

(RESEARCH ARTICLE)



THE BESOEKISCH EXPERIMENTAL STATION AND HIGH-YIELD CROP PRODUCTION (1910–1942)

Muhammad Riza Azizi *, Muhammad Hanifa Syarif Pane, Rinda Handayani and Ratna Endang Widuatie

Department of History, Faculty of Humanities, Universitas Jember, Jember, East Java, Indonesia.

* Corresponding Author

ORCID Details

Rinda Handayani: <https://orcid.org/0009-0007-6336-7474>

World Journal of Advanced Research and Reviews, 2026, 32(01), 716–723

Publication history: Received on 03 September 2026; revised on 10 October 2026; accepted on 12 October 2026

Article DOI: <https://doi.org/10.30574/wjarr.2026.32.1.2595>

Copyright © 2026 Author(s) retain the copyright of this article. This article is published under the terms of the Creative Commons Attribution License 4.0

ABSTRACT

This study examines the role of the *Besoekisch Proefstation* as a colonial agricultural research centre that supported the plantation industry in the Besuki Residency in the early 20th century. The institution served to increase productivity and reduce losses caused by pests, plant diseases and soil degradation. This study employs historical methods to investigate the institution's establishment, its organisational structure, and its impact on the development of colonial plantations. The findings indicate that the *Besoekisch Proefstation* played a significant role in developing technological innovations such as fertilisation trials, seedling propagation techniques, pest control, plant disease management, and cross-breeding experiments, which resulted in more adaptive and productive varieties. The findings indicate that the quality of export products was directly influenced by these innovations and contributed to the economic growth of the plantation sector in the Besuki region. Furthermore, the existence of this institution demonstrates how the colonial government utilised scientific knowledge to support private economic interests. It is hoped that this research will contribute to our understanding of history and provide new insights into the dynamics of colonialism within the plantation industry.

Keywords: *Besoekisch Proefstation*; Colonial plantations; Agricultural innovation; Besuki Residency.

1 INTRODUCTION

Communities across the Indonesian archipelago have practised agriculture and maintained garden-based farming systems as part of their economic life since pre-colonial times. During that period, these garden-based systems were generally managed in a simple manner by farming families, employing mixed cropping patterns that combined food crops, horticultural crops and perennial crops. The development of plantations underwent significant changes following the arrival of the Dutch colonial government. The colonial government and private companies subsequently developed a plantation system geared towards the production of export commodities such as coffee, tea, sugar cane and tobacco [21, 13].

The development of these commercial plantations drove an increasing demand for agricultural knowledge and technology. One of the colonial government's efforts to meet this demand was the establishment of research institutions and agricultural experimental centres. *Buitenzorg* became one of the early centres for the development of botanical and agricultural research in the Dutch East Indies. The establishment of the *Buitenzorg* Botanical Gardens in 1817 served not only as a site for plant conservation but also as an experimental space for testing various plant species from the Dutch East Indies and other regions [26].

In 1815, C. G. L. Reinwardt, a professor at the Athenaeum Illustre in Amsterdam who also served as Director of Agriculture, Arts and Sciences, set off for Java and settled in *Buitenzorg*. On April 15, 1817 he proposed the establishment of a botanical garden in *Buitenzorg*, with the aim of creating a site for experimenting with the cultivation of plants useful for the production of medicines. Experiments at the *Buitenzorg* Botanical Gardens were not only intended to test plants endemic to the *Dutch East Indies* but also to trial the cultivation of plants originating from various other parts of the world. Construction began on May 1, 1817 with 43 workers and supervisors; upon completion, Reinwardt himself took over the management of the *Buitenzorg* Botanical Gardens, assisted by one of his gardeners [31].

The reason *Buitenzorg* was chosen as a research centre was that it was an ideal location for growing plants: it was neither too cold nor too hot, and neither too low-lying nor too high. The *Buitenzorg* Botanical Gardens were laid out in terraces to make the most of the varying terrain. The first comprehensive catalogue of the *Buitenzorg* Botanical Gardens, published in 1844 and written by Hasskaari, listed 3,000 different plant species in the collection. However, by 1939 there were 374 species of palm and 1,270 species of orchid [5].

