

# 9. Information on Pesticides

## Efficacy Ratings for Pesticides

The value of all insecticides, miticides and fungicides is evaluated by the Pest Management Regulatory Agency (PMRA) prior to registration, which includes an assessment of efficacy. Wording on the product label such as control, suppression or partial suppression is used to describe the level of pest management provided by these products. The definitions of “control” and “suppression” for insecticides have a somewhat different meaning than the same terms applied to fungicides, according to the Pest Management Regulatory Agency’s *Value Guidelines for New Plant Protection Products and Label Amendments* and summarized in Table 9–1. *Pesticide Efficacy Ratings*, on this page.

Note: These guidelines are currently suggestions and are under review by the Pest Management Regulatory Agency. Current, approved Canadian labels may also include a statement “reduction in damage from” the target pest. This is an undefined level of control less than suppression, and this statement is still under review with the Pest Management Regulatory Agency.

For direct pests that cause damage to the fruit, it is important to choose products that provide control rather than suppression. However, if the pest is an indirect pest, and does not affect fruit directly, products labelled for suppression may be useful. Together with natural enemies or biological control, products used for suppression might be enough to prevent significant crop damage. Products labelled for suppression may also play a role in resistance management. By alternating with products from different families, the risk of pest resistance to important products can be reduced.

Price and intended markets play a big part of the decision to use products for suppression. Sometimes there are no other options for organic pest management. However, when using a new product for pest suppression, try to leave an untreated check and evaluate the benefits of using these products compared to the cost of application.

**Table 9–1.** Pesticide Efficacy Ratings

Pesticide	Efficacy Term	Defined As
Insecticide Miticide	control	The product, when applied in accordance with the label directions, consistently reduces pest numbers or pest damage to a commercially acceptable level.
	suppression	The product, when applied in accordance with the label directions, does not reduce pest populations or damage to a level typically required to achieve commercially acceptable control. Under such situations, the level of performance offered by the product should still have value in a pest management program.
Fungicide	control	A consistent level of disease management, as defined by commercial standards and expectations in the market, when compared to untreated control plots. In general, disease control ratings would be between 80%–100%.
	suppression	A consistent level of disease management that is less than full control, as defined by commercial standards and expectations in the market, when compared to untreated control plots. In general, disease control ratings would be between 60%–100%. Suppression is defined as consistent disease reduction to a level that is not optimal but is still of commercial benefit.
	partial suppression	A level of disease management that is less than suppression, as defined by the commercial standards and expectations in the market. This label claim will generally only be considered for non-conventional fungicides. In general, disease control ratings would be less than 40%.

Source: Pest Management Regulatory Agency (PMRA), April 2016.

## Handling and Mixing Pesticides

### Water Volumes

When the pesticide label does not prescribe a carrier volume, the spray operator must decide the appropriate volume. Ideally, it will be enough to suspend the product in solution and distribute spray droplets evenly over the target surface(s) but not so much as to cause excess spray to run off the plants. The spray operator must consider a few factors when determining an appropriate volume:

- The mode-of-action of the product being applied. For example, a contact product will require a higher droplet density than a locally systemic product, which has limited translocation in plant tissues.
- The location of the target. For example, if the target is a mobile insect found predominately on the upper-side of the leaf surface, it will be easier to spray and less carrier will be required. However, if the target is a disease or insect that occurs deep in the plant canopy, more carrier volume will be required to penetrate and contact the pest.
- The row spacing, size, density and stage of development of the crop. The more plant canopy to be protected per hectare, the more carrier volume will be required to adequately cover all surfaces.

To confirm sufficient coverage, the sprayer operator requires some form of feedback. Visually inspecting foliar “wetness” and spray residue, or waiting to see if the spray successfully controlled the pest is not sufficient. By placing water-and-oil sensitive papers in key locations within the target canopy, the spray applicator can quantify coverage. Good coverage on the upper, and often lower, leaf surface is an essential component of the performance of many fungicides and insecticides. For more information on quantifying coverage, see [sprayers101.com](http://sprayers101.com) and *Airblast 101, A Handbook of Best Practices in Airblast Spraying*.

### Formulations

Dry pesticide formulations include:

- **Wettable powders** – active ingredients added to a wetting and dispersion agent, such as talc mixed with water. They will not dissolve, but form a suspension that requires constant agitation. Unless the label states otherwise, premix wettable powders with water and add the slurry to the spray tank.

