Part III

Consultants

Chapter 9

The Role of Consultants in Vector Control

Frequently, entomological and vector control consultants or teams of multidisciplinary control personnel are needed in the period following a natural disaster. The composition of such teams will depend upon the nature of the disaster and the needs of the country. In general, the team may include an entomologist, a vector control specialist, a rodent control specialist and a sanitarian. If the country has a serious malaria problem, a malariologist should be added to the team. Any individual or team should collaborate with members of epidemiological teams and existing medical and vector control staffs.

Perhaps also needed are personnel who have had practical experience and training in the assembly, calibration, operation and maintenance of vector control equipment.

The Pan American Health Organization maintains a list of experts in these fields, some of whom have had experience as consultants during natural disasters. The Organization also has a procurement unit that is experienced in handling orders for equipment and supplies, and the unit is available to assist governments in emergency situations.

Recruitment

The Pan American Health Organization and cooperating international and bilateral agencies which provide assistance to other nations have developed a system for rapidly recruiting consultants to disaster relief efforts in cooperation with other international and bilateral aid agencies. Any country that needs this type of technical collaboration should determine the exact consultant requirements such as entomologist, technical officer, sanitarian, or malariologist, and express this need to the PAHO Country Representative so that prompt action can be taken.

Briefing and Equipment

Consultants should be briefed both before and after arrival to the requesting country. The Pan American Health Organization should furnish the consultant the following information prior to departure:

- (1) The general objectives of the visit
- (2) The expected duration of the visit
- (3) Names of contacts, especially of the officers in positions of responsibility and, whenever possible, names of entomologists, vector control specialists, civilian and military public health officials, and other potential sources of assistance within the country
- (4) The status of the disaster and its relation to potential problems
- (5) The types of supplies and equipment that the consultant should take (beyond those listed in Annex II)
- (6) A list of individuals who will supply logistic requirements, such as food, transportation, shelter and communication support
- (7) A profile of the country containing information about geographic, climatic and demographic features, political and socioeconomic conditions, past communicable disease history and the public health infrastructure
- (8) Current information concerning the following:
 - (a) The vector control staff
 - (b) Vector control equipment
 - (c) Insecticides and rodenticides
 - (d) Transportation and communication systems
- (9) Information for purposes of communication, such as:
 - (a) The address, telephone, cable and telex number of the Pan American Health Organization office
 - (b) Names and addresses of hotels, especially if the consultant is to reside in an area that is not near an office of the Pan American Health Organization
 - (c) United Nations Development Program, other United Nations, and international or national agencies which operate in the country.
- (10) Information regarding passport and visa requirements, appropriate currency, airline ticket, and excess accompanied luggage allowance.

The consultant can supplement this by reviewing information about diseases, vectors and geographical conditions of the country. Possible sources of such information are libraries, newspapers, United Nations country background reports, universities, area handbooks, other consultants' reports, and individuals with past experience of the conditions in the country. Local amateur radio operators who have contacts in the country can provide valuable additional information.

The Pan American Health Organization, other international agencies and bilateral aid programs handle arrangements for travel and local contacts. They will inform their officials within the country about the consultant's arrival and request arrangements be made to meet with the appropriate national authorities.

The local contact in the Pan American Health Organization should brief the consultant about the following:

- (1) Government contacts who work in the areas of public health, agriculture, defense, and natural resources
- (2) The current status of disaster and vector or rodent problems
- (3) Past reports about vector and rodent-borne diseases, in the possession of the Pan American Health Organization or the national government
- (4) Other assistance being provided by international agencies and organizations
- (5) Nongovernmental contacts and/or other sources of information, including local pest control firms and aerial spray operators
- (6) Any recent changes in government plans
- (7) The political or economic implications of the disaster
- (8) Road conditions and the availability of ground transportation for field work
- (9) A sample of press reports about disaster conditions.

Activities of Consultant upon Arrival

We recommended that the consultant initially contact the international or bilateral agency that arranged the visit. The emergency or disaster committee with a vector control subcommittee if one exists, should then be contacted. Whatever the points of technical contact may be, it is the consultant's responsibility to obtain a clear concept of what is required to identify his designated counterpart in the government and to maintain close communication with appropriate authorities. In most cases, the consultant will be asked to help the government assess the problem, outline control procedures and train personnel. The initial assessment may be difficult because of problems in transportation and communication. Maps and graphs prepared by the government will provide some information. However, there will be areas from which little or no information is available, and there will have to be adjustments to insufficiency of the information. There may be inventories of vector control equipment and supplies. These should be inspected as soon as possible.

Evaluation of information gathered in an early reconnaissance of the distribution, densities and stages of development of vector species is very useful. The consultant should be provided ground transportation for surveillance purposes and, if possible, the assigned vehicle should have four-wheel drive. In addition, information obtained in aerial reconnaissance can quickly provide a comprehensive overview of the areas and can give indication of possible methods of attack.

Outlining control procedures is often a difficult task. The effects of a given disaster may warrant the use of new technology to rapidly control vectors. Not all modern technology, however, is appropriate for use under all circumstances. A country may be aware of the existence of certain new types of equipment, insecticides and technology, and will seek to find out if they should be used. Sophisticated equipment may be used for the short-term relief from vector related problems. However, usual vector control methods, directed toward the larvae or the resting adults, may prove to be more effective and less expensive. Equipment that rusts on shelves kills few mosquitoes.

Recommendations and Reports

Recommendations should be practical and directed toward that which the local government actually can accomplish in vector control. However, recommendations can also assist governments in obtaining long-term goals that are only secondarily related to the natural disaster. It is worthwhile, therefore, to discuss all recommendations with members of international agencies and the government before writing them.

Reports should contain definitions of the potential for vector related problems and the current and future implications of the availability of manpower and other resources. Ongoing evaluation of the situation, as well as of training programs, is important because the primary concern in the report is that of the probability of the occurrence of future problems and future consequences. Actions that need to be undertaken at different points in time, or because the potential of vector related diseases is altered, should be clearly specified. Also to be included in the report are alternative ways to respond to problems that develop in regard to staff or equipment.

