



Control Union Certifications
Member of Control Union World Group

Meeuwenlaan 4-6
8011 BZ Zwolle (NL)
P.O. Box 161
8000 AD ZWOLLE (NL)
+31 (0)38 - 426 01 00
+31 (0)38 - 423 70 40
certification@controlunion.com
www.controlunion.com
24274509
NL12ABNA0468081410
ABNANL2A
NL806.327.789.B01

The use of Monocrotophos.

Introduction.

Control Union Certifications was instructed by the Danish Energy Agent to conduct an audit of the use of Monocrotophos by United Plantations Bhd.

Executive summary.

- Monocrotophos is used for the effective control of Bagworm Caterpillars in oil palm plantations.
- It is approved for use by the Malaysian Palm Oil Board and currently there are no effective alternatives.
- United Plantations have been actively trying to source and to evaluate alternatives to Monocrotophos since 2006 and another trial project has been recently initiated by United Plantations to find a natural biological control in co-operation with CABI (Commonwealth Agricultural Bureaux International).
- The use of Monocrotophos has been demonstrably reduced over the past 4 years but a lack of control of Bagworm Caterpillars on neighbouring estates is resulting in increased numbers (and associated attacks) despite very sound control methods being implemented by United Plantations.
- The use of Monocrotophos is only used as a last resort after all known biological controls have been exhausted.

Background.

Oil palm is a major agricultural crop with significant economic, environmental and social benefits for Malaysia. Like any agricultural crop, it is susceptible to attack by a wide range of pests and diseases some of which are of greater threat than others.

Two leaf eating pests are the Bagworm and Nettle Caterpillars which can devastate significant areas of oil palm if not detected and treated in the very early stages of an out-break. Of these two the Bagworm Caterpillar (referred to as Bagworms) is the most damaging.

Responsible growers take a pro-active approach to controlling Bagworms by carrying out regular field inspections and by planting a range of beneficial plants. These plants encourage predators of the Bagworms by providing nectar and shelter and represent an indirect bio-control system known as Integrated Pest Management (IPM).

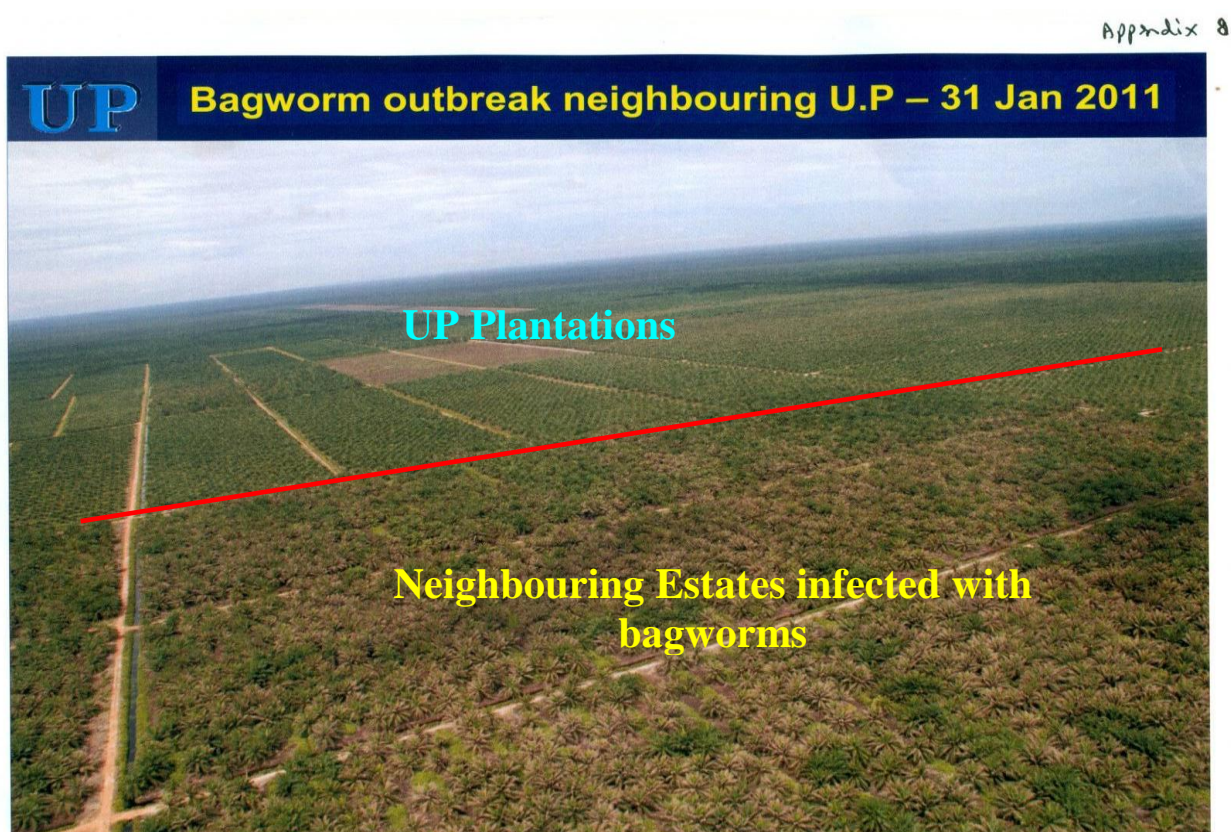
Fortunately Bagworms are not a wide spread problem for the oil palm industry but in 1988 the Palm Oil Research Institute of Malaysia (now known as the Malaysian Palm Oil Board – MPOB) conducted a survey and identified the lower areas of Perak State to contain endemic levels of Bagworms. See appendix

In the survey, 29 out of 113 respondents reported Bagworm outbreaks. This represents 26% of the oil palm estates in Perak State and is double the national average of 13.5%. Members of the MPOB report monthly on the total area of oil palm infested and the return for October 2010 show that out of 58,185ha, 13,847 ha were infested in the Perak State.

