16(2), 108–119.
- Stefano, M. G. Di. 2016. Toxic, repellent and antifeedant activities of *Lavandula anustifolia* Miller (Lamiaceae) essential oil against *Sitophilus granaries* (L.) (Coleoptera, Curculionidae) adults. In PhD Thesis. Universitas Delgi Studi Del Molise.
- Subiono, T. 2020. Preferensi *Spodoptera frugiperda* (Lepidoptera: Noctuidae) pada beberapa sumber pakan. *Jurnal Groekoteknologi Tropika Lembab*. 2(2), 130–134.
- Subiyakto., Asbani, N., Sunarto, D. A., & Sujak. 2016. Efikasi pestisida alami kalsium polisulfida (sulfur) terhadap tungau (*Polyphagotarsoneum latus* L.). *Agrovigor*. 9(1), 42–47.
- Suharno, P. 1985. Use of Calcium Carbonate for The Control of Insect Pests in Stored Paddy. Manila (Philippines): Asean Technical Seminar on Grain Post-Harvest Technology.
- Susilowati, R. P., & Sari, M. P. 2022. Perubahan histopatologis sel epitel midgut larva *Aedes aegypti* yang terpapar ekstrak daun permot (*Passiflora foetida*). *Jurnal Pembelajaran dan Biologi Nukleus*. 8(1), 53-63.
- Syah, B. W., & Purwani, I. K. 2016. Pengaruh ekstrak daun belimbing wuluh (*Averrhoa bilimbi*) terhadap mortalitas dan perkembangan larva *Spodoptera litura*. *Jurnal Sains dan Seni ITS*. 5(2), 2337-3520.
- Togola, A., Meseka, S., Menkir, A., Badu-Apraku, B., Boukar, O., Tamo, M., & Djouaka, R. 2018. Measurement of pesticide residues from chemical control of the invasive *Spodoptera frugiperda* (Lepidoptera: Noctuidae) in a maize experimental field in Mokwa, Nigeria. *International Journal of Environmental Research and Public Health*. 15(5), 849-860.
- Tacoli, F., Cargnus, E., Zandigiacomo, P., & Pavan, F. 2020. Side effects of sulfur dust on the european grapevine moth *lobesia botrana* and the predatory mite *Kampimodromus aberrans* in Vineyards. *Insects*. 11(11), 825-838.
- Trisyono, Y. A., Suputa, S., Aryuwandari, V. E. F., Hartaman, M., & Jumari, J. 2019. Occurrence of heavy infestation by the fall armyworm *Spodoptera*

- frugiperda*, a new alien invasive pest, in corn Lampung Indonesia. Jurnal Perlindungan Tanaman Indonesia. 23(1), 156-160.
- Visser, J. H. 1988. Host-plant finding by insects-orientation, sensory inputs and search patterns. Journal Insect Physiol. 34(3), 259-26.
- Wicaksono, R. C., & Endarto, O. 2019. Peran kaolin dalam pengendalian hama thrips pada buah jeruk. Jurnal Agronida. 5(4), 7-11.
- Wigglesworth, V. B. 1974. Insect Physiology. London: Chapman and Hall.
- Willing, B., Enie, T., Umi, K., Tri, M. P., Hadi, S., Surono, dan Didah, M. 2020. Efektifitas insektisida berbahan aktif klorantraniliprol terhadap larva *Spodoptera frugiperda* (JE Smith). Karawang: Jurnal Proteksi Tanaman. 4(1), 29-37.
- Yasin, N., Maharani, T., Hariri, A. M., & Wibowo, L. 2022. Aktivitas insektisida ekstrak biji sirsak (*Annona muricata* L.) terhadap *Spodoptera frugiperda* J. E. Smith. Journal TABARO. 6(1), 639-646.
- Yusoff, S.N.M., Kamari, A., & Aljafree, N.F.A. 2016. A review of materials used as carrier agents in pesticide formulations. International Journal of Environmental Science and Technology. 13(1), 2977–2994.