An outline of ways to implement and evaluate control measures should be presented in the report, and actions to be undertaken in the event that epidemic occurs should be suggested. A discussion of logistics of control (including work schedules, geographical areas to be covered and ways to implement control of diseases that may contribute to epidemics) should be included in the report. The report should also contain an enumeration of methods of supervising the staff and a list of supplies and equipment that are needed to augment current stocks.

The report and recommendations can provide guidelines when such are lacking, and they may also be used for educational purposes. It should be noted, however, that because of the existence of divergent opinions an entire program is rarely accepted and implemented unchanged.

Follow-up

Consultants, remembering that it is the prerogative of the country to make final decisions, nevertheless, often outline actions to be taken in the future. To assist the government, the consultant should do the following:

- (1) Be certain that everyone is briefed and that the report and recommendations are discussed before they are formally presented
- (2) Inform the international organizations and country representatives of the recommendations and discuss the possibility of the organization's involvement
- (3) Ensure that the personnel who are actually entrusted with the work, as well as the administrators, understand what they are doing and why
- (4) Brief (by letter, telephone or in person) the technical staff of the international organization about the situation and the reasons for the recommendations.

Too often, at the departure gate, consultants forget the country and its problems. In the age of instant photocopies, sending occasional reprints of scientific reports, or a personal letter is an easy method to bridge gaps that international organizations find impossible. In many instances, such little extra effort can make the difference between the success or failure of the country to implement recommendations.

Training

Weaknesses in training are never more vividly manifested than during the period after natural disaster. Vector control programs are designed to meet the needs of normal circumstances in which adequate response may follow an inflexible routine. During disasters a flexibility that is often lacking is called for. In addition, extra staff is frequently required during disasters and demands for immediate actions are made. All of this leads to confusion, waste, and tactical error. Most critics will be more concerned about these aspects than about any real progress that is made. There are few solutions to this dilemma, but a good, visible training program may lessen the critics' blows.

Because most malaria and other vector control programs have on-the-job training and annual refresher courses, continual upgrading of the courses and the educational and proficiency levels of the staff will add to the success of any surveillance or control program. The consultant, while visiting the country, should be asked to perform on-the-job training (apart from formal training courses) of national staff members with whom the consultant has contact.

Part IV

Annexes

Annex I

Bibliography

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Annex II

Suggested Vector Surveillance Equipment and Supplies

Collecting bag

Mouth or battery powered aspirators

Flashlight and spare batteries

Memo pad Pencil

White enameled dipper

Labels

Collecting vials

Bulb syringe or medicine dropper

Mirror

Collecting forms

Tea strainer

Grease pencil

Sweep net

Tweezers

Keys and other references

CDC light traps (optional)

Aedes aegypti ovitraps (optional)

Fly grill

Suggested Rodent Surveillance Equipment and Supplies

Teaching aids Transfer bags

Plastic bags Vials
Plastic cups Alcohol
Rubber bands Forceps

Scissors Insecticide dusting pan

Snap traps Formaldehyde
Live traps Acute rodenticides

Gloves Anticoagulant rodenticides

Flashlights and batteries

Annex III

Pesticides and Applications for the Chemical Control of Vectors, Rodents and Pests*

Type of Application	Pesticide and Application		Remarks	
Ants; General				
Residual indoors	propoxur diazinon bendiocarb	1.0% 0.1% 0.25%	See control recom- mendation for cock- roaches.	
Bed Bugs cimex sp.				
Rooms, beds or furniture (also chicken nests for source)	malathion ronnel dichlorvos diazinon	1 0% 1.0% E 0 5% E 0.5% E	Apply lightly to mat- tress surfaces and more heavily to bed frame. Allow to dry before using. Never apply to children's crib	
Cockroaches				
Enclosed spaces as kitchens, pan- tries or storerooms	b. chlorpyrifos c. bendiocarb d. diazinon e. dichlorvos f. malathion g ronnel	1.0% 0.5% 0.25-0.5% 0.5% 0.5% 5.0% 2.0%	Apply to hiding places and runways, use a spray and not a mist. Pay attention to warm humid places. Do not treat where children are likely to contact surfaces.	
	2 Powders in inert dust a boric acid b silica aerogel c. diazinon d malathion 3. Baits a. chlorpyrifos b. propoxur	90-99% 100% 2.0-5.0% 4 0-5.0% 0 5% 2.0%	Pyrethrins have been used as a ULV at 3-5% in unoccupied areas	

Type of Application	Pesticide and Application		Remarks	
Fleas				
1. Rooms	1. Solutions in kerosene concentrates a. bendiocarb b. malathion c. ronnel d. diazinon e. lindane	0.25% 2.0% 1.0% 1.0%	Spray floor and base- boards and walls to a height of 10 cm	
	 Powders in inert dust a. diazinon b. malathion c. carbaryl d. lindane 	ts 2.0% 4.0-5.0% 5.0% 1.0%	Avoid inhalation and contamination of food.	
	3. DDT		10 0%	
2. Animals	1. Powders of inert dust a. malathion b. rotenone c. pyrethrins d. carbaryl e. lindane f. DDT	ts 4.0% 1.0% 0.2% plus 2 0% 6 synergist 5.0% 1.0% 5.0%	Apply dust to domestic animals with small duster. Do not apply DDT, or lindanc to cats or puppies.	
Filth Flies, adult	ts			
1. Enclosed spaces, e.g houses and barns		sols in oil solutions or emul into air for 4 sec/10m ³ when 0.1% 0.5% 2% 5%	Space sprays have no long-lasting effects and must be applied frequently. Avoid contamination of food or food processing equipment. Treat garbage, refuse, manure and other fly breeding sites.	
	sion concentrates or wet solutions at 10-20 1/100m 1/100m² to give dosages of a bromophos b ronnel c fenitrothion d iodfenphos e trichlorfon f diazinon	ays in oil solutions, emultable powders (Apply 1% 2 and 5% solutions at 2-4 1-2 g/m².) 1-5% 1-5% 1-5% 1-5% 1-5% 1-5% 1-5% 1-2% dosages of 0.4 or 0 8 g/m²)	Can be used also in milk-rooms, restaurants and food stores Same as above	

