A PESTICIDES DIRECTORY

FOR
ST. VINCENT AND
THE GRENADINES

by
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SOME USEFUL MEASUREMENTS

SOLID MEASUREMENTS

3 tsp level = 1 tbsp
1tbsp = 1/3 oz
1 oz = 28.35 gms
1 Kg = 2.2 lbs (2lbs, 3ozs)
1 lb = 16ozs = 454gms = 0.454 kg
1 L of water = 1 kg = 1000gms = 1000mls
1 Ton = 1000kg = 2200lbs
1 sack of fertilizer = 50kgs = 110lbs
1 Small Match box = approx. 1oz

LIQUID MEASUREMENTS

3 tsp = 1 tbsp
2 tbsp = 1 Fl.oz
1 tsp = 5 mls
1 Fl.oz (Imp) = 28.4 mls
1 L (1000mls or cc) = 35.5 fl.ozs
1 gal. (Imp.) = 4.5 L = 160 fl.ozs
1 gal (U.S) = 3.78 L = 128 fl.ozs
1 Pt (U.S) = 16 fl.ozs = 473 mls
1 Pt (U.S) = 20 fl.oz = 568 mls
1 Rum bottle = 26 fl.ozs
1 Condensed milk tin = 10 fl.ozs
1 Whiskey bottle cork = approx 1 fl.oz
1 Quart oil tin = 34 fl.ozs
1 CP 3 spraycan capacity 4.5 gals

AREA MEASUREMENTS

1 Hectare (ha) = 10,000 m^2 = 2.5 acres
1 Acre (ac.) = 4,000 m^2 = 0.4 hectares
1 Acre = 43,560 ft^2

PROPORTIONS

1 Imp. gal/ac = 11.2 L/ha
1 US gal/ac = 9.4 L/ha
1 L/ha = 13.68 fl.ozs/ac (US)
1 L/ha = 14.24 fl.ozs/ac (Imp)
1 Kg/ha = 0.9 lbs/ac = 14.5 ozs/ac

RODENTICIDES		
TRADE NAME	COMMON NAME ACTIVE INGREDIENT	REMARKS
Klerat	Broadifacoum	A single feeding anticoagulant
Racumin	Warfarin	A multifeeding anticoagulant
Ramik Green	Diphacinone	A multifeeding anticoagulant
Rattex	Warfarin	A multifeeding anticoagulant

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NEMATICIDES						
TRADE NAME	**COMMON NAME ACTIVE INGRE-DIENT**	**ACUTE ORAL TOXICITY**	**USAGE CROP/ PEST**	**REMARKS**	**APPLICATION RATES Per/acre quantity/ mat/ year**	
Furadan 10 G	Carbofuran	LD50-8mg/kg Highly toxic	Banana and other crops: Root– knot nematode, soil insects and other nematodes.	A carbamate compound use as a systemic and contact stomach poison insecticide/ nematicide. A very toxic material. Gloves and mask should be worn at the time of application. Performance is reduced in dry soil condi-tions.	10-40 lbs	40 ms/ mat. Thrice/year
Mocap 10% G	Ethoprophos	LD50– 62mg/kg Highly toxic	Banana and tree crops. Soil nematodes and soil insects. Can be used at the time of final land preparation, at planting and as a spot treatmetnt on established crops.	A contact insecticide/ nematicide with excellent residual activity. Precau-tions– as per Furadan.	1– 40 lbs	30gm/ mat. Thrice/ year
Vydate E.C.	Oxamyl	LD50-5.4mg/kg Highly toxic	Banana: As for Furadan.	A contact and systemic insecticide/ acari-cide/ nematicide. May be phytotoxic on melongene. Apply with an injector.		7.5 ml/mat. Thrice/ year

TRADE NAMES	ACTIVE NAME/ COMMON INGREDIENT	ACUTE ORAL TOXICITY	USAGE CROP/WEEDS CONTROL	REMARKS	APPLICATION RATES Per/acre fl.oz/oz/gal tbsp/tsp/gal		
Round-Up	Glyphosate	LD50 - 4320mg/kg	A broad spectrum non-selective translocated herbicide. It is used at land preparation and as shielded or directed spray in established, crops for the control of perennial weeds. Can be applied as a stump spray or stem injection for the control of trees.	Foliage need not to be fully wetted. Needs about 4 hrs fine weather after application and will show its effect in about 6 dys. Ammonium sulphate can be added to sprays as a synergist. Tends to be more effective against grass weeds. Use low volumes in 5-10 gals water, attaching a TK .75 or TJ .8001 nozzle and a 100 mesh filter. Do not graze animals or cut feeding for 5 days. Do not spray weeds stressed by drought. Decaying remains of plant killed by spraying must be dispersed before direct seeding. Do not use treated straw as mulch or as growing medium for horticultural crops. Do not mix, store or apply in galvanized or unlined mild steel containers or spray tanks. Do not leave spray in spray tanks for long periods and make sure tanks are left open after use.	0.75 - 1.5 pts	2.4 fl.oz	4 - 8 tbsp
Talent	Paraquat + Asulam		Banana & sugar cane: Post-em for the control of watergrass and perennial grasses.	Translocated and slow acting herbicide. Requires upwards of 2 wks for herbicide to take effect. Best results are obtained when the weeds are actively growing and no thigher than 20cm.	4 - 6 pts	1.5 - 2.5 fl.oz	
Tordon	Picloram, 2,4-D	LD50 - 8200mg/kg	Post-em herbicide for control of unwanted trees. It acts via surface treatments, tree injection and girdle treatment. Can be use to control shrubs in pasture.	A ready to use persistent, translocated herbicide for non-crop land. Do not apply around desirable trees or shrubs where roots may absorb chemical. Do not use cuttings from treated grass for mulching or composting.			

