FARM OPERATORS' BEHAVIOURAL INTENTION TOWARDS SYNTHESIS PESTICIDE PURCHASE IN MALAYSIA

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ABSTRACT

This paper analyses factors influencing Malaysian farm operators' behavioural intention towards synthesis pesticide purchase. The research framework proposed was empirically tested using data collected from 118 farm operators in Malaysia. The result from the finding suggested that supplier's flexibility is significantly and positively affect Malaysia farm operators' behavioural intention towards synthesis pesticide purchase. Meanwhile, the routine purchase is significantly but negatively affecting Malaysia farm operators' behavioural intention towards synthesis pesticide purchase. However, the trust did not serve any moderating effect between independent variables and the dependent variable. The result of this study allows authorities such as the Department of Agriculture and the Pesticide Board of Malaysia to have better clarity in strategised their resources to counter the illegal pesticide issue. Marketing practitioners from the agrochemical company would benefit from this result to align their marketing strategy for their pesticide based on farm operators' behavioural intention of purchase.

Keywords: Behavioural Intention; Synthesis Pesticide; Farmers; Malaysia.

INTRODUCTION

Food security has become an alarming issue since the recent food crisis on staple food in several countries after China, Vietnam, and India limited their exporting of rice to other countries (Nordin et al, 2014). Fortunately, the contribution of the agriculture sector in Malaysia is increasing and becomes more obvious in recent years. Malaysia's staple food production showed an increment especially both important commodities which are paddy and oil palm in 2019 (Department of Statistics Malaysia, 2019).

Various researches indicated that pesticides improved agriculture's performance in terms of production (Terano et al, 2016; Schreinemachers et al, 2011). The trend of increasing synthetic pesticide application does not only happen in upper-middle-income countries but also in high-income countries which previously been reported as reducing in relying on synthetic pesticides for production. The positive relationship between the intensity of pesticide application and yield per hectare has also been reported in many countries (Schreinemachers & Tipraqsa, 2012).

The increasing figure of pesticide sales since 2005 also indicated that the increase in application intensity. The total sales of pesticide and agrichemicals products in Malaysia increased from RM 1.11 billion in 2012 to RM 1.47 billion in 2018 (Statista, 2019). Malaysia has been a net exporter of agrichemicals for the past few years where China, Indonesia, Australia, Thailand, Japan, and the Philippines are the biggest market for manufactured pesticides. Among the three main groups of pesticide, herbicide contributes the most in overall trading follow by insecticide and the least important group is fungicide (Malaysia

Agribusiness Directory, 2019).

Conceptual paper by Alizah et al. in 2012 pointed out a worrying trend on Malaysia's growers and smallholder's behavior in dealing with pesticides. As report, growers in this region are literate and ignorance towards the recommendation, unfamiliar with agrochemical, mixing several pesticides in one use, desperation to protect their interest that leads to misuse, decide which pesticide to use base on hearsay, pesticide option influence by middleman and creditors, and also types of agrochemical chosen including illegal and banned pesticide. This situation led to the concern of consumer safety and the conservation of the ecosystem (Khan et al., 2018). Paddy area under The Muda Irrigation Scheme Kedah also reported that there were residuals of banned pesticide namely endosulfan (Ismail. et al., 2012).

Widespread, misuse and banned pesticides could bring damages to the Malaysian agriculture sector. Furthermore, there are very limited studies on farm operators' behavioural intention towards pesticides purchase in Malaysia's agrochemical industry. Most studies only revealed the factors affecting farmer's decisions on pesticide application. Thus, this study aims to understand which factors are responsible to induce pesticide behavioural intention to purchase among farmers in Malaysia. Besides that, this study also wanted to understand how the trust will give impact on behavioural intention when related to the factors that will induce behavioural intention. Data collected will able to give certain insight to regulatory bodies on the reason why an existing farmer would still choose banned pesticides over legally registered pesticides as what induced the behavioural intention. Agrochemical marketing practitioners will be able to gain better clarity from the result in aligning their strategy to their core competencies.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Stakeholder Theory

Stakeholder theory is developed by Freeman (1984) to present as an alternative form of strategic management due to the increase of company operations complexity globalisation and competitiveness. Freeman (1984) stated that business organisations should concern about the interest of other stakeholders when making strategic decisions which previously shareholders are the only target to the management concern. This concept is getting more attention from the academic point of views (Mainardes, et al., 2011), stakeholder theory allows the management to understand the environment of their business better and have better clarity on who are stakeholders and which of them required management attention (Salem et al., 2018).