One of the outcomes of research at the *Buitenzorg* Botanical Gardens was the classification of various plant species according to their families; these included the plants lining the Canaries Avenues, as well as other climbing plants such as orchids and rattan [23]. However, during the period of the forced cultivation system (*cultuurstelsel*), the experimental and research centre shifted its focus to studying export crops such as coffee, tea, sugarcane and tobacco. With the introduction of research into crops of export value, farmers were introduced to the use of new agricultural technologies and a monetary economic system. On the other hand, the innovations introduced also had consequences borne by the farmers, namely low wages. Furthermore, famines and the consequences of implementing this system caused the people to suffer deeply [2].

The increase in colonial plantation production depended not only on land expansion, but also on the ability to address various agricultural problems, such as pest infestations, plant diseases, declining soil fertility and low crop productivity. These conditions spurred the development of various '*proefstations*' or experimental stations, which conducted research specifically into particular commodities and the agroecological conditions of each region. By the early 20th century, a number of agricultural research centres had been established in various regions. It was noted at the General Congress of Agriculture of the *Dutch East Indies*, held from October 25 to 28, 1916 in Yogyakarta, that several experimental and research centres were in operation, namely the West Java Rubber Proefstation in *Buitenzorg*, *The Proefstation voor Thee in Buitenzorg*, *The Deli Proefstation* in Medan, *The Proefstation voor de Suikerindustrie* in Cirebon, *The Proefstation voor Vorstenlandsche Tabak* in Klaten, *The Midden-Java Proefstation* in Salatiga, *The Malangsch Proefstation* in Malang, and *The Besoekisch Proefstation* in Jember [1].

Although the *Besoekisch Proefstation* played a significant role in the development of colonial agricultural research in Jember, studies on this institution—particularly regarding its establishment, research activities and its contribution to the production of high-yielding crops—remain relatively limited. Yet, the research conducted by this institution can provide insight into the relationship between the development of science, agricultural technology and the economic interests of plantations during the colonial period. A study of the *Besoekisch Proefstation* is also important for understanding how scientific knowledge was utilised to address production issues whilst simultaneously strengthening the colonial plantation system.

In light of these issues, this article examines the *Besoekisch Proefstation* and the production of high-yielding crops (1910–1942). This study focuses on the establishment of the *Besoekisch Proefstation*, the development of its research activities, and the types of crops and experimental methods employed to produce or improve the quality of plantation crops. It is hoped that this study will contribute to the historiography of colonial agriculture and plantations, particularly regarding the development of agricultural science in the Besuki Residency and the role of Jember as one of the centres for agricultural research during the colonial period.

2 MATERIAL AND METHODS

This study is a historical investigation that employs historical method to analyse and understand the subject of the research comprehensively. Historical method focuses on historical events and processes, utilising historical documents as research sources. The data used in this study comprises both primary and secondary data. The primary sources used are colonial archive collections, crop trial reports, and newspapers and magazines from the colonial period, accessed Delpher, National Archives of the Republic of Indonesia (ANRI) and *Koninklijk Instituut voor Taal-, Land- en Volkenkunde* (KITLV) website. The secondary sources consist of academic articles, books and research reports accessed online or from the Jember Library and the Jember Tobacco Museum Library.

3 RESULTS AND DISCUSSION

3.1 The Establishment of the *Besoekisch Proefstation*

The Besuki Residency is situated at the eastern tip of the island of Java, bordering directly on the Madura Strait to the north, the Bali Strait to the east, the Indian Ocean to the south, and the Pasuruan Residency; it lies on two highlands, namely the Ijen and Hyang [30]. The Besuki region, situated between two active volcanoes—Mount Semeru and Mount Raung—has seen a series of eruptions in the past; the resulting volcanic ash has made the surrounding soil fertile, including the Jember area [19]. The Besuki Residency has been known for its plantations since colonial times [15]. The fertility of this soil is evidenced by the large number of coffee, sugarcane and tobacco plantations established there, all focused on export.