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Karmex	Diuron	LD50 - 34000mg/kg	Pre-em for cotton, pineapple, treecrops, sugar cane. Post-em for pineapples. Control many annuals and seedling grasses and broad-leaf weeds.	A soil acting persistent herbicide. When used as a Post-em, crop damage may occur if growth is vigorous. Should not be used on light sandy soil. Use a higher rate on heavy clay soils. Do not treat plants less than 5cm tall or established less than 12 mths ago. Do not apply to areas intended for replanting within the next 12 months (2 yrs for vegetables)	1 - 2 lbs		2.5 - 5 tsp
Lasso	Alachlor	LD50 -1200mg/kg	Peanuts, corn & Soya bean: Pre-plant incorporated under dry conditions. Apply pre-em if rain is available to move chemical into soil. Post-em application will give control if applied before grasses are at the 1st-2nd leaf stage. Control annual grasses and some broadleaves.	A soil acting herbicide. Best results occur when rain falls within 10 days of application. Cucurbits are susceptible.	5 pts	2 fl.oz	4 tbsp
Maloran	Chlorbromuron	LD50-5000mg/kg	Banana: As part of a cocktail after planting but before the emergence of weeds and or the sprouting of the planting material.		3 - 4 lbs	1 - 1.5 ozs	
Prefar	Sulfonamide	LD50 - 770mg/kg	Cotton, broccoli, cabbage, carrots,cauliflower, lettuce, cucumbers, peppers, tomatoes, melons, onions: Apply as a pre -plant soil incorporated treatment. Control many grasses and broad-leaf weeds.	A long residual herbicide, so injury to crops may occur following a treated crop. Do not plant crops - other than those reccommended - for a period of 18 mths.	1- 1.5 gals	3 -4.5 fl.oz	
Reglone	Diquat	LD50 - 230mg/kg	Used in similar manner as Gramoxone, but less toxic to grass. Also used as a desiccant.	Can be used to control weeds that are resistant to Gramoxone. Acts rapidly on green parts of plants. Add a wetter for improved weed control.	2 -3 pts	1 fl.oz	2 tbsp

TRADE NAMES	COMMON NAME/ACTIVE INGREDIENT	ACUTE ORAL TOXICITY	USAGE CROP/WEEDS CONTROL	REMARKS	APPLICATION RATES Per/acre fl.oz/oz/gal tbsp/tsp/gal		
					1 - 2 pts	3/4 - 1 fl.oz	1½ - 2 tbsp
Gramoxone Super	Paraquat	LD50 - 150mg/kg	Many crop: Contact, fast acting post-em, used in land preparation and as shielded or directed spray in established crops for the control of annual weeds.	A very versatile contact herbicide. Immediately inactivated when in contact with the soil. At low light intensity they are often translocated. Apply to green weeds, preferably less than 0.5 cm high.Use only clean water for mixing spray.			
Herbidox/Prowl	Pendimethalin	Irritating to eyes and skin.	Onion:Post-em, after onions have a minimum of 3 leaves,(about 6-7 wks after sowing).	A soil acting herbicide. Dangerous to fish. Effectiveness reduced by prolonged dry weather and on soils with more than 6% organic matter. Incorporate any trash, ash or straw evenly during seedbed preparation. Do not use on crops suffering from stress due to disease, drought, waterlogging or chemical treatment.	3 1/3 pts	1.25 fl.oz	2.25 tbsp
Hyvar-x	Bromacil	LD50 - 5200mg/kg	Pineapple & citrus: controls most annual grasses and broad-leaf seedlings.	A soil acting persistent herbicide for long term control. Best applied to clean land before rain falls. Best result achieved when soil is moist at time of application. Do not apply on or near other desirable plants. Do not use on ground intended for subsequent cultivation.	4 lbs	1 - 1.5 oz	2 - 3 tbsp

PREFACE

The inspiration to produce this pesticide director came in response to the numerous enquiries from agricultural technicians with regards to the various pesticides currently used in St.Vincent and the Grenadines. Moreover, after many years working in the discipline of Crop Protection, it became apparent that the wanton misuse of pesticides by farmers was often as a result of the lack of knowledge about the pesticides being used. The information provided by pesticide retailers on Labels are very often not instructive and for the most part inadequate.

The publication of this pesticide directory is therefore an effort to address these problems, by making available to agricultural extensionists and other agricultural technicians working with farmers, basic information on various pesticides presently in use. The information provided in this publication includes: the crops and crop pests for which these pesticides are recommended; toxicity and safety periods; the recommended rates of application and some general information on the properties of these pesticides. The publication also includes insecticides, fungicides and herbicides use charts, and some common measurements used in pesticides application.

It is my hope that the information provided will assist in more prudent use of pesticides within the farming community.

Morris S.D. Fairbairn
May 1995.

DISCLAIMER

The information presented in this booklet is not complete. It consists of information only appropriate to the objective of this publication. It may, therefore, be necessary to read the approved label for additional information on a particular pesticide.

The information compiled in this booklet has been selected from official sources, and from suppliers' labels. Every effort has been made to ensure that the information is correct at the time of publication. The publishers do not accept liability for any error or omission in the content; for any loss, damage or other accident arising from the use of products listed herein.

