



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



**CARIBBEAN
FOOD
CROPS SOCIETY**

37

**Thirty Seventh
Annual Meeting 2001**

Trinidad and Tobago

Vol. XXXVII

THE POTENTIAL USE OF FARMER FIELD SCHOOLS WITHIN THE ENGLISH SPEAKING CARIBBEAN

David Dolly, Department of Agricultural Economics and Extension, School of Agriculture, University of the West Indies. Trinidad and Tobago

ABSTRACT: Farmer Field Schools (FFS) have become a useful institution in facilitating an integrated approach to Integrated Pest Management (IPM). It has been viewed as an impressive advance in IPM implementation over the last decade (Ter Wheel and Van Der Wulp, 1999). Its impact is well documented among the rice production systems of small farmers in The Philippines, Indonesia, Vietnam and India. For instance in Indonesia following the implementation of FFS, rice farmers were able to reduce pesticide use by 60% with an accompanying yield increase of 13% (Kairo, 2000). Similarly in the Philippines there was a recorded 80% decrease in the use of insecticide among vegetable growers. There have also been many success stories out of Central America. This presentation explores potential use of this methodology within the English Speaking Caribbean.

INTRODUCTION

Excessive Pesticide use among growers is a key concern to the global interest in Sustainability. Pesticides pose serious health hazards to women, men, girls and boys. They contaminate the environment. They exacerbate crop production problems by building pest resistance, eliminating natural enemies of pests and encouraging the use of allegedly safer but more expensive products. According to FAO, 520 species of insects and pests worldwide 150 plant diseases and 113 weeds are resistant to pesticides (FAO 2000). There is also the chance that farmers loose touch with more indigenous control methods to which they were accustom and which may not use much pesticide.

The region has fallen prey to excessive chemical pesticide use. There is an efficient and highly successful agribusiness which markets pesticides and which farmers customarily rely on, especially for routine guidance. Many farmers can easily obtain credit and subsidy support for chemical use which would not be available for non-chemical alternatives. Occasionally the region is the recipient of obsolete stock, which is outlawed in their countries of origin. Pesticide laws themselves are either obsolete, non-existent or disobeyed.

Growers are still unable to interpret dosage requirements. They hold strongly to the philosophy of quick visible kills without respect to post harvest intervals. Storage facilities are poor, so is the disposal of used containers and the use of leak-free machinery. There is the often-reported use of "cocktails" which at times contain up to 4 or 5 pesticides in a daily routine and especially close to harvest in order to ensure a good-looking harvest for the consumer. There is minimal or non-existent pressure from the consumer who is either very ignorant of what is taking place or very helpless to demand improved standards.

Thus in keeping with the philosophy of IPM, this paper asks how can the farmer field school concept become a useful institutional mechanism within the English speaking Caribbean in order to minimize quantities of pesticides used while maximizing productivity?

CURRENT IMPORT- EXPORT TRENDS

The Tables 1 and 2 below indicates the current trends of Import and Exports into and out of Trinidad and Tobago.

Table 1. Agricultural Insecticide Exports and Imports (kg) to and from Trinidad and Tobago for the period January to September 2000. Source CSO, Port of Spain, Trinidad and Tobago.

Country	Imports	Exports
Anguilla	-	80
Antigua and Barbuda	-	960
Barbados	-	366
China	1,609	-
British Virgin Islands	-	40
Dominica	-	420
Germany	29,560	-
Grenada	-	1717
Guyana	-	5011
St Kitts Nevis	-	1122
St Lucia	-	139
St Vincent & the Grenadines	-	5
United States of America	43,910	-

Table 2. Imports of Agricultural Insecticides, Fungicides, and Herbicides (Mkg) into Trinidad and Tobago for the years, 1985, 1990, 1995-2000. Source CSO, Port of Spain, Trinidad and Tobago.

Year	Insecticides for Agricultural Use	Fungicides in Packets	Herbicides in Packets
2000	1.41	0.11	0.34
1999	0.43	0.15	0.56
1998	1.59	0.13	0.70
1997	0.39	0.16	1.44
1996	0.33	0.14	0.35
1995	0.33	0.08	1.21
1990	0.60	0.17	0.10
1985	0.67	0.33	0.10

Table 1 indicates that this country has imported the bulk of its needs from the larger countries in the business namely: China, The USA and Germany. In return this country has no export business to them. It also engages in “re-exporting” to many of the smaller territories within the region. The largest recipient of exports is Guyana followed by Grenada and St Kitts- Nevis. These countries therefore have a dependency which may not be appropriate in controlling what pesticides they purchase.