Despite stakeholder theory is widely applied, however, the definition of stakeholder has been vagued to a certain extent. There is no standardised definition of the "stakeholder" concept and a total of 66 different concepts have been recorded for the term "stakeholder" (Freudenreich et al., 2019; Rose et al., 2018). There is study suggested that among all the concepts proposed, there are rules that should be followed into certain extend which is the company should considerate the needs, interests, and influences of individual or groups who have impact on or may be impacted by the company's policies and operations (Lawrence & Weber, 2016).

Stakeholder theory contributes to the development of stakeholder management. Stakeholder management is important to identify, analyse, and evaluate the nature and

characteristics of stakeholders that influencing or being affected by organisational practices. There are three fundamental factors should be included in stakeholder concepts which are the company/organisation, the other actors, and also the nature of the organisation-actor relationships. Another important proposal on the concept of stakeholder summarised that stakeholder is connected to organisations and able to guide the actions of that particular organisation (Freudenreich et al., 2019).

Behavioural Intention

Behavioural intention is widely studied in previous literature initially based on the Theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975). TRA proposes that a person's behavior is strongly influenced by his or her intention to carry out a particular behaviour. A person will most likely have the behavior if he or she intended to act. Other definitions of intention from previous studies shown very high similarity was also being suggested. The intention also defined as subjective judgments that a person will behave or react in the future (Chahal & Kamil, 2018; Wong et al., 2020).

This logical relationship between intention and behavior serves as the fundamental idea in previous studies to predict purchase behavior across different industries. The researcher is interested in purchase intention as it has been well recognised as the most influential and reliable precursor of purchase behavior. The positive relationship between purchase intention and purchase behavior give more insight and clarity to marketing practitioner on the overall market. Probability of purchase risen when the behavioural intention increase (Abadi, 2018; Asif et al., 2018; Lee & Lee, 2015;). Behavioural intention is not only applicable to predict purchase behavior of tangible goods but also services offered by a service firm (Roy et al., 2018). Moreover, behavioural intention is not affected by the presents of control factors such as demographic factors (Webb & Sheeran, 2006). Hence, it is crucial and important to predict the purchases of agrochemicals of Malaysia farmers through behavioural intention to addressed food security and environmental-related concerns (Rezai et al., 2013).

Industrial Purchasing

Industrial purchasing is considered as a most important function to an enterprise due to it involves a large proportion of enterprise income, possible output disruptions due to the purchasing disruption, product design based on purchasing function and shorten the cycles of product development through more complex materials (Laios & Moschuris, 2001). Despite its important role, organisational buying is however very complicated due to challenges such as economics dynamic, availability of raw materials, political stability, price fluctuations, competitions, and innovation on new technologies (Kraljic, 1983; Lindgreen et a, 2013). On top of that, most researches have been carried out on mature and stable economies, while studies on emerging economies are still lacking. Thus, lacking a universal typology of buying decision approaches is expected (Brashear et al, 2011).

Considering most of the farm is a small business entity that produces fresh goods, the researchers paid extra caution on the theory applied. There has been an argument on the most purchasing theory that is not suitable to imply the small company but rather more appropriate to targets large companies. It is, however, limited literature is available on buying behavior in small companies probably due to the priority is given to large corporations with huge sales

volumes (Ellegaard, 2009; Morrissey & Pittaway, 2004). The small companies paid attention to how to ensure a planned production running (main operation) rather than invest time to formalise their purchasing strategy. Hence, it is expected that delivery, price, and quality of the purchased goods played an important role in small companies (Ellegaard, 2009).

Supplier's Flexibility

The supplier's flexibility refers to the characteristic of a supplier on how flexible they respond to customer's needs. Customer needs such as delivery time, customisation of the product and inventory control will change from time to time. Thus, the flexibility provided by suppliers plays the main role for a customer to purchase from them (Sinčić Ćorić et al, 2017). Other literature referred to supplier's flexibility as the capability of suppliers to manage production resources and uncertainty to improve flexibility in fulfilling the various requests of their buyers. These processes involve supply chain management which is not a matter for an only individual firm, improving supplier's flexibility has become decisive criteria in getting the business as it will eventually improve the manufacturer's performance (Chu et al, 2012).

Several different flexibilities revealed that volume flexibility and mix flexibility have strong positive and direct relationships with customer satisfaction in the manufacturing industry. Among these two, volume flexibility is the most important flexibility factor in ensuring customer satisfaction from the supplier (Zhang et al., 2003). In manufacturer points of view, quantity flexibility and timing flexibility contribute to reducing supply chain cost and important for innovative products and items that require longer lead-time (Milner & Kouvelis, 2005). Greater supplier's flexibility gives them more advantages of responsiveness in the competition. Suppliers with the ability to change their production quantities promptly (volume flexibility), at the same time able to produce multiple products or changeover from one to another (mix flexibility), are more competitive compare to other suppliers (Chu et al., 2012). Hence, the first hypothesis was developed as below.