Type of Application	Pesticide and Application	Remarks Animals must be removed Not to be used in milk-rooms	
	g. dimethoate $1-2\%$ (Apply 8 $1/100m^2$ to give dosages of 0 8 or 1 6 g/m^2 .)		
	h. malathion 5% (Apply 2-4 $1/100m^2$ to give dosages of 1 or $2 g/m^2$)	Only premium grade malathion can be used in milk-rooms and food processing plants.	
	i. naled 1% (Apply at 4-8 1/100m ² to give dosages of 0 4-6.8 g/m ² .)	Not to be used in milk-rooms. At 0.25% strength can be ap- plied to chicken roosts, nests, etc. without re- moving the birds	
	3. Baits containing insecticides and sweetening agents as sugar, malt or molasses. Dry baits contain 1-2% and wet baits 0.1-0.2% of insecticide (Apply 60-120g/100m² of dry bait or sprinkle the liquid bait at the rate of 4 1/100m²). a. diazinon b. dichlorvos c. dimethoate d. ronnel e malathion f. naled	Fly baits should not be used inside dwellings. Care should be taken that they are not placed where children or domestic animals can easily come into contact with them.	
2. Outdoor space- treatment	Emulsion or fuel oil formulations are applied at the following dosages. (g/ha) a. diazinon 336 b. dichlorvos 336 c. dimethoate 224 d. ronnel 148 e. fenthion 448 f. malathion 672 g. naled 224	The listed organophosphorus compounds used as emulsion or fuel oil formulations are applied at rates of 21-48 1/km to obtain the required dosage. Also, ULV applications from the ground, with bioresmethrin at 10g/ha have been found effective	
3 Aircraft	Aerosols Resmethrin, bioresmethrin or d- phenothrin 2% + 98% Freon 11 + Freon 12 (1 1) as propellent. (Spray into air from aerosol can- nister for 10 sec/100m ³ .)	Approximate cabin volumes of aircraft are. Boeing 747: 2800m ³ : 3800m ³ Boeing 707: 800m ³ DC-9: 345m ⁴ DC-8: 800m ³	

Type of Application	Pesticide and Application	Remarks	
Fly larvae			
1. Outdoors by spraying manure and refuse, human-excrement	Sprays applied as emulsions concentrate or wettable powders, (Thoroughly spray decaying vegetation, manure and refuse at 28-56 1/100m ² Pay particular attention to animal manure, privies and garbage. In addition to the insecticides listed, ronnel fenitrothion, fenthion and trichlorfon can be applied as finished sprays at concentrations from 0 25-2.5%)	Applications must be made once or twice each week to maintain good control	
	a diazinon 1% b dimethoate 1% c. malathion 1-2% d. dichlorvos 0.5% e. ronnel 1%		
Lice			
1. Head	Lindane 1.0% ointment or shampoo	Keep out of eyes and mucous membranes	
2 Body	Lindane 1% dust or shampoo	Sterilize clothing and bed clothes by laundering	
3. Pubic	Lindane 1.0% ointment or shampoo	Do not apply to eyelashes	
	Benzyl benzoate emulsion 25% (Pediculosis of eyelashes may be treated with 0.25% physostigmore ophthalmic ointment twice daily or a vaseline ointment containing pyrethrins may be used)	Apply by spray or hand.	
Mites: Chiggers, etc.			
Clothing	 Mosquito repellents toxic to mites: a. diethyltoluamide (DEET,OFF) b. dimethyl phthalate c. benzyl benzoate 	Keep out of eyes Damages some plastics	
Outdoor vegetation	1 Residual as wdp or powders in mert dusts: a. chlorpyrifos b. diazinon c. lindane d. chlordane e. toxaphene	Spray plants thoroughly. Checklabel for dosage. Keep children away until spray dries.	

Type of Application	Pesticide and Application	Remarks	
Scabies			
Body	1. Lindane 1.0% cream, lotton or shampoo.	Keep away from eyes and mucous membranes.	
	2. Benzyl benzoate (25%).	Do not apply to head. Do not overtreat	

Mosquito adults

- 1 Enclosed spaces 1. Aerosols Pyrethrins 0.25% + piperonyl butoxin buildings, as ide or sulfoxide 2%. (Spray into air from aerosol canbarracks, rooms, nister for 4 sec/100m³.) barns
 - 2 Space sprays
 - a. naled 1%
 - b. malathion 2-5%
 - c. resmathion 1-2%
 - d. dichlorvos
 - e. methoxychlor
 - 3. Residual fumigant: Dichlorvos dispensers, containing 20% of toxicant are suspended in enclosed spaces at one dispenser per 14-28m³. (Spray on interior walls and ceiling of building (1 1/25m²).)
 - 4 Residual contact sprays in oil solutions, emulsion concentrates or wettable powders.
 - a. DDT 5%
 - b. methoxychlor 5%
 - c lindane 0.5%
 - d. malathion 3-5%
 - e. fenitrothion 1-2%
 - f propoxur 0 5-1%
 - g. chlorphoxim 3-5%
 - h. pirimiphos-methyl 2-3%
 - i. permithrin 0.5%
- 2. Aircraft

Aerosols Resmethrin, Bioresmethrin or Dphenothrin 2%. (Spray into air from aerosol cannister for 10 sec/100m³) Approximate cabin volumes of some aircraft are:
Boeing 747, 2800m³
3800m³
Boeing 707, 800m³
DC-9, 345m³

