

Jurnal SERAMBI ILMU



Journal of Scientific Information and Educational Creativity

VOLUME 23

NOMOR 1

EDISI MARET 2022

Contents

- Socio-Economic Impact Of Integrated Pest Management Field School Implementation On Coffee Farmers In Panditan Village
Muqtafiah, Luchman Hakim, Aminudin Afandhi 1-11
- The Correlation Between Students' Formal Thinking Skills And The Capability To Solve Chemistry Olympiad Problems
Said Ali Akbar, Muhammad Hasan, Syahril 12-23
- Duties and Functions of the Bone Resort Police in Overcoming Narcotics Abuse as a Rescue Effort Bone's Young Generation
Mukhawwas Rasyid, Faisal, Sutri Helfianti, Muhammad Ridhwan, Gunawan, T. Makmur 24-35
- High Order Thinking Skills (HOTS) Of Ibtidaiyah Madrasah Teacher Education Program (PGMI) Study Program Students During **The Covid-19 Pandemic**
Siti Sarah 36-47
- Effects Of Youtube Tutorial On Mental Computation Competency Of Pre-Service Teachers
Zulkifli, Yuhasriati, Nida Jarmita, Zaid Zainal, Jasmaniah, Samsul Bahri 48-58
- Analisis Penggunaan Bentuk Deiksis Dalam Novel Api Tauhid Karya Habiburrahman El Shirazy
Emilda, Masithah Mahsa, Siti Husnul Khairani 59-77
- Model Concept Attainment To Enriching Students' Vocabulary Mastery By Using Integrated Reading Book As A Learning Media During The Covid-19 Pandemic
Wawat Srinawati, Meita Lesmiaty Khasyar 78-89
- Improving Mathematical Reasoning Ability Students Through Strategy Learning Genius
Rifaatul Mahmuzah, Muhamad Saleh, Rahmawati, Kairul Asri, Nur Ainun, 90-99
- Penetapan Kadar Pengawet Natrium Benzoat pada Mayonaise Kemasan Secara Spektrofotometri UV-Vis sebagai Upaya Peningkatan Pengalaman Praktek Mahasiswa Mata Kuliah Kimia Dasar
Lidyawati, Muhammad Nazar, Fadli Syahputra 100-112
- Hubungan Antara Kepemimpinan Transformasional Kepala Sekolah Dengan Kinerja Guru
Anwar, Yenni Agustina, Ahmad Yani 113-130

Diterbitkan Oleh
FKIP Universitas Serambi Mekkah Banda Aceh

Jurnal
Serambi Ilmu

Volume 23

Nomor 1

Hal.
1 - 130

Banda Aceh
Maret 2022



Socio-Economic Impact Of Integrated Pest Management Field School Implementation On Coffee Farmers In Panditan Village

Muqtafiah¹, Luchman Hakim², Aminudin Afandhi³

¹Muqtafiah is a student of postgraduate Program of Environmental and Development,
Brawijaya University

Email : Muqtafiah.ita@gmail.com

²Luchman Hakim is a Lecturer Departement of Biology, Faculty of Mathematics and
Natural Science, Brawijaya University

Email : Luchman@ub.ac.id

³Aminudin Afandhi is a Lecturer Department of Plant Pests and Diseases, Faculty of
Agriculture, Brawijaya University

Email: aaf_fp@ub.ac.id

Abstract

Integrated Pest Management Field School (IPM-FS) is an extension method that is still being applied in Indonesia. IPM-FS is considered still relevant to be applied in Indonesia. However, farmers still have obstacles that cause farmers not to fully apply the knowledge obtained from the Integrated Pest Control Field School. The purpose of this study was to examine and analyze the benefits and constraints after implementing the IPM-FS in Panditan Village, Lumbang District. The method used is descriptive qualitative. Collecting data through observation, interviews, and documentation. The results showed that farmers benefited from the Integrated Pest Management Field School (IPM-FS), namely increasing farmer knowledge, changing farmer perceptions and behavior, and increasing coffee productivity. The absence of a specific price difference between coffee with the application of IPM and non-IPM is an obstacle for farmers so that farmers pick coffee carelessly.