Dalapon	Dalapon	LD50-970mg/kg	Coconut, cocoa, coffee, citrus and banana: Selective herbicide against perennial grasses. Can be used to control bamboo during the rainy season	A systemic herbicide used at pre-planting, as a part of land preparation. Allow some weeks between application and planting.	8 - 10 lbs	3 - 3.5 ozs	
Dosanex	Metoxuton		Carrots and cereals: Post-emmergence herbicide against grasses and broadleaf weeds.	When used in carrots, it should only be after the 3rd true leaf stage. Do not spray when soil is very wet.	1.75 - 2.75 lbs		1.5 - 2.5 tbsp
Fusilade	Fluazifop-butyl	LD50 - 1840	Broad-leaf crops and onions: Post-em. grass herbicide. Can be used as a spot or overall treatment in land preparation.	Translocated and slow acting. Needs about 2 hrs fine weather after spraying. Increase rate for established perennials. A selective weed killer for grasses. Control of perennial grasses under dry conditions may be reduced.	1-2 pts		1-2 tbsp
Gesagard 50 WP	Prometryn	LD50 - 3150mg/kg	Pre-em for peanuts, dasheen, eddoes, pigeon pea, carrots, white potato. Post-em for carrots and cotton; apply before weeds are 2 inches high.	A soil acting herbicide with sone contact activity. More effective on broad leaved weeds than on grasses. Weeds will emerge before dying. Best results achieved on seedling weeds up to 5 cm high. Do not use on very cloddy soils. On organic soil, only contact action effective.	2 - 4lbs	1 - 1.5 oz	2 - 3 tbsp
Gesaprim	Atrazine	LD50 - 1100mg/kg	Treecrops, bananas, pineapples, sugarcane, yams, tannias, cassava, corn: Pre-em for the control of grasses and broadleaf weeds	A soil acting herbicide with foliar activity. At high rates, it is non-selective. Foliar activity effective on weeds up to 3cm high. Resistant weeds may develop with repeated use. Do not apply on ground where the roots of valuable trees or shrubs extend.	4 - 8lbs	1.5 -3 ozs	
Gesapax-Combi 500 FW	Ametryne + Atrazine	LD50 - 1100mg/kg	Banana, citrus, sugar cane, pineapple: Pre-em for control of broad-leaf weeds and grasses.	Contact and long residual action.	4 imp pts/30gal of water		5.5 tbsp

HERBICIDES

TRADE NAMES	COMMON NAME/ ACTIVE INGREDIENT	ACUTE ORAL TOXICITY	USAGE CROP/WEEDS CONTROL	REMARKS	APPLICATION RATES per/acre fl.oz/oz/gal tbsp/tsp/gal		
Agroxone	2-Methyl-4-Chlorophenaxy Acetic Acid	LD50- 28mg/kg	Arrowroot: Pre-emergence	Soil acting herbicide. Usually effective against established weeds	1 gal	3.5 - 4 fl.oz	
Amiben	Chlorabem	LD50 - 3500mg/kg	Vegetables and legumes: A pre-emergence soil acting herbicide for the control of seedling grasses and many broad leaf weeds. Sweet potato: Pre-emergence	Should not be used on very light soils for it is readily leached.		40 lbs	
2,4 -D/ Estemine	Amine	LD50-300-1000 mg/kg	Lawns, pastures, corn (before the crop is 12 inches) Rice (4 wks after sowing): Post-em. Also used for killing shrubs and trees.	A systemic herbicide selective to broad-leaf weeds. Do not spray if rain is imminent. Do not cut grass or graze animals for at least 7 days after spraying. Do not use on stressed crops.	2 pts	0.5 -1 fl.oz	2 tbsp
Daconate/MSMA	Methylarsonic acid	LD50-700mg/kg	Direct spray in cotton, pigeon pea and treecrops. Controls many perennial weeds including nutgrass.	A systemic herbicide with slow acting with visible effects within 2-3 days. It requires 5 hours of sunlight for effectiveness.	4-5 pts	1.5 - 2 oz	3 - 4 tbsp
Dacthal 75 WP	Dimethyl-tetrachlorate-rephthalate	LD50 - >3000 mg/kg	Vegetables: Pre-emergence herbicide. More effective on annual grass weeds than on broad leaf weeds. A very good pre-em. herbicide of onions.	A very versatile pre-em. herbicide for both direct seeded and transplanted vegetables. Best results on fine, firm, weed free soil, when adequate rain or irrigation follows application. Do not plant lettuce within 6mths of application; other crops - 3mths.	5 - 10 lbs	2 - 4 oz	

INTRODUCTION

The use of pesticides is fast becoming a significant component of the pest management strategy of farmers in St.Vincent and the Grenadines. However, there are a number of misconceptions on the use of these pesticides and consequently, the misuse of these potentially hazardous materials is a common phenomenon within the farming community. Such misuse not only manifest itself in terms of economic loss to the farmer, but often aggravate the problems they were intended to combat. It also creates a number of health and environmental problems.

The information provided in this guide is designed to assist extensionists and other field workers in formulating the most appropriate recommendation when advising farmers on the use of pesticides. This information is not exhaustive. It provides guidelines for the proper use of commonly used pesticides. Moreover, the pesticides covered are restricted to those sanctioned by the Pesticide Board for use in St.Vincent and the Grenadines.

Although the guide dealt exclusively with chemical control of pests, the recommendations are based on the premise that this will form part of an integrated pest management strategy.

NOTES ON CONCEPTS AND TERMINOLOGIES USED IN THIS GUIDE

Pesticides are made up of inert materials and a certain component which has pesticidal activity. It is this component that has a toxic effect on the pest, and is referred to as the **active ingredient (a.i)**; a particular product may contain more than one active ingredient.

Active ingredients are given chemical names which confirms with accepted guidelines established by Chemists. These names often appear in parenthesis. Active ingredients are also assigned common names. A given **common name** always refers to a particular active ingredient, regardless of the manufacturer.
Manufacturers generally give one or more specific names to their formulation of a particular active ingredient. These names are referred to as **trade names, brand names or proprietary names.**

INSECTICIDES

Insecticides exert their toxic effect in a number of ways. Some must be swallowed by the insect in the act of feeding; these are the **stomach poisons.**

Others can penetrate the outer membrane or can enter through the respiratory tubes (the spiracles); these are the **contact poisons.**

Some insecticides are absorbed in the host plant and are subsequently translocated throughout the plant; these are the **systemic insecticides.** They are particularly useful against insects with piercing/sucking mouthparts.