DC-8 800m³

Type of Application	Pesticide	Remarks	
3. Outdoors- exterior space treatment	Applications from aircraft, mistblowers or thermal aerosol machines as oil solutions or emulsion concentrates: a. malathion 100-500 g/ha b. fenitrothion 200-400 g/ha c. fenthion 112 g/ha d. naled 56-280 g/ha e. chlorpynfos 10-40 g/ha f. pyrethroids		These sprays usually furnish immediate but only temporary relief. High volume thermal fogging may be preferable when vegetation is dense
Mosquito larvae			
1 Potable water receptacles around houses (Aedes aegypti) 2 Streams, lakes, swamps, pools, ruts and non-potable water containing receptacles around houses	tainers with drinking wigranules are applied by at 1 mg/1 (e.g. 1 g of g volume of container—w Applications from aircra emulsions, wettable powa. chlorphoxim 100 b. chlorpyrifos 56-c fenitrothion 100 d. fenthion 22-112 e. iodfenphos 50-f. malathion 224-g. methoprene 100 h. Paris green 850 t. phoxim 100 g/h j temephos 56-40 k. fuel oil 142-190	d. fenthion 22-112 g/ha e. iodfenphos 50-100 g/ha f. malathion 224-1000 g/ha g. methoprene 100-1000 g/ha h. Paris green 850-1000 g/ha 1. phoxim 100 g/ha j temephos 56-400 g/ha k. fuel oil 142-190 l/ha l larvicidal oil 19-47 i/ha	
Scorpions and centipedes			
Rooms	Residual sprays as EC, dusts. a. diazinon b. bendiocarb c. malathion d. lindane	wdp or powders in inert 0.5% 0.25% 3.0% 0.5% liquid 1.0% dust	Make spot applications such as baseboards, windows, wall cracks, openings around water pipes, underneath sinks, corners. Also can treat ground and outbuildings.

Type of Application	Pesticide and Application	Remarks	
Spiders Black widow, Brown, etc.			
Residual indoors, outbuildings, and around houses, stores, etc.	1. Residual sprays as EC or wdp. a. bendiocarb 0.25% b chlorpyrifos 0.25-0.5% c. diazinon 0.5% d. propoxur 1.0% e. malathion 2.0% f. lindane 0.2-0.5%	Do not use as space spray. Treat as for scorpions and centipedes. Watch out for falling spiders as they sometimes bite.	
Ticks (most species)			
I Animals	1. Washes, sprays or dips as emulsions a. malathion 0.5% b rotenone 0.05% c. lindane 0.05%	Use indicated concentrations for washes or sprays but reduce to half for dips.	
2 Buildings	1 Residuals in oil solutions or E.C.: a propoxur 10% b. diazinon 0.5% c chlorpyrifos 0.5% d. bendiocarb 0.25% e. malathion 20% f. carbaryl 20% g. lindane 0.5%	Treat floors and wall cracks, between and under cushions of upholstered furniture. Keep away from children and pets until dry.	
3. Outdoors vegetation	Residual sprays in E.C., wdp or inert dusts. a. tetrachlorvinphos b. carbaryl c dieldrin d. chlordane e. lindane	Control where needed. Follow instructions on label	
Triatominae			
House and furniture	1. Residual wdp and E.C.: a HCH 1.0% b fenitrothion 2.0% c. malathion 2.0% *not for R. prolixus	Treat ceiling and walls of houses and furniture when necessary.	

Type of Application	Pesticide a	Remarks	
Repellents for flies, mosquitoes, gnats, mites, black-flies, sandflies, fleas, and ticks			
Exposed surfaces of body and clothes	1. Diethyltoluamide (OFF, DEET) (Application on skin. Shake ½ teaspoonful into palm of hand; rub hands together and then apply in thin layer to face, neck, ears, hands and wrists. Do not get into eyes and mouth On clothes, spray or apply by hands Effective for a number of days Best all-around repellent)		Nontoxic Avoid eyes and mucous mem- branes -
	2. Dimethylphthalate (Particularly effective against Anopheles and larval mites (chiggers) Use same as above (1)		Same as above
	3. Indalone (Same as (1) above Best use against biting flies.)		Same as above
		,3 (repellent 612) (Same as we against Acdes.)	Same as above.
Rodents Domestic rats and mice			
Baits	brodifacoum (Talon) ¹	0.005% bait	Single dose anticoagu- lant. Effective against warfarin-resistant Norway rats Formu- lated as grain-based pellets
	diphacinone (Diphacin) ¹	0 005% bait	Anticoagulants. Various brands are formulated as ready to use
	coumafuryl (Fumarın) [†]	0.025% bait	baits, paraffinized blocks and pellets, con centrates, and as track ing powders. Also available as liquid
	$\begin{array}{c} \text{pivaldlone} \\ (\text{Pival})^{\dagger} \end{array}$	0 025% bair	baits Use both liquid and dry baits where possible. Expose liquid
	warfarın	1.0% bait	bait in glass or plastic chicken watering de- vices
	warfarın	0 025% bait	

Type of Application	Pesticide and Application		Remarks
	chlorophacinone (Rozol Hot shot) ¹	0 025% bait	
	zınc phosphide	1-2% bait	Single dose poison. Mix toxicant with fresh bait materials (corn meal, fish, mea fruit) Do not use foo attractive to children.

¹Common or genetic names begin with a small letter, trade or other names are in parentheses. No discrimination against similar products is intended.

^{*}Information from WHO publications, Pocket Guide to Pest Management (US Navy) and Tropical Medicine 5th Edition (Hunter, Swartzwelder and Clyde). Mention of specific companies or manufacturers' products does not imply that they are recommended by the Pan American Health Organization.