In 2007, the Deputy Plantation Industries and Commodities Minister reported that 33,475ha of oil palm in lower Perak State were seriously affected by Bagworm outbreaks. As a result, a Government subsidised aerial spraying program was initiated but the number of Bagworms is again on the increase in part due to the lack of control by some estates and many smallholders.

United Plantations manage about 35,791 ha of oil palm in lower Perak State and an aerial survey taken on 31st January 2011 shows that the infestation of Bagworms in neighbouring properties is of significant threat to United Plantations. It is noted that airborne Bagworm larvae can spread over several kilometres over-time and that one male and one female can become 843,000 bagworm within 6 months – assuming no natural mortality.

This photograph shows the outbreak of bagworm in estates that adjoin United Plantations.



Following this reconnaissance, a second aerial reconnaissance was arranged for 13 managers of neighbouring estates to United Plantations. It is noted that several of these managers were surprised to note the extent of the bagworm outbreak on their respective properties.

United Plantations subsequently arranged for training in bagworm monitoring and control techniques for the neighbouring estates who clearly have an obligation to control bagworm.

Scope.

The audit scope covered the following:

- The practice of pest control as conducted by United Plantations.
- The criteria for pest control as in the Round Table on Sustainable Palm Oil International Principles and Criteria as interpreted for Malaysia.

Round Table on Sustainable Palm Oil. (RSPO).

The RSPO is a global, multi-stakeholder initiative on sustainable palm oil. Members of RSPO and participants in its activities come from many different backgrounds, including plantation companies, manufacturers and retailers of palm oil products, environmental NGOs and social NGOs and from many countries that produce or use palm oil.

The principal objective of RSPO is “to promote the growth and use of sustainable palm oil through co-operation within the supply chain and open dialogue between its stakeholders”.

The RSPO Principles and Criteria for Sustainable Palm Oil Production were adopted in November 2005. Malaysia prepared a National Interpretation of these Principles and Criteria and this was endorsed by the RSPO Executive Board in 2008. There are 8 principles, 39 Criteria and 125 indicators used to evaluate whether an oil palm plantation and associated palm oil mill is operating in accordance with the RSPO before a certificate of compliance can be awarded.

On the 5th July 2011, there were 865,563 ha of certified oil palm across the globe producing 4,244,543 mt of CPO. This represented about 10% of the supply base.

There are 2 principles and some associated criteria that are related to the scope of this audit:

- **Principle 4:** The use of appropriate best practice by growers and mills.
‘Criterion 4.5: Pests, diseases, weeds and invasive introduced species are effectively managed using appropriate integrated Pest Management (IPM) techniques’.
 - 4.1.1: Documented Standard Operating Procedures (SOP) for estates and mills.
 - 4.1.2: Records of monitoring and the actions taken are maintained and kept for a minimum of 12 months.
‘Criterion 4.6 Agrochemicals are used in such a way that does not endanger health or the environment. There is no prophylactic use, and where agrochemicals are used that are categorised as World Health Organisation Type 1A or 1B, or are listed by the Stockholm or Rotterdam Conventions, growers are actively seeking to identify alternatives, and this is documented’.
 - 4.6.1: Written justification in Standard Operating Procedures of all agrochemical use.
 - 4.6.2: Pesticides selected for use are those officially registered under the Pesticides Act 1974 (Act 149) and the relevant provision (Section 53A); and in accordance with USECHH Regulations (2000).
 - 4.6.3: Pesticides shall be stored in accordance to the Occupational Safety and Health Act 1994 (Act 514) and Regulations and Orders and Pesticides Act 1974 (Act 149) and Regulations.
 - 4.6.4: All information regarding the chemicals and its usage, hazards, trade and generic names must be available in language understood by workers or explained carefully to them by a plantation management official at operating unit level.
 - 4.6.5: Annual medical surveillance as per CHRA for plantation pesticide operators.
 - 4.6.6: No work with pesticides for confirmed pregnant and breast-feeding women.
 - 4.6.8: Documented justification of any aerial application of agrochemicals.
‘Criterion 4.7: An occupational health and safety plan is documented; effectively communicated and implemented’.
 - 4.7.1: Evidence of documented Occupational Safety Health (OSH) plan which is in compliance with OSH Act 1994 and Factory and Machinery Act 1967(Act 139).
‘Criterion 4.8 All staff, workers, smallholders and contractors are appropriately trained’.
 - 4.8.1: A training programme (appropriate to the scale of the organization) that includes regular assessment of training needs and documentation, including records of training for employees are kept.
- **Principle 8:** Commitment to continual improvement in key areas of activity.
‘Criterion 8.1: Growers and millers regularly monitor and review their activities and develop and implement action plans that allow demonstrable continual improvement in key operations’.
 - 8.1.1: Minimise use of certain pesticides.

United Plantations Bhd.

In 2008, United Plantations became the first plantation company in the world to be awarded the prestigious RSPO certification for all their operations in the Perak State. The process included 2 pre-assessments and a full main assessment conducted by an audit team from Control Union Certifications.

Subsequently annual surveillance audits have been conducted to confirm that the company continues to operate in accordance with the RSPO principles and criteria and both Principles 4 and 8 were included in the annual surveillance audits.

Principle 4: The use of appropriate best practice by growers and mills.

4.1.1: Documented Standard Operating Procedures.

United Plantations has a full set of Standard Operating Procedures covering all oil palm operations. The SOP for Bagworm identification and control comprises a 5 step preventative program:

1. IPM.
 - Planting of beneficial plants to enhance the natural parasitic and predator activities against bagworm.
 - To date more than 98,000 beneficial broadleaved flowering plants have been planted.
2. Monitoring and census.
 - Census gangs deployed on each estate who take random frond samples in a pre-determined pattern.
 - These fronds are subjected to insect counts and damage assessments by trained personnel.
3. Aerial surveillance.
 - Regular aerial reconnaissance is carried out to better detect, pre-empt and treat potential outbreaks.
4. Use of biological control agents.
 - For example: *Bacillus Thuringiensis* as the first line of treatment against an outbreak.
5. Chemical intervention.
 - As a final resort and only when the above steps have proven to be futile.