H1: Supplier's flexibility is positively affected farm operators' behavioural intention towards synthetic pesticide purchase.

Routine Purchase

Routine purchase refers to purchasing activities based on experiences (Sinčić Ćorić et al., 2017). The different situations might lead to repeat purchases from the same supplier. More importantly, this behavior can be predicted through the previous purchasing experience and information related to the current purchasing (Alshurideh, 2014). Previous literature suggested that a future purchase is more likely to happen if the customer has previously purchased and consumed the products or services directly. The probability becomes higher if the past purchasing experiences were positive (Clow, et al., 2005).

The small companies have been reported that they normally involve suppliers for problem-solving in a fairly small matter. Due to their lack of resources to scan for more suppliers, a small company tends to repurchase from the same supplier most of the time. This explains why research showed that a small company is a customer with high loyalty (Ellegaard, 2009). Previous studies showed that routine purchase is highly influenced their behavioural intention to purchase with same suppliers (Ellegaard, 2009; Sinčić Ćorić et al., 2017). Routine purchasing may have several benefits to farmers which include reducing

perceived risk, reduce uncertainty, increased perceived quality, and reduce transaction costs (Bengtsson & Servais, 2005; Kotler & Pfoertsch, 2007; Mudambi, 2002). Hence the second hypothesis is developed as below.

H2: Routine purchase is positively affected farm operators' behavioural intention towards synthetic pesticide purchase.

Trust

Trust in inter-organisation is defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" (Stallman & James, 2017). A simpler definition adapted by Terpend and Ashenbaum (2012) is a combination of belief in the other party's honesty and a belief that they will not act opportunistically when presented with the opportunity to do so. Trust as a coordination mechanism has always thought to be a positive factor in business relationships (Terpend & Ashenbaum, 2012). Trust serves as an important factor in reducing risks and improve business competitiveness in a challenging business environment (Stallman & James, 2017).

Buyer and sellers are said to be interdependent in the market to improve their businesses. Several factors that played different extend of the roles have been identified. Among these factors trust, reputation, quality, satisfaction, dependence, delivery, price, relationship-specific investments, and communication have been reported to influence the small company buyer-seller relationship (Ellegaard, 2009; Ismail et al, 2013).

Trust has been studied as a moderator factor between antecedent and outcome variables in the buyer-supplier relationship in terms of relation continuity (Morgan & Hunt., 1994; Wagner et al., 2011). Trust also found to be improving the interaction of supplier and buyer to become more relational as it moderating the effect of interdependence on the relational orientation of the exchange (Izquierdo & Cillan, 2004). Hence, hypotheses for the moderating variable is developed as below.

H3(a): Supplier's flexibility is positively affected farm operators' behavioural intention towards synthetic pesticide purchase with a greater level of trust from buyers towards suppliers.

H3(b): Routine purchase is positively affected farm operators' behavioural intention towards synthetic pesticide purchase with a greater level of trust from buyers towards suppliers.

Research Model

In this study, the researcher adopted the determinants of industrial purchasing developed by Sinčić Ćorić et al. (2017) to explore the factors that might influence pesticide behavioural intention to purchase among Malaysian farmers. Two variables were identified namely supplier's flexibility and routine purchase. A final research model for this study is shown in Figure 1.