With respect to Table 2, the quantity of Insecticide imported for Agricultural use has doubled since 1985. There has been less Fungicide in packets since 1985. Generally Fungicide imports are lower than the other Pesticides. Also since 1995, there has been a tendency to import less Herbicide in packets. One speculation about Herbicide use is that previous users could be returning to manual weed control or the noticeably popular (throughout Trinidad and Tobago) method of using a “String Trimmer” device.

THE FARMER FIELD SCHOOL

The school operates as a network, which facilitates interaction between the decision-makers viz. The Extension workers, Technical Expertise of varying institutional origins, The Farmers, Researchers and other useful contributors. All become stakeholders in a quest to reduce pesticide use and costs, minimize health risks and contain environmental hazards. The idea is that farmers will be encouraged and trained to observe specific trends of pest infestations on a designated plot owned by one of them. They would be encouraged to understand the modes of life and habits of crop pests in relation to their surroundings. Different environments become targets of comparisons. So one major point of contrast becomes the plot with pesticide applications versus the one without. In so doing they would understand

the real effect (if any) of chemical control on any yield increases and decide whether the cost of the pesticide applications could be minimized. To obtain maximum success there must be a high quality relationship among the stakeholders.

CURRENT SITUATIONS

Specialist crop protection technical and extension experts from Antigua (Gore, 2000), Belize (Magloire, 2000), Grenada (Phillip, 2000), Haiti (Donis, 2000), Jamaica (Chung, 2000), Saint Vincent and the Grenadines (Edwards, 2000) and Trinidad and Tobago (Ramroop et al., 2000) reflected on pest control practice and related issues within their respective Agrarian environments. A review of their reports reveals several current situations as follows:

- In most countries there is an understaffed crop protection unit unable to cope with all the possible pest control initiatives.
- There is an Extension link with farmers which is still “top down” in its approach despite more recent sensitivity to “bottom up” approaches. Accompanying research is lacking especially due to a shortage of funds.
- Agricultural input suppliers dominate the transfer of pesticide technology
- Farmers still prefer to use broad-spectrum pesticides, which are readily available but do not easily focus on specific pest targets. Despite this prevailing situation some farmers are becoming aware of newer target specific pesticides and biopesticides
- There is a lack of policy on Integrated Pest Management or any type of pesticide control. Where policies exist, much revision is needed.
- Biological control mechanisms have become popular since its successful use in the control of the Hibiscus Mealy bug.
- The experts define IMP more in the context of cultural practices, not necessarily thinking about a truly integrated concept.
- Some countries, which have poorer farmers, have a better record of limited pesticide use.

Given these circumstances the FFS will need much new support preferably organized from a new operation with linkages to existing units. Research and Development funds for the required networks will need to be sought. Given the dominance of pesticide importers, it may be useful to respect their stakeholder status and incorporate them in the process. Can such an entity employ IPM officers or share a state cost for this purpose? A likely outcome of their participation is that they may have to agree to lower volume of sales to maintain their business. Network decisions are expected to help this major decision.

Can consumers and middlemen be part of the funding process by being made to pay a tax to help fund the schools’ activity? A strategy, which promotes the use of pesticide-free products, can help this process. Environmental and Ecotourism groups could also be persuaded to join IPM networks.

Any new operation will organize the growers and choose lead participants for their indigenous knowledge, keen observation skills and their influence of reasonable proportions of other growers. This mobilization would challenge existing patterns of selection where Extension Officers tend to be selective of clients on biases of class, income, ethnicity, age and gender. Even consumers can be made to be a part of the network observing trends among pest populations and in post harvest circumstances. It would also be important to assess the large proportion of parttime farmers within the sector. They may need special incentives and persuasions to become part of any fulltime involvement within FFS networks.

Farmers can be credited with strategic and practical powers of observation, given the fact that their daily livelihoods depend on the agricultural products they produce. It is essential to understand that they have become industry driven in this era of postmodern development. No longer are Caribbean farmers food producers for an exclusive niche immediately surrounding their farms. Hence in observing how to increase output from the farm, they know that maximum yield and a blemish free product is an answer to survival. In so doing they excel in the use of unwarranted quantities of many products. A large number of

them may still be unable to comprehend instructions on labels without misinterpretation and subsequent overkills and abuses to the environment. The quest of the Farmer Field School in the Caribbean is how to contain these approaches while helping farmers to sustain their livelihood and equity status within communities.

CASE STUDY

A case study of a recent farm visit further illustrates this dilemma.