4.1.2: Records of monitoring.

Monitoring records of the use of Monocrotophos include:

- Monitoring census.
- Date of application.
- Field of application.
- Quantity of pesticide used and quantity of active ingredient per ha.
- Name of operator.

4.6.1: Written justification for all agrochemical use.

Justification for use is laid out in Field Management Manual supplements section 3.1.4.1.

The use of Monocrotophos is justified as follows:

- It is the only effective pesticide available for the effective control of Bagworm in oil palm plantations with tall palms (3 metre total height).
- It is included in the Malaysian Palm Oil Board (MPOB) list of approved Pesticide for use in oil palm plantations in Malaysia.

4.6.2: Pesticides are those officially registered under the Pesticides Act 1974.

Monocrotophos is registered under the Pesticides Act 1974. See also appendices.

4.6.3: Pesticides shall be stored in accordance to the Occupational Safety and Health Act 1994 etc.

All the United Plantation chemical stores are inspected as part of the RSPO certification procedure and it is noted that they all comply with the relevant act as well as best practice.

- All stores are secured under lock and key with restricted access.
- Pesticides are separated by class and class 1 and II chemicals are further stored under separate lock and key within the main store.
- Store keeper is fully trained in the handling of all pesticides.

4.6.4: All information regarding the chemicals and its usage, hazards, trade and generic names must be available in language understood by workers or explained carefully to them by a plantation management official at operating unit level.

- MSDS leaflets are available in all pesticide stores. (Material Safety Data Sheet)
- Workers applying Monocrotophos are fully trained and aware of the hazards.

- 4.6.5: Annual medical surveillance as per CHRA for plantation pesticide operators.
- All pesticide operators have a monthly medical check-up.
 - All pesticide operators undergo a comprehensive annual medical check-up which includes blood analysis.
 - It is noted that there have been no documented cases of any operators suffering from any symptoms of pesticide poisoning over the past 15 years.
 - **Furthermore It is noted that immediately after the allegation arose in the Danish press, an interim and additional full medical check-up was conducted and blood analysis show neither exposure nor symptoms of Monocrotophos poisoning.**
- 4.6.6: No work with pesticides for confirmed pregnant and breast-feeding women.
No women are employed for agrochemical application purposes. This includes both pesticides and herbicides.
- 4.6.8: Documented justification of any aerial application of agrochemicals.
No aerial application of any agrochemicals on any United Plantation estates.
- 4.7.1: Evidence of documented Occupational Safety Health (OSH) plan which is in compliance with OSH Act 1994 and Factory and Machinery Act 1967(Act 139).
United Plantations have a comprehensive generic OSH plan which includes:
- A list and classification of all hazards – including the application of pesticides.
 - A risk assessment for each hazard.
 - Action to be taken to eliminate the risk associated with each hazard.
 - Personal Protective Equipment (PPE) to be worn for all operations.
 - Management responsible for ensuring implementation of action.
 - Training required for each operation that is linked to the hazard and risk assessment.
 - Regular meetings of OSH committees for each estate.
 - Daily safety briefings for all workers applicable to their duties.
 - Records of distribution and maintenance of all PPE distributed.
- 4.8.1: A training programme (appropriate to the scale of the organization) that includes regular assessment of training needs and documentation, including records of training for employees are kept.
Training programs are prepared based upon the hazard and risk assessments and full training records are available that include:
- Date.
 - Purpose.
 - Details of the training.
 - List of all participants.
 - Photographic evidence.
 - It is noted that for the application of Monocrotophos, dedicated and trained teams (comprising 3 persons to a team) are deployed.
 - **The audit team note that the training records are comprehensive and linked to the OSH (Occupational Safety and Health) policy procedures. Interviews of workers confirmed that the training was carried out and was effective.**

Principle 8: Commitment to continual improvement in key areas of activity.

- 8.1.1: Minimise use of certain pesticides.
United Plantations were awarded RSPO certification in July 2008 and since then have under-gone 2 annual surveillance audits. During these audits, their progress to reduce certain pesticides was audited and the following findings noted with particular reference to Monocrotophos:
- IPM is implemented throughout all estates.
 - The number of beneficial plants on all estates is being increased on an annual basis.
 - In 2007 the average number of plants per ha was 1.11. There has been an increase of about 260% to 2.92 plants per ha.
 - The use of pheromone traps has increased.
 - Across the entire United Plantations oil palm estates, the quantity of Monocrotophos has decreased from 0.35 kg/ha in 2006 to 0.20kg in 2009 and a slight increase in 2010 to 0.245 kg/ha due to a rise in bagworm numbers on neighbouring estates which have spread into United Plantations Estates.
 - It is also noted that the use of paraquat was eliminated entirely as from October 2010 as a consequence of a voluntary effort which commenced in February 2008.

Research work to find an effective alternative to Monocrotophos for trunk injection.

The Research Department of United Plantations has been taking a pro-active approach to source and evaluate alternatives Class 1B to Monocrotophos since 2006 and this work includes the following:

1. Internal trials of 2 formulations of acephate and imacloprid.
2. Active engagement of multi-national pesticide companies to source viable alternatives to monocrotophos for trunk injection.
3. Engaging CABI (Commonwealth Agricultural Bureaux International) to conduct a two year project to research other effective bio control methods of bagworm.

With reference to each of the above:

1. Internal trials.

An area has been identified to carry out trials over a period from February 2011 to first quarter of 2013. The trials include the following treatments of trial plots covering 4 rows of 5 palms replicated 3 to 4 times:

- a. Acephate at 3.7g a.i. per palm. (5ml/palm).
- b. Acephate at 7.5g a.i. per palm. (10ml/palm).
- c. Acephate at 11.25g a.i. per palm. (15ml/palm).
- d. Acephate at 15g a.i. per palm. (20ml/palm).
- e. Imidacloprid at 10ml product per palm.
- f. Imidacloprid at 20ml product per palm.
- g. Monocrotophos at 10 ml product per palm.
- h. Untreated.