- **Granules** – a mix of dry, large free-flowing particles, usually with a low concentration of active ingredient. They are ready to be added directly to water.
- **Soluble powders** – dry materials, similar to granules, but dissolve in water.

Liquid pesticide formulations mix in water to form a solution. Some pesticides may be oil-based, such as emulsifiable concentrates, and form an opaque (milky) emulsion that requires agitation.

### Soluble Packaging

Water-soluble packaging is used for dry flowable and wettable powder formulations. In most cases, the water-soluble packaging material is PVA (polyvinyl alcohol), which dissolves completely when added to the tank water according to instructions. Read labels carefully.

- Keep soluble pouches dry until added to the spray tank.
- Do not handle pouches with wet hands or wet gloves.
- Do not remove pouches from the outer package until just before use.
- Always reseal the outer package to protect the remaining pouches from moisture.

### Mixing Soluble Pouches

Consult product labels for specific mixing instructions for each product.

1. Half-fill the spray tank with water and have the agitator running. Add pouches directly to the tank (not into the basket).
2. Most pouches dissolve completely within 5 minutes, depending on water temperature and agitation.
3. As the tank continues to fill, add any other compatible pesticides.

Do not add:

- A pesticide that is incompatible with the PVA packaging material, such as oils (e.g., Superior Oil) and emulsifiable concentrate formulations containing mineral or vegetable oil.

- Any material containing boron, chelated micronutrients or water-soluble fertilizers. Rinse spray tank carefully after applying these nutrients.

### Compatibility of Spray Materials

Users of commercial-class pest control products for crop protection or vegetation management are permitted to apply unlabelled tank mixes as long as:

- each product is registered for use in Canada on the crop.
- each product is used according to the label.
- the tank-mix only includes an adjuvant when specifically required by one of the product labels.
- the application timing of each product is compatible with crop and pest staging.
- no product is specifically excluded on any other of the tank-mix product labels.

For information on compatibility of spray materials, always check the product label. Physical incompatibility can result in a physical change in the solution. Components of the combined product may plug nozzles or become solidified or gummy in the tank. Chemical incompatibility can result in a chemical change in the solution. This can lead to reduced efficacy, or can cause plant injury when sprayed on the crop.

Generally, compatibility:

- varies with the formulation of the products. For example, two products may be compatible as wettable powder formulations, but the same active ingredient may be incompatible as emulsifiable concentrate formulations.
- refers to two-way mixtures. Adding a third product to a tank-mix, even if all are compatible with each other in two-way combinations, may result in incompatibility.
- may depend on the solvents and emulsifiers the manufacturer uses. Emulsifiable concentrates are more likely to cause compatibility problems than wettable powders.

Specifically:

- Add Captan or Maestro first when mixing with emulsifiable concentrate formulations of pyrethroids. Apply immediately with constant agitation.
- Do not mix pesticides with lime sulphur or streptomycin.
- Do not use oil sprays within 14 days of Captan or Maestro, including the oil used with Agri-Mek.

For more information on compatibility, contact the product manufacturer or distributor.

### Jar Test for Pesticide Compatibility

Always check the product labels for information on compatibility of spray materials. “Compatibility” refers to the physical and/or chemical compatibility of two or more products in a solution. If you are concerned, you should perform a jar test.

Always wear personal protective equipment (PPE) when performing a jar test. Do so in a safe and ventilated area, away from sources of ignition.

1. Measure 500 ml of water into a 1 litre glass jar. This should be the same water you would use to fill a spray tank.
2. Add ingredients according to Table 9–2. *Tank-Mix Order for Pesticide Compatibility Test*, page 410, stirring after each addition.
3. Let the solution stand in a ventilated area for 15 minutes and observe the results. If the mixture is giving off heat, these ingredients are not compatible. If gel or scum forms or solids settle to the bottom (except for the wettable powders) then the mixture is likely not compatible.
4. If no signs of physical incompatibility appear, test the mixture using a spray bottle on a small area where it is to be applied. Look for phytotoxic indications, such as plant damage, and monitor efficacy (this will be hard to do unless you fill the sprayer and try it on a few plants).

