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Qualité, économie, progrès social, environnement”**

**“What is the future of Agriculture in the Caribbean ?
Quality, Economy, Social Progress, Environment”**

**“¿ Cuál es el futuro de la Agricultura en el Caribe ?
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Ex Hotel de ville, Rue Schoelcher,
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E-mail : amadepa@wanadoo.fr
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EFFORTS TOWARDS ESTABLISHING A NATIONAL, COORDINATED PEST RESPONSE MECHANISM FOR THE GALL MIDGE (*DIPTERA: CECIDOMYIIDAE*) PEST COMPLEX ON HOT PEPPERS IN JAMAICA

C. Philip Chung, Senior Plant Protection Specialist.

Rural Agricultural Development Authority (RADA), Jamaïque. E-mail : chung_pl@hotmail.com

RESUME

En 1998, les autorités américaines de quarantaine pour la plante (USDA/APHIS) ont imposé des exigences impératives de fumigation au bromure de méthyle pour toutes les exportations de piments forts de la Jamaïque, à cause de l'éventualité de galle causée par le moucheron (*Diptera : Cecidomyiidae*) à l'état de pupe dans des cargaisons. Le Ministère de l'Agriculture de la Jamaïque a réuni un comité d'étude pluridisciplinaire du piment fort afin de développer et exécuter une stratégie de gestion. Les interventions majeures du comité d'étude étaient dans l'inspection du magasin de rangement des paquets au port, la recherche concertée, le contrôle au champ, la formation et la gestion après récolte. Au milieu de l'année 2000, les niveaux d'interception au port ont chutés considérablement, les niveaux d'infestation au champ ont aussi chuté. Un système informatisé de traçabilité du produit est maintenant presque complet. Cependant, la recherche d'un éventuel fumigène est loin d'être une réussite. En 2002, une revue demande à USDA/APHIS de considérer les cargaisons non traitées choisies sous un programme spécifique renforcé. L'approche concertée fournit un modèle vers le déploiement optimal des rares ressources. Cela facilite le système de réponse à la peste à multi-facettes, crucial pour les exigences phytosanitaires de croissance de l'environnement courant du commerce mondial.

ABSTRACT

In 1998, United States plant quarantine authorities (USDA/APHIS¹) imposed mandatory methyl bromide fumigation requirements for all Hot Pepper exports from Jamaica, due to interceptions of Gall Midge (*Diptera: Cecidomyiidae*) pupae in shipments. The Jamaican Ministry of Agriculture assembled a multi-agency Hot Pepper Task Force to develop and implement a management strategy. Major Task Force interventions were in port/pack-house inspection, collaborative research, field monitoring, training and post-harvest management. By mid-2000, port interception levels had fallen significantly; field infestation levels have also fallen. A computerized produce traceback system is now almost complete. However, the search for an alternative fumigant has so far been unsuccessful. In 2002, a review requested of USDA/APHIS made allowances for select non-fumigated shipments under a specified, strengthened programme. The collaborative approach provides a model towards optimal deployment of scarce resources. It facilitates the multi-faceted pest response system, crucial for the growing phytosanitary requirements of the current global trade environment.

¹ United States Department of Agriculture/Animal & Plant Health Inspection Service

INTRODUCTION

The current global trade dispensation emphasizes competitiveness in the production and supply of goods and services. In agriculture, international movement of pests is a major concern. This falls under increasingly strict phytosanitary regulations as in trade agreements like the World Trade Organization Sanitary and Phytosanitary measures. These regulations present formidable challenges, particularly for countries with severe resource constraints and associated socio-economic and geo-political circumstances. Inadequacies in research, extension, regulation and policy are compounded by low producer resource base, literacy levels, unsustainable life-style expectations and global inequity, all of which militate against their competitive ability.

To be effective, a pest response mechanism must readily identify the pest, assess associated risks and manage it as the situation demands. This requires ready access to information along with adequate capabilities for communication, monitoring and traceback, pest suppression and research. A lack of these facilities in resource-poor countries emphasizes the need for optimal rationalized resource use within, and indeed, among such states. This paper presents the case of Jamaican hot pepper exports to the United States and the associated gall midge pest issue, outlining the collaborative approach to management, achievements made and lessons learnt.

Hot pepper production in Jamaica (Table 1) has grown for most of the past 20 years, particularly for export to North America and the United Kingdom (Table 2) where the Jamaican Scotch Bonnet pepper is effectively a brand name. Over the period the industry has expanded significantly, earning over US\$1 m and employing some 3,000 workers at field, distributor and processor levels in 2001. The crop falls within the Ministry of Agriculture (MinAg) diversification programme.