Palm census is carried out by well trained and experience staff assisted by workers to check the trial results. The census is carried out at each week for 4 weeks from the treatment day. The 10 most infested palms in each plot is marked and results monitored. Census includes the recording the live larvae, dead larvae, live pupae, empty pupae and dead pupae.

Early results show that monocrotophos is more effective in controlling bagworm. Acephate treated palms show re-infection after 4 weeks.

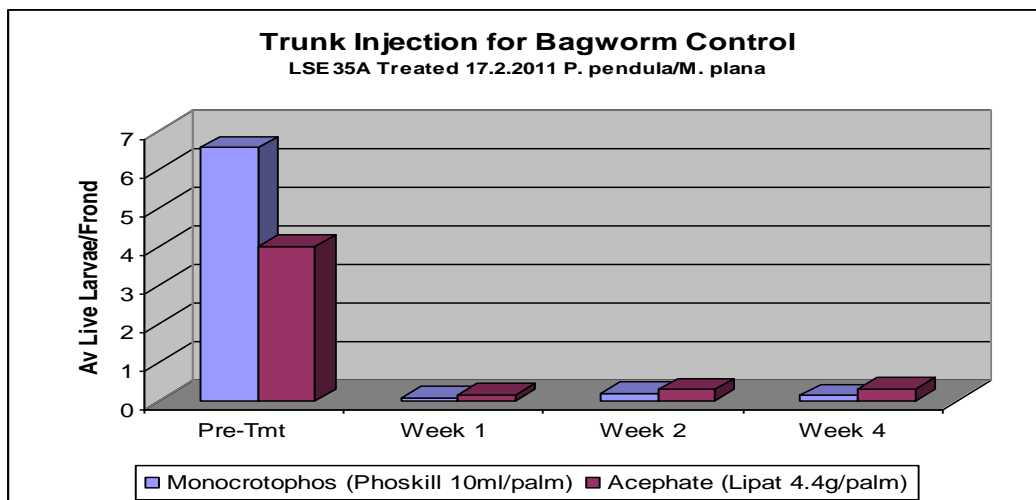


Table showing trial result with monocrotophos and acephate.

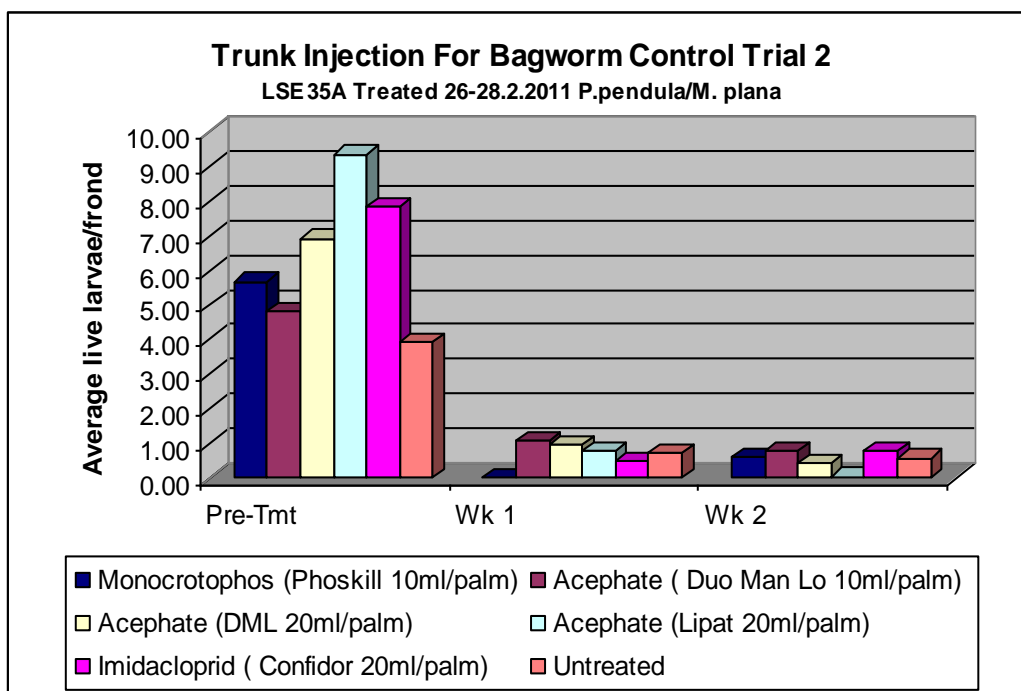


Table showing second trial result with monocrotophos and acephate.

2. Active engagement of multi-national pesticide companies.

See also appendices for communications with the following companies.

BASF.

After several meetings between United Plantations and their R & D personnel, BASF indicated they are yet to formulate an alternative to replace monocrotophos. (Appendix 10).

Bayer Crop Science.

Active discussions are on-going between United Plantations and Bayer Crop Science to test a range of existing and novel Bayer products for their efficacy in trunk injection for bagworm control. Bayer is still working on the technical stability of their products before commencing the trial. (Appendix 11).

Syngenta.

Several discussions have been held between United Plantations and Syngenta to seek for alternative insecticides to replace monocrotophos. Whilst Syngenta indicated they have some experimental compounds that can be tested for trunk injection, they have written to request for more time before the samples are available for testing. (Appendix 12).

Cheminova.

Having met with Cheminova's Business Manager for Asia and their Malaysia Head we had enquired if they have any alternatives to monocrotophos. To-date United Plantations have not received any indications from them on this subject. (Appendix 13).

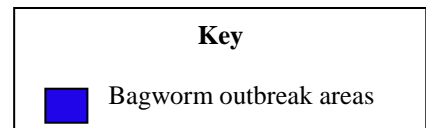
3. Engaging CABI to conduct a two year project to research other effective bio control methods of bagworm.

It is anticipated that an agreement will be entered into with CABI for a collaborative trial to breed and release predators as biological control agents for bagworm.

This project is expected to last for a period of 2 years and interim results are not expected until the third quarter of 2012.

Appendices.

