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Food safety in farmer participatory learning: The Trinidad and Tobago experience

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ABSTRACT

The growth of the agricultural sector in Trinidad and Tobago can be considered to be slow relative to other sectors. There is, however, great potential in the agriculture sector to generate more public attention and investment. While the relative contribution of this sector to the gross domestic product (GDP) is merely 2.5 to 3%, it employs approximately 10% of the country’s labour force. Thus, agriculture continues to play an important role as a result of its economic and social impact (GORTT/PPAB 2000). Crop production alone accounts for 64% of the agricultural GDP, with livestock, forestry and fisheries contributing approximately 22%, 5%, and 10% respectively (GORTT/PPAB 2000). Crop production continues to take a prominent position in highlighting agricultural issues and play a major role in the food security of the nation.

Recent developments in the Information and Communication Technology have helped raise consumer awareness and demand for safer produce as well as good cosmetic appeal and presentation. Global and regional free trade agreements together with stringent international standards have started to put pressure on farmers to produce high quality commodities for export in a very competitive environment. Farmers, however, are unprepared to meet this challenge. They have not gained the technological skills necessary to grapple with the difficult task of producing crops in an environment fraught with problems ranging from high input costs to unfavourable weather conditions and marketing of produce.

Pest management continues to be one of the most limiting factors to vegetable production in Trinidad & Tobago. Surveys conducted in 1995/96 revealed that pest control is also the single largest expense, accounting for 30 to 40% of total crop production costs (Lopez et al., 1995/1996). Surveys on management practices revealed a tendency among farmers to apply cocktails in vegetables or use pesticides according to a planned calendar without the understanding of the agro-ecological requirements of the crop (Ramroop et al., 2000). Pest management continues to rely heavily on chemical control methods alone, with negative implications to the consumer, the environment and the farmer’s health (Lopez et al., 2004). The situation is now slowly changing due to the introduction of farmer participatory learning.

There is evidently the need for safer approaches to crop production. The recent successes in the management of the Hibiscus Mealybug (Maconellicoccus hirsutus) and The Citrus Blackfly (Aleurocanthus woglumi) using biological control have proven that alternatives to pesticide use exist and need to be explored and exploited. The problem now lies in the transfer of both existing and new technologies to farmers to ensure development of their knowledge base, leading to sustainable agricultural production.

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have a range of objectives, including satisfying the needs of the market, reducing pesticide uses, increasing the knowledge for alternatives in pest management and increasing farmers' income. Both private and governmental extension entities in Trinidad & Tobago have traditionally used top-down approaches towards their clients, where the needs of the farmers are not really considered and the technology is transferred without the farmers understanding or being part of the decision-making process. Current extension methods include result demonstrations, farmer visits, workshops, seminars, printed information, media and telephone assistance.

Thus, the dissemination of research-generated information using top-down methods combined with a low extension officer to farmer ratio has rendered extension services relatively ineffective in changing farmers' attitude and approaches. There is clearly a need for a more effective mode of extension, which would allow the farmer to embrace the technology to be transferred. This is especially apparent with the agricultural community recognizing the need to implement safer alternatives for chemical control and sustainable pest management approaches.

There is a strong cadre of research that highlights the disadvantages of the top-down approach for transfer of technology to farmers (Teer Weel, 1999). The dissemination of Integrated Pest Management technologies proves to be more effective by the process of discovery learning in which farmers and other stakeholders are involved collaboratively. In addition, blanket recommendations developed for single pest scenarios in research stations often do not apply to farmers' plots, which involve pest complexes and a range of ecological factors. Social, economic and cultural factors are also often ignored, as traditional methods are less likely to allow for extended interaction or techniques in gathering information.

Farmer Participatory (FP) approaches are intended to empower farmers to make informed decisions that would be more specific to the agro-ecological environment in their own fields. It generally takes more time than traditional methods and involves a team of interested, dedicated and committed stakeholders working with farmers. During the training, farmers learn to collect, analyse and interpret data, which is then used to make decisions, based on their findings and group discussions. In other words it encourages the process of 'learning by doing'. As farmers are more involved from the beginning to the end of the extension and research process, they feel a sense of ownership and are more encouraged to embrace new technologies, and better understand systems surrounding the crops. At the same time, extensionists and researchers are more informed of the farmers needs and intellectual level, hence research is more farmer driven.