Annex IV

Guide to Insecticides, Rodenticides and Equipment

Insecticides

Abate (temephos)
American Cyanamid Company
Berdan Avenue
Wayne, NJ 07470
Telex: 130400
Tel· (201) 831-1234

Southern Mill Creek Products P.O Box 1096 Tampa, FL 33601

Actellic (pirimiphos - methyl)
ICI Americas Inc.
Agricultural Chemical Division
Wilmington, DE 19897

Imperial Chemical Industries
Plant Protection Division
Fernhurst
Haslemere
Surrey, England GU27 3JE
Telex: 858270 Ic. pp Fernhurst
Tel. Haslemere (0428) 4061
Tel. Somerset Court (0428) 4061
Cable: Plantecton

Altosid (methoprene)
Zoecon Industries
975 California Avenue
Palo Alto, CA 94304
Telex: 345-550
Tel: (415) 329-1130

Baygon (propoxur)
Mobay Chemical or Chemagro Corp.
P.O. Box 4913
Howthorn Road
Kansas City, MO 64120
Tel: (816) 242-2000
Cable: KEMAGRO, Kansas City

Johnson Wax Company 1525 Howe St. Racine, WI 53403 Telex: 264429 Tel: (414) 554-2000 Cable: JON WAX RON, Wisconsin

Baytex (fenthion)

Mobay Chemical or Chemagro Corp. P.O. Box 4913 Howthorn Road Kansas City, MO 64120

Tel: (816) 242-2000

Cable: KEMAGRO, Kansas City

Baythion (phoxim)

Bayer AG Pflanzenschutz 509 Levenkusen Bayerwerk Federal Republic of Germany

Telex: 8510881 Tel: 02172-301 Cable: BAYER

Baythion C (chlorophoxim)

See Baythion Chlordane Velsicol Chemical Corporation 341 East Ohio St. Chicago, Il 60611

Telex: 910-221-5738 Tel: (312) 670-4500

Cyanophos (Cyanox)

Sumitomo Chemical America, Inc. 345 Park Avenue New York, NY 10022 Telex: 640249 Tel: (212) 935-3813

Cygon (dimethoate)

American Cyanamid Company See Abate

Cythion (malathion)

American Cyanamid Company See Abate

Diazinon

Ciba-Geigy Corporation P O. Box 11422 Greensboro, NC 27409 Tel: (919) 292-7100 Ciba-Geigy International AG

Postfach 4002

Basel

Telex: 62991 Tel: 061/361111

Markteshim Chem Warks Ltd.

Box 60

Beer Sheva, Israel

Pennwalt Chemical Corporation 1630 East Shaw Ave.

Fresno, CA 93710

Thompson-Haywood Chemical Co.

5200 Speaker Road Kansas City, KS 66110 Tel: (913) 321-3131

Dibrom (naled)

Chevron Chemical Com. Ortho Division 575 Market Street P.O. Box 3744 San Francisco, CA 94105

Tel: (Orlando, Florida) (305) 288-0414

Tel: (San Francisco, CA) (415) 894-7800

Dimetilan

Ciba-Geigy Ltd. P.O. Box 11422 Greensboro, NC 27409 Tel: (919) 292-7100

Dimilin (diflubenzuron)

Thompson-Hayward Chemical Co. 5200 Speaker Road Kansas City, KS 66110 Tel: (913) 321-3131 Dursban (chlorpyrifos)
Dow Chemical Co.
P.O. Box 1706
9008 Building
Midland, MI 48040
Tel. (517) 636-2231

Thompson-Hayward Chem Co 5200 Speaker Road Kansas City, KS 66110 Tel. (913) 321-3131

Fenitrathion (Sumithion)

Sumitomo Chemical America, Inc. 345 Park Avenue New York NY 10154 Telex: 232 489 (RCA) Tel: (212) 935-7000

Bayer AG Pflanzenschutz 509 Levenkusen Bayerwerk Federal Republic of Germany

Telex: 8510881 Tel: 02172-301 Cable: BAYER

Ficam (bendiocarb)

BFC Chemicals, Inc. 4311 Lancaster Pike P O Box 2867 Wilmington, DE 19805 Tel: (302) 575-7847

Fison Inc. Ag Chemicals Div. 2 Preston Court Bedford, MA 07130 Telex: 951-253 Tel: (617) 275-1000

Fisons Ltd.
Fison House
9 Grosvenor Street
London WIXOAH, UK

Telex: 263184 Tel: (01) 493-1611 Flit MLO

Exxon Company P.O Box 21801 Houston, TX 77001 Tel: (713) 656-3636

Heptachlor

Velsicol Chemical Corporation 341 East Ohio St. Chicago, Il. 60611 Telex 910 221-5738 Tel: (312) 670-4500

Iodofenphos

Rentokil Ltd Export Product Division Felcourt East Grinstead West Sussex England RH 19 104

Lindane

Hooker Chemical Co P.O. Box 344 1042-7 Iroquois Ave. Niagara Falls, NY 14302 Telex: 91-575 Tel: (716) 278-9000

All India Medical 185 Princess Street Mulji Jetha Bldg. Bombay, India 400 002

Thompson-Hayward Chemical Co 5200 Speaker Road Kansas City, KS 66110 Tel: (913) 321-3131

Malathion

American Gyanamid Company Berdan Avenue Wayne, NJ 07470 Telex: 130400 Tel: (201) 831-1234 All India Medical 185 Princess Street Mulji Jetha Bldg Bombay, India 400 002

Tel: (212) 935-7000

Sumitomo Chemical America, Inc. 345 Park Avenue New York, NY 10154 Telex: 232489 (RCA) SUMISHO

Thompson-Hayward Chemical Co. 5200 Speaker Road Kansas City, KS 66110 Tel. (913) 321-3131

Mesurol (methiocarb)

Mobay Chemical or Chemagro Corp. P.O. Box 4913
Howthorn Road
Kansas City, MO 64120
Tel: (816) 242-2000
Cable: KEMAGRO, Kansas City

Methoxychlor

E.C. DuPont de Nemours Chemical Dyes and Pigment Dept. 1007 Market Street Wilmington, DE 19898

Nexion (bromophos)
Celamerck GmbH and Co.
P.O. Box 202
6507 Ingelheim am Rhein
West Germany

Permethrin

Shell International
Chemical Co (talcord)
Agro-Chem. Division
Shell Center
London S.E. 17PG England
Telex: 919651
Tel: 01-934-1234
Cable. CHEMISHELL
London SE 1