The geographical distribution of bagworm outbreaks in Peninsular Malaysia





- [Journals \(2,297\)](#) [Magazines \(1,853\)](#) [Newspapers \(1,765\)](#) [Reference works and books \(113\)](#) [Print](#)



RM5m system to curb bagworm threat

Publication:

New Straits Times

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December 12, 2007

New Straits Times

12-12-2007

RM5m system to curb bagworm threat

Edition: Main/Lifestyle

Section: Main Section

LUMUT: Oil palm plantation managers and smallholders will be able to breathe easy with the introduction of an integrated pests management (IPM) system to control the spread of bagworms in estates and plantations.

The RM5 million system, a project by the Malaysian Palm Oil Board (MPOB), was launched here yesterday in a move to protect the country's main commodity from suffering serious losses due to bagworm outbreaks. Bagworms are insects which destroy oil palm trees if left unchecked. The three common species in Malaysia are metisa plana, pteroma pendula and mahasena corbetti.

Deputy Plantations Industries and Commodities Minister Datuk Anifah Aman said in a speech read by ministry parliamentary secretary Datuk Dr S. Vijayaratnam that bagworms which have caused sporadic economic damage and crop losses of up to 40 per cent have been recorded in the first year of attack in some affected estates.

The IPM combines the strengths of biological agents and beneficial bacteria - beneficial plants to attract insects which feed on bagworms as well as the use of predator bagworms as a long term effort to control the bagworm population in oil palm plantations throughout the country.

Anifah said a study carried out by MPOB this year showed that 33,475ha of oil palm estates, mostly in southern Perak, including 5,100ha which are owned by smallholders, were seriously affected by bagworm outbreaks.

To address the problem, he said the ministry had, through MPOB, allocated RM5 million for the IPM system to be implemented.

To date, some 14,000ha of oil palm plantations exposed to the threat of bagworms, have been sprayed with BT (bacillus thuringiensis), a biological agent in the form of a bacteria which is friendly to the environment and is not harmful to useful predators, parasitoids and pollinating weevils.

BT, said Anifah, could help reduce or eventually replace the reliance of chemical pesticides for the control of, not only bagworms, but also other pests like nettle caterpillars and bunch moths at oil palm estates.

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UPRD

From: "UPRD" <uprd4@tm.net.my>
To: <varghese.tvgeorge@basf.com>
Sent: Wednesday, January 19, 2011 10:46 AM
Subject: Substitute for Monocrotophos

Dear Mr. Varghese,

Further to our earlier meetings and communications, we are interested to know whether BASF have any potential insecticides that can be a replacement for monocrotophos for trunk injection in oil palm.

We appreciate your feedback and collaboration in this important aspect of leaf eating pest control.

Regards,

Ho Shui Hing
Research Controller

1/19/2011



The Chemical Company

Appendix 10b

Mr. C. Mathews
Group Manager Human Resources and
Environment, Safety & Health,
United Plantations Berhad
Jendarata Estate
36009 Teluk Intan, Perak
Fax : 05-6411876

1 March 2011
Vince Loo,
Technical Manager,
BASF (M) Sdn. Bhd.
Mobile: +6012 6388557
E-Mail: vince.loo@basf.com

Dear Mr. C. Mathews,

RE: Alternative product to replace Monocrotophos for Bagworm control.

Further to our several meeting we regret to inform that our R&D are yet to formulate an alternative to replace Monocrotophos. We shall contact you if there are any other further developments.

Currently Monocrotophos is widely used within the plantation industry of Malaysia and it has been difficult to find effective and suitable alternatives.

In line with our Company policy and BASF's Responsible Care management, BASF (MALAYSIA) SDN BHD is more than happy to collaborate with United Plantations in order to develop alternative and effective products that eventually will be able to replace Monocrotophos in the future.

Yours Truly,

Vince Loo,
Technical Manager,
BASF (M) Sdn. Bhd.
NO. 2, Jalan U8/87, Seksyen U8,
Bukit Jelutong, Shah Alam,
Selangor, 40706, Malaysia
Mobile: +6012 6388557
E-Mail: vince.loo@basf.com

BASF (Malaysia) Sdn. Bhd.
(No. Syarikat 182871-M)
No. 2, Jalan U8/87
Seksyen U8, Bukit Jelutong
40706 Shah Alam

Pasir Gudang Plant
Lot 143, Jalan Cecair
Free Trade Zone
Johor Port
81700 Pasir Gudang

Bukit Raja Plant
No.8 Jalan Keluli
Kawasan Perindustrian Bukit Raja
41050 Klang
Selangor Darul Ehsan

Kulim Site
Lot7, Jalan Hi-Tech 4
Phase 1 Industrial Zone
Kulim Hi Tech Industrial Park
09000 Kulim, Kedah

Appendix 10d



C Mathews <mathewsc6@gmail.com>

Fw: Alternative product to replace Monocrotopos for Bagworm control

1 message

vince.loo@basf.com <vince.loo@basf.com>
To: mathewsc6@gmail.com

17 January 2011 16:29

Hi Mr Mathew,

I am sorry if you have not received my previous reply. This is the forwarded copy. Thanks

----- Forwarded by Vince Loo/HQ/BASF-MALAYSIA/BASF on 17/01/2011 04:28 PM -----
From: Vince Loo/HQ/BASF-MALAYSIA/BASF
To: up@unitedplantations.com
Cc: Varghese TVGeorge/HQ/BASF-MALAYSIA/BASF@BASF
Date: 13/12/2010 10:25 PM
Subject: Alternative product to replace Monocrotopos for Bagworm control

Hi Mr C.Mathews,

Thanks for the letter which I received today pertaining to Alternative product to replace Monocrotopos for Bagworm control.

Glad to hear that you do not have bagworm infestations to date.

After the discussion we had on 6th Dec 2010, we have revert to our regional office for more information. Unfortunately at the moment, we do not have a product to fit the current market gap with very systemic characteristic. However, we can test Alpha-cypermethrin + fipronil for foliar sprays if your part is interested.