Keywords: Management-Field-School, coffee farmers, benefits, constraints

INTRODUCTION

Indonesia became the first country to implement the Integrated Pest Management Field School (IPM-FS). In 1989-1999 Indonesia received financial support from the World Bank to organize a social project in the form of Integrated Pest Control (IPM) for farmers (Untung, 2000).

The implementation of IPM-FS was motivated by the Presidential Instruction No. 3 of 1986 which prohibited the use and distribution of 57 insecticide formulations, followed by the repeal of pesticide subsidies in 1989. The history of the Integrated Pest Management Field School (IPM-FS) began with excessive pesticide dependence on pesticides, thus the background to the existence of presidential decisions (Thorburn, 2014).

Thirty-two years of implementing the Integrated Pest Management Field School has had a significant impact on farmers. Several studies have been conducted to determine the positive impact of the implementation of the Integrated Pest Management Food School (IPM-FS). Research conducted by Dani *et al* (2016), that farmers after participating in IPM have a higher level of knowledge in the application of Integrated Pest Agriculture (IPM), than before participating in IPM, which has an impact on farmers' rice production.

According to Mancini (2006) the benefits of Farmers Field School (FFS) in addition to increasing farmers' income, can also reduce poverty levels among farmers, and increase collective activities. The implementation of the Integrated Pest Management Field School (IPM-FS) is still very relevant to be applied in Indonesia, this is due to the high use of inorganic pesticides by farmers so that the Field School can increase farmers' knowledge about the importance of using plant-based pesticides (van den Berg *et al.* 2020).

The Integrated Pest Control Field School has been adopted by many countries in Africa, reality in Indonesia there has never been an evaluation in terms of socio-psychological farmers (Setyowati 2012). In fact, the challenges of farmers in this globalization era are increasing, in contrast to the era when the IPM-FS was initially implemented.

The application of renewable technology and improving the quality of farmer human resources is a challenge that should be adapted in the implementation of the Integrated Pest Control Field School Program. IPM-FS which was previously implemented on rice plants then switched to all plant varieties, not only agriculture but also plantation crops.

Lumbang District is a coffee-producing village with an altitude of about 351-1200 m above sea level. The potential of coffee in Panditan Village is quite abundant with the area of the plant reaching 21.70 ha. In the Dutch era, the Panditan area became the center of coffee plantations. In 2018 in Panditan Village an Integrated Pest Management Field School (IPM-FS) was implemented with the target being the Sidorukun 1 Forest farmer group.

The implementation of the Integrated Pest Management Field School (IPM-FS) has an impact on farmers' knowledge and income. Two years after the implementation of the Integrated Pest Management Field School (IPM-FS), there are still farmers who pick coffee in a raw way, namely red, green and yellow.

The purpose of this study was to examine and analyze the benefits and constraints after implementing the IPM in Panditan Village, Lumbang District. The benefits of research can be used as a guide for the community of stakeholders in increasing the human resource capacity of coffee farmers.

METHOD

This research was conducted in Panditan Village, Lumbang District, Pasuruan Regency, East Java. The selection of research locations was carried out based on certain criteria, namely Panditan Village is one of the areas targeted for counseling from the Integrated Pest Control Field School (IPM-FS). This research was conducted over 6 months from September 2020 – February 2021.

Framework

Coffee is the main commodity of the Pasuruan Regency. The development of coffee quality continues to be carried out by the district government. The implementation of the Integrated Pest Management Field School (IPM-FS) in Pasuruan Regency is based on proposal submissions made by farmers by obtaining legitimacy or approval from the local Village Head. The existence of the Field School provides many benefits to farmers such as increasing farmer knowledge, changing farmer behavior patterns in coffee cultivation, and increasing farmers' income. However, this is also inseparable from several obstacles experienced by farmers after the implementation of the Integrated Pest Management Field School (IPM-FS), namely related to the application of renewable technology and marketing.

Data Collection

Collecting data in this study using the methods of observation, interviews, and documentation. Researchers when observing are directly involved in the implementation of cultivation and the application of coffee cultivation technology on farmers' land. Interviews were conducted in-depth with the informants by including a guide or interview guide. Interviews were conducted on 15 informants. The informant determination method used was purposive sampling method with certain criteria, namely Plant Destruction Organism Control (POPT), Field Agricultural Extension (FAE) Lumbang District, Village Apparatus, Head of a farmer group, and members of Sidorukun 1 farmer group.