Figure 1: Research Model
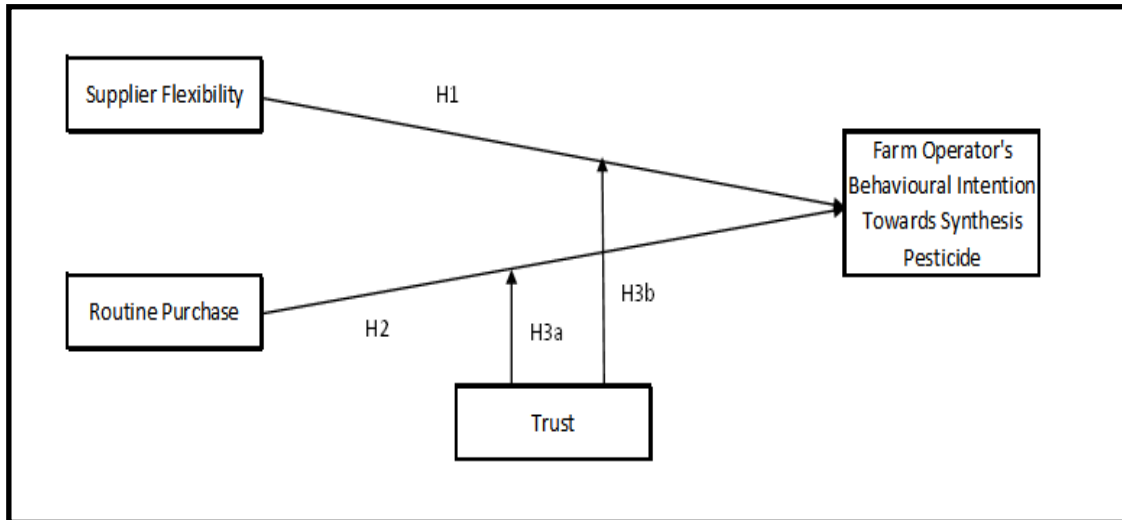
METHODOLOGY

Samples

This research was conducted through quantitative research. A questionnaire was utilised to collect data for data analysis. Data analysis was the approach for the researcher to testing and conclude hypothesises derived from the variables. This study was conducted among farmers in Peninsular Malaysia which were available to the researcher. The target group of this research limited to the person in charge of a farm which including farm owners, farm managers, and farm supervisors who will decide or influencing the decision in purchasing synthetic pesticides for their operating farm. There is however no target registered list that able to represent the whole farmer population in Malaysia. Hence, this research acquires a non-probability sampling method. The sample size for non-probability is pointed out as no rules and ambiguous which contrasts with the probability sampling technique (Saunders et al, 2019). In this study, a total of two predictors that may influence farm operators' behavioural intention towards synthesis pesticide purchase. In terms of deciding the minimum sample sizes, a software called Gpower 3.1.9.3 was used and the effect size was chosen at 0.15 (medium level) which is higher than Becker et al. (2016) recommendation of 0.10. Based on the result, the minimum sample sizes needed for this study was 107.

Measures

The questionnaire used in this survey was split into two sections to collect different information. The first section of the questionnaire was designed in such a way to collect sociodemographic information and farming profiles of target respondents. To ensure the respondent fall into the correct population, they were required to states their position which most accurately represents their status. Following that, farm location, gender, age, ethnicity, and education level were requested in the questionnaire. Others questions in this section

which are farm acreage, experiences with synthetic pesticide, and crops they planting will provide insight into the respondent background.

The second section of the questionnaire was developed to determine the factors affecting pesticide behavioural intention to purchase among farmers in Malaysia. Each variable to be examined in this research will have an independent subsection with an explanation for a better understanding. The respondents were asked to rate each statement using a five-point Likert-scale ranging from 1 for strongly disagree to 5 for strongly agree. Items for behavioural intention were adopted from Ha, et al. (2014). Meanwhile, all the items for the supplier's flexibility and routine purchase were tailored from Sinčić Ćorić, et al. (2017). Items for the trust were modified from Jena, et al. (2011).

Data Analysis

Data collected were analysed using Statistical Package for the Social Sciences (SPSS) software, version 24.0. Descriptive analysis was carried out to gain the frequency of each variable that the researcher was interested in. Kaiser-Meyer-Olkin (KMO) was performed to test if the sample size is sufficient from the data collected. A KMO score of at least 0.5 indicates the data collected is sufficient to continue with factor analysis. Bartlett's Test of Sphericity was done and the score should be lesser than (<) 0.05 to proceed of factor analysis (Hair, et. al., 2018). Scale validation was carried out using confirmatory factor analysis, four factors have been identified based on the initial framework. In this analysis, principal component extraction method and Varimax rotation were applied. Validity and reliability test were tested through Cronbach's Alpha value. Cronbach's Alpha is the value indicating the reliability of a tested domain. A variable should be dropped if the value is lower (<) than 0.5. In terms of quality, Cronbach's Alpha value is considered good if it is more than 0.7 and 0.5 to 0.7 is considered moderate reliable (Pallant, 2001). Pearson's Correlation analysis was performed to check the linear relationship between the dependent variable, independent variables, and moderator. The significance level in this particular test indicates the correlation strength between those variables. Finally, multiple regression analysis was performed between dependent variables and independent variables. A total of three regression models have been carried out in this study. The first model was carried out to test between independent variables and the dependent variable. The second model of regression analysis includes a moderating variable towards a dependent variable. The third model of regression tested the interaction of independent variables and moderator. The result will indicate the contribution of each variance and its significant levels of tested variables among the model.

FINDINGS

Profile of Respondents

Respondents for this study are a farmer who is currently still active in farming. The farmers were asked regarding their location, gender, age, ethnicity, education level, farm acreage, experience in using the pesticide, and types of crop planting. This study collected responses from a total of 118 farmers across Peninsular Malaysia. The summary of the respondent's demographic profile is presented in Table 1.