Imperial Chemical Industries
Plan Protection Division
Fernhurst
Haslemere
Surrey, England GU27 3JE
Telex: 858270 Ic.pp Fernhurst
Tel. Haslemere (0428) 4061

Fairfield American Corporation 3932J Salt Road Medina, NY 14103 Tel: (716) 798-2141

McLaughlin Gormley King and Co 8810 10th Avenue, North Minneapolis, MN 55427 Telex: 290-544 Tel. (612) 544-0341

Wellcome Industrial (coopex) Ravens Lane Berkamsted Herts, England HP4 2DY

Cooper Pegler and Co. Ltd. Burgess Hill Sussex RH159LA, UK Tel: Burgess Hill 42526 Cables: 87354 COOPEG G

d-phenothrin

McLaughlin Gormley King and Co (Multicide) 8810 10th Avenue, North Minneapolis, MN 55427 Telex: 290-544 Tel: (612) 544-0341

Sumitomo Chemical America, Inc (Sumithrin) 345 Park Avenue New York, NY 10154 Telex 232489 (RCA) Tel: (212) 935-7000

Piperonyl Butoxide

Fairfield American Corporation 3932J Salt Road Medina, NY 14103 Tel: (716) 798-2141

McLaughlin Gormley King and Company 8810 10th Avenue, North Minneapolis, MN 55427 Telex: 290-544 Tel: (612) 544-0341

Pyrethrins

McLaughlin Gormley King and Company 8810 10th Avenue, North Minneapolis, MN 55427 Telex: 290-544 Tel: (612) 544-0341

Fairfield American Corporation 3932J Salt Road Medina, NY 14103 Tel: (716) 798-2141

S.B. Penick and Company 1050 Wall St., West Lyndhurst, NJ 07071 Telex: 133525 Tel. (201) 935-6600 673-1335

Prentiss Drug and Chemical 363 Seventh Avenue New York, NY 10001

Pyrethrins (encapsulated) (sectrol)
3M Company
J.F. Piper/Industrial Tape Division
Building 220 3M Center
St. Paul, MN 55101

Resmethrin

S.B. Penick and Company (SBP-1382) 1050 Wall Street, West Lyndhurst, NJ 07071 Telex: 133525 Tel: (201) 935-6600 673-1335

Fairfield American Corporation (Synthrin) 3932J Salt Road Medina, NY 14103 Tel: (716) 798-2141

Sumitomo Chemical America, Inc. 345 Park Avenue, New York, NY 10154 Telex: 232489 (RCA) Tel: (212) 935-7000

Rotenone

S.B. Penick and Company 1050 Wall Street, West Lyndhurst, NJ 07071 Telex: 133525 Tel: (201) 935-6600 673-1335

Sevin (carbaryl)

Union Carbide Corporation 7825 Bay Meadow Way Jacksonville, FL 32216 Telex: 510661 2634 Tel: (904) 731-4250

Toxaphene

BFC Chemicals Inc. P.O. Box 2867 Wilmington, DE 19805 Tel: (302) 575-7858

Hercules Inc. 910 Market Street Wilmington, DE 19899 Tel: (302) 575-5000 Vapona (DDVP, dichlorvos)
All India Medical
185 Princess Street
Mulji Jetha Bldg.
Bombay, India 400 002

Markteshim Chemical Warks Ltd. Box 60 Beer Sheva, Israel

Insect Repellents

Deet (diethyl toluamide) Cutter Laboratories 2200 Powell Street Emeryville, CA 94608

> McLaughlin Gormley King Co. 8810 10th Avenue, North Minneapolis, MN 55427 Telex: 290-544 Tel: (612) 544-0341

Hills Pet Chemicals Inc. P.O. Box 660656 Miami Springs, FL 33166

Dibutyl phthalate

Eastman Chemical Products, Inc. P.O. Box 431 Kingsport, TN 37664 Telex: 55-34-50

Tel: (615) 246-2111

Insecticide Application Equipment

Fogger, Thermal

Burgess Vibrocrafters RT 83 Grays Lake, IL 60030 TWA 910-651-2531 Tel: (312) 223-4821 Cable: VBE Grays Lake Shell Chemical Company 1 Shell Plaza P.O. Box 2463 Houston, TX 77001

Dimelone (dimethyl carbate)
Fairfield American Corporation
3932J Salt Road
Medina, NY 14103
Tel: (716) 798-2141

Dimethyl phthalate
Eastman Chemical Products, Inc.
P.O. Box 431
Kingsport, TN 37664
Telex: 55-34-50
Tel: (615) 240-2111

MGK 11, 326,874

McLaughlin Gormley King and Co. 8810 10th Avenue, North

Minneapolis, MN 55427

Telex: 240-544

Tel: (612) 544-0341

Tabatrex (dibutyl succinate)
Glenn Chemical Co. Inc.
4149 Milwaukee
Chicago, IL 60641

Curtis Dyna-Products Corporation (Dyna-Fog) P.O. Box 297 Westfield, IN 46074 Tel: (317) 896-2561 J. Hofman Overseas USA, (Dynafog) P.O. Box 318 Carmel, IN 46032

London Fog Co. 505 Brimhall Long Lake, MN 55356 Tel (612) 473-5366

Motan GMBH (Swingfog) P.O. Box 1260 Max-Eyth-Weg 42 D-7972 Isny, W. Germany Telex: 7321 524 Tel 07562-6/6 Cable: Motan ISNY

Lowndes Engineering Co. 125 Blanchard St. Box 488 Valdosta, GA 31601

Telex: LECO VALD 810-786-5861

Tel: (912) 242-3361 Cable: LECO VALD

Ultra-low volume Devices

AFA Corp. of Florida (Fogmaster) 14201 NW 60th Ave. Miami Lakes, FL 33014

Amdreas Stoil Maschineafabrik Postfach 1760 7050 Walblingen - Neustadt West Germany