Dithane M45	Mancozeb	LD50 - 800mg/kg	Many crops: Anthracnose, Early and Late blights, Downy mildew, various rots, Rust, Scab and many others.	A very versatile contact fungicide. Do not use on young seedlings of tomatoes and tobacco.	7dys	2 - 2.5 lbs		1 tbsp
Kocide 101 50WP	Copper hydroxide		Many crops: Early and Late blight, Powdery mildew, Downy mildew, Cercospora leaf spot, Bacterial spot, Anthracnose, Black rot(Xanthomonas), Black pod, Melanose, Scab, Rust.	A fixed copper fungicide with contact action. Compatible with Dithiocarbamate fungicides. It also possesses bactericide qualities.	10 dys	2 -3 lbs	1 oz	2 tbsp
Manzate 200	Maneb	LD50 - 7500mg/kg	Many crops: Anthracnose, Phytophthora, Downy mildew, Black rot, Cercospora leaf spot, Early and Late blight, Alternaria leaf spot, and many others	A foliar carbamate protectant fungicide. Do not apply if crop is wet or suffering from drought or physical or chemical stress.	7 dys	1.5 - 3 lbs	3/4 - 1 oz	
Ridomil 5G	Metalaxyl		Many crops: Soil borne fungi (mostly Phytophthora and Pythium spp), causing root, collar and stem rot. Use as Post-harvest dip.	A systemic soil fungicide.	7 - 14 dys	20 - 30 lbs 4 oz/tree		
Ridomil mz 72 WP	Metalazyl + Mancozeb		Many crops: Blue mould, Early and Late blight, Anthracnose, Phytophthora, Downy mildew, Pythium.	Systemic and Contact fungicide.	14 - 28dys	2 lbs		1tbsp
Trimiltox forte	Mancozeb + Copper + Ferro Ferry Cyanide		Many crops: Early and Late blight, Downy and Powdery mildew, Bacterial blight, Anthracnose, Cercospora leaf spot, Septoriosis, Rust, Black rot, Melanose, Leaf rust, and many others.	A contact copper fungicide. The iron complex improves food production within the plant by increasing chlorophyll content and strengthens lignification in young shoots.	4 dys	3 lbs	1 oz	2 tbsp

TRADE NAME	COMMON NAME/ ACTIVE INGREDIENT	ACUTE ORAL TOXICITY	USAGE/CROP/DISEASE	REMARKS	SAFETY PERIOD	APPLICATION RATES Per/acre FLoz/oz/gal Tbsp/tsp/gal		
							1 fl.oz	1tbsp
Bravo 500/ Daconil 75 WP	Chlorothalomil	LD50 - 10,000 mg/kg	Many crops: Cercospora leafspot, Mildews, Anthracnose, Southern blight, Septoria Phytophthora, Rhizoctonia, rust.	A protectant fungicide. Gives some control of mosses in container grown nursery stock. Do not use on dessert grapes as russetting may occur.	7 dys	1.5 - 2.25 pts 1.5 - 2 lbs		
Calixin	Tridemorph/ Beacon	LD50 - 1000mg/kg	Banana:A spray for Yellow Sigatoka, Leafspot	A systemic eradicant and protectant fungicide.	2 -6 wks			
Captan/ Orthocide	Captan	LD50 - 9000mg/kg May cause skin irritation	Seed and soil treatment, foliar spray: Black rot, Brown rot, Downy mildew, Early and Late blight of tomatoes, snaping off, Septoria leaf spot and many others. Used as a Post-harvest spray or dip for fruits.	A broad spectrum protective eradicant fungicide. N.B. It does not control powdery mildew. Do not leave dilute material for more than 2 hrs. Do not mix with strong alkaline material or sprays containing soils.	7 dys	soil - 10 lbs foliar - 4lbs	3.5 oz 1.5 oz	
Chipco 26019	Iprodione		Turf grasses and ornamentals: Dollar spot, Fusarium, Blight, Alternaria, Rhizoctonia.	A broad spectrum contact fungicide with some eradicant activities. Apply turf treatment after mowing.				3/4 - 1.5 tbsp
Cupravit (blue)	Copper oxychloride		Treecrops: Black pod of cocoa, Anthracnose, Scab, Alternaria leafspot, Gummosis of citrus.	A prophylactic copper fungicide and bactericide. Spray crops when foliage is dry. Slight damage may occur to leaves of cherries and plums.	5 -7 dys	5 lbs	2 -3 0z	

Some insecticides kill only a few kinds of insects, without harming the beneficial ones; these are the **selective or narrow-spectrum insecticide.**

Many more insecticides are general purpose or **broad-spectrum**; these are useful when several kinds of insects are a problem.

Insecticides also vary in the length of time they remain effective as toxic agents. Some break down immediately into non-toxic by-products; these are **non-residual insecticides**. They are particularly useful when crops are nearing harvesting.

The **residual insecticides** on the other hand, remain active for relatively long periods. They are valuable when particular insects present constant control problems, and where adverse environmental effects are unlikely.

Insecticides are also classified into broad groups, based on some common chemical characteristics. Some of the more common groups include:

1. **CHLORINATED HYDROCARBONS** - These are residual insecticides which tend to persist in the environment. They tend to accumulate in the fatty tissue of mammals and can cause general health problems. Consequently, there are restrictions on the use of these.

2. **ORGANOPHOSPHATES** - These are the most widely used class of insecticides. They have shorter residual life than the chlorinated hydrocarbons.

3. **CARBAMATES** - These are quite variable in human toxicity and persistence in the environment.

4. **SYNTHETIC PYRETHROIDS** - These are known for their almost instantaneous knockdown of flying insects. They

generally exhibit low toxicity to mammals.

5. **BIOLOGICALS** - These include pathogenic agents and insect growth regulators (IGRs) which cause abnormal reactions (diseased conditions) in given species of pest. Insect growth regulators are either naturally occurring insects hormones or synthetic chemicals designed to mimic hormone activities. IGRs tend to be highly specific in their action and are virtually harmless to non-target species.

HERBICIDES

Herbicides are **selective** when they kill weeds but leave the crop unharmed. They are **non-selective** when they kill all the plants present.