The pioneer in the development of plantations in Jember was George Birnie, who arrived in Jember in 1857 as a controller after holding the same post in Blitar. In addition to carrying out his duties as a plantation supervisor, Birnie conducted research into the climate and soil characteristics of the Jember region. The results of his research supported his view that the Jember region was a suitable place for growing tobacco. In 1859, he established a tobacco plantation in partnership with Matthiesen and Van Gennep; however, production at that time remained relatively low due to inadequate facilities. Subsequently, tobacco prices rose sharply in 1870 as a result of the Franco-Dutch War [19].

It was in that year that the Dutch East Indies implemented the *Agrarische Wet*; this agrarian law came into being following pressure from private capitalists, who felt that the colonial government had too much of a monopoly over the plantation industry. The private sector took steps to secure seats in parliament through the Liberals, leading to one of their leading figures, Engelbertus de Waal, being appointed Minister for Colonial Affairs. With this shift in power within the Dutch parliament, the Agrarian Act came into being and ushered in an era of economic liberalisation for the *Dutch East Indies* [20]. The Agrarian Act enabled foreign investors to enter the Dutch East Indies and establish plantations by leasing land from the government or from indigenous landowners [18].



Figure 1: George Birnie

Source: <http://hdl.handle.net/1887.1/item:783852>

Investors injected capital to establish plantations, which led to the construction of facilities in Jember. Subsequently, George Birnie founded a company called *the Naamlooze Vennotschap Landbouw Maatschappij Oud-Djember* (LMOD) in 1893 [19], with David Birnie and M. Sanders serving as heads of administration. The formation of LMOD was followed by others; one example is the *Besoeki Tabak Maatschappij* (BTM) in 1897 [14]. This company was founded by d'Leeuwen Boomkamp and Jaeggis [19]. The establishment of the company by George Birnie marked the beginning of private

investment in the plantation industry in Jember, and many private companies cleared land to establish plantations there. With so many private companies establishing plantations, there was a need for a research centre for plantation crops in order to maximise profits and minimise losses.

In addition to establishing plantation companies, private entrepreneurs sought to establish the *Besoekisch Proefstation* as a plant research station. The failure to establish a research station in Salatiga led the Colonial Government to shift its focus to the *Besoekisch Proefstation* as its primary priority. However, the establishment of the *Besoekisch Proefstation* could not be carried out immediately due to a lack of experts in plant research (Soerabaijasch Handelsblad, December 6, 1935).[24] Finally, on January 1, 1911, the *Vereniging tot Bevordering van Landbouw en Nijverheid* (Jember) decided to establish the *Besoekisch Proefstation* [6].