Beemer Products Company (Ground ultra-low volume sprayers) FT Washington, PA 19034 Tel: (215) 646-8440

Public Health Equipment and Supply Co. P.O. Box 10454 San Antonio, TX 78210 Tel. (512) 532-6351

Dr. Stahl & Son (Pulsfog) P.O. Box 1227 Uberlingen D-777 West Germany

Tifa (CI) Ltd. 50 Division Avenue Millington, NJ 07946 Telex: 136340

Tel: (201) 647-4570 and 647-4573

Cable TIFA Stirling

Buffalo Turbine (Mity Moe: SONIC ultra-low volume) Agricultural Equipment Co, Inc. 70 Industrial St. Gowanda, NY 10470 TWA 716-532-2210 Tel· (716) 532-2272

FMC Corp: John Bean Div. 516 Dearborn St. Tipton, TN 46072

Gerbruder Holder, BmbH and Co. (Holder) P.O. Box 66 D7418 Metzingen, West Germany Telex: 7245319

Tel: 07123-2036

H.D. Hudson MFG Co.
(Porta-pak^R, Compression Sprayers and Dusters)
500 North Michigan Avenue
Chicago, IL 60611
Tel: (312) 644-2830

Hatsuta Suzuki Industrial (Hatsuta Mistblower) Av. Monteiro Lobato 2700 Caixa Postal 9 Guarulhos 0700, Sao Paulo, Brazil Cable: HATSUMEC Tel: PABX 209-2133 Telex. HABR 1125046

Hatsuta Industrial Co. Ltd. 4-39, I-Chrome Chifune Nishiyodogawa-ku Osaka, Japan

Kioritz Corporation P.O. Box 10 M. Taka Tokyo, Japan

Kioritz Corporation 350 Wainwright North Brook, IL 60062

Maruyama Manufacturing Go. Ltd. 4-15, Uchi-Kanda, 3-Chome Chiyoda-ku Tokyo, Japan

London Fog Company 505 Brimhall Long Lake, MN 55356 Tel: (612) 473-5366

Lowndes Engineering Company 125 Blanchard St. Box 488 Valdosta, GA 31601

Telex: LECO VALD 810-786-5861

Tel: (912) 242-3361 Cable: LECO VALD Micro-Gen Equipment Corporation 10700 Sentinel Drive San Antonio, TX 78217 Telex: 9108711000 Tel: (512) 654-8570 Cable: MCROGEN

Micron West Inc. (ULVAFAN^R portable) 8582 Katy Freeway P.O. Box 19698 Houston, TX 77024 Telex: 792911 Tel: (713) 932-1405

Cable: MICRONW HOV

Motan GMBH
(Fontan)
P.O. Box 1260
Max-Eyth-Weg 42
D-7972 Isny, Germany
Telex: 7321 524
Tel: 07562 - 6/6
Cable: Motan ISNY

Public Health Equipment & Supply (London Aire) P.O. Box 10458 San Antonio, TX 78210 Tel: (512) 532-6351

Root-Lowell Corporation 1000 Foreman Road Lowell, MI 49331 Tel: 1-800-253-4342

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Solo Canada Caribbean Deppe Ag-Tec. Box 464 Burlington, Ontario L7R 3Y3 Canada

Turbair (ULV Spraying Systems) Britannica House Waltham Cross Herts, England Telex. 23957 Tel: Lea Valley (0992) 7633008

Sprayer-Hand Compression

B & G Equipment Co. Applebutter Road Plumstead, PA 18949 Tel: (215) 766-8811

Blue Spruce International (Pesticide Equipment & Insecticide Supplies) 1390 Valley Road Stirling, NJ 07980 Telex: 136340 Tel: (201) 647-4570 Cable: TREE Stirling

Champion Sprayer Co 6581 Heintz Avc. Detroit, MI 48211

Clarke Outdoor Spraying Co. (Pesticide Equipment Supplies) P.O. Box 288 Roselle, IL 60172 Tel: (312) 894-2000 Vandermolen Corporation (KWH-44 Mistblower) 119 Dorsa Avenue Livingston, NJ 07093

Wambo Co. Ltd. Postfach 102606 D-8900 Augsburg 1 West Germany

Whitmire Research Laboratories, Inc. 3568 Tree Court Industrial Blvd. St. Louis, MO 63122

Yanmar Diesel Engine Co. Ltd. (ULV Knapsack) 1-11-1 Marunouchi, Chiyodo-Ku Tokyo, Japan Telex: TOK 0220-2310 Cable, YANMAR TOKTU

Flow Dynamics Inc. 1333 State College Parkway Anaheim, CA 92806

H.D. Hudson Mfg. Co.
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500 North Michigan Ave.
Chicago, IL 60611 Tel: (312) 644-2830

PARCO (Division of Blue Mountain Products)
P.O. Box 250
New Hartford, NY 13413
Tel (315) 797-3214

Root Lowell Corporation 1000 Foreman Road Lowell, MI 49331 Tel: 1-800-253-4342

Rodenticides

Baran (fluoroacetamide)

Archem

1514 11th Street

Box 767

Portsmouth OH 45662

Tamogan Ltd.
3 Hakhshmal Street
P.O. Box 2438
Tel Aviv, Israel

Brodifacoum

ICI Americas Inc. (Talon) Agricultural Chemicals Division Wilmington, DE 19897

Rodent Control Ltd. 70/78 Queens Road Reading, Berks, England Tel: READING 54740

Sorex Ltd.
St. Michaels Road
Widnes, Cheshire WA8 8TJ England
Tel: 051420 7151

Bromadiolone

Chempar Chemical 60 E 42nd St., Ste. 652 New York, NY 10016

Sanex Chemicals Inc. (Bromone) (MAKI) 1307 South 30th Avenue Hollywood, FL 33020 Tel: (305) 921-5666

Castrix (crimidine)

Bayer AG Pflanzenschutz 509 Levenkusen Bayerwerk Federal Republic of Germany

Telex: 8510881 Tel: 02172-301 Cable: BAYER Calcium Cyanide

Degesch America Inc. P.O. Box 116 Weyers Case, VA 24486

Coumatetralyl (Racoumin)

Bayer AG
Pflanzenschutz
509 Levenkusen Bayerwerk
Federal Republic of Germany
Telex: 8510881

Tel: 02172-301 Cable: BAYER

Cymag (Sodium Cyanide)

Imperial Chemical Industries Plant Protection Division

Fernhurst Haslemere

Surrey, England GU27 3JE Telex: 858270 Ic.pp Fernhurst Tel: Haslemere (0428) 4061

ICI American Inc. Agricultural Chemical Div. Wilmington, DE 19897

Tel: Summerset Court (0428) 4061

Cable: Plantecton

Difenacoum (Ratak)

ICI American Inc.