Researchers when conducting interviews and observations use a recording device to make it easier to store interview data, and a camera to take pictures. Researchers obtained secondary data from BPS (Central Statistics Agency), Technical Guidelines for Integrated Pest Management Field Schools (IPM-FS) 2016. Other secondary data obtained by researchers were village administration data and coffee plantation land ownership data from Field Agricultural Extension (PPL) Lumbang District.

Data Analysis

Data analysis in this study used descriptive analysis and process tracing. The data is presented in a detailed and comprehensive manner with the following stages: 1) Data collection, 2) Data reduction, 3) Data presentation, 4) Decision making or verification (Miles and Huberman, 1992).

RESULT

Overview of Research Sites

Panditan Village, Lumbang District is an area located in the Highlands with coordinates between 531 m above sea level with an area of 41.850 km² or 418.50 ha. The boundaries of the Panditan Village area, in the north bordering the Watulumbung

Village, Kec. Lumbang, in the east, bordering the village of Banjarimbo district. Lumbang, in the south by the State Forest, and in the west by Bulukandang Village, Lumbang District

Panditan Village is one of the coffee-producing villages in Pasuruan Regency. Based on data obtained from the Field Extension Officer (PPL) of Lumbang District, it is known that in 2019 there were 21.70 hectares of smallholder coffee plantations located in Panditan Village, with a total production of 28.275 kg of coffee in the form of ose. Types of Coffee in Panditan Village are Robusta Coffee and Arabica Coffee, Arabica Coffee is still in the trial phase for 1 year. Arabica coffee seeds were obtained from the assistance of the East Java Provincial Agriculture Service as many as 100,000 arabica coffee seeds, which in the allocation were given 400 seeds in every 1 hectare of farmer's land.

Coffee farming is a supporting job for the people of Panditan Village, this is because the coffee plant is a seasonal plant so other income is needed to meet daily needs. The main occupation of the Panditan community is dairy farming. The total quantity of cows in Panditan Village is 3,245 heads, exceeding the population of only 2,828 (A. Village administration, 2019).

In Panditan Village there are 3 farmer groups, namely Sidorukun I, Sidorukun II, and Sidorukun III, and there is a combination of farmer groups. The Integrated Pest Management Field School Extension (IPM-FS) was carried out in the Sidorukun 1 Forest farmer group, with a total of 22 members.

Mechanism of Implementation of Integrated Pest Management Field Schools (IPM-FS)

Integrated Pest Management Field School or IPM-FS is one of the extension methods in the application of Integrated Pest Management (IPM), in which farmers are accompanied by POTP from the Agriculture and Plantation Service of Pasuruan Regency (Direktorat Jenderal Perkebunan Kementrian Pertanian, 2014). The Integrated Pest Management Field School (IPM-FS) is empowerment of farmers by prioritizing the principles of Integrated Pest Management (IPM) in farming (Nusantara and Kurniawan, 2020).

IPM-FS is a forum for the facilitation of farmers in improving their abilities and skills both individually and in groups, so that farmers are able to implement Integrated Pest Management based on IPM principles. Implementation of the Integrated Pest Management Field School (IPM-FS) requires a proposal from farmer groups, meaning that the program is bottom-up in which farmer groups identify the potential of their Natural Resources, which will then be developed with the Field School.

After the farmer groups make their submissions, they are discussed in the Village Musrembang, after that an official proposal is made from the village by getting assistance from the sub-district agricultural instructor. Implementation of the Field

School is based on four principles of Integrated Pest Control, namely: 1. Cultivation of healthy plants, 2. Utilization and preservation of natural enemies, 3. Routine observation, 4. Farmers become IPM experts (Untung, 2000).

The implementation of the Integrated Pest Management Field School (IPM-FS) also aims to make farmers experts in the maintenance and care of coffee plants. In addition to making farmers experts in the cultivation of coffee plants, the existence of the Integrated Pest Management Field School (IPM-FS) aims to increase the human resources of farmers in Panditan Village, so that farmers can maximize the potential of coffee in Panditan Village.