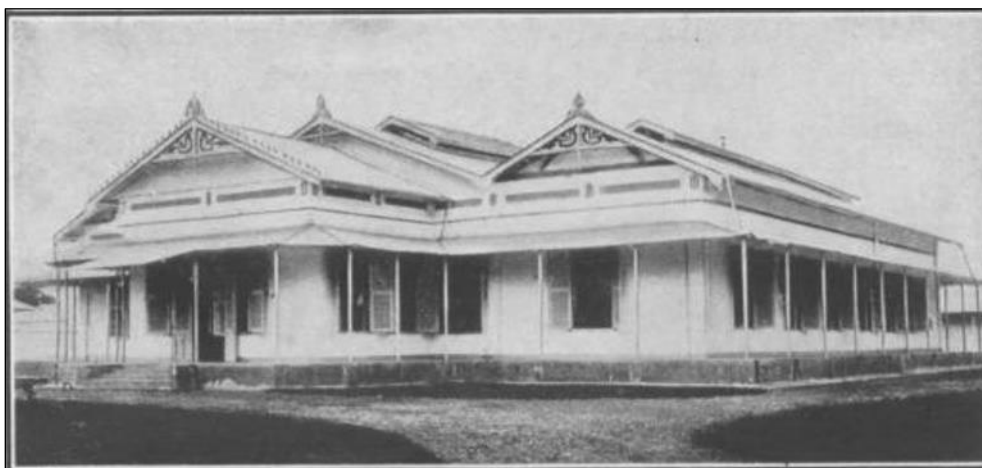


Figure 2: The *Besoekisch Proefstation* building, 1913

Source: <https://resolver.kb.nl/resolve?urn=MMUBWA06:235830026:00001>

The *Besoekisch Proefstation* had an organisational structure comprising a board that governed the institution. There were two groups on the *Besoekisch Proefstation* board: the tobacco plantation sector, represented by three people—D. Birnie, C. A. Koning and A. H. Loeff, and the mountain crop sector, represented by three members: E. du Bois, T. Ottolander and G. Schrieke, whilst the technical leadership of the research institute was held by Dr A. J. Ultée [3]. The *Besoekisch Proefstation* was divided into two groups: the *Tabaksonderneming*, comprising 8 tobacco plantations, and the *Onderneming voor Bergcultures* (mountain crop plantations), comprising 44 types of crops including coffee, rubber and cocoa. This research institute was established in the heart of the plantations so that the staff of the *Besoekisch Proefstation* could monitor crop commodities rather than passively awaiting instructions from private companies [22].

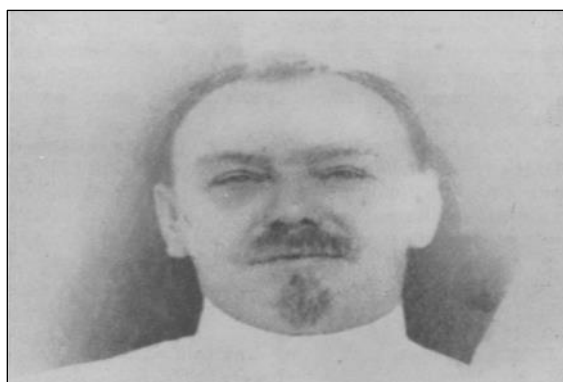


Figure 3: Dr A. J. Ultée, Chief Researcher at the *Besoekisch Proefstation*

Source: <https://resolver.kb.nl/resolve?urn=MMUBWA06:235830026:00001>

3.2 Research Focus of the *Besoekisch Proefstation*

As a research station, the *Besoekisch Proefstation* focused exclusively on export crops such as tobacco, coffee and rubber. In conducting its research on plantation crops, the *Besoekisch Proefstation* collaborated with the *Malangsche*

Proefstation and the Midden-Java *Proefstation* to bring in experienced staff from those institutions [22]. The *Besoekisch Proefstation* conducted research on crops covering fertilisation, pest management and control, and plant grafting.



Figure 4: Workers at the *Besoekisch Proefstation*

Source: <https://resolver.kb.nl/resolve?urn=MMUBWA06:235830026:00001>

The findings of the *Besoekisch Proefstation's* research into tobacco covered fertilisation, tobacco diseases and pests, and seed production. The first research into tobacco fertilisation took place in 1913–1914, conducted by Dr Ultée, and revealed that tobacco plants were highly responsive to fertilisation; this effect was attributed to the addition of 3 grams of nitrogen per plant, whilst sufficient rainfall also significantly influenced fertilisation [29]. Fertilisation trials carried out by the *Besoekisch Proefstation* in 1914 found that, although green manure was very beneficial to the plants initially, soil quality deteriorated over time because weeds in the soil drew nutrients from the green manure. If green manuring is continued, it can have adverse effects: seedlings may be damaged, and plants grown in areas previously used for green manuring may struggle to survive [28]. Research on tobacco at the *Besoekisch Proefstation* involved not only fertilisation trials but also the monitoring of tobacco pests.

Observations of pests have revealed that certain insects cause the death of tobacco plants and stunted their growth. The types of insects that threaten the survival of tobacco are thrips and soil beetles. Thrips are insects that feed on tobacco leaves; they belong to the order *Thysanoptera* (*Physopoda*). They pose a serious threat to tobacco plants as they absorb nutrients from the leaves by feeding on them from tip to base, causing the leaves to wilt. The method used to control thrips involves spraying a pesticide made from green soap mixed with 1 kg of tobacco boiled in 5 litres of water; this pesticide is sprayed onto the plants after watering [17]. There is a soil beetle (*Opatrum depressum*) that causes problems for tobacco; the adult beetles feed on the stems of tobacco plants, whilst the larvae attack the plants as they emerge from the ground, resulting in plant death and stunted growth of the tobacco. One method of controlling this pest is to use naphthalene-based pesticides; however, this approach is not very effective, leading to the discovery of an alternative method involving flooding the fields, though this carries a high risk [17].