On a visit to Farmer Dell he had three plots of vegetables namely Eggplant, Tomato and Corn. The former two were still in production and the corn crop had just been completed. There were two dead birds, apparently "freshly killed" by stomach poisoning. They were found among the corn stalks perhaps having mistaken pellet granules of a preemergent herbicide for grain. His eggplant plot looked healthy and he was harvesting the following day for the local market. However he chose to spray the previous day with a 'cocktail' of pesticides with varying post harvest intervals. On being questioned about this practice, he said he had to do this so that when he harvested fruit, the parent plants would be ready to continue production for the following week. Still there were reasonable quantities of white flies and other pests, which seem completely adapted to the high levels of pesticides present in the plots.

Dell complained of a persistent symptom of unexplained joint pains, which he noticed has eased since he employs someone else to spray. He has had little formal education and don't think he can be employed in any other occupation but vegetable crop production.

Dell does not think that he would easily join a farmer's group as the executives of such organizations only look after themselves and he would not derive benefits from his participation. August 2000.

This is the typical small farmer from Trinidad and Tobago. He is part of a total population of approximately 6,000, which helps to feed the island's 1.2 million population and possibly the hotel, restaurant and other service industries. It would be difficult yet important to reorient his thinking to the FFS concept. He is not easily persuaded by neighbors, hence not readily inclined to adopt new group rules, which will pertain to information sharing among them. Given his dependence on the continuous cash flow for the standard of his livelihood, the FFS model may have to help the farmers find a diversified perspective for their small businesses.

An additional perspective pertains to a misunderstanding that the FFS is a panacea solution to all pesticide problems. Extension and other outreach agencies will need to inform personnel about the precise definition of the school. Currently it addresses specific needs in crop production.

Within the Caribbean region, it is possible to create networks among other types of practitioners such as the home gardeners, the livestock farmer and the homemaker who for instance may have a severe mosquito infestation, which cannot be controlled by regular aerosol spraying. These are new challenges for the FFS concept.

Pest management problems arise from two sets of use changes namely those of Human use, where human beings make new demands, acquire new taste and become victims of new marketing arrangements. Secondly those of changes in the natural system through pest introductions and pesticide resistance (Norton, 2000). This paradigm must influence the thinking of policy and decision makers. Can tariffs and other trade interventions curb unwarranted introductions to the region? Can the new mandates of the World Trade Organization influence policy and method in order to enhance IPM approaches? These are important research questions.

Consumers can be encouraged to understand their taste patterns and possibly realize the potential value of more local, fresher, minimally processed foods in their diets. Researchers may also need to monitor the introduction of new biological pests, biological pesticides and other such product interventions, which may eventually become an unsustainable entity within the natural system. What I conclude from these points is that there needs to be a new thrust in research, which refreshes options for

crop production and other options pertaining to pesticide use in other occupational domains. Many researchers will need to retool their capacities to be successful interveners in the development process.

The typical Gender issue of the invisible female will need to be addressed in the new FFS paradigm. The distinct Gender Division of labor does exist in the region. Females still perform specialist agricultural assignments while carrying out their caring functions in the home. Many of these assignments are invisible to their spouses, other males, researchers and extension workers. Therefore women must not be obliterated from the FFS networks because of this invisibility. If so, there is the likelihood that their best roles in the process may be undermined much to the detriment of the change processes involved.

EXPERIENTIAL LEARNING

From the perspectives of Extension Teaching methods, the FFS School is an attempt at Experiential Learning. This is a learner-centered approach where the farmers will learn from experience. It is a paradigm recognized since the late twentieth century whereby learning provides opportunities for a person to engage in an activity, review it critically, draw some useful insight from an analysis and apply the result in a practical situation. The FFS will use Experiential learning in order to provide an effective IPM strategy. A graphic representation is illustrated in Figure 1 below

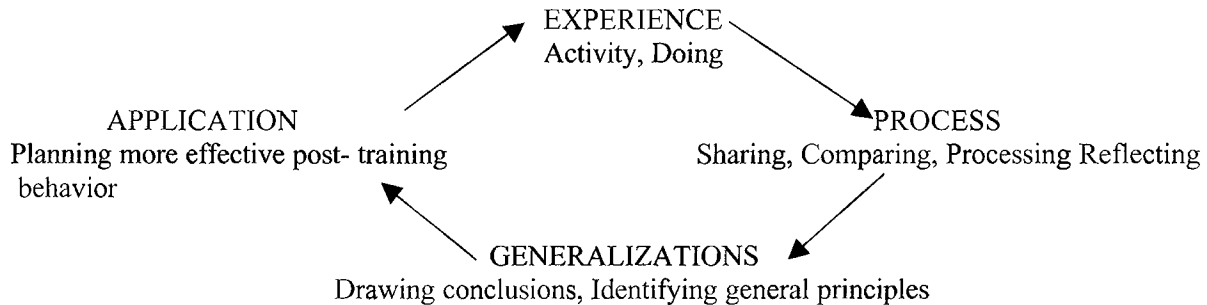


Figure 1. Experiential Learning. TC110: Instructional Methods and Course Requirements Page AE-18. University of Wisconsin, Madison 1989.