The Integrated Pest Management Field School (IPM-FS) was carried out for 10 months, more precisely from February to November 2018. The implementation mechanism is 20 meetings, with a meeting period of every 2 weeks. The implementation mechanism is not only providing material but also practice, with the percentage being 30% in the room and 70% in the field practice

The field practice method in IPM-FS is to select two samples of land to be used as a pilot, the first is IPM (Integrated Pest Control) land and the second is non-IPM conventional land. The time required for each meeting is from 8 to 2 in the afternoon. Before implementing the IMP-FS activity, the POPT implementer first carried out a pretest as a first step in identifying problems and used it to formulate solutions needed in the form of materials.

The questions in the pretest relate to OPT (Plant Destruction Organisms), coffee cultivation, and post-harvest. POPT conducted a pretest to determine the level of knowledge of farmers, the results of the pretest were used as a reference in formulating material during the Integrated Pest Management Field School.

The material in the Field School has been completely formulated in the Technical Guidelines for the Integrated Pest Management Field School (IPM-FS), in which the material provided is not only related to coffee cultivation but also group organization because the target of this activity is farmer groups.

Tabel 1.
Learning Materials for Integrated Pest Management Field School (IPM-FS)

No	Learning Materials	Field Instructions
1.	IPM-FS preparation	- What's this? - Analysis of training needs - Study contract - Organizing learning citizens - Initial Ballox Box test
2.	Designing Study Plots	IPM and Non IPM Plots
3.	General Topics	Basic Ecosystems Agroecosystem Analysis (BEAA)

4.	Special Topic a. Cultivation b. Pests and Natural Enemies/ APH c. Impact of Climate Change and fire management	Components of plant cultivation according to commodity IPM-FS - Pests/diseases/weeds - Predator - Parasitoids - Biological Control Agency - Insect collection • DPI mitigation and adaptation • Impact of Climate Change on pest attack
5.	Pesticide support materials	The impact of using chemical pesticides Vegetable pesticides
6.	Group dynamics a. Introduction b. Familiarity c. Creativity d. Cooperation e. Solution to problem f. Communication	a.Chain the name and make a line b. The ship sank c. 9 point 4 line d.Draw Together e. Samson Delilah f. Playing rope
7.	Evaluation	- Ballot Box (end) - Detailed Pair Analysis

Sumber : Direktorat Jenderal Perkebunan Kementrian Pertanian, 2014

The material provided in the IMP-FS in Panditan Village is not entirely based on the Technical Guidelines but rather adapts to field conditions by referring to the needs of farmers. The material given in the Field School in Panditan Village is related to the agro-ecosystem of coffee plants, care, rejuvenation, fertilization, and the use of pesticides.

The transfer of material on the use of natural fertilizers on coffee plants is very important to be taught in the Integrated Pest Control Field School, considering that the majority of the people in Panditan Village are dairy farmers, so that cow dung waste has the potential to be used as fertilizer. Before and after the Field School activities, farmer knowledge evaluation was also carried out using the Ballot Box method.

Benefits After Implementation of IPM-FS

The existence of the Integrated Pest Management Field School (IPM-FS) has had a positive impact on coffee farmers in Panditan Village, wherewith the implementation of the Integrated Pest Management Field School (IPM-FS), farmers' knowledge about coffee cultivation is increasing so that it will later affect the production of coffee.

The existence of the Integrated Pest Management Field School (IPM-FS) increases the knowledge of farmers in maintaining better coffee plants. Previously, farmers had an understanding that coffee plants were allowed to grow tall (*lancur*) and after the Field School, they were pruned and rejuvenated. This was also confirmed by Informant Mr. Suntoro