Further research into tobacco focused on seedling production. In 1920, problems arose with the quality of tobacco seedlings; some seedlings experienced stunted growth whilst others thrived in the same field. This problem led to the underdeveloped seedlings dying, causing losses for tobacco growers. To address this issue, the *Besoekisch Proefstation* conducted research but failed to find a solution. The *Besoekisch Proefstation* carried out further research as they had not yet identified the cause of the problem. They discovered that 'aaltjes'—tiny nematode worms much feared in the tobacco industry—were attacking the majority of the plants. In 1924, a method of soil disinfection using heat was devised to prevent these nematodes. However, this technique proved ineffective, so a new and more effective method was developed using carbon disulphide [11].

It was not only tobacco plants that were studied; rubber trees were also researched at the *Besoekisch Proefstation*. The rubber tree (*Hevea brasiliensis*) originates from Brazil and is the primary source of natural rubber. Before this plant was cultivated on a large scale, communities in the Americas, Asia and South Africa utilised various other sap-producing trees, including *Castilla elastica* from the *Moraceae* family, which produces a latex-like sap. However, since the rubber tree became popular and was cultivated on a massive scale, the use of sap from other plants has steadily declined, meaning that rubber from *Hevea brasiliensis* has become the only variety cultivated extensively [4]. During the *Dutch colonial* period, rubber was first brought to Indonesia as a specimen plant at the Bogor Botanical Gardens in 1864. Subsequently, in several locations, rubber became a commercial crop [25]. In 1907, the *Rubbercultuur-Maatschappij* Amsterdam was established by merging several small plantations. In 1903 and 1904, rubber planting began, establishing the first rubber plantation in Besoeki [3].

Research findings on rubber trees cover fertilisation, disease control and pest management. Fertilisation trials on rubber trees conducted by Dr Ultée in 1913 showed that fertilised rubber trees exhibited up to 22.5 per cent better growth compared to unfertilised trees, which showed only 13 per cent growth; the fertilisation was deemed successful as growth reached 1 cm per month. This significant growth was attributed to the application of a fertiliser containing 600 grams of oilcake, 100 grams of double superphosphate and 100 grams of potassium sulphate per plant; the fertilisation was carried out every three months and the plants were monitored following each application [27].

The *Besoekisch Proefstation* conducted research into methods of treating a rubber tree disease affecting the trunk; this disease is known as *streepjesanker* (rubber tree trunk cancer), caused by the pathogen *Phytophthora palmivora*. Researchers initially used a disinfectant containing solarolie tar mixed with *Smeerolie* tar to treat the trunk cancer. In 1937, many planters opted to use pesticides containing a mixture of Izal and Funshine. Although both methods were successful, the use of pesticides proved more effective as they killed the pathogen, whereas the disinfectant merely prevented the trunk from becoming infected. The method of using pesticides involved applying them once every two months after tapping had been carried out in the morning [6].

The *Besoekisch Proefstation* also carried out observations on the pests attacking rubber trees. Research carried out by the *Besoekisch Proefstation* in 1941 involved the observation of aphids attacking rubber seedlings. The aphids in question are *Nysius senecionis*; they dwell in piles of fallen leaves on the ground at night, then emerge from the leaf litter in the morning and settle on grafted rubber seedlings. This pest attacks one-year-old grafted seedlings; at the shoot stage, it attacks the bark of the stem, causing the shoots to die. However, once the plants have been growing for more than a year, the impact of the pest is minimal and the affected plants are able to recover on their own. A method of controlling this pest involves removing the piles of fallen leaves that serve as its habitat [10].

In addition to rubber trees, another agricultural commodity studied at the *Besoekisch Proefstation* was coffee, with the aim of developing high-yielding varieties. The *Dutch colonial* government decided to cultivate coffee in its colonies so that it could export coffee to Europe. The surge in coffee sales led the colonial government to decide to establish plantations in the Besuki region, including in Banyuwangi. Banyuwangi's topography, situated on the slopes of Mount Ijen, makes it a suitable location for coffee cultivation. The coffee plantation in Banyuwangi was established in 1788 through the efforts of a man named Clement de Harris. This plantation utilised prisoners convicted of minor offences to work on the coffee plantation. The reason for using prisoner labour was that the Banyuwangi region had a low population [32].

