Agrisaintifika
Jurnal Ilmu-Ilmu Pertanian

Agrisaintifika, Vol. 8, No. 2, 2024
https://journal.univetbantara.ac.id/index.php/agrisaintifika
ISSN 2580-0345 (print), 2580-748X (online)
DOI: 10.32585/ags.v8i2.5578

Intensity of Fall-Armyworm (*Spodoptera litura* Fabricius) pest attacks on Cayenne Pepper (*Capsicum frutescens*) plants in karst land

Alan Handru[1)*], Diyona Putri[2)]

[1]Department of Agrotechnology, Faculty of Agriculture, STIPER Agricultural Institute, Yogyakarta
Email : alan@instiperjogja.ac.id*

[2]Department of Biological Sciences, Tokyo Metropolitan University, Tokyo, Japan
Email : dyon.putri@gmail.com

* *Received for review July 23, 2024 Accepted for publication November 29, 2024*

Abstract
Agriculture is an important sector in global food needs. One of the plants that has high economic value in Indonesia is cayenne pepper (Capsicum frutescens). However, the productivity of cayenne pepper is often threatened by pest attacks, one of which is the fall-armyworm (Spodoptera litura), which can cause significant damage to plants. In karst areas such as Ponjong village, Gunung Kidul, Yogyakarta, pest management challenges become more complex due to unique environmental conditions. Karst has calcareous soil and limited water availability, which affects interactions between plants and pests. This research aims to understand the intensity of fall-armyworm attacks on cayenne pepper in karst areas and the environmental factors that influence these attacks. Using survey and field observation methods, this research found that the intensity of pest attacks varied in each plot, with an average percentage of plants attacked at 15.71%. High temperature (>32^{0}C), humidity (>75%) and karst soil characteristics create an environment conducive to the development of fall armyworms. Therefore, an effective and sustainable control strategy is needed to support cayenne pepper productivity in karst areas.

Keywords: *Capsicum frutescens, karst area, Spodoptera litura*

Abstrak
Pertanian merupakan sektor penting dalam memenuhi kebutuhan pangan global. Salah satu tanaman yang memiliki nilai ekonomi tinggi di Indonesia adalah cabe rawit (*Capsicum frutescens*). Namun, produktivitas cabe rawit sering kali terancam oleh serangan hama, salah satunya adalah ulat grayak (*Spodoptera litura*), yang dapat menyebabkan kerusakan signifikan pada tanaman. Di daerah karst seperti Ponjong, Gunung Kidul, Yogyakarta, tantangan pengelolaan hama menjadi lebih kompleks karena kondisi lingkungan yang unik. Karst memiliki tanah berkapur dan ketersediaan air yang terbatas, yang mempengaruhi interaksi antara tanaman dan hama. Penelitian ini bertujuan untuk memahami intensitas serangan ulat grayak pada cabe rawit di lahan karst dan faktor-faktor lingkungan yang memengaruhi serangan tersebut. Dengan menggunakan metode survei dan observasi lapangan, penelitian ini menemukan bahwa intensitas serangan hama bervariasi di setiap plot, dengan rata-rata persentase tanaman yang terserang sebesar 15,71%. Faktor suhu tinggi (>32^{0}C), kelembapan (>75%), dan karakteristik tanah karst menciptakan lingkungan yang kondusif bagi perkembangan ulat grayak. Oleh karena itu, strategi pengendalian yang efektif dan berkelanjutan diperlukan untuk mendukung produktivitas cabe rawit di wilayah karst.

Kata Kunci: *Capsicum frutescens*, lahan karst, *Spodoptera litura*

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1. INTRODUCTION

Agriculture is one of the main pillars in providing food for the growing human population. Cayenne pepper (*Capsicum frutescens*) is a type of vegetable that has high economic value and is important to develop in tropical areas such as Indonesia (Handru, Sidiq, et al., 2024). Based on data from the Central Statistics Agency or Badan Pusat Statistik (BPS) in 2021, it was recorded that the harvested area of chili plants was ranked highest compared to other vegetables and at the amount of production, chilies are also the vegetable with the highest production in Indonesia (BPS Kab. Gunung Kidul, 2021). The high economic value of cayenne pepper products means that this vegetable commodity is cultivated in most provinces in Indonesia. However, big challenges always lurk in efforts to maintain plant productivity, including pest attacks that can significantly threaten crop yields (Saroinsong, 2014). One of the pests that is of primary concern to farmers is the fall-armyworm (*Spodoptera litura* Fabricius) (Arsi et al., 2021; Arsi & Kemal, 2021; Satrah et al., 2022; Septian et al., 2021), which is often found attacking cayenne pepper (*Capsicum frutescens*), a plant that has an important role in daily life and in the agricultural commodity market.