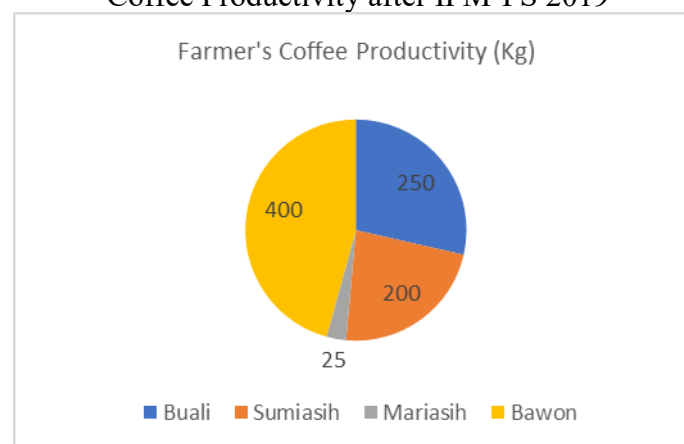
“terasa, sangat terasa itu. Sebelumnya ya, sebelum ada pelatihan itu kopinya orang sini itu mayoritas kopi lacuran. Maksudnya itu kopi yang ndak di rawat. Jadi tinggi. Jadi kesulitan untuk manennya. Nah setelah ada SL, kopi dipotong, kopi diambil nanti kira-kira ketinggian itu sudah 180 ndak tinggi sudah. Jadi rantingnya banyak, cara manennya mudah itu. Dulu lacuran dulu itu sebelum ada SL. Wes dibiarkan wes setinggi apa lek jarene Wong biyen kan eman – eman, tak potong kan eman – eman. Padahal produksinya menurun”

According to Mr. Suntoro, the existence of the Field School has changed the farmers' perspective on coffee, which in the understanding of farmers before the field school was implemented they believed that the higher the coffee, the better, but this makes it difficult for farmers to harvest and hamper coffee productivity. After the existence of the Integrated Pest Management Field School (IPM-FS), coffee plants are then cultivated according to the knowledge that has been obtained in the Field School.

In addition to maintenance by pruning, farmers also know the importance of cleaning tree trunks from "wewel". The Integrated Pest Management Field School (IPM-FS) increases farmers' knowledge and changes farmers' behavior patterns. farmers' participation in FFS makes farmers able to think critically and make decisions independently (Friis-Hansen & Duveskog, 2012).

According to Harahap (2012), IPM has an impact on increasing lowland rice production, decreasing production costs, and increasing farmers' income. The implementation of IPM-FS also affects farmers' coffee productivity (Wijayanti, 2013).

Figure 1
Coffee Productivity after IPM-FS 2019



Sumber : Primary Data (processed), 2019

Based on Figure 1, farmers' coffee productivity increases after implementing Integrated Pest Management (IPM) cultivation. Previously, the Buali informant only got 200 Kg of coffee beans in the form of ose, then after IPM the yield increased to 250 Kg from 2 hectares of land. Informant Sumiasih before the implementation of IPM the yield was only 1 quintal or 100 Kg, then after applying the knowledge gained from IPM her coffee productivity increased to 2 quintals/200 Kg in 2 hectares of land.

Informant Mariasih, who owned 0.50 hectares of land before IPM, her coffee yield only reached 10 Kg, then after IMP-FS it increased to 25 Kg. The most significant

increase in coffee productivity was obtained by Bawon informants, before IPM the coffee yield was only 100 Kg, then after applying the knowledge of Integrated Pest Management (IPM) obtained from the Field School increased to 400 Kg or 4 Kwintal from 1 Hectare of land owned.

The implementation of the Integrated Pest Management Field School (IPM-FS) also increases farmers' access to technology. After implementing the IPM-FS, farmers received 5 items of coffee milling machines, with details of 1 wet milling machine, 1 dry milling machine, 1 coffee bean drying machine, 1 roasting machine, and 1 coffee powder machine. However, until this research was carried out, the machines that had been accepted by the farmer groups were still wet-milling machines and dry-milling machines.

Obstacles After IPM-FS Implementation

The obstacle experienced by farmers after the implementation is that there are still farmers who pick coffee carelessly, meaning that farmers do not pick red but also yellow and green. Farmers do pick coffee carelessly due to time efficiency. Farmers think for one harvest so it doesn't take much time even though the coffee is still green.

In Brazil, the Coffee Express 200 Multiself-Propelled Coffee Harvester technology has been used in the coffee harvesting process to minimize time and effort. Meanwhile, in Indonesia, there is a technology with the concept of a simple machine, which uses a class I lever consisting of a pick and a handle as a PowerPoint equipped with a net on the tool to accommodate coffee beans (Nabil *et al*, 2019).