The results of the research on coffee plants include pest control, root trials and coffee stem trials. Pest control in coffee is required due to whiteflies on the coffee cover crop (lamtoro), specifically the *Leucaena glauca* variety. Initially, the lamtoro plants served to protect the coffee plants from direct sunlight; however, when their growth was not controlled, this led to the emergence of mealybugs (*Pseudococcus citri*) that attacked the coffee plants. The impact of these mealybugs resulted in the secretion of a sticky substance, which became a breeding ground for sooty mould. This in turn hindered the photosynthesis process and caused the leaves of the coffee plants to turn yellow. Initially, the method used to eradicate these scale insects was to burn the lamtoro trees infested with white scale, but over time a more effective method was discovered: pruning the lamtoro trees to a certain height [7].

The *Besoekisch Proefstation* also investigated the impact of salvia cover crops on coffee roots. The growth of salvia roots causes coffee roots to suffer from a lack of nutrients and oxygen. The competition between coffee and salvia roots is caused by the compacted soil conditions in this area, which in turn leads to a lack of oxygen. This runs counter to the original purpose of the salvia plant as a pest-control crop intended to boost coffee yields; however, in sandy soil conditions, this plant does not interfere with coffee plants. The research yielded successful results after five trials [7].

The first experiment led to the conclusion that this root competition did not cause nutrient deficiency in either plant; however, the second experiment found that competition between the two root systems resulted in nutrient deficiency, which can inhibit coffee growth. A third experiment was conducted to investigate the cause of the competition between the two plants, and it was concluded that the root competition was not caused by a lack of oxygen. In the fourth experiment, it was found that root competition between the two plants was likely due to a lack of oxygen and the presence of toxic substances. The fifth experiment concluded that the root competition between the two plants was caused by a lack of oxygen; however, the risk of damage could be minimised through root care and the supply of oxygen [8].

Research has also been carried out on coffee plants through grafting to achieve maximum yields. Initially, the *Excelsa* variety was crossed with the *Robusta* variety, using *Excelsa* as the rootstock and *Robusta* as the scion. The reason for using *Excelsa* as the rootstock was that this variety is resistant to pest attacks, whilst the *Robusta* scion produces the best-quality coffee. After eight months of growth, the plants suffered stem rot caused by toxins resulting from the grafting process. Researchers then attempted to cross-graft *Robusta* with *Arabica*, but the results from grafting these

two varieties were less than optimal. Subsequently, the best hybrid was found to be a cross between the *Excelsa* variety and a Liberian hybrid; this hybrid survived for three years before the stems began to rot [9].

The results of the laboratory experiments conducted by the *Besoekisch Proefstation*, as described above, have been of great assistance to plantation owners in achieving the best possible yields. All crops grown on plantations in the Besuki region have been examined by this laboratory [16]. The presence of the *Besoekisch Proefstation* has been of great assistance to plantation owners in terms of fertilisation, pest control and innovation aimed at producing high-quality crops. The produce from these high-quality crops is then exported to European markets, which has a significant impact on the economy of the Besuki region.

4 CONCLUSION

The *Besoekisch Proefstation* was established as a strategic response by plantation owners in the Besuki Residency to the need to improve the productivity and quality of export products, particularly rubber, coffee and tobacco. Private-sector stakeholders, particularly owners of tobacco and highland crop plantations, recognised that sustainable profits could only be achieved through consistent scientific research, which led to the establishment of this research institution. The *Besoekisch Proefstation* successfully produced scientific recommendations that had a direct impact on cultivation techniques and production efficiency through experiments on fertilisation, seedling techniques, pest and disease management, and plant cross-breeding. With the assistance of this institution, plantation yields improved in both quality and quantity; Jember, in particular, became a key centre within the Dutch East Indies' plantation industry network. Consequently, the *Besoekisch Proefstation* not only functioned as a research institution but also acted as a catalyst for the colonial economic transformation centred on key commodities. European plantation owners in the region felt the impact of this.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Acknowledgments

The author would like to express his gratitude to the History of Agriculture course for its support in terms of academic collaboration and research discussions throughout the process of drafting this manuscript.