Nevertheless, we have some good news for *Ganoderma* control. With our previous trial showing some activity of retardation, we also found a new potential compound which is more systemic in moving acropetal and basipetal for a better coverage. After we have the protocol from my regional colleagues, we can start to do the test if your part is interested

Thanks again.

Best regards,
Vince Loo
Technical Manager

Phone: 603-56283796. BCN: 8673 3779, Mobile: +6012 6388557, Fax: 603-56283756, E-Mail: vince.loo@basf.com

BASF (MALAYSIA) SDN BHD, NO. 2, Jalan U8/87, Seksyen U8, Bukit Jelutong, Shah Alam, Selangor, 40706, Malaysia

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UNITED PLANTATIONS BERHAD
(Incorporated in Malaysia)
COMPANY NO. 246-A

TELEPHONE: + 6 05 6411 411
TELEFAX : + 6 05 6411 876 / 6 05 6417 396
E-MAIL : up@unitedplantations.com
WEBSITE : www.unitedplantations.com

REGISTERED OFFICE:
JENDARATA-ESTATE,
36009 TELUK INTAN, PERAK,
MALAYSIA.

02nd December 2010

The Senior Manager
Crop Protection Division
BASF (Malaysia) Sdn Bhd
No. 2 Jln. U8/87
Seksyen U8, Bukit Jelutong
40706 Shah Alam

Dear Sir,

ALTERNATIVE PRODUCT TO REPLACE MONOCROTOPHOS FOR BAGWARM CONTROL

Further to your letter of 22nd September 2010 and our subsequent meeting on 06th October 2010 at United Plantations Research Department, we were unable to carryout any trials as there are no bagworm infestations todate.

In this connection, we suggest that chromatogram scanner with the use of isotopes/radionuclides be utilized to study the upward translocation of various pesticides such as acephate and fipronil with selected carriers on the tall palms' foliage – its merely a suggestion.

We are fully aware that you are deliberating with your team on the possible alternatives and look forward to it, in the not too distant future.

Thank you.

Yours faithfully
UNITED PLANTATIONS BERHAD


C. Mathews
Group Manager Human Resources And
Environment, Safety & Health
CM/sj

cc : The Senior Executive Director, U P Bhd
cc : The Executive Director (Corporate Affairs), UP Bhd
cc : The Executive Director (Finance & Marketing) U P Bhd
cc : The Estates Director, U P Bhd
cc : The Director of Research, U P Bhd



The Chemical Company

Appendix 10g

BASF (Malaysia) Sdn. Bhd.

Mr. C. Mathews
Group Manager Human Resources and
Environment, Safety & Health,
United Plantations Berhad
Jendarata Estate
36009 Teluk Intan, Perak
Fax : 05-6411876

22nd September 2010
T. George Varghese.
Crop Protection
Tel: 603-56283839
Fax: 603-56283756
Email: george.TVGeorge@basf.com

Dear Mr. C. Mathews,

RE: Alternative product to replace Monocrotophos for Bagworm control.

Further to our meeting we would be very pleased to co-operate with your esteemed company for a trial to control bagworms on United Plantations.

Currently Monocrotophos is widely used within the plantation industry of Malaysia and it has been difficult to find effective and suitable alternatives.

In line with our Company policy and BASF's Responsible Care management, BASF (MALAYSIA) SDN BHD is more than happy to collaborate with United Plantations in order to develop alternative and effective products that eventually will be able to replace Monocrotophos.

We would be pleased to work with United Plantations, one of the leading palm oil companies in Malaysia.

We look forward for further discussions and collaboration on the above topic.

With Best Regards,

T. George Varghese

Senior Manager,
Crop Protection Division
BASF (Malaysia) Sdn. Bhd.

BASF (Malaysia) Sdn. Bhd.
(No. Syarikat 182671-M)
No. 2, Jalan U8/87
Seksyen U8, Bukit Jelutong
40706 Shah Alam
Selangor Darul Ehsan, Malaysia

Pasir Gudang Plant
Lot 143, Jalan Cecair
Free Trade Zone
Johor Port
81700 Pasir Gudang
Malaysia

Bukit Raja Plant
No.8 Jalan Keluli
Kawasan Perindustrian Bukit Raja
41050 Klang
Selangor Darul Ehsan
Malaysia

Kulim Site
Lot7, Jalan Hi-Tech 4
Phase 1 Industrial Zone
Kulim Hi Tech Industrial Park
09000 Kulim, Kedah
Malaysia

Bayer CropScience



**United Plantations Berhad
Research Department
Jendarata Estate
36009 Teluk Intan
Perak Darul Ridzuan
Malaysia
Attention: Dr. Xaviar Arulandoo and Mr Ho Shui Hing**

Dear Sirs,

29 September 2010

ALTERNATIVE PRODUCT TO REPLACE METHAMIDOPHOS AND MONOCROTOPHOS FOR BAGWORM CONTROL IN OIL PALM

With reference to the above matter, we would like to express our sincere gratitude to United Plantations Berhad on your agreement to collaborate with BAYER CO. (MALAYSIA) SDN BHD in research and development activities for our new potential products in controlling bagworm in your plantation.

Bayer Co. (Malaysia) Sdn Bhd
(Co. No. 7563 M)

T1-14 Jaya 33
No. 3, Jalan Semangat
Seksyen 13
46200 Petaling Jaya
Selangor, Malaysia

Tel. +60 3 6209 3088
Fax +60 3 7960 5718

www.bayercropscience.com

Bayer is a global enterprise with core competencies in the fields of health care, nutrition and high-tech materials. Bayer CropScience AG, a subsidiary of Bayer AG with annual sales of about EUR 5.8 billion (2007), is one of the world's leading innovative crop science companies in the areas of crop protection, non-agricultural pest control, seeds and plant biotechnology. Bayer CropScience is at the forefront of innovation with a spending of EUR 625 million for R&D. The company offers an outstanding range of products and extensive service backup for modern, sustainable agriculture and for non-agricultural applications. Bayer CropScience has a global workforce of about 17,800 and is represented in more than 120 countries.