Herbicides differ in the way they kill plants. Some kill only the portion of the plant which actually comes into contact with the chemical. These are the **contact herbicides**.

Others are absorbed and are translocated throughout the plant. These are **systemic herbicides** and are generally capable of killing the entire plant.

Herbicides can be applied pre-plant or before the crop is sown or planted. This is referred to as **pre-emergence** application which is done after planting but prior to the emergence of the crop and or weeds. When the herbicide is applied after the crop or weed appear, it is called a **post-emergence** application. The chemical can, therefore, be applied **overall**, that is, on both crops and weed (**selective herbicides**), or **directed -** the spray is kept off the crop by means of a shield.

FUNGICIDES

TRADE NAMES	COMMOM NAME/ ACTIVE INGREDIENTS	ACUTE ORAL TOXICITY	USUAGE/ CROP/ DISEASE	REMARKS	SAFETY PERIOD	APPLICATION RATES Per/ acre Fl .oz/ oz/ gal Tbsp/ tsp/gal		
Aliette	Fosetyl-Al (80%)	LD50– 2680 mg/ kg	Treecrops,vegetables, pineapples 7 ornamentals: Root rot (Phytophthora), Phythium (Damping off), heart rot or pineapples, Stimulates the plants natural defence mechanism to prevent initial infection.	A systemic fungicide with both preventative and curative qualities. Do not apply to ornamentals in mixture with nutrient solutions. Some lettuce cultivars and ornamentals in mixture with nutrients solutions. Some lettuce cultivars and ornamentals may be sensitive.	15days	7.5 oz	1/2-1tsp	
Banrot 40 WP	Ethanol, thiophanatemethyl	ID50– 5000mg/ kg	A soil fungicide used for the control of Damping off, Root rot and Stem rot caused by pythium, Phytophthora, Rhizoctonia and Fusarium. Can be used as a paint on pruning cuts.	A broad spectrum fungicide that provides contact and systemic action. Do not mix with copper.		7.5 oz		1/2 - 1 lbs
Benlate WP 50%	Benomyl	LD50-9590mg/ kg	Many crops: Antracnose, Cercospora leafspot, Powdery mildrew, Fusarium, Blackspot, yellow Sigatoka, gray mold, Melanose, Sclerotonia crown rot, smuts, rhizoctonia spp. And many others. Can be used as a post-harvest dip.	A broad spectrum carbonate fungicide used as a systemic foliar fungicide. It iscommon for resistant strains of fungi resistant starins of fungi to develop with frequent use. It does not control-downy mildrew and damping off cuased by pythium.	7– 29 yrs	3 lbs	1 oz	

OTHERS								
TRADE NAME	**COMMON NAME/ ACTIVE INGREDIENT**	**ACUTE ORAL TOXICITY**	**USAGE CROP/ PEST**	**REMARKS**	**SAFETY PERIOD**	**APPLICATION RATES Per/acre Fl.oz/oz/ gal Tbs/tsp /gal**		
M-Pede	Potassium salts of fatty acids.	Relatively safe. Does not kill lady bird beetles, parasites wasps honey bees	Treecrops, vegetables and ornamentals: Aphids, mealy bugs, mites, scales, thrips, white flies and others.	A true soap that exhibits outstanding insecticidal properties.	None	51/2 –9 pts	2 1/2-4 fl.oz	6-8 tbsp
Sun spray Ultra fine Spray Oil	Refined petroleum distillate		Treecrops, vegetables and ornamentals: Aphids, mites and ovicide leafminers, mealy bugs, whiteflies and others.	Acts as a suffocant and ovicide		1/2 gal	11/2-2.5 fl.oz	7 tsp

FUNGICIDES

Most fungicides are applied as **Protectants**, i.e. they are applied to the plant before the disease develops. Another type of fungicide kills or stops the spread of the fungus once it has become established in or on the plant. These fungicides are called **Eradicants.**

RODENTICIDES

Most of the rodenticides used in St.Vincent and the Grenadines are **Anticoagulants**. Some are classified as **multi-feeding anticoagulants**, which must be consumed repeatedly over a period of several days before a lethal dose is acquired. Others are **single-feed anticoagulants** which are capable of causing death after a single feeding.

SAFETY PERIOD/HARVEST INDEX - This refers to the period which must elapse between the last application of a pesticide and the harvesting of plant produce for human or animal consumption.

TOXICITY OF PESTICIDES

	ORAL	DERMAL
Highly toxic	LD50 < 50 mg/kg	< 200 mg/kg
Moderately toxic	LD50 50-500 mg/kg	200-2000 mg/kg
Slightly toxic	LD50 500-5000 mg/kg	2000-20 000 mg/kg
Relatively non-toxic	LD50 >5000 mg/kg	>20 000mg/kg

All pesticides are toxic. They range from the most dangerous (category I) to the least dangerous (category IV). The **LD50** ("LD"- lethal dose) rating, measures the amount of pesticide that kills 50% of the test animals (white male rats), in terms of milligrams of pesticide per kilogram of body weight. For example, if the LD 50 of a rat poison is 200, then 200mg of the poison should kill one of every 2 rats that weigh 1kg each. These values provide a fairly good measure of the relative toxicity of pesticides to humans. The lower the LD 50, the higher the toxicity, thus the greater the hazard.

Oral LD 50 applies to pesticides taken through the mouth.
Dermal LD 50 applies to pesticides absorbed through the skin.