Disclosure of conflict of interest

The authors declare no conflicts of interest regarding this manuscript.

REFERENCES

- [1] "Algemeen Nederlandsch-Indisch bodemcongres met demonstratieve tentoonstelling, te houden te Djocja van 25 t/m 28 Oct. 1916 onder auspiciën van het Nederlandsch-Indisch Landbouw Syndicaat", (1916). <https://resolver.kb.nl/resolve?urn=MMUBL07:000003441:00003>
- [2] Aprilia, A. T., Irawan, H., & Santosa, Y. B. P. (2021). Meninjau praktik kebijakan tanam paksa di Hindia Belanda 1830–1870. *Estoria: Journal of Social Sciences & Humanities*, 1(2), 120–134. Universitas Indraprasta PGRI.
- [3] Broersma, R. (1913), "Besoeki, een gewest in opkomst". Scheltema & Holkema. <https://resolver.kb.nl/resolve?urn=MMKB18:009156000:00006>.
- [4] Budiman Haryanto, S.P. (2012). *Budidaya Karet Unggul*. Yogyakarta: Pustaka Baru Press.
- [5] Dammerman, Karel Willem. (1939), "The Botanical gardens at Buitenzorg as a scientific institution : its past and its future". Brill. <https://resolver.kb.nl/resolve?urn=MMKB31:035550000:00001>
- [6] De bergcultures, "Bij het 25-jarig Jubileum van het Besoekisch Proefstation", 07-12-1935. <https://resolver.kb.nl/resolve?urn=MMUBWA06:235830026:00001>
- [7] De bergcultures, "Resultaten van een tweetal proeven over den invloed van streepjeskanker-bestrijdingsmiddelen op de productie van Hevea brasiliensis", 23-04-1938. <https://resolver.kb.nl/resolve?urn=MMUBWA06:235835019:00001>
- [8] De bergcultures. "Mededeeling van het Besoekisch Proefstation Resultaten, verkregen bij de bestrijding van de witte luis van de koffie langs mechemschen en chemisch-mechanischen weg en door cultuurmaatregelen", 02-07-1938. <https://resolver.kb.nl/resolve?urn=MMUBWA06:235836003:00001>
- [9] De bergcultures. "Mededeeling van het besoekisch proefstation korte mededeeling over wortelconcurrentie bij koffie in watercultures". 01-10-1938. <https://resolver.kb.nl/resolve?urn=MMUBWA06:235836016:000>