After 1996, production levels fell sharply due to protracted droughts, pest incidence, increased export rejections due to pest contamination and consequent lowered exporter participation in the market.

Several pests affect the crop but only 2, Broad mite and an aphid/potyvirus, complex are of major field importance. Late in 1997, a gall midge pest of quarantine importance to the US was first detected, in shipments from Jamaica. Larvae feed within flower buds, fruit pedicels or fruits and necrotic lesions may appear on the pedicel of infested fruit.

In 1998, USDA/APHIS imposed a mandatory methyl bromide fumigation requirement on all hot pepper shipments from Jamaica. This removed hot pepper from the joint Jamaica-US Pre-clearance programme. This programme facilitated rapid movement through USDA, of shipments pre-inspected in Jamaica over the previous 18 years.

Besides detracting from an already poorly competitive price, methyl bromide fumigation has sometimes been observed to significantly reduce shelf life of treated fruits. At least one exporter has reported losing market share due to this factor.

After the imposition of mandatory fumigation, production levels and export volumes (Tables 1,2) continued falling as the more cautious exporters weighed their options. Since 2001 however, there has been some recovery in both these levels.

The US action presented a major test of the existing local facilities to address this phytosanitary challenge. This is due to the following:

1. Very little information exists on the pest complex: It is yet to be identified to species and no record of gall midge on hot peppers has been detected.
2. Infested fruit may show no sign at sorting yet generate an interception at the port.
3. No suitable alternative to methyl bromide is known for pepper.

4. Commitment among many producers and distributors to efficient systems management is lacking, as demonstrated in field sanitation, transport and packing house management practices which foster pest infestation.

METHODOLOGY

In response to US concerns over the first interceptions, MinAg convened a national multi-agency task force to develop and implement appropriate remedial strategies. Membership includes regulatory, research and development, extension and agri-business agencies (Table 3). An action plan was developed covering critical areas of field and post-harvest management to restrict gall midge presence in shipments. Agencies were assigned responsibilities (Table 3) to make the best use of the scarce available resources. USAID and FAO assisted with funding.

Interventions were initially based on existing literature covering two related midges along with field observations. Subsequent observations took the process forward, with interventions at strategic points along the production and distribution chain.

Coordination utilized joint inter-agency planning, regular meetings and joint or individual implementation. These promoted commitment to the plan and acceptance of delegated tasks and responsibilities, based on jointly-identified needs, established mandates and existing resources. It also helped to identify possibilities for resource access and encouraged resource sharing among stakeholders. Activities are summarized below.

MinAg Plant Quarantine/Produce Inspectorate, being the sole phytosanitary regulatory agency, conducted this work in collaboration with resident USDA/APHIS personnel.

- ✓ Pre-fumigation port (and packing house) inspections were intensified to monitor efficacy of the pre-port management systems.
- ✓ Methyl bromide fumigation was supervised by PQPI officers.
- ✓ Data recording was expanded.
- ✓ Constant dialogue was maintained with the local APHIS personnel, to enhance their appreciation of the situation and facilitate rapid feedback.

MinAg entomologists applied basic taxonomic work, with assistance from the foremost gall midge taxonomists, Raymond Gagne, USDA, and Keith Harris, International Institute of Entomology, UK. The IPM-CRSP² provided technical information and expertise. Assistance was also sought from CARINet, the regional biosystematics network of PROCICARIBE³.

The gall midge issue presented a case for developing an IPM programme. Research was done on-station. IPM tactics studied included field sanitation, mulching, trapping and pesticides use. Fumigation studies were conducted at the airport facility, CARDI⁴ and FSPID⁵ laboratories.

Training was conducted in the 2 major export centres of the island, for exporters and their agents. Farmers and rural students were trained in major production districts island-wide. Packing house management, recognition of infestation, damage caused and field management were the focus topics. Exporters assisted the process.

²The US-based global Integrated Pest Management Collaborative Research Support Project

³ The agricultural research & development network of the Wider Caribbean.

⁴ The Caribbean Agricultural Research & Development Institute

⁵ Food Storage & Prevention of Infestation Division, Ministry of Industry & Commerce

Exporters, buying agents and farmers were sensitised through meetings, electronic and print media. Simple information leaflets were also issued. Task Force members were supported by the Jamaica Information Service and individual radio stations, free of cost. Extension, plant quarantine personnel, exporters and their agents also assisted.

Three surveys were conducted by as many parties (Table 4). Two, in 2000, shared common sampling sites; looked at field infestation levels, soil and weather, socio-economic features and used Geographic Information Systems (GIS) technology. The other, in 2001, looked at incidence of gall midge, 2 other pests and rainfall.