FP approaches focus on facilitation as a main mode of action where the information flow is both ways: extension staff learns from farmers and vice-versa. Facilitators provide the forum for farmers to absorb information via group discussions, field data collection, analyses, experimentation and forms of non-formal education. FP tools vary and are important for effective training and learning. They encourage facilitators to: speak the farmers language, use open-ended question, use visualization, design practicals that are related to present issues and to ask the right questions to encourage farmers to deduce the answers to their own questions.

The Farmer Field School (FFS) is a major farmer participatory strategy used to implement discovery-learning based IPM extension programmes. The training is done in
the field and often lasts for the life of a crop. Extension officers conduct the sessions and 2 to 3 facilitators train about 20 to 30 farmers. The four major principles of FFS training are, grow a healthy crop, observe fields weekly, conserve natural enemies and farmers become experts in their own field. Following FFSs, farmers can chose to have FP Research, which is geared to and instigated by the farmer. Traditionally, farmers are limited to on-farm trials where they have little in put into the planning.

FP, Integrated Pest Management (IPM) is also not restricted to certain crops or production systems. As a result, it is having a significant impact on plant protection practices in Trinidad and the MALMR is establishing national IPM programmes based on participatory IPM. This is seen as the way forward to consolidate the gains of intensified production and to make production more sustainable and environmentally sound and cost effective. Presently, in Trinidad FPA programmes have been tried and proven successful, especially with IPM. As a result of this programme, pesticide use by trained farmers was reduced to zero or near zero. While most farmers were trained in IPM on vegetables that began practising IPM in the other crops, for example, watermelon, ginger, beans etc.

With the EC-CARIFORUM, Caribbean Agriculture and Fisheries Programme an IPM Project was developed in 2002, focussing on the Farmer Field School model and using two crops: cabbage and tomato. Trinidad & Tobago participated in the project, funded by the European Union and technical backstopping by CAB International. On vegetables, the programme started with the training of a cadre of local staff to become "Master Trainers" (MT). Further staff was trained in the Training of Trainers (ToT) segment, where these trainers would conduct FP activities with farmers. Participants grew crops from seed to seed.

Ultimately there are now reports of a significant reduction in the use of synthetic pesticides and an increase in the knowledge and decision-making capacity of the farmers. Farmers also experiment with low cost materials such as botanicals as alternatives to traditional insecticides. The preliminary impact assessments studies reveal substantial reductions in pesticide use, equal or higher yields and significant increases in farmer’s profits.

The trials during the ToT formed the working background in training the participants in participatory methods and decision-making processes based on ecological observations (Agro ecosystem analysis or AESA). Analyses for data lead participants to recommend IPM practices for crop management. The emphasis was on reducing pesticide use, discovering alternatives, e.g., biological agents, and employing cultural practices thereby generally producing safer foods. Additionally, the programme was aimed at developing the human resources needed to help farmers learn about IPM and implement it in their production fields.

Different types of evaluations were done in participatory fashion and all geared to assess the participant’s level of understanding and their satisfaction towards various aspects of the training. The evaluations took various forms: written/spoken, public/private, open-ended/closed, group/individual. The daily activities in the ToT were guided by a planned weekly schedule, which followed standard times such that all field activities were undertaken in the morning, e.g., crop observation, data collection and monitoring or AESA and fieldwork. The fieldwork requirements were dictated by the result of the AESA.
The ToT trainees established two FFSs, one each on cabbage and tomato, in the Caura Valley in North Trinidad, with approximately 20 farmers. Farmers in this area generally grow mainly vegetable crops including tomato and are very conscious of the environment and the negative effects of the use of toxic pesticides. The FFS activities were dictated by the morphological stage of the crop, the activities and special topics were addressed according to the priority problems discovered during each week's activity. The ToT trainees (FFS Facilitators) have now conducted over sixteen FFS throughout Trinidad in various crops, training over two hundred and fifty farmers.

