

# PALM-BASED STICKY GLUE FOR HOUSEHOLD AND PLANTATION PEST CONTROL

MOHD NORHISHAM SATTAR; TUAN NOOR MAZNEE TUAN ISMAIL; KOSHEELA DEVI POO PALAM; MOHAMED MAZMIRA MOHD MASRI; ZAFARIZAL ALDRIN HASAN and ZAINAB IDRIS



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Malaysia is among the top-most palm oil producers in the world. In 2022, the total oil palm planted area in Malaysia accounted for 5.67 million hectares (Parveez *et al.*, 2023). However, threats from bagworm outbreaks are one of the major problems faced by the oil palm plantation industry. According to a study, bagworms attack palm leaves and cause damage from 10% to 50% and 43% of yield loss oil palm (Basri and Kevan, 1995; Wood, 2002). The outbreak of the bagworm population increases and becomes serious without proper control measures.

Various studies have been conducted to control the bagworm populations in oil palm plantations and to increase the yield of oil palm. Mass trapping using pheromones is anticipated to be an easier option for smallholders to adopt. Typically, traps consist of a sticky glue layer mounted on a piece of plastic. Most of the commercial sticky glue for pest control relies on petroleum-based materials. The technology offered here discloses the preparation of a novel palm-based sticky glue for controlling bagworms. The sticky glue is a simple flat sheet structure often baited with pheromones that ensnare the insects with an adhesive substance.

Therefore, MPOB has developed palm-based sticky glue technology specifically designed to control bagworms and other pests in household and plantations.

## THE TECHNOLOGY

This technology discloses the preparation of a novel palm-based sticky glue (Figure 1) from palm-based materials and its derivatives. The palm-based sticky glue is safe and effective for household use. This palm-based sticky glue product is locally manufactured for use in household and plantation pest control.



Figure 1. Palm-based sticky glue.

The characteristics and properties of palm-based sticky glue compare with commercial sticky glue is listed in Table 1.

Field trials conducted in oil palm plantations exhibited bagworms trapped on the plastic surface after three weeks of installation (Figure 2). The results of the field trial are encouraging. It shows that the developed palm-based sticky glue is functioning well and efficiently, catching the bagworms.

## NOVELTY OF THE TECHNOLOGY

This product was produced using locally derived ingredients and contains more than 60% palm-based ingredients, primarily palm oil and its derivatives. The production this technology, which was developed in-house, offers not just excellent consistency in operational performance but also ability to scale to meet rising demand.

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Head of Innovation Commercialisation Center, Malaysian Palm Oil Board. 6 Persiaran Institusi, Bandar Baru Bangi, 43000 Kajang, Selangor, Malaysia.  
Tel: 03-8769 4574 Fax: 03-8926 1337 E-mail: tot@mpob.gov.my Website: www.mpob.gov.my



**TABLE 1: PALM-BASED STICKY GLUE AND COMMERCIAL STICKY GLUE CHARACTERISTICS**

Characteristics	Methods	Palm-based sticky glue	Commercial sticky glue
Peel adhesion at 90°, N/mm	ASTM D3330M-04	0.118	0.032
Peel adhesion at 180°, N/mm	ASTM D3330M-04	0.030	0.029
Tackiness test (Rolling ball test), mm	ASTM D3121-06	1.41	1.69
Stickiness test, N	Penetration method using a texture analyser	1.05	0.67
Colour	Visual	Orange	White
Appearance	Hand feel	Tacky and sticky	Tacky and sticky



Figure 2. Field trial in oil palm plantation.

**BENEFITS AND ADVANTAGES**

This technology harbors significant commercial promise as a palm-based sticky glue and eco-friendly product. The safe and effectiveness of palm-based sticky glue for pest control contributes to: -

1. Increased in farm productivity where it is potential to reduce the oil palm yield loss and prevent palm leaves damage.
2. Improved environmental management where the sticky glue produced contains 60% palm-based material and reduced carbon footprint.
3. Reduced cost of farm maintenance where the production of this palm-based sticky glue can reduce costs by 30% compared to commercial glue that is used as pest control in the farm.

**ECONOMIC ANALYSIS AND COMMERCIAL BENEFITS**

The estimated economic analysis for palm-based sticky glue is shown in Table 2. This evaluation is based on a product selling price of RM35 per kg and a production capacity of 5 tonnes per year.

**TABLE 2. ECONOMIC ANALYSIS**

Cost of raw materials	RM9.83 per kg
Selling price	RM35.00 per kg
Capital expenditure	RM110 000.00
Net present value (NPV)	RM191 069.00
Internal rate of return (IRR)	37%
Discounted payback period	3 years 10 months
Return on investment (ROI)	35%
Discounted benefit: Cost ratio (B:C)	1.25

\* Calculated based on a discounted rate of 10%

Potential takers such as: -

1. Manufactures of pest control and sticky glue.
2. Distributor of pest control and sticky glue.
3. Support service provider such as pest control company.
4. Users such as household, oil palm plantations, fruits garden *etc.*

**IMPACT**

The commercialisation of this product serves multiple benefits: It reduces dependence on fossil fuels, fosters value creation within the domestic economy and increases export figures. Apart from that, the manufacture of palm-based products present a viable solution to mitigate greenhouse effect. This approach aligns with the current

global governmental agenda, which priority on addressing environmental concerns, particularly the issue of climate change.

### **IP STATUS**

Protected as Trade Secret.

### **CONCLUSION**

- Sticky glue from palm-based material with better stickiness properties offered a better alternative to the commercial sticky glue products.
- The palm-based sticky glue is produced from renewable and sustainable raw materials.

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For more information, kindly contact:

Head of Innovation Commercialisation Center, MPOB  
6 Persiaran Institusi, Bandar Baru Bangi,  
43000 Kajang, Selangor, Malaysia  
Tel: 03-8769 4574  
Fax: 03-8926 1337  
E-mail: [tot@mpob.gov.my](mailto:tot@mpob.gov.my)  
[www.mpob.gov.my](http://www.mpob.gov.my)