In certain geographical contexts, such as in the karst areas of Ponjong village, Gunung Kidul, Yogyakarta, the challenges in managing pest attacks become more complex. Karst is a unique and sensitive environment, where water availability and less fertile soil can be factors that influence ecosystem dynamics and interactions between plants and pests. In addition, agricultural management on karst land also often requires a different approach compared to conventional agricultural environments (Handru, Sidiq, et al., 2024; Nuraini, 2012). Farmers in karst areas like Ponjong village face challenges such as water scarcity, low soil fertility, pest-friendly environmental conditions, limited adaptability of conventional control methods, increased costs and labor, ecological sensitivity, and lack of access to resources and knowledge, all compounded by the unique constraints of the karst ecosystem.

Fall-armyworm pests that disrupt the growth and development of cayenne pepper will certainly make the productivity of the harvested fruit low and the long harvest time will reduce the profit ratio of chili farmers (Handru, Sidiq, et al., 2024; Hasibuan, 2020; Septian et al., 2021). Therefore, further innovation and review is needed regarding the intensity of fall-armyworm attacks on cayenne pepper plants in the karst land of Ponjong village. By better understanding the dynamics of pest attacks in this unique environmental context, it is hoped that effective and sustainable control strategies can be found to support agricultural productivity and environmental sustainability as well as to determine the intensity of pest attacks on farmers' cayenne pepper plantations in Ponjong village.

2. RESEARCH METHODS

This research was conducted on January 29th and February 3rd 2024 in a cayenne pepper plantation on karst land belonging to the Giri Muda Gedaren II farmer group, Sumbergiri, Ponjong village, Gunung Kidul Regency, Yogyakarta Special Region Province (7°96'84.01"S, 110°73 '42.48"E) during the cayenne growing season. Data was collected through survey methods and direct observation in the field. Observations were carried out on several randomly selected experimental plots (purposive sampling). The parameters observed included the intensity of the attack by the fall-armyworm *Spodoptera litura* pest which was measured based on the percentage of plants attacked and the level of leaf damage: attacks were characterized by the presence of transparent white spots or holes in the leaves on the cayenne pepper; environmental conditions,

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including temperature, humidity and soil type; as well as the presence of natural enemies by observing the natural predators of fall-armyworms. Then the data was analyzed using descriptive and inferential statistics to see the correlation between attack intensity and environmental factors. The intensity of pest attacks is calculated using the formula:

$$P = \sum (n \times v) / N \times Z \times 100\%$$

where: P = Intensity of plant damage (%), v = Value (score) of plant damage based on the leaf area of all affected plants, namely: 0 = No damage at all, 1 = Area of plant damage > 0 - ≤ 25%, 3 = Area of plant damage 25 - ≤ 50 %, 5 = Area of plant damage 50 - ≤ 75 %, 7 = Area of plant damage 75 %, n = Number of plants that have the same v value (plant damage), Z = Value (score) highest (v = 7), N = Number of plants observed (Prabaningrum & Moekasan, 2016).

3. RESULTS AND DISCUSSION

The results of the research showed that fall-armyworm (*Spodoptera litura*) (Figure 1.) pest attacks on cayenne pepper plants in the karst land of Ponjong village, Gunung Kidul, varied in each plot with an average percentage of plants attacked being 15.71% and the level of leaf damage between 0 and 25%. The varying intensity of pest attacks in each plot shows that there are certain factors that influence the severity of attacks in each area. These factors can include microclimate conditions, soil fertility levels, the presence of natural predators, as well as land and crop management practices implemented by farmers. The average percentage of plants attacked was 15.71%, indicating that fall-armyworm attacks are a significant problem that requires attention. Even though this percentage does not seem too high, the impact on the productivity of cayenne pepper plants must still be considered. Pest attacks can reduce the rate of photosynthesis and ultimately reduce crop yields (Hasibuan, 2020). Leaf damage ranging from 0 to 25% indicates variations in the severity of attacks on cayenne pepper plants. Plants with 0% leaf damage may have better natural resistance or receive better protection from farmers, whereas plants with up to 25% leaf damage may be more susceptible to attack or less protected. Effective monitoring and control of pests, as well as good land and plant management, are needed to reduce the negative impact of these pest attacks and increase the productivity of cayenne pepper plants.