A Web-based surveillance pilot activity began in 2002 with fortnightly sampling in 17 districts island wide to ascertain seasonal distribution of the pest.

The Jamaica Exporters' Association led the design of a computerized traceability system involving unique farmer codes affixed to shipping boxes containing their fruit. RADA would be notified of port interceptions for tracking, assessment and corrective action. This system will also facilitate development of the hot pepper export database.

Technical assistance and funding were provided by the USAID-funded IPM-CRSP which adopted gall midge as one of its research projects and FAO, through a hot pepper seed production project. Jamaica's national CIPMNet⁶ committee also placed the project among the top three crop/pest priority issues in its 1998 national work plan.

The action plan was assessed periodically by individual agencies and the Task Force. Annual reviews were also conducted by IPM-CRSP since their involvement in 1999. In 2001 December, USDA/APHIS at the request of the Ministry of Agriculture, conducted a special review of the programme.

RESULTS & DISCUSSION

Initially, packing-house inspections often revealed lax sanitation practices, associated with the high interception levels in 1998. After 2 years, notable reductions were observed in these levels (Table 5). From a high of approximately 1 interceptions per thousand cases shipped in 1998, it fell to a low of 0.02 in 2000. This followed greater care in sorting and grading. The action plan had apparently achieved some success. Subsequent increased interceptions in 2001 might reflect increased exporter comfort zone due to mandatory fumigation, making less effort to exclude symptomatic fruit from shipments.

Surveys showed a decline in farms infested from 51% to 28% between 2000 February and 2001 August (Table 4). In 2000 July, improved field management was observed, compared to 2000 February, although with a smaller sample size. The 2001 survey precluded a similar comparison, highlighting the need for greater adherence to assigned roles to optimise resource use. The exercise however, furthered a more scientific approach to extension work by officers involved, though with room for improvement.

The Web-based surveillance activity is intended to show midge population trends, detect pest-free periods and guide buyers to low-infestation areas. Recent flood rains, budgetary cut-backs and low staff morale due to the associated uncertainties, have hampered consistency of activity.

⁶ Caribbean Integrated Pest Management Network of PROCICARIBE

The concept of Pest-free areas is accepted USDA. However, survey and surveillance results so far, make this unlikely for the pest complex in Jamaica. Attention has thus shifted to possible pest-free periods: The accepted positive correlation between midge infestation and rainfall and Jamaica's marked dry seasons, will facilitate the concept.

In the single IPM trial, complete reaping of infested fields significantly reduced field infestation levels and plastic mulch showed promise. Colour traps failed. A lack of infestation at the experimental station over subsequent seasons, hampered repetition of this trial. Due to a lack of farmer support and programme follow through, the more complicated option of on-farm trials, was not utilized.

In 2 trials, methyl bromide fumigation effectively killed the insect but sometimes caused premature fruit breakdown, apparently influenced by pre- and post-fumigation storage conditions. The fumigant magnesium phosphide, accepted by USEPA⁷ for other fresh produce, offers a slim possibility on hot peppers, due to an excessive treatment time. One trial proved inconclusive. There was inadequate involvement of existing facilities with this most important activity. A comprehensive determination of the effects of fumigants on treated fruits is needed to clarify the issue of fruit breakdown, that could jeopardize sustained market share.

Pest identification has been a major challenge but success achieved so far promises a taxonomic milestone. Neither of the 2 leading taxonomists worldwide, has been able to identify the insects. However, MinAg morphology work suggests two unrecorded species of Cecidomyiidae: One feeds on flower buds alone; the other feeds on pedicels and fruit.

Post-training assessment of the farmer training programme in the eastern half of the island, though biased, showed significantly increased knowledge of the pest complex and recommended management practices. Exporters, given their shared interest, assisted through consistent contact with farmers. Adoption by RADA, of formal training evaluations introduced, will facilitate enhanced extension training impact.

The computerized traceback system is under review and efforts are being made to synchronize its list of some 200 farmers, with the national farmers' register. Geographic Positioning Systems technology is being incorporated to expedite locating farms. Already, interest in the model is being expressed from other Caribbean states.

Subsequent to the above, Jamaica sought a review by USDA, of the mandatory fumigation requirement. That evaluation of the Action Plan resulted in a 10-point conditional lifting of mandatory fumigation.

The major stipulations include:

- ✓ Only pre-cleared shipments are eligible.
- ✓ Participating farmers must be registered in the traceability programme and certified in a Non-fumigation programme.
- ✓ Growers in whose shipments gall midge is detected, will be suspended.
- ✓ Re-instatement will be based on field inspections by RADA
- ✓ Once the "running average" of port interceptions of all pests in pepper reaches 15% (i.e. 3 interceptions over any 20 consecutive shipments), mandatory fumigation of all hot peppers will resume.