We are very proud to work with United Plantations Berhad in developing alternative products to replace methamidophos and monocrotophos substances for bagworm control in oil palm.

Thank you in advance for your kind attention.

Best regards,
Bayer Co. (Malaysia) Sdn. Bhd.


Hoe Choon Keong
Head of Business Development


Mohd Hezri Sairi
Technical Development Manager

Appendix 11b

Bayer CropScience



**United Plantations Berhad
Research Department
Jendarata Estate
36009 Teluk Intan
Perak Darul Ridzuan
Malaysia
Attention: Dr. Xaviar Arulandoo and Mr Ho Shui Hing**

Dear Sirs,

15 March 2011

**ALTERNATIVE PRODUCT TO REPLACE METHAMIDOPHOS AND
MONOCROTOPHOS FOR BAGWORM CONTROL IN OIL PALM**

Further to the several discussions we had on a joint trial evaluating Bayer's novel range of products as possible alternatives to monocrotophos and methamidophos for trunk injection in mature oil palm, we are still intent on pursuing this trial but regret that there will be a delay in the implementation date because of some technical issues that need to be resolved before the trial can proceed.

Bayer will make the samples available as soon as these issues have been overcome so that together we can seek for a viable alternative to the two above insecticides for the betterment of the oil palm industry.

Thank you in advance for your kind attention.

Best regards,
Bayer Co. (Malaysia) Sdn. Bhd.

A handwritten signature in black ink, appearing to read "X. Hezri Sairi".

Mohd Hezri Sairi
Technical Development Manager

Bayer Co. (Malaysia) Sdn Bhd
(Co. No. 7563 M)

T1-14 Jaya 33
No. 3, Jalan Semangat
Seksyen 13
46200 Petaling Jaya
Selangor, Malaysia

Tel. +60 3 6209 3088
Fax +60 3 7960 5718

www.bayercropscience.com

Appendix 12



Syngenta Crop Protection Sdn Bhd
(437832-V)
MR1-02-02
Sri Acappella Commercial Annex
No 1, Jalan Lompat Tinggi 13/33
Seksyen 13, 40100 Shah Alam
Selangor Darul Ehsan, Malaysia
Tel +603 5510 9878, 5510 6878
Fax +603 5510 2818
www.syngenta.com

Att:- Mr. Ho Shui Hing
United Plantations

30 March 2011

Re: Protocol for OPTI for bagworm control in mature OP

Dear Mr. Ho Shui Hing,

Thank you for your interest in wanting to evaluate some of our products that could potentially have effect for bagworm control. Under normal spraying/ topical application it has no problems controlling the bagworms. Some of the products are also use for trunk injection in pine trees overseas. However, we need to evaluate it through trunk injection in tall oil palm.

We will send you the samples when we get them. It could take sometime as some of them are made in the lab.

Looking forward to the joint trial and hope we will be able to get an effective compound for bagworm control via trunk injection.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeremy Ngim".

Mr. Jeremy Ngim
Consultant
Agronomist

UPRD

From: "Nathaniel Lam" <nathaniel.lam@cheminova.com>
To: <uprd4@tm.net.my>
Cc: <xaviar_agro@yahoo.com>
Sent: Wednesday, November 03, 2010 9:10 PM
Attach: img-101103191748.pdf
Subject: RE: Visit to UP on 22nd November 2010

Dear Dr Xaviar

Please find attached the official letter with regard to Rob King and my visit to your research station.

Looking forward to our meeting.

Best Regards

CHEMINOVA A/S
Nathaniel Lam, Regional Sales Manager - Asia
Mobile: +60 122 786 988

Name	Initials	Date
Dr. Xaviar		
Mr. Ho		
Encik Mursih Billa		
Miss Lim		
Mr. Vijiandran		
Mr. Joel Michon		
Miss Heemaashini		
Mr. M.A. Naidu		

From: Nathaniel Lam
Sent: Tuesday, November 02, 2010 5:21 PM
To: 'uprd4@tm.net.my'
Cc: 'xaviar_agro@yahoo.com'
Subject: Visit to UP on 22nd November 2010

Dear Dr Xaviar

Thank you for making time during my last visit to your research station. As discussed I confirmed the visit of Mr. Rob King, Cheminova's Business Manager for Asia to your research station on the 22nd November. We would like to explore possible cooperation with UP using Cheminova's crop protection inputs in the production of oil palm.

Proposed the following:-

- 10.00am - Arrival at UP Research Station
- 10.30am - Field visit and discussion on Cheminova's products
- 1.00pm - Lunch
- 2.00pm - Other matters

I will be sending the official letter soon as my scanner is being fixed today.

Best Regards

CHEMINOVA A/S
Nathaniel Lam, Regional Sales Manager - Asia
Mobile: +60 122 786 988

This message has been scanned by TM antivirus for viruses and spyware and found to be clean.

11/4/2010

From: UPRD [mailto:uprd4@tm.net.my]
Sent: Tuesday, January 18, 2011 3:37 PM
To: Nathaniel Lam
Subject: Re: Flutriafol half life

Dear Sir,

Thanks and greetings to you. Does Cheminova have an alternative of bagworms other than monocrotophos?

Thank you.

Regards,

Dr. Xaviar Arulandoo

UPRD

From: "Nathaniel Lam" <nathaniel.lam@cheminova.com>
To: "UPRD" <uprd4@tm.net.my>
Cc: "Eric Harrestrup Andersen" <Eric.Andersen@cheminova.com>; "Rob King" <rob.king@cheminova.com>
Sent: Wednesday, January 19, 2011 1:33 AM
Subject: RE: Flutriafol half life

Dear Dr Xaviar,

I have copied our Global Insecticide Technical Manager, Eric Anders look into Cheminova's portfolio of insecticides and revert to us.

By the way, is there any decision as to what we can do with our Flutr plantation?