The tool is already available in Indonesia but has not been introduced in the Integrated Pest Management Field School (IPM-FS). Another reason behind farmers picking coffee randomly is that there is no specific price difference between red picking and green or yellow picking. So that farmers do coffee picking carelessly and not periodically but only once harvested.

The price difference is only known from the physical aspect of coffee beans, if the coffee beans look good, then they have high selling power, which is Rp. 30.000 while bad coffee beans will be priced below Rp. 25.000. This is the same as the research conducted by Nurman *et al*, (2019) that there is no difference in price between the tea shoots of IPM farmers and non-IPM farmers so that the application of the 4 principles of IPM is abandoned by farmers and returns to the previous practice.

Another obstacle, namely in post-harvest processing, farmers still carry out simple techniques, with only drying. Post-harvest processing of coffee does not use certain methods such as full wash, semi wash, honey, and so on. After harvesting, it is then dried in the sun with a makeshift tool, after that it is ground.

Farmers in Panditan Village grind coffee beans in the Sidorukun 3 group with each 1 kg of which is valued at Rp. 1000, some use the service of roving with services that must be paid Rp. 25,000 for every 50 kg of ground coffee. Coffee production is sold locally in Panditan Village and at Triwung Grati Market.

Within the internal scope of Panditan Village, the coffee market share is quite strong and there are many enthusiasts, the economic chain is not only limited to sellers and buyers, even in the village there are several farmers who also become collectors, to take coffee beans from farmers and sell them in powder form. Farmers get a price of Rp. 30,000 per Kg, and sold in powder form for Rp. 10,000 per 100 Gr, then deposited in a shop and sold for Rp. 12,000.

Coffee grounds in Panditan Village are not only used for consumption but are also used as medicine for cows mixed with chicken eggs. Although the coffee sales flow in Panditan Village is quite potential, farmers still have difficulty in marketing in the form of the packaging outside Panditan Village.

Marketing is still a major obstacle for coffee farmers. According to Apsari *et al*, (2017), it is necessary to conduct training on coffee processing and product packaging. As research conducted by Purwaningtyas *et al*, (2020) that counseling and branding strategies were carried out for coffee farmers at Bratasena Papring Banyuwangi, as an effort to overcome farmers' problems.

Moreover, the implementation of the Integrated Pest Management Field School (IPM-FS) in Indonesia is still controlled by one institution. Comparative research conducted by van den Berg *et al*, (2020) in Indonesia and Malawi show that Farmer Field Schools in Indonesia are implemented by one division through a cadre of pest observers without interaction with other divisions and lack of coordination between other public sector bodies.

Whereas in Malawi the Farmer Field School (FFS) is embedded in the decentralized system of agricultural services, with the district office as the implementing agency. The addition of topics to the field school curriculum allows the collaboration of various district programs with speakers who are experts in their fields.

CONCLUSIONS

Based on the results of the research and data processing above, it can be concluded as follows :

1. Implementation of the Integrated Pest Control Field School has an impact on increasing coffee productivity. The average increase in coffee productivity received by farmers is 2 times that of the harvest before the SLPHT. The Bawon informant experienced a significant increase, after applying the knowledge from the Integrated Pest Management Field School (IPM-FS) the yield of his harvest became 4 quintals from the previous 1 quintal.
2. Farmers are still experiencing problems related to the technology of the harvest process so that farmers are still picking coffee as a whole, namely red, green and yellow. The absence of a specific price difference between red and green picking also motivates farmers to pick coffee as a whole.