**Table 9–2.** Tank-mix Order for Pesticide Compatibility Test

Order	Ingredient	Quantity for 500 ml or 500 g of Product Labeled for 1,000 L of Final Spray Volume
1	compatibility agents	5 ml (1 teaspoon)
2	water-soluble packets, wettable powders and dry flowables	15 g (1 tablespoon)
3	liquid drift retardants	5 ml (1 teaspoon)
4	liquid concentrates, micro-emulsions and suspension concentrates	5 ml (1 teaspoon)
5	emulsifiable concentrates	5 ml (1 teaspoon)
6	water-soluble concentrates or solutions	5 ml (1 teaspoon)
7	remaining adjuvants and surfactants	5 ml (1 teaspoon)

### Factors Impacting Pesticide Performance

Water quality can affect pesticide performance. The four variables are: pH (acidity & alkalinity), dissolved minerals (water hardness or softness), suspended particles (dirty water) and temperature. For more information, see [sprayers101.com](http://sprayers101.com), OMAFRA Factsheet 09–037, *How Weather Conditions Affect Spray Applications* and OMAFRA Factsheet 09–039, *Six Elements of Effective Spraying in Orchards and Vineyards*.

### Filling the Tank

Pesticide labels usually provide directions for mixing different materials, including the sequence for mixing. The order in which you add each product to the tank, or inductor, is critical. For the latest information, see [sprayers101.com](http://sprayers101.com).

#### Spray drift

Do you know what pesticide drift looks like or what you can do about it? OMAFRA and CropLife Canada have created two short videos with innovative visual demonstrations using dyes and night-spraying to show what drift actually looks like. See how spray particles behave and discover what changes can be made to your spray program to greatly reduce the risk of pesticide drift. Learn more at [ontario.ca/spraydrift](http://ontario.ca/spraydrift).

For more information on pesticide handling and operator safety, consult the Ontario Pesticide Education Program (OPEP) Grower Pesticide Safety course ([www.opep.ca/resources](http://www.opep.ca/resources)).

## Pesticides Used on Fruit Crops in Ontario

### In this section:

- Table 9–3.** *Pesticides Used on Fruit Crops in Ontario by Active Ingredient*, on this page.  
**Table 9–4.** *Pesticides Used on Fruit Crops in Ontario*, page 415.  
**Table 9–5.** *Thinners and Plant Growth Regulators Used on Fruit Crops in Ontario*, page 425.

Only crops included in this publication are listed under pesticide registrations in Table 9–4. A crop group is a grouping of plant species based on botany and taxonomy (e.g., plant families), as well as on how the crops are produced. Crop groups are often further divided into smaller and more closely related subgroups. A pest control product may be registered on a subgroup, rather than the entire crop group. Crop groupings are used primarily to set maximum residue limits and establish a common pre-harvest interval for a similar set of crops. It is important to remember that not all products have a crop group registration,

and products registered on one crop are not necessarily registered on all members of its crop group. There are some crops that do not belong in a crop group. See Health Canada's *Residue Chemistry Crop Groups* (<https://www.canada.ca/en/health-canada/services/consumer-product-safety/pesticides-pest-management/public/protecting-your-health-environment/pesticides-food/residue-chemistry-crop-groups.html>) for a complete list of all crops included in both original and revised crop groups. Growers of low acreage, specialty fruit should always check product labels to ensure the product is registered on their crop.

**Table 9–3.** Pesticides Used on Fruit Crops in Ontario by Active Ingredient

Common Name/Active Ingredient	TRADE or BRAND Name *
abamectin	AGRI-MEK SC
acephate	ORTHENE 75% SP
acequinocyl	KANEMITE 15 SC
acetamiprid	ASSAIL 70 WP
ametoctradin + dimethomorph	ZAMPRO
<i>Aureobasidium pullulans</i>	BLOSSOM PROTECT, BOTECTOR
aviglycine hydrochloride	RETAIN
azoxystrobin	QUADRIIS FLOWABLE
azoxystrobin + propiconazole	QUILT

Common Name/Active Ingredient	TRADE or BRAND Name *
<i>Bacillus amyloliquefaciens</i>	DOUBLE NICKEL LC
<i>Bacillus subtilis</i>	SERENADE OPTI
<i>Bacillus thuringiensis</i> var. <i>kurstaki</i>	BIOPROTEC CAF, DIPEL 2X DF, FORAY 48 BA
6-benzyladenine	MAXCEL
6-benzyladenine + gibberellins	PROMALIN SL
6-benzylaminopurine	CILIS PLUS
6-benzylaminopurine + gibberellins	PERLAN
benzovindiflupyr + difenoconazole	APROVIA TOP 195 EC
BLAD polypeptide	FRACTURE

\* Mention of a TRADE or BRAND name does not constitute a guarantee or warranty of the product by the Ontario Crop Protection Committee or the Ontario Ministry of Agriculture, Food & Rural Affairs.