LABEL SIGNAL WORDS

LABEL	WORDS	SIGN
DANGER, POISON, TOXIC	EXTREMELY OR HIGHLY TOXIC	
WARNING, HARMFUL	MODERATELY TOXIC	**X**
CAUTION	SLIGHTLY TOXIC	NONE

NEMATICIDES

TRADE NAME	COMMON NAME ACTIVE INGREDIENTS	ACUTE ORAL TOXICITY	USUAGE CROP/ PEST	REMARKS	APPLICATION RATES Per/ acre quantity/ mat/ year	
Furadan 10G	Carbofuran	LD50– 8mg/ kg Highly toxic	Banana and other crops: Root-knots nematode, soil insects and other nematodes.	A carbonate compound used as a systemic and contact stomach poison insecticide/ nematicide. A very toxic material. Gloves and mask should be worn at the time of application. Performance is reduced in dry soil condition.	20- 40 lbs	40 ms/mat. thrice/year.
Mocap 10 % G	Ethoprophos	LD50-62mg/kg Highly toxic	Banana and tree crops: Soil nematodes and soil insects. Can be used at the time of final land preparation, at planting and as a spot treatment on establish crops.	A contact insecticide/ nematicide with excellent residual activity. Precaution as per Furadan.	1– 40 lbs	30 gm/mat. thrice/year.
Vydate E.C.	Oxamyl	LD50-5.4mg/kg Highly toxic	Banana: as for Furadan	A contact and systemic insecticide/ acaricide/ nematicide. May be phytoxic on melongene. Apply with an injector.		7.5 ml/ thrice/year

PYRETHROIDS								
TRADE NAME	**COMMON NAME/ACTIVE INGREDIENT**	**ACUTE ORAL TOXICITY**	**USAGE CROP/PEST**	**REMARKS**	**SAFETY PERIOD**	**APPLICATION RATES Per/acre**	**Fl/oz/oz/gal**	**Tbs/tsp/gal**
Ambush 50% EC	Permethrin	LD50-4000mg/kg eye irritation. Toxic to bees and fish.	Vegetables and Legumes: Aphids, caterpillars, leafminers, budworms, pod borers, stink bugs, white flies, pin worms	A broad spectrum stomach poison and contact insecticide. May cause mite build up.	3 dys	5 fl.oz		½ - 1 tsp
Belmark	Fenvalerate	LD50l-450mg/kg Causes irritation to eye and skin. Toxic to fish and bees.	Vegetables and Legumes: As for Ambush.	Contact and stomach poison insecticide. Do not graze treated area and don not mix with alkaline material.	21 dys	8 fl.oz		1 tsp
Decis 2.5 EC	Decamethrin	LD50-135mg/kg Toxic to bees and fish.	Many crops: beetles, caterpillars, houseflies, and many others.	Contact and stomach poison insecticide.	3 dys	5 fl.oz		½ - 1 tsp
Fastac	Alpha-cypermethrin	Irritation to skin, risk of serious damage to eyes	Vegetables: Flea beetles, aphid, and cut worms.					
Karate	L-cyhalothrin	LD50-56mg/kg	Many crops: Apids, white flies, beetles, weevils, caterpillars, mosquities, flies, midges, cockroaches	Contact residual and stomach acting insecticide with repellant properties. Highly active at low rates. Rapidly absorbed and degraded. Compatible with most insecticides and fungicides.	7 dys	5 fl.oz		½ tsp

PESTICIDES USE CHARTS

KEY TO ABBREVIATIONS

EC	**-**	**Emulsifiable Concentrate**
WP	**-**	**Wettable Powder**
G	**-**	**Granular**
SP	**-**	**Soluble Powder**
TC	**-**	**Termite Concentrate**
Pre-em	**-**	**Pre-emergence**
Post-em	**-**	**Post-emergence**
tbsp	**-**	**Tablespoon**
tsp	**-**	**Teaspoon**
gal	**-**	**gallon**
oz	**-**	**ounce**
fl.oz	**-**	**fluid ounce**
Imp.	**-**	**Imperial**
Kg.	**-**	**Kilogram**
ha.	**-**	**Hectare**
ac.	**-**	**Acre**

NEREISTOXIN DERIVATIVES
N.B: Excessive use may retard growth and cause burning.

TRADE NAME	COMMON NAME/ ACTIVE INGREIENTS	ACUTE ORAL TOXICITY	USUAGE CROP/ PEST	REMARKS	SAFETY PERIOD	APPLICATION RATES Per/ace Fl.oz/ oz.gal tbs/tsp/gal		
Evisect	Thiocyclam	LD50-31 mg	Many crops; many caterpillars, sucking insects, flies.	Contact and stomach activity. Fungicidal activity against some rust fungi. Do not mix with fungicides containing copper. May affect cabbage growth.	7 days	1/4– 1 lb		2 tsp
Padan 50 SP	Cartap	LD50– 250/mg Toxic to fish. Moderatelt toxic to honey bees	Many crops: many caterpillars, leafminers, boll weevil, flea beetles, leafhoppers, onion thrips	Contact and stomach poison. Compatible with most commonly used pesticides except alkaline ones.	10 days	1.25 lbs	1/2 oz.	

TRADE NAME	COMMON NAME/ ACTIVE INGREDIENTS	ACUTE ORAL TOXICITY	USAGE CROP/ PEST	REMARKS	SAFETY PERIOD	APPLICATION RATES Per/acre Fl.oz/oz/gal Tbs/tsp/gal		
Malathion 57 EC	Malathion	LD50-137-2800 Toxic to bees.	Many crops: Wide use.	A non-systemic insecticide/ acaricide with contact, residual and systemic activity. Phytotoxic effects have been reported on certain varieties of tomatoes, beans, sweet peppers, sour sop flower and ornamentals. Incompatible with alkaline compounds. Use a wetting agent for control of aphids.	7 days	3/4-11/2 pints	3/4-1 fl.oz	4-6 tsp
Orthene 75 SP	Acephate	LD50 866MG/ KG Toxic to bees.	Many crops: Aphids, leaf hoppers, leafminers, armyworm, hornworm, loopers, thrips and many others.	A contact systemic insecticide with moderate persistence. Compatible with other pesticides. Do not apply at flowering.	14 days	2/3-11/3 lbs	1/2 oz	
Primicid 50% EC	Pirimiphos-ethyl	LD50-140mg/kg	Soil application; white grubs, weevil-larvae cutworms, mole cricket.	A persistent contact insecticide.		5 pts	2 fl.oz	4 tbs
Rogor/Perfekthion 40% EC	Dimethoate	LD50-225mg/kg Toxic to bees.	Many crops: mealy bugs, scales, mites, aphids, leafhoppers, thrips and many other sucking insects.	Insecticide/acaricide with contact, residual and systemic activity. Phytotoxic effects have been reported on certain varieties of tomatoes, beans, sweet peppers, sour sop flower and ornamentals. Do not use on chineese cabbage and citrus seedlings. Compatible with chemicals that are not alkaline in reaction.	15 days	1 pt		2 tsp