Environmental factors in the form of temperatures ranging between 32-34°C and high humidity ranging between 75-87% in this karst area tend to increase the activity of fall-armyworms (*Spodoptera litura*) on cayenne pepper plants. Fall-armyworms (*Spodoptera litura*) tend to be more active at high temperatures. The optimal temperature for the development of Spodoptera larvae ranges from 21° - 33°C (Septian et al., 2021). At this temperature, the fall-armyworm's metabolic rate increases, which causes them to be more active in foraging and breeding. High temperatures also speed up the fall-armyworm's life cycle, so that the population of this pest can grow quickly in a short time. High humidity also plays an important role in increasing armyworm activity. Optimal humidity for armyworms ranges from 85-92% (Taufika et al., 2022; Widhayasa & Suryadarma, 2021). High humidity supports the fall-armyworm's physiological processes, such as respiration and excretion, and prevents dehydration in the larvae. This condition makes armyworms more resistant to environmental stress and more active in destroying plants. In addition, the type of calcareous soil influences the distribution and development of this pest. *Spodoptera* pests tend to hide during the day in the soil (damp places) and attack plants at night. Usually, caterpillars move to other plants in large groups (DPKP DIY, 2019). The combination of high temperatures, high

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humidity and karst soil conditions creates an environment that is very conducive to fall-armyworms.

Calcareous karst soil has different physical and chemical characteristics compared to other types of soil. Calcareous soils typically have a higher pH and different levels of certain nutrients, which can affect pest distribution and activity. Karst soil tends to have good drainage due to its high porosity. Although good drainage can reduce excess moisture on the soil surface, this is not always beneficial for plants because it can cause dry conditions (Muhartanto et al., 2008; Nuraini, 2012). However, humidity below the soil surface can remain high, especially after rain, creating a microenvironment that favors fall-armyworm development near plant roots. The type of calcareous soil also affects the availability of nutrients for plants and pests. Chalky soil tends to be rich in calcium, but may lack other nutrients plants need, such as nitrogen and phosphorus. This nutritional imbalance can affect the health of cayenne pepper plants, making them more susceptible to pest attacks. The microenvironment produced by the interaction of these factors facilitates the fall-armyworm's rapid life cycle and high population (Susrama, 2018). Fall-armyworms may find these conditions favorable because stressed plants tend to be more susceptible to attack.

Monitoring temperature and humidity regularly is very important to anticipate spikes in fall-armyworm populations. Technology such as environmental sensors and local weather stations can be used to monitor microclimatic conditions. Good soil management, including adding organic matter and adjusting soil pH, can help improve plant health and reduce susceptibility to pest attacks. Practices such as cover planting and crop rotation can also help manage soil conditions and reduce pest populations. An approach through Integrated Pest Management (IPM) that combines mechanical, biological and chemical methods can be more effective in controlling fall-armyworm populations (Setiawati et al., 2016). The use of natural enemies, such as parasitoids and fall-armyworm predators, as well as timely and appropriate application of pesticides, can help reduce pest populations.

The presence of natural predators such as birds and other insects is quite significant in suppressing the fall-armyworm (*Spodoptera litura*) population on cayenne pepper plants (Kristiaga & Agastya, 2020) in karst areas. Karst land has unique ecosystem characteristics with chalky soil and good drainage. However, this condition also poses challenges for biodiversity because the soil tends to be dry and less fertile for several types of plants. Vegetation that grows on karst land is often limited to plant species that are able to adapt to less fertile soil conditions, which results in a lower diversity of flora and fauna species (Handru, Sidiq, et al., 2024). Efforts to increase biodiversity can be made through planting ground cover vegetation, habitat management, reducing the use of chemical pesticides, and using flowering plants. In this way a balanced and healthy environment can be created supporting agricultural productivity and ecosystem preservation.