This challenges the linear model, which has a top-down relationship in which Research and Development resides at the upper end and the farmer at the lower. The model assumes that the farmer will be engaged only in the 'lower order' thinking areas of Recall Remember and Recollect. Frequently they are regarded as too poorly educated to even do this very well. This model is illustrated in Figure 2

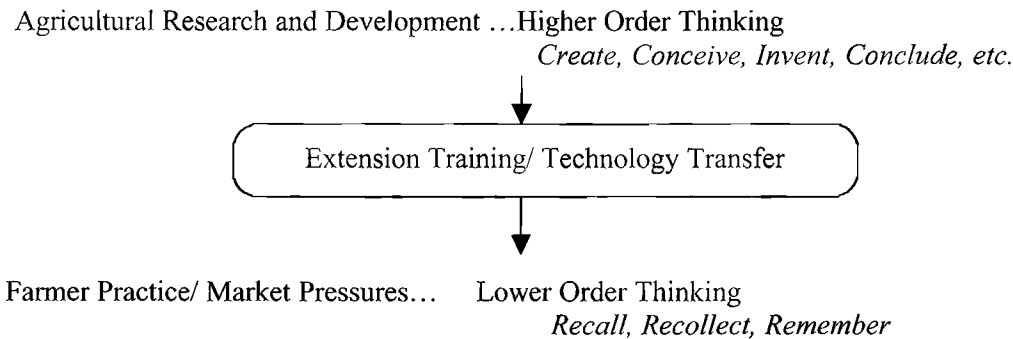


Figure 2. The Linear Model of Technology Transfer. Adapted from Norton 2000 and Grasha 1987.

The new approach of the FFS is to engage higher order thinking among the farmers. They are expected to reflect, consider, reason, invent and conceive. This newer change model where relationships are realigned is illustrated in Figure 3.

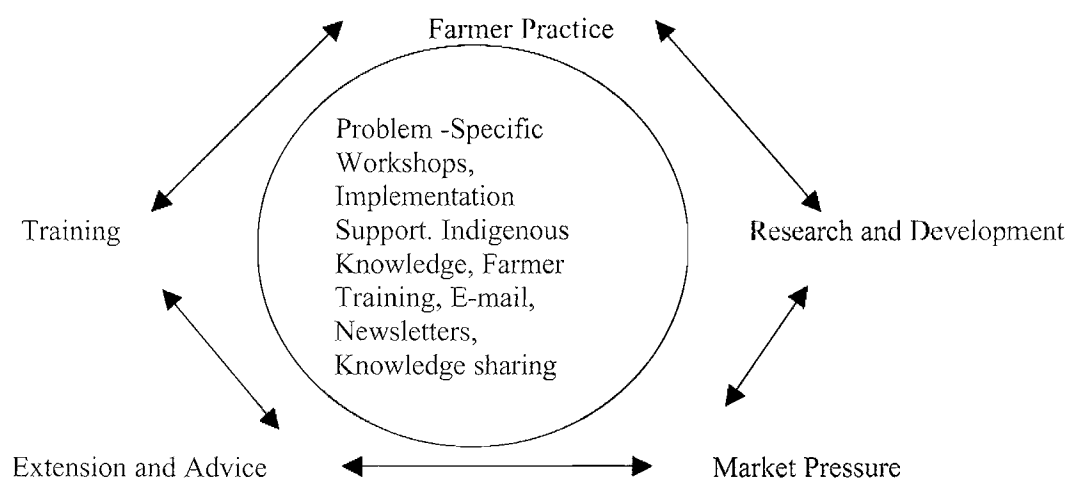


Figure 3. Model of realigned relationships required for The Farmer Field School. Adapted from Norton 2000.

This model challenges the Extension-Research linkages to become much more involved with clients. Within the region all the intended activities of such an integrated system are present. However the intensity of operation and interest is lacking especially with respect to involving the larger population of typical small farmers. They are constrained by many reasons previously mentioned. There is still much casual interest in Indigenous knowledge. Networks are weak and biased. Implementation support usually lacks funds for effective completion. Market pressure is mounting almost to the point of latent intimidation. So much work will be needed in order to reorient Extension- Research systems into the FFS paradigm.