**Table 9–3.** Pesticides Used on Fruit Crops in Ontario by Active Ingredient (cont'd)

Common Name/Active Ingredient	TRADE or BRAND Name *
bifenthrin	CAPTURE 240 EC
bifenazate	ACRAMITE 50 WS
calcium polysulphide	LIME SULPHUR
boscalid	CANTUS WDG
boscalid + pyraclostrobin	PRISTINE WG
canola oil	VEGOL CROP OIL
captan	MAESTRO 80 DF, SUPRA CAPTAN 80 WDG
carbaryl	SEVIN XLR
chlorantraniliprole	ALTACOR
chloropicrin	CHLOROPICRIN 100, PIC PLUS FUMIGANT
chlorothalonil	BRAVO ZN, ECHO 90 DF
chlorpyrifos	LORSBAN 50 W, PYRINEX 480 EC, WARHAWK 480 EC
citric acid + lactic acid	TIVANO
clofentezine	APOLLO SC
clothianidin	CLUTCH 50 WDG
copper hydroxide	KOCIDE 2000
copper octanoate	CUEVA
copper oxychloride	COPPER SPRAY, GUARDSMAN COPPER OXYCHLORIDE 50
copper sulphate, tri-basic	COPPER 53 W
cyantraniliprole	EXIREL
cyazofamid	TORRENT 400 SC
<i>Cydia pomonella</i> granulovirus	CYD-X, VIROSOFT CP4
cyflumetofen	NEALTA
cymoxanil + famoxadone	TANOS 50 DF
cypermethrin	MAKO, UP-CYDE 2.5 EC
cyprodinil + difenoconazole	INSPIRE SUPER
cyprodinil + fludioxonil	SWITCH 62.5 WG

Common Name/Active Ingredient	TRADE or BRAND Name *
deltamethrin	DECIS 5 EC
deltamethrin + imidacloprid	CONCEPT
diazinon	DIAZINON 500 E
difenoconazole + benzovindiflupyr	APROVIA TOP 195 EC
difenoconazole + cyprodinil	INSPIRE SUPER
dimethoate	CYGON 480-AG, LAGON 480 E
dimethomorph	FORUM
dimethomorph + ametoctradin	ZAMPRO
dodine	EQUAL 65 WP, SYLLIT 400 FL
ethephon	ETHREL
famoxadone + cymoxanil	TANOS 50 DF
fenbuconazole	INDAR
fenhexamid	ELEVATE 50 WDG
ferbam	FERBAM 76 WDG
ferric phosphate	SLUGGO PROFESSIONAL
flonicamid	BELEAF 50 SG
fluazinam	ALLEGRO 500 F
fludioxonil	SCHOLAR 230 SC
fludioxonil + cyprodinil	SWITCH 62.5 WG
fluopyram	VELUM PRIME
flupyradifurone	SIVANTO PRIME
flutriafol	FULLBACK 125 SC
fluopyram + pyrimethanil	LUNA TRANQUILITY
fluxapyroxad	SERCADIS
folpet	FOLPAN 80 WDG
fosetyl al	ALIETTE
garlic powder	BURAN
gibberellic acid	FALGRO TABLET

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**Table 9–3.** Pesticides Used on Fruit Crops in Ontario by Active Ingredient (cont'd)