Agricultural Chemical Div. Wilmington, DE 19897

Tel: Summerset Court (0428) 4061

Cable: Plantecton

DPL-/87 (Vacor)

Rohm & Haas Co. Agricultural & Sanitary Chemicals Dept. Independence Mall West Philadelphia, PA 19105

Tel: (215) 592-3032

Dipacinone

Bell Laboratories 3699 Kinsman Boulevard P.O Box 5133 Madison, WI 53705 Tel. (608) 256-2632

Velsicol Chemical Co. 341 East Ohio St. Chicago, IL 60611 Telex: 910-221-5738 Tel (312) 670-4500

Fumarın

Union Carbide Agricultural Products Co. 300 Brookside Ave. Ambler, PA 19002

Pival

Motomco Inc. 267 Vreeland Ave P.O. Box 300 Paterson, NY 07513

Red Squill

S.B. Penick & Co.
1050 Wall Street, West
Lindhurst, NJ 07071
Telex: 133525
Tel: (201) 935-6600

Prentiss Drug & Chemical Co. 363 Seventh Avenue New York, NY 10001

Warfarın

Bell Laboratories 3699 Kinsman Boulevard P.O. Box 5133 Madison, WI 53705 Tel: (608) 256-2632 Hopkins Agricultural Chemical Co. Manufacturing Division P.O. Box 7532 Madison, WI 53707

Prentiss Drug and Chemical Co. 363 Seventh Avenue New York, NY 10001

Roberts Laboratories 4995 N. Main Rockford, IL 61101

Velsicol Chemical Corporation 341 East Ohio St. Chicago, IL 60611 Telex: 910-221-5738 Tel: (312) 670-4500

Zinc Phosphate
ARCHEM
1514 11th St.
Box 767
Portsmouth, OH 45602

Bell Laboratories 3699 Kinsman Boulevard P.O. Box 5133 Madison, WI 53705 Tel: (608) 256-2632

Hooker Chemical Co 1042-7 Iroquois Ave P.O Box 344 Niagara Falls, NY 14302 Telex: 91-575 Tel: (716) 278-7000

Rodenticides (Prepared Baits)

Bell Laboratories Inc. (ZP^R, RAZE^R, PCO and FINAL^R) P.O Box 5133 Madison, WI 53705 Tel: (608) 256-2632

Chempar Chemical Co. (ROZOL^R) 60 E. 42nd St New York, NY 10165 Telex: 710-581-2318 Tel: (212) 687-3990

J.T. Eaton & Co. Inc. 1393 East Highland Road Twinsburg (Cleveland), OH 44087 Tel. (216) 425-7801

Special Insecticide Products

Cenol (Insecticide Aerosols) P.O. Box 177 Rt. 45th Peterson Road Libertyville, IL 60048 Tel: (312) 362-6600

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Environmental Chemicals, Inc. (Temephos formulations)
703 North Lake Shore Drive
Barrington, IL 60010
Tel: (312) 526-7744

Gold Crest Pest Control Supplies (Rodenticides & Insecticides) 1700 Liberty P.O Box 5668 Kansas City, MO 64102 Tel· (816) 421-4696 J.E. Bolt CorporationP.O. Box 25103Chicago, IL 60625Tel: (312) 327-7173

Southern Mill Creek Products, Inc. (PARA-BLOX^R)
P.O Box 1096
5414 56th Street
Tampa, FL 33601

Velsicol Chemical Corporation (Promar^R and Ramik^R) 341 East Ohio St Chicago, IL 60611 Telex: 910-221-5738 Tel: (312) 670-4500

McLaughlin Gormley King Co. (Dipterex^R) 8810 Tenth Avenue Minneapolis, MN 55427

Pet Chemicals Inc. (Vapona Aerosols) P.O. Box 660656 Miami Springs, FL 33166

Peterson/Puriton, Inc. (Aerosols) Hegeler Lane Danville, IL 61832 Tel: (217) 442-1400

Stephenson Chemical Co., Inc (Aerosol Flea Control) P.O. Box 87188 College Park, GA 30337 Tel: (404) 762-0194 Time-Mist Inc. (Insecticide Aerosols) 135 South Main Street Thomaston, CT 06787 Tel: (203) 283-8226 Wyco International, Inc. (Tossit)
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Cleveland, OH 44103
Tel: (216) 391-5047

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Old Freehold Road
Toms River, NJ 08753
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John W. Hock, Co. P.O. Box 12852 Gainesville, FL 32604

BioQuip Products Company P.O. Box 61 Santa Monica, CA 90406 Tel: (213) 322-6636

New Jersey-like Concession Supply Company, Inc. 1016 Summit St. P.O. Box 1007 Toledo, Ohio

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Three Hills
Bromyard, Herfordshire HR 7 4HU
United Kingdom

Micronair (Aerial) Ltd Bembridge Fort Sandown Isle of Wight, PO36 8Q3, England

isie of Wight, PO56 8Q3, England

Tel: Brading 461

Cable: Micronair Sandown England

Telex: 86448

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Pierce Chemical (Dri-film SC-87) P.O. Box 6055 Rockford, IL

Rohm & Haas Co. (Tritons) Independence Mall West Philadelphia, PA 19105

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