Best Regards

CHEMINOVA A/S

Nathaniel Lam, Regional Sales Manager - Asia

[tps://mail.google.com/mail/?ui=2&ik=0c24b823a2&view=att&th=12f4d59c0a675088&attid=0.2&disp...](https://mail.google.com/mail/?ui=2&ik=0c24b823a2&view=att&th=12f4d59c0a675088&attid=0.2&disp...) 4/22/2011

Appendix 14 a



13th April, 2011

Mr. C. Mathews
Group Manager
Human Resources and Environment,
Safety and Health,
United Plantations Berhad,
Jendrata Estate, 36009,
Teluk Intan, Perak
Malaysia.

Dear Mr. Mathews,

RE: Alternatives for monocrotophos

Thank you for the query mentioned above.

With regards to the use of alternative insecticides for trunk injection against bagworms for palms above 2m, we are not aware of any other effective alternatives besides monocrotophos, as permitted under the Malaysian Pesticide Act 1974 (amended 2004).

In this context, our potential collaboration with United Plantations on the management of bagworms will look into the use of biological control agents for long term sustainability in concert with the use of other environment-friendly measures.

Thank you.

Dr. A. Sivapragasam
Senior Scientist
CABI Southeast and East Asia

Cc: Dr. Loke Wai Hong, Regional Director,
CABI-SEA

CABI is not a profit organisation

<p>CABI improves people's lives worldwide by providing information and applying scientific expertise to solve problems in agriculture and the environment.</p>	<p>CABI South East Asia Regional Centre, PO Box 210, 43400 UPM Serdang, Selangor, Malaysia</p> <p>T: +60 (0) 3 89432921 F: +60 (0) 3 89426460</p>
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P01/91

ID=608 89426499

04-13-11 14:55 CAB INTERNATIONAL

Project Proposal 2: Management of bagworms through an integrated ecological approach with biological agents

Background

CABI is firstly not in a position to work on or develop alternative systemic insecticides for trunk injection in oil palm owing to there being no suitable alternative insecticides in the market that can be developed by end-users for this purpose. The only avenues for progress would be for new molecules or formulations to be developed and these are clearly the purview of the agrochemical companies, which CABI is not.

Proposed collaborative action

CABI, feels that there is good prospect in the enhancement of sustained management of bagworms by the use of biocontrol agents, particularly predators and entomopathogens. Field levels of these biological control agents are generally low to be of impact –and thus the need for pesticide applications. However, our proposition to mass produce key biological control agents with technologies available with CABI followed by their inundative releases in the field, allows suppression of bagworms on a regular basis and substantially reduce pesticide applications. When realised, this will be a first for the oil palm industry (and of course UP) and will go a long way in bolstering UP's already advanced journey towards sustainability of palm oil production."



JABATAN PERTANIAN
(Department of Agriculture)
BAHAGIAN KAWALAN RACUN PEROSAK
(Pesticides Control Division)
TINGKAT 4 - 6, WISMA TANI
JALAN SULTAN SALAHUDDIN
50632 KUALA LUMPUR
MALAYSIA

Tel: 03-20301400 Faks: 03-26917551



Ruj. Tuan :
(Your Ref.)
Ruj. Kami JP KRP
(Our Ref.) 207/12/705
1/1(2)
Tarikh 18 April 2011
(Date)

Senior Executive Director,
United Plantations Bhd.,
Jenderata Estate,
36009 Teluk Intan,
Perak.
(Att: Mr. C. Mathews)

Dear Sir,

Use of Monocrotophos

I refer to your letter dated 15th April 2011 on the above mentioned matter.

I hereby certify that monocrotophos is registered in Malaysia. This active ingredient is registered at a concentration of 55% w/w in the soluble concentrate (SL) formulation for use in the control of artona and nettle caterpillars as well as bagworms in Oil Palms and Coconut. The Pesticides Board, Malaysia under the Ministry of Agriculture and Agro-based Industries, Malaysia has allowed registration of a total of 9 products. This means that monocrotophos products registered under the Pesticides Board, Malaysia can be imported, manufactured, and sold for use in Malaysia. However, the use of this active ingredient is restricted only for the application through trunk injection. This active ingredient is also controlled under the Highly Hazardous Pesticides Regulations 1996 which further regulates the safe use of monocrotophos by the employers and workers.

Thank you.

Yours faithfully,

(HALIMI MAHMUD)
On Behalf Secretary,
Pesticides Board, Malaysia.

UNITED PLANTATIONS BERHAD
(Incorporated In Malaysia)
COMPANY NO. 240-A

TELEPHONE : + 6 05 6411 411
TELEFAX : + 6 05 6411 876 / 6 05 6417 396
E-MAIL : up@unitedplantations.com
WEBSITE : www.unitedplantations.com

REGISTERED OFFICE:
JENDARATA ESTATE,
36009 TELUK INTAN, PERAK,
MALAYSIA.

29th October 2010

Puan Nursiah Mohd Tajol
Pengarah
Bahagian Kawalan Racun Perosak
(Pesticide Control Division)
Jabatan Pertanian
Jalan Sultan Salahudin
50632 Kuala Lumpur

Dear Puan,

**RESEARCH ON PESTICIDE - REQUEST FOR DISPENSATION ON
ACEPHATE THAT IS NOT IN ACCORDANCE WITH THE USES
STIPULATED ON THE LABEL, AS APPROVED BY THE
BOARD – PESTICIDE ACT 14 A (5)**

As Acephate is approved by the Pesticide Board strictly for coconut and oil palm below 2 years by foliage spraying only for the control of bagworm; we wish to request for a special permit to conduct trials with Acephate by *trunk injections* on oil palms above *2 meters length* for control of bagworm.

We would be much obliged if our request is granted, as we are evaluating various alternatives to monocrotophos for control of bagworms.

Thank you.

Yours faithfully
UNITED PLANTATIONS BERHAD


C. Mathews
Group Manager Human Resources And
Environment, Safety & Health
CM/am

cc : The Executive Director (Corporate Affairs), UP Bhd
cc : The Executive Director (Finance & Marketing), UP Bhd
cc : The Director of Research, UP Bhd