Table 1: Demographic Attributes of the Respondents

Demographic Variables		Frequency	Percentage (%)
Status	Farm Owner	90	76.3
	Farm Manager	12	10.2
	Farm Supervisor	11	9.3
	Farm Labor	5	4.2
Farm Location	Johor	11	9.3
	Kedah	60	50.8
	Kelantan	3	2.5
	Pahang	3	2.5
	Perak	12	10.2
	Perlis	14	11.9
	Pulau Pinang	15	12.7
Gender	Female	6	5.1
	Male	112	94.9
Age	21-30	41	34.7
	31-40	41	34.7
	41-50	32	27.1
	51-60	4	3.4
Ethnicity	Chinese	37	31.4
	Malay	81	68.6
Highest Education	SPM or lower level	80	67.8
	Bachelor Degree	21	17.8
	Diploma	13	11.0
	Postgraduate or higher level	4	3.4
Acreage	0-10 acres	53	44.9
	11-20 acres	27	22.9
	21-30 acres	10	8.5
	31-40 acres	8	6.8
	41-50 acres	4	3.4
	51 acres & above	16	13.6
Experience	0-5 years	53	44.9
	6-10 years	44	37.3
	11-15 years	14	11.9
	16-20 years	2	1.7
	21-25 years	2	1.7
	26-30 years	3	2.5
Planting Crop Vegetables	Fruit	27	22.9
	Paddy	10	8.5
	Oil Palm	75	63.6
	Rubber	2	1.7
	Others	1	0.8
		3	2.5

Reliability and Validity Testing

The reliability and validity of the measurement instrument are also known as the goodness of measure (Hair, et al., 2018). Factor analysis is one of the methods that normally applied to validate the reliability and validity of measurement scales (Sekaran & Bougie, 2016). Factor analysis can only be performed if there are univariate and multivariate normality within the data (Child, 2006). Confirmatory Factor Analysis (CFA) was applied in this study as the factor structure of a set of observed variables were based on theory or past studies or both. Whereas Exploratory Factor Analysis (EFA) is applied to cluster the factor of set underlying observed variables without prefix number of the domain (Hair et al., 2018).

The reliability of the survey instrument was tested by Cronbach's alpha coefficient to measure internal consistency. A validity test needs to be carried out for every item that constructs the study to ensure the data used for measurement instruments will be able to carry out factor analysis (Hair, et al., 2018). Principal component extraction (PCA) and Varimax rotation (orthogonal) have been carried out in this study. PCA ran to extract domains. Various standards or cut-off point was used in previous studies to decide if an item should be dropped from the domain which including the main loading value of more than (>) 0.5 and 0.3 (Sekaran & Bougie, 2016). The researcher is allowed to set their cut-off point based on pragmatic reasoning for a better analysis if many complex variables are present (Yong & Pearce, 2013). The lower factor loading scores show that the dimensions of the factors are less accounted for by the studying variables (Yong & Pearce, 2013). In this study, the cut-off point was set at 0.4 for the main loading and if there is no more other loading value more than that (Hair et al., 2018). Any item which is not fulfilling the main loading value more than 0.4 and cross-loading value of 0.4 will be dropped. Each factor loading value for the item in variables can be found in Table 3. Base on the simple rule of thumb of more than (>) 50 samples will be adequate for an accurate correlation matrix. On the other hand, the determinant must not be zero to run the factor analysis (Sekaran & Bougie, 2016; Hair et al.,2018).

Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) have also been done to check on the sample adequacy. The researcher is looking for a minimum KMO score of 0.5 and Bartlett's Test score of less than (<) 0.05 (Bartlett, 1954; Kaiser, 1974). All independent variables (supplier's flexibility and routine purchase) were run through a validity test together, whereas moderator (trust) and dependent variable (pesticide behavioural intention) were analysed individually. None of the variables having a KMO score < 0.5 and Bartlett's Test score > 0.05.

Pearson's Correlation analysis shows the level of correlation between independent variables and a moderating variable towards the dependent variable. The result is shown in Table 2 where supplier's flexibility, SF (r=0.201, p<0.05) is positively correlated with pesticide behavioural intention (BI) and significance at 0.05 level. Whereas routine purchase (RP) is also found to be significantly correlated towards BI but it is correlated negatively (r = 0.331, p<0.01).

Table 2: Pearson's Correlation Analysis

	Behavioural intention	Supplier's flexibility	Routine purchase	Trust
Behavioural intention	1			
Supplier's flexibility	0.201*	1		
Routine purchase	-0.330**	-0.008	1	
Trust	0.100	-0.360	0.084	1
Mean	3.53	4.00	3.01	4.08
Standard deviation	1.02	0.63	1.08	0.66
Cronbach's alpha	0.91	0.72	0.67	0.83

*Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Table 3. Factor Analysis for Independent Variables and Moderating Variable

| Variables	Measures	Factor loading	Sources
Supplier's flexibility (% of variance explained = 17.75%)	Our farm only wants to purchase pesticides from the company that is willing to customise their products according to just for us.	0.803	Sincic Coric et al. (2017)
	Our farm only wants to purchase pesticides that can be changed to fit our pesticide application practices.	0.483	
	Our farm only wants to purchase pesticides that are willing to be sold in a quantity that we require.	0.863	
	Our farm only wants to purchase those pesticides that willing to change their delivery procedures to fit our needs.	0.471	
	Our farm would most likely purchase pesticides from the companies that are able to adjust their product according to our requirements.	0.585	
Routine Purchase (% of the variance explained = 12.83%)	When our farm purchases pesticides that we used to bought, we rarely ask for new information.	0.809	Sincic Coric et al. (2017)
	When our farm purchases pesticides, we rarely search for new suppliers and their products.	0.814	
	Our farm always chooses the pesticides that offer the cheapest price.	0.506	
Trust (% of the variance explained= 60.68%)	This supplier keep promises it makes to our farm.	0.75	Jena et al. (2011)
	This supplier is trustworthy.	0.75	
	This supplier is genuinely concerned that my farm operation succeeds.	0.83	
	When making important decisions, this supplier considers our farm's welfare as well.	0.84	
	Our farm believes that this supplier keeps my farm interest in mind.	0.72	

Independent variables: KMO = 0.631, Bartlett's Test of Sphercity = 0.000***
Moderator variable: KMO = 0.78, Bartlett's Test of Sphercity = 0.000***

Hypothesis Testing

Multiple linear regression analysis was applied to test the research hypotheses in this study. Three models of regression analysis carried out. The results were extracted and summarised in Table 3. In model 1, only 14.8% variation of pesticide behavioural intention was explained by two independent variables. Durbin-Watson value from the analysis shown that the error is independent as the value falls between 1 to 2.5 (Hair, et al., 2018). Supplier's flexibility has a beta value = 0.198 and p-value = 0.023 which indicates that it is significance at 95% confidence level (p<0.05). The supplier's flexibility has a positive and significant relationship with pesticide behavioural intention. Thus, Hypothesis 1 (H1) is supported. In the other hand, routine purchase shows its beta value = -0.328 and p-value = 0.000 which indicates a significance relationship at 99% confidence level (p<0.01). Based on the result, Hypothesis 2 (H2) is not supported as shown in Figure

Figure 2: Empirical Results
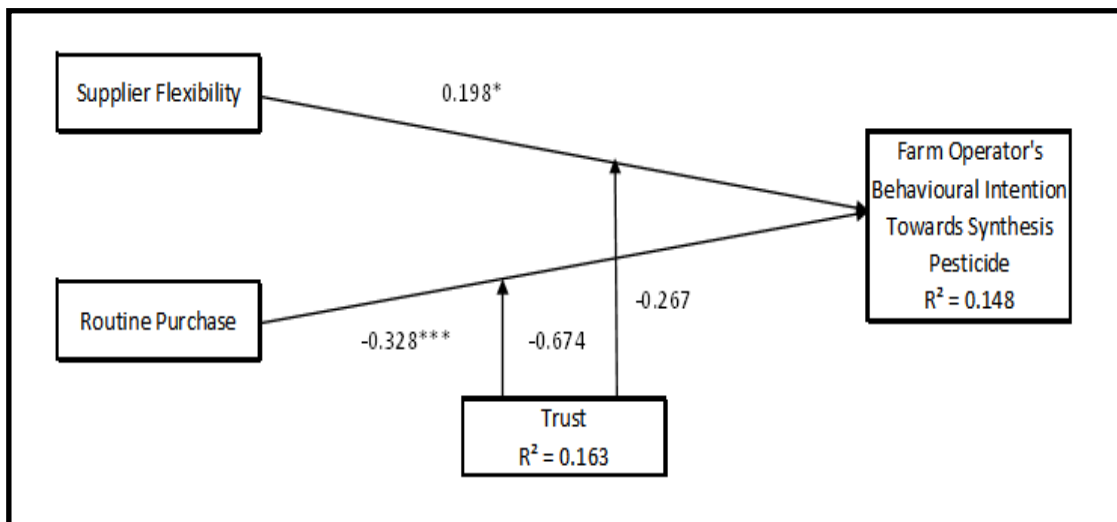
Model 2 showed a slight rose of R-square value to 0.150 after inserting moderator variables into the testing model. The significance of the model remains high (0.000) as in Model 1. Durbin-Watson value 1.148 as well falls within the range of 1 to 2.5. Trust as the moderator variable is however scored a beta value = 0.519 and p-value = 0.605 which indicates that it is positive but insignificance related to pesticide behavioural intention to purchase among Malaysian farmers. Model 3 shown that Hypothesis 3(a) [H3(a)] and Hypothesis 3(b) [H3(b)] are not supported. Both independent variables were found to be negative and insignificant towards pesticide behavioural intention in the interaction of trust. This result proves that trust does not work as a moderator in pesticide behavioural intention to purchase among Malaysia. The result is presented in Table 4.