An isolate of the fungus *Paecilomyces tenuipes* from *P. xylostella* larvae on cabbage at Aranguez, Trinidad was identified by and obtained from the Caribbean and Latin America Regional Centre (CLARC) of CAB International. This was grown using rice as a medium at CLARC and the farmers participated in testing this fungus in the field for the control of DBM. There was a significant control of the DBM larvae in these marked areas. To date there is no real problem of the pest *P. xylostella* that seems to have been under control since the introduction of the fungus. Additionally the farmers have moved on and designing their own farms using polyculture systems of production. They use crop rotation, multi cropping, intercropping to help in keeping pest populations in control. Leaf fall and other crop residues in combination add more value to the soil or compost heap which all leads to producing safer foods.

In the Caura Valley, where the pilot FFS project was done in 2002 the trained farmers continued with FFS activities thereafter training other farmers in Caura and surrounding areas. With each successive crop there was the use of a lower level of pesticides and fertilizers. There was also the need to extend to include other crops and to look in-depth into alternative solutions defining production costs and profit differences between normal production and IPM. A number of potential partners and stakeholders were identified and funding was sought for an Integrated Development Initiative from the Global Environment Fund (GEF) of the UNDP Small Grants programme.

The initiative sought to develop improved technology for crop, pest and farm management, use of inputs based on the actual needs of the crop, use of environmentally friendly pest control methodology, conservation and preservation of the environment, improved social structure of the community and improved livelihood for the farmers and others.

In 2005 the FFS activities in the Caura Valley moved from a monoculture system to strip cropping polyculture with intercrops. Perimeter or border crops were used which included plantain, bananas, cassava, seim and corn. The main crops grown were tomato, sweetpepper, melongene, bodi, corn, cauliflower, broccoli, paw-paw, red cababbage, green cabbage. Several crops were intercropped: tomato/marigold/celery, paw-paw/urdi, tomato/radish, cauliflower/chive, bodi/corn, tomato/beet and cabbage/chive.

In all crops there was little or no use of pesticides and in some plots no fertilizer was used either. The application of pesticides was based on regular observation to the fields. A lot more soil and natural enemy activity was seen in the field and less incidence of disease problems. Bamboo leaves and wood chips were used as mulch, with the woodchips being bagged and packaged for sale. Marigold was also placed within some plots as a means to repel insect pests.
Several of the FFS Facilitators trained during the ToT have already implemented FFSs in their counties. Participating farmers have been attending FFS sessions held weekly in the field and learning from the dynamic ecology of the crop. Words like AESA, one of the major aspects of FFS, natural enemies, IPM and team building have now become part of their vocabulary. Most of them apply what they have learnt in the FFS in their own fields, thus, they do not apply pesticides on a pre-planned basis or use a cocktail of pesticides to treat an unknown problem hoping that ‘something will work’. Farmers involved in the programme have discovered many aspects in a range of crops, watermelons, tomatoes, cabbage, broccoli, corn, sweetpeppers, watermelons, chives, melongene, sweet potato, and hot peppers through regular field observation, logical inference, sharing and learning from their collective experiences. The farmers have found that their time was not wasted since they learnt things that enabled them to save money or helped them to obtain greater yields. They learnt that applying pesticides based on observation and identification of the problem was beneficial.

The strengths of a FP programme are many. Participatory and other social group building activities and discovery skills are applicable to a range of areas in the daily lives of farmers. It empowers them and leads to an increased awareness of their community, the environment, health issues etc. FP methods also present opportunities to test alternative approaches to pest management. There is confidence and excitement generated among the FFS facilitators and farmers about ‘fresh” alternatives to existing traditional approaches. It is also timely in terms of the current trends and demands of the process of globalisation of trade (GAP, etc.).

Because of the success stories throughout Trinidad and Tobago with FPA/FFS, the MALMR has outlined a range of short and medium to long –term goals and is presently up-scaling activities to include other crops/cropping systems. Some programs include: cocoa production, livestock, tree crops, root crops and irrigation. The results from these trials and initiatives throughout Trinidad and Tobago reaffirm the importance of farmer participation and also demonstrate that farmers can solve problems to improve their productivity when given the opportunity to do so. This response will definitely result in a better quality and safer product that in turn could command a higher price.

LITERATURE CITED