Planting ground cover vegetation such as legumes and grasses can help increase soil fertility and provide better habitat for natural predators. Ground cover vegetation also helps maintain soil moisture and reduces erosion, which contributes to more stable environmental conditions for various species. In addition, the creation of artificial habitats such as wood piles, grassy areas and bushes can provide shelter and breeding ground for predatory birds and insects. Management of wild vegetation around agricultural land can also help provide habitat for natural predators (Agustinawati et al., 2016). Excessive use of chemical pesticides can reduce natural predator populations and overall biodiversity. The use of selective pesticides and the application of IPM techniques can help preserve natural predator populations (Setiawati et al., 2016). Planting

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flowering plants around agricultural land can attract pollinators and natural predators such as bees and beetles (Handru, Putri, et al., 2024). Flowering plants also provide additional food sources for predatory insects, so they are more attracted to living in the area (Kurniawati & Martono, 2017). Apart from that, biological control can be carried out by using natural enemies of fall-armyworms such as parasitoids and predators, or rotating crops on the same land to reduce the intensity of attacks by rotating non-solanaceae crops and using botanical pesticides to reduce environmental impacts.

4. CONCLUSION

Research on the intensity of fall-armyworm (*Spodoptera litura*) attacks on cayenne pepper (*Capsicum frutescens*) plants in the karst land of Ponjong village, Gunung Kidul, Yogyakarta, revealed that the intensity of pest attacks reached an average of 15.71%. Environmental factors such as high temperature (32-34°C) and high humidity (75-87%) in karst areas increase fall-armyworm activity. The chalky characteristics of karst soil also influence the development of *Spodoptera* pests. Karst soils tend to be dry and less fertile, creating additional challenges in managing pest attacks. Without proper management, farmers may face reduced yields, increased costs for pest control, and long-term soil degradation, while the overuse of chemical pesticides could harm the local ecosystem so that coordinating with local agricultural agencies to optimize planting times and select resistant cayenne pepper varieties is recommended to minimize the impact of fall armyworms.

5. ACKNOWLEDGEMENT

The authors would like to thank the STIPER Agricultural Institute, Yogyakarta (Instiper) which provided laboratory facilities and equipment during the research, the 2023 Instiper Kurita Overseas Research Grant (KORG) research team, and the Giri Muda farmer group in Ponjong village, Gunung Kidul.

6. REFERENCES

Agustinawati, M. H., Toana, M. H., & Wahid, Abd. (2016). KEANEKARAGAMAN ARTHROPODA PERMUKAAN TANAH PADA TANAMAN CABAI (*Capsicum annum* L.) DENGAN SISTEM PERTANAMAN YANG BERBEDA DI KABUPATEN SIGI. *Jurnal Agrotekbis*, *4*(1), 8–15.

Arsi, A., & Kemal, A. (2021). Pengaruh Kultur Teknis terhadap Serangan Hama *Spodoptera litura* pada Tanaman Cabai Merah (*Capsicum annuum* L.) di Desa Kerinjing Kecamatan Dempo Utara Kota Pagar Alam Provinsi Sumatera Selatan: Effects of Cultural Technique on The Infestation of *Spodoptera litura* on Red Chilli (*Capsicum annuum* L.) Cultivation In Village Kerinjing, District Dempo Utara City of Pagar Alam, South Sumatra. *J-Plantasimbiosa*, *3*(1), 66–77. https://doi.org/10.25181/jplantasimbiosa.v3i1.1984

Arsi, A., Sukma, A. T., Bp, K. C., F, M. R., Gustiar, F., Irmawati, I., Shk, S., Hamidson, H., Pujiastuti, Y., Gunawan, B., Umayah, A., & Nurhayati, N. (2021). Keanekaragaman Arthropoda dan Intensitas serangan pada Tanaman Cabai (*Capsicum Annum* L,) Di Desa Tanjung Pering Kecamatan Indralaya Utara. *Sainmatika: Jurnal Ilmiah Matematika dan Ilmu Pengetahuan Alam*, *18*(2), 183. https://doi.org/10.31851/sainmatika.v18i2.6584

BPS Kab. Gunung Kidul. (2021). *Luas Panen Tanaman Sayuran Menurut Kecamatan dan Jenis Tanaman (Hektar), 2019-2021* (pp. 1–19). Badan Pusat Statistik Kabupaten Gunung Kidul. https://gunungkidulkab.bps.go.id/indicator/55/170/1/luas-panen-tanaman-sayuran-menurut-kecamatan-dan-jenis-tanaman.html