INSECTICIDES USE CHART

PESTS	RECOMMENDED INSECTICIDE
1. Ants	Basudin 40% WP Basudin 60% EC Sevin 85% WP
2. Aphids, Leafhoppers	Ambush Belmark Basudin 60 E Decis 2.5 EC Dursban 50 WP Ekalux Forte Karate
3. Caterpillars	Ambush Belmark Basudin 60 E Decis Dipel Dursban 50 WP Ekalux Forte
4. Cutworms, Grubs, Mole Cricket	Basudin 60 EC Dursban Bait: 1lb active ingredient Basudin WP or any other insecticide in powdered form; 20lbs cornmeal, citrus pulp, sawdust, coir dust; 3lbs molasses or 1 - 1½ gals water.
5. Citrus Weevil, Flea Beetles, Grasshopper	Ambush Basudin Decis Dursban Evisect
6. Leafminer	Ambush Basudin 60 EC Belmark Dursban

Evisect
Karate
Malathion
Nomolt
Orthene
Padan
Sevin 85% WP

Furadan
Primicid 50 EC

Karate
Malathion
Orthene
Padan

Malathion
M-Pede
Orthene
Primor
Rogor
Sun spray

Malathion
Belmark
Basudin 60 E
Orthene
Rogor
Sun spray

Orthene
Padan
Rogor 40
Sunspray

7. Mealy Bugs	Basudin 60 E M-Pede Ekalux forte Rogor 40 Malathion 57% EC Sunspray
8. Mites	Basudin Kelthane Dursban Malathion Ekalux Forte M-Pede Rogor 40
9. Scale Insects	Basudin M-Pede Ekalux Forte Rogor 40 Malathion Sunspray
10. Stink Bugs	Ambush Ekalux Forte Basudin 60 EC Malathion Belmark Orthene Rogor 40
11. Slugs and Snails	(i)Metaldehyde Bait: 1 oz metaldehyde to 1½ lbs cornmeal, bargasse, citrus pulp, sawdust, and water to make into a paste. (ii) Sluggit: Apply to soil around damaged plants and next to stones and other likely hiding places of slugs and snails. Apply preferably at late evening.
12. Thrips	Ekalux Forte Orthene Malathion Padan M-Pede Rogor 40
13. White flies	Ekalux Forte M-Pede Karate Orthene Malathion Rogor 40 Sunspray Decis

ORGANOPHOSPHATES

Actellic 50 EC	Pirimiphos-methyl	LD50-2050mg/kg Toxic to fish.	Legumes, vegetables, ornamentals:Leaf feeding insects.	Fast acting broad spectrum contact insecticide. Expresses translaminar and fumigant action	7dys Cucumber-3 weeks	10 fl.oz	¼ oz	½ tbsp
Basudin 60 EC	Diazinon	LD50-300mg/kg May be absorbed through the skin. Highly toxic to birds, bees and fish.	Many crops: Soil insects, mealy bugs, beetles, mites, aphids, leafhoppers, corn earworm, scales and many others.	A contact and stomach poison with some acaricidal action. Long residual effect. Phytotoxicity reported on Pawpaw, african violet, poinsettias, gardenias, hibiscus and ferns. Do not use to treat begonias and chrysanthemums.	15 dys	24 fl.oz (650 mls)	½ fl.oz	4 tsp
Dursban 50 WP	Chlopyrifos	LD50-135-163mg/kg Dangerous to bees	Many crops: Aphids, beetles, caterpillars, grasshoppers, leafminers, mealybugs, soil pests, mites and many others.	A broad spectrum insecticide and acaricide with short residual effect on foliage and lasting effect on inert surfaces. Not to be used with spreader sticker or wetting agent. Not compatible with alkaline compounds and Zineb.	14-21 dys. Brassicas/ 6 wks	3.3 oz		½ tsp
Dursban TC	Chlopyrifos		Termite control	Toxic to birds, wildlife and extremely toxic to fish and other aquatic organisms.				
Ekaluxforte	Quinalphos	LD50- 65mg/kg Very toxic	Many crops: Aphids, thrips, mited, plant hoppers, leaf hoppers, mealybugs, scales, and caterpillars.	A contact and stomach poison used agianst sucking and biting insects, Should only be used by trained operators.	7 - 21 dys	0.5 - 1pt (205-475cc cc)		1 -2 tsp

INSECTICIDES

N.B: Alkaline pesticides include Copper fungicides, Bordeaux lime, Ammonium compounds

TRADE NAME	COMMON NAME/ ACTIVE INGREDIENT	ACUTE ORAL TOXICITY	USAGE CROP/PEST	REMARKS	SAFETY PERIOD	APPLICATION RATES Per/acre	Fl.oz/oz/gal	tbs/tsp/gal
BIOLOGICALS								
Dipel WP	Bacillus thuringiensis	Non-toxic to animals.	Vegetables, field crops and Ornamentals: Leaf eating caterpillars and leaf rollers.	Caterpillars are the only insects controlled. Do not expect insect to die immediately. They remain on the plant and keep eating until they die. Alternated with other types of insecticides. Do not store above 90°F . Do not allow diluted sprays to stand in spray tank for more than 12 hours. Addition of a wetter is recommended for use on brassicas.	No time limit	½ lb		1 tsp
Nomolt	Teflubenzuron	Non-toxic to animals	As for Dipel. Also effective on white flies	Products acts as a growth regulator. Best results achieved when used as a preventative treatment, or at first signs of pest. Adult insects are not killed. The addition of a suitable reccommended "knock down" chemical is necessary. Use 2 applications against caterpillars; 3 against whitefly.	no time limit	22.5 - 45 Fl.ozs		1 - 2 tbsp