Clarifications have been sought and preparations are underway for implementation.

⁷ United States Environmental Protection Agency

Despite shortcomings, our experience over the period re-enforces the importance of collaboration in today's global trade environment. It further illustrates the need for a paradigm shift in the approach to managing productive resources, particularly public agencies, among resource-poor states. The following are noteworthy.

Firstly, multi-stakeholder participatory planning allows a more comprehensive setting of objectives and guidance of strategies. Except for the absence of strong farmer representation and public relations, the Task Force composition facilitated this. Outside this approach, the synergies generated by this fusion of minds are often otherwise lost.

This inter-agency approach promotes a sense of ownership and the attendant levels of commitment to agreed programmes, among the participants. By avoiding duplication and promoting specialization and resource sharing, it optimises resource utilization. Where available national resources still fall short, regional and international networking provides other options. The support of PROCICARIBE and USAID-funded IPM-CRSP networks; linkages with USDA/APHIS; funding support from FAO and JEA are cases in point.

Secondly, for the collaborative approach to work well, individual agency preferences must be subordinated to the collective national benefit. In the absence of this, shortcomings such as with aspects of the survey and research components, and omissions are likely to result. Incisive leadership, re-education, at all levels, accountability and systems modification are pre-requisites for this to materialize.

Thirdly, is the importance of the major beneficiaries, the private sector, to the sustainability of the system: Willingness of producers, distributors and their workers to safeguard the industry is critical. Commitment to carry out appropriate field and post-harvest sanitation practices, are a critical case in point. Re-defined business relationships between distributors and farmers will improve efficiencies of production and distribution, thereby enhancing reliability and affordability of supply and competitiveness of the industry. An organized private sector approach can also lobby and provide leverage to secure and maintain vital inputs to a long-term strategic development of the industry. All the above require an enabling environment fostered by a comprehensive futuristic policy on agriculture, regional and international cooperation.

CONCLUSION

In today's global context, for agriculture to maintain its significant role in the socio-economy of resource poor countries like Jamaica, efficient national pest response mechanisms are critical. These require coordinated effort of strategic agencies to strengthen each other's weaknesses. The foregoing illustrates potential benefits of collaboration and disadvantages associated with either a lack of, or inadequacies in the approach. The future of agriculture in countries like Jamaica and the Caribbean, depends significantly on how well they adopt and hone this process for the collective good.

Table 1. Hot Pepper Production in Jamaica (Tonnes), 1981 – 2001

1981	1983	1985	1987	1989	1991	1993	1995	1997	1999	2001
1,229	1,978	2,191	2,120	1,725	2,595	5,975	8,431	6,923	6,363	4,438

Source: Ministry of Agriculture Data Bank & Evaluation Division

Table 2. Hot Pepper Exports from Jamaica (Tonnes), 1995-2001

1995	1996	1997	1998	1999	2000	2001
371	512	855	405	300	252	309

Source: Ministry of Agriculture Plant Quarantine/Produce Inspection Division

Table 3. Agencies and their responsibilities, Hot Pepper Action Plan, Jamaica, 2002

Agency	Responsibility
Plant Quarantine Division	Port inspections, fumigation supervision, sensitization .
Plant Protection Division	Midge behaviour, ecology, taxonomy.
CARDI	IPM, fumigation (initially).
RADA	Technology transfer, survey, public awareness.
JEA	Traceability system, sensitization.
FSPID	Fumigation.
USDA/APHIS	Oversight, feedback.

Table 4. Hot pepper gall midge incidence, Jamaica, 2000-2001

Survey date	00Jan-Feb ^a	00Jun-Jy ^b	01Jun-Aug ^c
% farms infested	51	35	28

Source : ^a - RADA, ^b - Virginia Polytechnic & State University, ^c - MinAg

Table 5. Hot pepper gall midge port interceptions, 1998-2001

	1998	1999	2000	2001
'000 cases shipped	103	75	58	42
Interceptions	104	6	1	9

Source: Ministry of Agriculture Plant Quarantine/Produce Inspection Division

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BIBLIOGRAPHY

- Goldsmith, J. Preliminary investigations into the taxonomy of Gall Midges on hot peppers in Jamaica, Paper presented at CFCS 2001.
- IPM-CRSP Jamaica Site, Annual reports: 2000, 2001.
- Thomas, C.Y. Overview of the National Hot Pepper Work Plan, Jamaica, 2001.
- Williams, R. Hot pepper gall midge survey report, IPM-CRSP unpublished, 2000.