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DPKP DIY. (2019, September 3). *Merusak Dalam Waktu Singkat, Ulat Grayak Spodoptera frugiperda Menjadi Ancaman Serius Produksi Jagung di D.I. Yogyakarta*. https://dpkp.jogjaprov.go.id/baca/Merusak+Dalam+Waktu+Singkat%2C+Ulat+Grayak+Spodoptera+frugiperda+Menjadi+Ancaman+Serius+Produksi+Jagung+di+D.I.+Yogyakarta/030919/abe9ca50fe1b2c0958a25a3311b4338eb5e92a4a73e3c6e644d2a45d3f97b21279

Handru, A., Putri, D., & Sidiq, M. F. (2024). Keragaman Serangga Pengunjung pada Kelapa Sawit (*Elaeis guineensis* Jacq.) di Kebun Pendidikan dan Penelitian (KP2) Stiper Edu Agro Tourism Ungaran. *AGROISTA : Jurnal Agroteknologi*, *7*(2), 107–117. https://doi.org/10.55180/agi.v7i2.1026

Handru, A., Sidiq, M. F., & Putri, D. (2024). APLIKASI METHYL EUGENOL SEBAGAI PENGENDALI LALAT BUAH (*BACTROCERA* SP.) PADA TANAMAN CABE RAWIT DI LAHAN KARST DESA PONJONG, GUNUNG KIDUL, YOGYAKARTA. *Agrisaintifika: Jurnal Ilmu-Ilmu Pertanian*, *8*(1), 42–48. https://doi.org/10.32585/ags.v8i1.4988

Hasibuan, S. (2020). PENGENDALIAN TERPADU HAMA PADA TANAMAN CABAI (CAPSICUM ANNUM L) DENGAN MENGGUNAKAN PERANGKAP FLUORENSE DAN BERBAGAI PERANGKAP WARNA. *Prosiding Seminar Nasional Multidisiplin Ilmu Universitas Asahan*, 1022–1033.

Kristiaga, Z. C. J., & Agastya, I. M. I. (2020). Kelimpahan Serangga Musuh Alami dan Serangga Hama Pada Ekosistem Tanaman Cabai Merah (*Capsicum Annum* L.) Pada Fase Vegetatif di Kecamatan Dau Kabupaten Malang. *Jurnal Penelitian Pertanian Terapan*, *20*(3), 230–236.

Kurniawati, N., & Martono, E. (2017). PERAN TUMBUHAN BERBUNGA SEBAGAI MEDIA KONSERVASI ARTROPODA MUSUH ALAMI (THE ROLE OF FLOWERING PLANTS IN CONSERVING ARTHROPOD NATURAL ENEMIES). *Jurnal Perlindungan Tanaman Indonesia*, *19*(2), 53. https://doi.org/10.22146/jpti.16615

Muhartanto, A., Hidartan, Djohor, D. S., & Mukti, N. (2008). *KAWASAN KARST PACITAN BAG. TIMUR & POTENSINYA* (Program Penelitian FTKE Universitas Trisakti, pp. 1–125).

Nuraini, F. (2012). *Kajian Karakteristik dan Potensi Kawasan Karst untuk Pengembangan Ekowisata di Kecamatan Ponjong Kabupaten Gunung Kidul* [UNY]. https://eprints.uny.ac.id/24490/1/SKRIPSI_Fahad%20Nuraini_08405244013.pdf

Prabaningrum, L., & Moekasan, T. K. (2016). Pengelolaan Organisme Pengganggu Tumbuhan Utama Pada Budidaya Cabai Merah di Dataran Tinggi. *Jurnal Hortikultura*, *24*(2), 179. https://doi.org/10.21082/jhort.v24n2.2014.p179-188

Saroinsong, R. (2014). INVENTARISASI JENIS-JENIS HAMA PADA PADA PERTANAMAN CABAI (*Capsicum annum* L.) DI KELURAHAN KAKASKASEN I KOTA TOMOHON. *Cocos*, *5*(2), 1–7.

Satrah, V. N., Darlan, D., M., R., Syair, S., Khaeruni, A., Mariadi, M., Rahman, A., Pakki, T., & Anas, A. A. (2022). JENIS DAN INTENSITAS KERUSAKAN HAMA UTAMA TANAMAN CABAI PADA SISTEM BUDIDAYA YANG BERBEDA. *Jurnal Agroteknos*, *12*(3). https://doi.org/10.56189/ja.v12i3.29458