FUNGICIDE USE CHART

DISEASE	RECCOMMENDED FUNGICIDE
1. Alternaria Leaf Spot	Benlate Cupravit Dithane Peltar
2. Anthracnose	Benlate Kocide 101 Cupravit Manzate 200 Daconil Peltar Dithane M 45 Trimiltox Forte
3. Black Pod	Cupravit Kocide Ridomil (systemic) Trimiltox Forte
4. Black Pod	Benlate Bravo/Daconil Kocide 101
5. Black Rot	Captan Kocide 101 Manzate 200 Trimiltox Forte
6. Cercospora Leaf Spot	Benlate Bravo/Daconil Kocide 101 Manzate 200 Trimiltox Forte
7. Damping-off	Aliette Banrot Benlate Ridomil
8. Downy Mildew	Bravo/Daconil Kocide 101 Captan Manzate 200 Dithane M45 Peltar Trimiltox Forte

9. Early/Late Blight	Captan Manzate 200 Dithane M45 Trimiltox Forte Kocide 101
10. Greasy Spot	Benlate Oil Emulsion Cupravit Kocide 101 Trimiltox Forte
11. Gummosis	Bordeaux Mixture (mix) Cupravit (blue) Kocide 101
12. Melanose	Benlate Kocide 101 Trimiltox Forte
13. Powdery Mildew	Benlate Mertect Bravo/Daconil Peltar Kocide 101
14. Phytophthora Stem and Root Rot	Aliette Banrot Ridomil
15. Rust	Benlate Dithane M45 Bordeaux Mix. Kocide 101 Bravo/Daconil Manzate 200
16. Septoria Leaf Spot	Bravo/Daconil Captan Peltar Dithane M45 Trimiltox Forte
17. Southern Blight	Benlate Bravo/Daconil
18. Sooty Mould	Cupravit Kocide 101 Trimiltox Forte
19. Scab	Benlate Dithane M45 Bordeaux Mix Kocide 101 Bravo/Daconil
20. Yellow Sigatoka	Calixin Mertect Benlate Tilt

PESTICIDE

PROFILES

HERBICIDE USE CHART			
CROPS	**HERBICIDE**	**TIME OF APPLICATION**	**LENGTH OF CONTROL**
1. Tomatoes, Sweet Pepper, Egg Plants etc.	Amiben Dactal Fusilade Prefar	Pre-em Pre-em & transplant Post-em Pre-plant	4 - 6 weeks 3 - 6 weeks ---------- ----------
2. Cucumber, Pumpkim, Watermelon etc.	Dacthal Fusilade Prefar	Pre-em Post-em Pre-plant	3 - 6 weeks
3. Cabbage, Cauliflower Broccoli etc.	Amiben Fusilade Prefar	Pre-em Post-em Pre-plant	4 - 8 weeks ---------- ----------
4. Carrots	Dosanex Gesagard Kerosene	Post-em Pre-em Post-em	---------- 4- 6 weeks 2 - 6 weeks
5. Onions	Dacthal Fusilade Goal Herbidox	Pre-em Post-em Post-em Post-em	3 - 6 weeks ---------- 8 - 10 weeks ----------
6. Beans, Peanuts Pigeon Pea etc.	Amiben Fusilade Gesagard Gramoxone Lasso	Pre-em Post-em Pre-em Post-em Pre-em	3 - 6 weeks ---------- 4 - 6 weeks 3 - 12 weeks 8 - 16 weeks
7. Banana	Dalapon ---------- Daconate Gesapax Gramoxone Karmex Maloran Reglone Round-up Talent	Pre-plant Pre & Post-em Post-em Post-em Pre-em Post-em Pre-em Pre-em Post-em Pre-plant Post-em	Permanent Kill ---------- 8 -12 weeks 10 - 16 weeks 3 - 12 weeks 8 - 20 weeks 10 - 16 weeks 3 - 12 weeks Permanent Kill 12 - 27 weeks

8. Corn	Gesaprim Lasso 2,4 - D	Pre-em Pre-em Post-em	8 - 16 weeks 8 - 16 weeks ----------
9. Pineapple	Gesapax-Combi Gesaprim Hyvar-x Karmex	Pre-em Pre-em Pre- & Post-em Pre-em	10 - 16 weeks 8 - 16 weeks Permanent Kill Permanent Kill
10. Ginger	Gesagard	Pre-em	4 - 6 weeks
11. Arrowroot	Agroxone	Pre-em	
12. Cassava	Fusilade Gesaprim Gramoxone Karmex Lasso Round-up	Post-em Pre-em Post-em Pre-em Pre-em Post-em	---------- 8 - 16 weeks 3 - 12 weeks Permanent Kill 8 - 16 weeks Permanent Kill
13. Eddoes, Dasheen	Fusilade Gesagard Gramoxone Maloran	Post-em Pre-em Post-em Pre-em	---------- 4 - 6 weeks 3 - 12 weeks ----------
14. Tannias	Gesaprim	Pre-em	8 - 16 weeks
15. Sweet Potatoes	Amiben	Pre-em	4 - 6 weeks
16. Yams	Dalapon Fusilade Gesaprim Karmex	Post-em Post-em Pre-em Pre-em	---------- ---------- 8 - 16 weeks ----------
17. Love Vine control	Gramoxone Sulphate of Ammonia 2,4 - D		

PESTICIDE TIPS

- **Let us teach each other what we know about Pesticides.**
- **Pesticides are dangerous - use them judiciously.**
- **Always read the label before using Pesticides.**
- **When applying Pesticides, always wear protective clothing.**