Table 4: Results of Multiple Regression Analyses

Variables	Dependent Variable: Pesticide Purchase Intention (PI)					
	Model 1		Model 2		Model 3	
	B coefficients	p value	B coefficients	p value	B coefficient	P value
Supplier's Flexibility	0.198	0.023*	0.200	0.023*	0.401	0.549
Routine Purchase	-0.328	0.000***	-0.332	0.000***	0.257	0.572
Trust			0.519	0.605	0.500	0.473
SF x TR					-0.267	0.769
RP x TR					-0.674	0.189
R^2	0.148		0.150		0.163	
R^2 Change	0.148		0.002		0.013	
Durbin-Watson	1.131		1.148		1.158	
Sig. of Model (p)	0.000***		0.000***		0.001***	

*$p<0.05$(5%), **$p<0.01$ (1%), ***$p<0.001$(0.1%)
Note: SF = Supplier's Flexibility; RP = Routine Purchase; TR = Trust.

DISCUSSION

According to the findings, the supplier's flexibility has a positive and significant relationship with pesticide purchase intention among Malaysian farmers. Due to the limited study on pesticide purchase intention from previous studies, the researcher is lacking comparable material for this result. The flexibility of production volumes is recognised as one of the main considerations in supplier selection (Choi & Hartley, 1996). The supplier's flexibility is previously reported as an important factor that drives the company's performance in manufacturing firms (Avittathur & Swamidass, 2007; Chan, et al., 2009). Comparing to agriculture cultivation, it is reasonable to relate the farmer would concern about the flexibility of a supplier able to provide due to various uncontrollable variables such as weather that might favor infection of pest and disease. Hence, the flexibility in acquiring agriculture input including pesticide will become crucial in securing their production.

The uncertainty of various factors in the farming sector will most possibly welcome flexibility. Flexibility is normally adopted as an adaptive response to environmental uncertainty which makes the relationship between uncertainty and flexibility become a critical issue (Prater, et al., 2001). Flexibility helps a producer to respond efficiently and immediately to market changes. Improve the flexibility of the logistic system is another strategic response to environmental uncertainties as well (Barad & Sapir, 2003). Higher supplier's flexibility capabilities will be emphasised if higher levels of perceived environmental uncertainty imposed (Sanchez & Perez, 2005). Studies on other industries showed that the producer's agility depends on its supply chain flexibility (Avittathur & Swamidass, 2007). Similarly, a firm's supply chain flexibility is directly and positively influenced by the level of flexibility available in manufacturing and its sourcing process which is the supplier's flexibility (Swafford et al., 2006).

Furthermore, the farmer is highly concern about their production flexibility regardless

of them consciously aware of it or not. Manufacturing or production flexibility is considering one of the strategic dimensions which have many types when they first gain attention in the 1980s. The producer may appropriately enhance one form of flexibility and discard another form of flexibility to remain or improve their competitiveness. More importantly, flexibility is considered as a response to environmental uncertainty by the producer (Browne, et al.,1984; Swamidass & Newell, 1987). However, there are limited studies on the degree of production flexibility in the farming sector.

The result from our finding revealed that routine purchase has a negative and significant relationship between routine purchase and pesticide purchase intention among Malaysian farmers. The result indicated that the more a particular pesticide routine purchase done by farmers, the less intention they would like to purchase on that pesticide. The assessment of routine purchase towards purchasing highly depends on the group of customers that are being targeted. Previous literature stated that different group of customer reacts differently toward routine purchase where ad hoc buyer has the least price-sensitive will perceive routine purchase as not important even they are doing a routine purchase. The study even suggested that suppliers can sell the same goods at a higher price to ad hoc buyers. Other groups of customer namely prudential buyers, centralised buyers, and economic buyers weighted routine purchases on a more important scale (Sinčić Ćorić, et al., 2017).

Our study did not segment respondents into the corresponding buyer group as mentioned. Hence, it has a very low chance to tell how routine purchase plays an important role in different segments among farmers in Malaysia. Furthermore, the farm owner (76.3%) is dominant in our respondent target. Based on this finding, it is possible to suggest that a farmer who owns a farm in Malaysia might majority consist of ad hoc buyer. Farmers are possibly switching between brands and rotate with other pesticides very fast as well since the experiences do not contribute to future purchasing. Agrochemical companies might need to adopt a different strategy to build up brand loyalty towards their product beside based on user experience alone.