- [10] De bergcultures. "Eerste resultaten van een tweetal onderstamproeven bij Robusta-enten op Kaliwining en Djember", 05-11-1938. <https://resolver.kb.nl/resolve?urn=MMUBWA06:235836021:00001>
- [11] De bergcultures. "Een nieuwe beschadiging aan Hevea door wantsen", 27-12-1941. <https://resolver.kb.nl/resolve?urn=MMUBWA06:235842028:00001>
- [12] De locomotief, 29-12-1925. "Tabakszaadbedden. Een belangrijk onderzoek van het besoekisch proefstation. De watersnood in de oosthoek". <https://resolver.kb.nl/resolve?urn=MMKB23:001698146:mpeg21:p00001>
- [13] Dillen, L.R. van. (1929), "Onderzoekingen over het fermentatieproces bij tabak". Nix. <https://resolver.kb.nl/resolve?urn=MMKB31:034881000:00001>
- [14] Evizal, R. (2014). Dasar-dasar produksi perkebunan. Yogyakarta: Graha Ilmu.
- [15] Fitriana, R. (2025). NV Landbouw Maatschappij Oud Djember: Sejarah berdirinya perusahaan hingga nasionalisasi tahun 1859–1958 (Skripsi Sarjana). Universitas Islam Negeri Kiai Haji Achmad Siddiq Jember.
- [16] Handayani, R., & Widuatie, R. E. (2025). Transformasi lanskap: Pembukaan perkebunan di Besuki terhadap ekologi pada awal abad ke-20. Keraton: Journal of History Education and Culture, 7(1), 55–62.
- [17] Izzah, L. (2023). Besoekisch Proefstation for European investors in the district Oosthoek Dutch East Indies. Historia: Jurnal Program Studi Sejarah, 6(1), 1–16. Universitas Jember.
- [18] Keuchenius, P.E. (1915), "Waarnemingen over ziekten en plagen bij tabak : (eerste serie)". <https://resolver.kb.nl/resolve?urn=MMKB21:041431000:00001>
- [19] Masyrullahushomad, & Sudrajat. (2019). Penerapan Agrarische Wet (Undang-Undang Agraria) 1870: Periode awal swastanisasi perkebunan di Pulau Jawa. HISTORIA: Jurnal Program Studi Pendidikan Sejarah, 7(2), 159–174.
- [20] Nawiyanto. (2018). The making of plantation economy in Jember (East Java) Indonesia. Yogyakarta: LaksBang PRESSindo.
- [21] Pamungkas, S. C. (2021). Transformasi UU Agraria Tahun 1870 ke UUPA 1960 pada masa dekolonisasi kepemilikan tanah pasca kemerdekaan di Indonesia. Al-Isnad: Journal of Islamic Civilization History and Humanities, 2(2), 43–52.
- [22] Rahman, Z. (2016). Perkembangan perkebunan kopi rakyat Desa Sidomulyo Kecamatan Silo Kabupaten Jember pada tahun 2004–2013 (Skripsi, Universitas Jember). Hal 47.
- [23] Rumanto, U. (2008). Nasionalisasi Pusat Penelitian Kopi dan Kakao (Puslit Koka) Jember Tahun 1957–1962 (Skripsi, Universitas Jember).
- [24] Safarinanugraha, D., Gunawan, A., & Mugnisjah, W. Q. (2018). The development of Bogor Botanic Garden design from 1817 to 2017 based on spatial and functional. IOP Conference Series: Earth and Environmental Science, 179(1), 012026
- [25] Soerabajasch handelsblad, 6-12-1935. Zilveren Jubileum van het Besoekisch Proefstation. 1910—10 December—1935. <https://resolver.kb.nl/resolve?urn=ddd:011107113:mpeg21:p022>
- [26] Sofiani, I. H. (2018). Rubber Tree (Hevea Brasiliensis) Culticition In Indonesia and Its Economic Study (MPRA Paper No. 90336). Munich Personal RePEc Archive.
- [27] Sutrisna, D. (2020). Kebun Raya Bogor Dan Fasilitasnya, Sejarah Dan Fungsi Di Masa Lalu Dan Kini. Jurnal Panalungtik, 3(2), 129-141.
- [28] Ultée, A.J. (1913), "Bemestingsproeven bij tabak en rubber : voordracht gehouden op de Algemeene vergadering der Vereeniging tot bevordering van landbouw en nijverheid te Djember op Zaterdag 22 Februari 1913". <https://resolver.kb.nl/resolve?urn=MMKB31:036996000:00001>
- [29] Ultée, A.J. (1915), "Verslag over enkele bemestingsproeven bij tabak in 1913 - 14". <https://resolver.kb.nl/resolve?urn=MMKB31:045610000:00001>
- [30] Ultée, A.J. (1916), "Bemesting van tabakskweekbedden". <https://resolver.kb.nl/resolve?urn=MMKB31:045609000:00001>
- [31] Van der Aa, A. J. (1840). Aardrijkskundig woordenboek der Nederlanden (Vol. 2). Gorinchem: Jacobus Noorduy. <https://www.delpher.nl/nl/boeken1/gview?query=Besoekie&coll=boeken1&identifier=gSUZuSBdGksC&rowid=5>
- [32] Went, F.A.F.C."s Lands plantentuin te Buitenzorg". Hollandia, 1915. <https://resolver.kb.nl/resolve?urn=MMKB24:066430000:00005>
- [33] Zulfikar, F., & Basundoro, P. (2017). Perkebunan kopi di Banyuwangi tahun 1818–1865. Verleden: Jurnal Kesejarahan, 11(2), 129–136.