REFERENCES

- Administrasi Desa, 2019. Profil Desa Panditan. Arsip Desa, Pasuruan.
- Apsari NC, Gutama AS, Nurwati N, Wibowo H, Resnawaty R, Darwis RS, Santoso MB, Humaedi S. 2017. Pemberdayaan Petani Kopi Melalui Penguatan Kapasitas Dalam Pengolahan Hasil Kopi Di Desa Genteng, Kecamatan Sukasari, Kab. Sumedang. Pros Penelit dan Pengabdi Kpd Masy. 4(2):290–296.
- Van den Berg H, Ketelaar JW, Dicke M, Fredrix M. 2020. Is the farmer field school still relevant? Case studies from Malawi and Indonesia. NJAS - Wageningen J Life Sci [Internet]. 92(July 2019):100329. <https://doi.org/10.1016/j.njas.2020.100329>
- Dani A, Rusman Y, Noormansyah Z. 2016. DAMPAK SEKOLAH LAPANG PENGENDALIAN HAMA TERPADU (SLPHT) TERHADAP TINGKAT PENERAPAN TEKNOLOGI PENGENDALIAN HAMA TERPADU (PHT) PADA USAHATANI PADI SAWAH (*Oryza sativa* L.) (Studi Kasus Pada Kelompok Tani Kutawaringin Desa Cinyasag Kecamatan Panawangan Kabupa. J Ilm Mhs Agroinfo Galuh [Internet]. 2(3):159–166. <https://jurnal.unigal.ac.id/index.php/agroinfoGaluh/article/view/272>
- Direktorat Jenderal Perkebunan Kementrian Pertanian. 2014. Dukungan perlindungan perkebunan : Pedoman Teknis Sekolah Lapang Pengendalian Hama Terpadu (SL-PHT) Tahun 2016. (November 2015).
- Friis-Hansen E, Duveskog D. 2012. The Empowerment Route to Well-being: An Analysis of Farmer Field Schools in East Africa. World Dev [Internet]. 40(2):414–427. <http://dx.doi.org/10.1016/j.worlddev.2011.05.005>
- Harahap KB. 2012. Dampak Sebelum dan Setelah Penerapan Sekolah Lapang Pengendalian Hama Terpadu (SLPHT) Terhadap Biaya Produksi, Produksi dan Pendapatan Petani Padi Sawah di Kabupaten Serdang Berdagai. Tesis, Univ Sumatera Utara.
- Mancini F. 2006. Impact of Integrated Pest Management Farmer Field Schools on health , farming systems , the environment , and livelihoods of cotton growers in Southern India. [place unknown].
- Miles, Matthew dan Michael Huberman, 1992. *Analisis Data Kualitatif: Buku Sumber Tentang Metode-metode Baru* oleh Tjetjep Rohendi Rohidi, Jakarta : UI-PRESS
- Nabil muhammad, Widiyanto DN, Inayah N, Kurniasari EP, Bimanata J, Juliyanto E. 2019. Alat Pemetik Kopi “Apik” Penerapan Konsep Pesawat Sederhana. Indones J Nat Sci Educ. 2(2):214–220.
- Nurman N, Hidayat A, Anggraini E. 2019. Analisis Kelembagaan Pengendalian Hama Terpadu Perkebunan Teh Rakyat. Risal Kebijak Pertan DAN Lingkung Rumusan Kaji Strateg Bid Pertan dan Lingkung. 4(3):201–216.
- Nusantara RM, Kurniawan B. 2020. Pemberdayaan Petani Melalui Penerapan Pengendalian Hama Terpadu Di Jawa Timur. :1–12.

- Purwaningtyas A, Saparia PM, Juwita R. 2020. Pemberdayaan Petani Kopi dalam Rangka Branding Strategy ala Papring di Banyuwangi. SETRINOV. 6(3):195–202.
- Setyowati D. 2012. Pengaruh dampak psikologis dan sosiologis pelaksanaan sekolah lapangan pengendalian hama terpadu (slpht) di kabupaten bantul berbasis amos. XI(3).
- Thorburn C. 2014. Empire strikes back: The making and unmaking of Indonesia's national integrated pest management program. Agroecol Sustain Food Syst. 38(1):3–24.
- Untung K. 2000. Pelembagaan Konsep Pengendalian Hama Terpadu di Indonesia. J Perlindungan Tanam Indones. 6(1):1–8.
- Wijayanti L. 2013. Efektivitas Program Sekolah Lapang Pengendalian Hama Terpadu (SLPHT) pada Perkebunan Kopi Rakyat di Kabupaten Temanggung Jawa Tengah. Tesis, Institut Pertanian Bogor.