Pesticide resistance to the pest is an alarming issue globally. Pesticide resistance might build up on pest towards a specific active ingredient due to continuous application. High selection pressure through a single active ingredient eventually causes the resistance issue. Hence, approaches to counter the issue through insecticide resistance management (IRM) strategies have been introduced. One of the methods suggested to release the selection pressure is management by multiple attacks through pesticide rotation and mixture (Sawicki & Denholm, 1987). Hence, a pesticide which previously purchased and used by farmer might not be their first choice in the coming purchase. The farmer could consider the pesticide alternation approach in managing pest resistance problems in their farm during purchasing.

The final finding on trust revealed that it has no significant effect on serving as a moderator in pesticide behavioural intention to purchase among Malaysian farmers. It does not moderate the relationship between the supplier's flexibility and routine purchase towards pesticide behavioural intention. However, other studies revealed the importance of trust in industrial purchasing. In business to business context, the trust is cited as an important mediator to several factors including a commitment to industrial buyer relationship and influence of communication (Saleh, et al., 2014). Trust plays significant roles in improving inter-organisational relationships performance (Palmatier, et al, 2007). Previous literature focusing on trust in industrial purchasing discussed on purchase behavior where real purchasing made before the stronger trust that was built. The result from this study suggests that trust might not be appropriately applicable to predictor such as behavioural intention in

agrochemical context.

This study applies stakeholder theory to evaluate the relationship between stakeholders on behavioural intention in the agrochemical industry. Stakeholders in this industry are farmers as the client and supplier who are involved in selling the pesticide to the farmers. The relationship between farmer and supplier has been identified as a mutual power dependence relationship. Both suppliers and farmers need each other to sustain their business. The farmer will have a very huge risk if no pesticides available and pesticide suppliers need a farmer to purchase the pesticide they are selling.

Limitation and Suggestion

There are limited studies available on pesticide behavioural intention, hence, this study adopts a literature review from other industries which is mainly the manufacturing industry. Considering the core activity of cultivation/ planting/ farming is also producing an output through the production process, it is safe to say that the manufacturing industry is closer to agriculture production compare to other industries. Besides, the distribution of farmers responded to this survey was uneven, most respondents were from north Malaysia and they are cultivating paddy. Differences would occur among different areas and different crops due to several factors. First, paddy is a seasonal crop that required farmers to follow strictly to the planting time frame. Whereas vegetable planting requires more frequent pesticide applications due to the short life span. Commodities' prices might also contribute to different perspectives towards the application of pesticides and other agriculture inputs. Prices for certain crops are highly fluctuating such as rubber and vegetables compare to fixed price crops like paddy. This could give different results due to the segmentation of farmers has not been carried out.

Based on the limitation mentioned in the previous section, several suggestions for future research were proposed. First, industrial purchasing factors adopted by this study shown there was a gap in reflecting the real situation among farmers in Malaysia. As the result showed, only two independent variables namely supplier's flexibility and routine purchase are related to behavioural intention. Finding from this study also shows that the relationship between IVs and DV are weak and only explained a small part of the relationship between suggested variables and farmer's behavioural intention in Malaysia. Second, a similar study framework for other agriculture input is most likely to cross-reference with the current study. Other agriculture input including fertiliser, seeds, and other non-asset inputs. Through cross-reference with other studies, it is very likely to give more clarity regarding the agriculture market for stakeholders who are involving. Third, since there is no similar study carried out before for this particular topic, the relationship between pesticide behavioural intention and purchase behaviour of Malaysia's farmer is still lacking. Further studies should be carried out in testing the connection strength between behavioural intention and purchase behaviour.

CONCLUSION

Ever since the pesticide has been introduced into the agriculture sector, the usage and rate of adoption have increased dramatically. Due to the misuse and overuse of pesticides, it has affected the environment and every component in the ecosystem. Farmers in Malaysia are

generally less sensitive to environmental issues. Things are however changing slowly in a recent era where regulation and improvement on cultivation technology have improved gradually. Improvement of the new cultivation method including introducing newer active ingredients from the agrochemical company has provided more alternatives to extremely hazardous chemicals that have been used in the previous generation. The number of generic agrochemical companies in Malaysia has been increased lately. More generic products are offered in the market at an affordable price. Unfortunately, banned pesticide users and suppliers are still existing. Thus, it is important to discover what are the factors that trigger the farmer's behavioural intention towards synthesis pesticide purchase to provide a better alternative for the farmer. Meanwhile, policies regulator and related authorities such as the Department of Agriculture (DOA), Malaysia Agricultural Research and Development Institute (MARDI), and Pesticide Board would benefit from such market insight in providing safer alternate solutions to the grower through extension services. Authorities can also align farmers in using the correct pesticide accurately to improve their yield, thus improving the contribution of the agriculture sector in Malaysia's s gross domestic product (GDP).

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