Septian, R. D., Afifah, L., Surjana, T., Saputro, N. W., & Enri, U. (2021). Identifikasi dan Efektivitas Berbagai Teknik Pengendalian Hama Baru Ulat Grayak *Spodoptera frugiperda* J. E. Smith pada Tanaman Jagung berbasis PHT- Biointensif. *Jurnal Ilmu Pertanian Indonesia*, *26*(4), 521–529. https://doi.org/10.18343/jipi.26.4.521

Setiawati, W., Sumarni, N., Koesandriani, Y., Hasyim, A., Uhan, T. S., & Sutarya, R. (2016). Penerapan Teknologi Pengendalian Hama Terpadu pada Tanaman Cabai Merah untuk Mitigasi Dampak Perubahan Iklim. *Jurnal Hortikultura*, *23*(2), 174. https://doi.org/10.21082/jhort.v23n2.2013.p174-183

Susrama, I. G. K. (2018). VARIASI KOMPOSISI PAKAN BUATAN UNTUK SERANGGA: SUATU KAJIAN PUSTAKA. *Jurnal Biologi Udayana*, *22*(2), 59.

Agrisaintifika, Vol. 8, No. 2, 2024
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ISSN 2580-0345 (print), 2580-748X (online)
DOI: 10.32585/ags.v8i2.5578

https://doi.org/10.24843/JBIOUNUD.2018.v22.i02.p02

Taufika, R., Sumarmi, S., & Hartatie, D. (2022). Pemeliharaan ulat grayak (*Spodoptera litura* Fabricius) (Lepidoptera: Noctuidae) menggunakan pakan buatan pada skala laboratorium. *AGROMIX*, *13*(1), 47–54. https://doi.org/10.35891/agx.v13i1.2866

Widhayasa, B., & Suryadarma, E. (2021). Peranan Faktor Cuaca terhadap Serangan Ulat Grayak *Spodoptera frugiperda* (Lepidoptera: Noctuidae) Pada Tanaman Jagung di Kabupaten Berau, Kalimantan Timur. *Journal of Tropical AgriFood*, *4*(2), 93–98. https://doi.org/10.35941/jatl.4.2.2022.6999.93-98

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7. ATTACHMENT

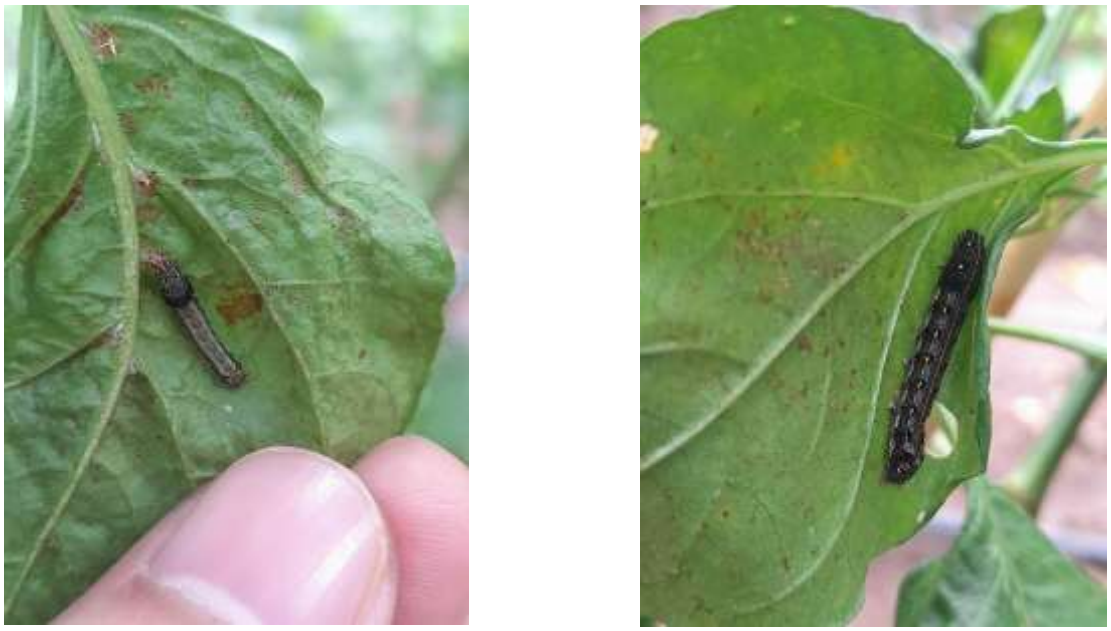

Figure 1. Fall-armyworm (*Spodoptera litura*) larvae on cayenne pepper leaves.