Common Name/Active Ingredient	TRADE or BRAND Name *	Common Name/Active Ingredient	TRADE or BRAND Name *
gibberellins + 6-benzyladenine	PROMALIN SL	mineral oil	PURESpray GREEN SPRAY OIL 13 E, SUPERIOR 70 OIL, SUPERIOR 70 OIL E
gibberellins + 6-benzylaminopurine	PERLAN	myclobutanil	NOVA
imidacloprid	ADMIRE 240 FLOWABLE, ALIAS 240 SC	1-naphthaleneacetic acid	FRUIT FIX CONCENTRATE, FRUITONE-L
imidacloprid + deltamethrin	CONCEPT	novaluron	RIMON 10 EC
iprodione	ROVRAL WP	oriental mustard seed meal	MUSTGROW
isofetamid	KENJA 400 SC	oxamyl	VYDATE L
kaolin	SURROUND WP	penthiopyrad	FONTELIS
kasugamycin	KASUMIN 2L	permethrin	AMBUSH 500 EC, PERM-UP EC, POUNCE 384 EC
kresoxim-methyl	SOVRAN	pheromone	ISOMATE-CM/OFM TT, ISOMATE-DWB, ISOMATE-GBM PLUS, ISOMATE-PTB DUAL, ISOMATE OFM TT
lactic acid + citric acid	TIVANO	phosmet	IMIDAN WP
lambda-cyhalothrin	MATADOR 120 EC, SILENCER 120 EC	phosphites, ammonium, potassium, mono- and di-basic sodium	PHOSTROL
malathion	MALATHION 85 E	phosphorous acid, mono- and di-potassium salts of phosphorous acid	CONFINE EXTRA, RAMPART
mancozeb	DITHANE RAINSHIELD, MANZATE PRO-STICK, PENNCOZEB 75 DF RAINCOAT	potassium bicarbonate	MILSTOP, SIROCCO
mancozeb + metalaxyl	RIDOMIL GOLD MZ 68 WG	potassium salts of fatty acids	KOPA, OPAL
mancozeb + zoxamide	GAVEL 75 DF	prohexadione calcium	APOGEE
mandestrobin	INTUITY	prohydrojasmon	BLUSH
mandipropamid	REVUS	propiconazole	BUMPER 432 EC, FITNESS, JADE, TILT 250 E
metalaxyl-m and s-isomer	RIDOMIL GOLD 480 SL	propiconazole + azoxystrobin	QUILT
metalaxyl-m and s-isomer + mancozeb	RIDOMIL GOLD MZ 68 WG	prothioconazole	PROLINE 480 SC
metam potassium	BUSAN 1180	<i>Pseudomonas syringae</i>	BIO-SAVE 10 LP
metam sodium	BUSAN 1020, BUSAN 1236, ENFUSE M510, VAPAM HL	pyraclostrobin	CABRIO EG
metconazole	QUASH	pyraclostrobin + boscalid	PRISTINE WG
methomyl	LANNATE TOSS-N-GO	pyrethrins	PYGANIC EC 1.4 II
methoxyfenozide	INTREPID	pyridaben	NEXTER
1-methylcyclopropene	HARVISTA 1.3 SC	pyrimethanil	SCALA SC
metiram	POLYRAM DF	pyrimethanil + fluopyram	LUNA TRANQUILITY
metrafenone	VIVANDO SC		

\* Mention of a TRADE or BRAND name does not constitute a guarantee or warranty of the product by the Ontario Crop Protection Committee or the Ontario Ministry of Agriculture, Food & Rural Affairs.



**Table 9–3.** Pesticides Used on Fruit Crops in Ontario by Active Ingredient (cont'd)

Common Name/Active Ingredient	TRADE or BRAND Name *	Common Name/Active Ingredient	TRADE or BRAND Name *
pyriofenone	PROPERTY 300 SC	sulphur	COSAVET EDGE DF, KUMULUS DF, MICROSCOPIC SULPHUR WP, MICROSCOPIC WETTABLE SULPHUR, MICROTHIOL DISPERSS
quinoxifen	QUINTEC	tea tree oil	TIMOREX GOLD
<i>Reynoutria sachalinensis</i> extract	REGALIA MAXX	tebufenozide	CONFIRM 240 F
spinetoram	DELEGATE	tetraconazole	METTLE 125 ME
spinetoram + sulfoxaflor	TWINGUARD	thiabendazole	MERTECT SC
spinosad	ENTRUST, GF-120 FRUIT FLY BAIT, SUCCESS	thiacloprid	CALYPSO 480 SC
spirotetramat	ENVIDOR 240 SC	thiamethoxam	ACTARA 25 WG
spiromesifen	OBERON FLOWABLE	thiophanate methyl	SENATOR 50 SC
spirotetramat	MOVENTO 240 SC	thiram	GRANUFLO T
spiroxamine	PRIWEN	trifloxystrobin	FLINT
<i>Streptomyces lydicus</i>	ACTINOVATE SP	triforine	FUNGINEX DC
streptomycin sulfate	STREPTOMYCIN 17	zoxamide + mancozeb	GAVEL 75 DF
sulfoxaflor	CLOSER		
sulfoxaflor + spinetoram	TWINGUARD		

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**Table 9–4.** Pesticides Used on Fruit Crops in Ontario