CONCLUSIONS

It is firstly concluded the FFS idea is not currently implemented within the region. Many odds are against its proliferation. Farmers are using exorbitant quantities of pesticides and may not easily be inclined to change. Neither are they inclined to network discussions about pesticide use and attendant IPM. Some stakeholders are ignorant of the methodology and liken it to Cultural practice control and Biological control. Some of the stakeholders like the consumers, female farmers and the environmentalist are currently invisible. They must become visible.

FFS needs an Extension teaching methodology, which is well known but never easily practiced in the English speaking Caribbean. If it were to be implemented it would halt a thriving pesticide business and affect the income of both the farmer and the input supplier in unpredictable ways.

The use of FFS is therefore thwart with constraints, which must be challenged. It would be important to organize the stakeholders for learning. In so doing the region needs to understand the big difference between knowledge based on recall and deeper forms of understanding. All learning is rich, complex and occasionally unpredictable. (Ewell, 1997) Hence all stakeholders in IPM must be immediately identified and an attempt must be made to build an effective learning environment, which can foster collective knowledge and active discussion among the desired FFS networks.

Then learning about curbed pesticide use, pest behavior and plant host reaction must shift from the teacher-centered stage to the learner-centered stage. The networks are expected to facilitate learning in the context of compelling “presenting problems” with reflection, reworked patterns, reworked

relationships and connections. The objective is to improve an understanding of the pest problem and identify the full range of opportunities for improving IPM.

Like all successful Extension work, stakeholders should use “bite-size” attacks on the problem. Given the proliferation of small farmers juxtaposed fewer but influential large producers, careful decisions need to be made about where to start the process and which networks should initiate the process. Authorities must start with few networks, which can focus on the specific problems and achieve results, which could serve to gain political mileage and enhance popularity within the Agricultural community.

Therefore much work needs to be done if the Farmer Field School concept is to be implemented in the English Speaking Caribbean. When doing so it would be important to be sensitive to sound “bottom up” Extension methodologies and ensure a realignment of relationships among carefully identified stakeholders. Eventually with key, appropriate activities in place the region will boast of similar successes as its Asian and Central American counterparts.

REFERENCES

- Chung P. 2000. IPM/ICM for vegetables and other crops in Jamaica: Status potential and problems with particular reference to implementation. Presented at the Workshop on Farmer Participatory Methods for Ecological Crop Management. September 11-15 September 2000, Trinidad and Tobago.
- Donis J. Haiti Country Paper Presented at the Workshop on Farmer Participatory Methods for Ecological Crop Management. September 11-15 September 2000, Trinidad and Tobago.
- Edwards S. 2000. Pest Management in Saint Vincent and the Grenadines. Presented at the Workshop on Farmer Participatory Methods for Ecological Crop Management. September 11-15 September 2000, Trinidad and Tobago.
- Ewell P.T. 1997. Organising for Learning- A New Imperative. AAHE bulletin, Chicago. USA. Experiential Learning. Instructional Methods and Course Requirements. TC110. August 1989. CAVE, University of Wisconsin, Madison. USA.
- Gore J. 2000. IPM/ICM for Vegetable and other Crops in Antigua and Barbuda: status, potential and problems. Presented at the Workshop on Farmer Participatory Methods for Ecological Crop Management. September 11-15 September 2000, Trinidad and Tobago
- Grasha A. Teaching with Style Alliance Publishers.
- Kairo M. 2000 Farmer Participatory Methods: Scope for Use in the Caribbean. Working paper prepared for The Regional Training Workshop on Farmer Participatory Methods for Ecological Crop Management. September 11-13, 2000, Macoya, Trinidad.
- Magloire F. 2000. Country Report- Belize IPM/ICM for vegetables and other Crops. Presented at the Workshop on Farmer Participatory Methods for Ecological Crop Management. September 11-15 September 2000, Trinidad and Tobago.
- Norton, G.N. 2000. Farmer Participatory Methods. Paper presented at the National CIPNET Committee, Trinidad and Tobago. Department of Agricultural Economics and Extension.
- Phillip G. 2000. Country Report –Grenada Presented at the Workshop on Farmer Participatory Methods for Ecological Crop Management. September 11-15 September 2000, Trinidad and Tobago.
- Ramroop D. 2000. Integrate Pest Management/ Integrated Crop Management for Vegetables and Other Crops in Trinidad and Tobago; Status, Potential and problems. Presented at the Workshop on Farmer Participatory Methods for Ecological Crop Management. September 11-15 September 2000, Trinidad and Tobago.
- Ter Weel P., Van Der Wulp, H. 1999. Participatory Integrated Pest Management Policy and Practice. Document 3. Netherlands, Ministry of Foreign Affairs and Development Cooperation, The Hague.