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
27925	ACRAMITE 50 WS	bifenazate	a	apple, apricot, blackberry, cherry, grape, hazelnut, peach, pecan, plum, raspberry, sweet chestnut, walnut	WSP	50%	4
28408	ACTARA 25 WG	thiamethoxam	i	apple, blackberry, blueberry, cherry, currant, gooseberry, pear, raspberry, saskatoon berry, strawberry	D	25%	3
28672	ACTINOVATE SP	<i>Streptomyces lydicus</i> strain WYEC108	f	blueberry, grape, strawberry	D	0.037%	4
24094	ADMIRE 240 FLOWABLE	imidacloprid	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon berry, strawberry, sweet chestnut, walnut	L	240 g/L	4
31607	AGRI-MEK SC	abamectin	a, i	apple, blackberry, grape, pear, raspberry, strawberry	L	84 g/L	3
28475	ALIAS 240 SC	imidacloprid	i	apple, blackberry, blueberry, cherry, peach, raspberry, saskatoon berry, strawberry	L	240 g/L	4
27688	ALIETTE	fosetyl al	f	apple, blackberry, blueberry, grape, raspberry, strawberry	D	80%	3
27517	ALLEGRO 500 F	fluazinam	f	apple, blueberry, currant, gooseberry	L	40%	3
28981	ALTACOR	chlorantraniliprole	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon berry, strawberry, sweet chestnut, walnut	D	35%	2
14882	AMBUSH 500 EC	permethrin	i	apple, grape, peach, pear, plum	EC	500 g/L	4
28042	APOGEE	prohexadione calcium	pgr	apple, cherry, strawberry	D	27.5%	4
21035	APOLLO SC	clofentezine	a	apple, peach, pear, raspberry, strawberry	L	500 g/L	3
31526	APROVIA TOP 195 EC	difenoconazole + benzovindiflupyr	f	apple, grape, pear	EC	117 g/L + 78 g/L	2
27128	ASSAIL 70 WP	acetamiprid	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, nectarine, peach, pear, plum, raspberry, saskatoon berry, strawberry	D	70%	4

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<sup>1</sup> a = Acaricide, miticide. b = Bactericide. ba = Bacterial antagonist. cp = Crop protectant. f = Fungicide. h = Herbicide. i = Insecticide. n = Nematicide. md = Mating disrupter. pgr = Plant growth regulator. s = Slug bait.

<sup>2</sup> D = Dry formulations (including wettable granule, wettable powder, water-dispersible granule). DIS = Dispenser units. EC = Emulsifiable concentrate. L = Liquid formulations (including liquid, suspension concentrate, solution, suspension, micro-emulsion). P = Particulate/pellet. WSP = Water-soluble packets.

**Table 9–4. Pesticides Used on Fruit Crops in Ontario (cont'd)**

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
29796	BELEAF 50 SG	flonicamid	i	apple, apricot, blueberry, cherry, peach, pear, plum, strawberry	D	50%	4
26854	BIOPROTEC CAF	<i>Bacillus thuringiensis</i> var. <i>kurstaki</i>	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon berry, strawberry, sweet chestnut, walnut	L	8.12%	3
29673	BIO-SAVE 10 LP	<i>Pseudomonas syringae</i> strain ESC-10	f	apple, cherry, pear	D	9 x 10 <sup>10</sup> CFU/g	4
30552	BLOSSOM PROTECT	<i>Aureobasidium pullulans</i> strains DSM 14940/14941	b	apple, pear	D	5 x 10 <sup>9</sup> CFU/g	3
31248	BOTECTOR	<i>Aureobasidium pullulans</i> strains DSM 14940/14941	f	blueberry, grape, strawberry	D	5 x 10 <sup>9</sup> CFU/g	3
28900	BRAVO ZN	chlorothalonil	f	blueberry, cherry, hazelnut, peach, strawberry	L	500 g/L	3
28017	BUMPER 432 EC	propiconazole	f	apricot, blackberry, blueberry, cherry, peach, plum, raspberry, saskatoon berry, strawberry	EC	432 g/L	3
30601	BURAN	garlic powder	f	apple, grape, pear	L	15%	3
19421	BUSAN 1020	metam sodium	f, h, n	fruit crops (before planting)	L	33%	4
25124	BUSAN 1180	metam potassium	f, h, n	fruit crops (before planting)	L	54%	3
25103	BUSAN 1236	metam sodium	f, h, n	fruit crops (before planting)	L	42%	4
27323	CABRIO EG	pyraclostrobin	f	apricot, blueberry, cherry, peach, plum, strawberry	D	20%	4
28429	CALYPSO 480 SC	thiacloprid	i	apple, pear	L	480 g/L	3
30141	CANTUS WDG	boscalid	f	apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, peach, plum, raspberry, strawberry	D	70%	2
31396	CAPTURE 240 EC	bifenthrin	i	raspberry	L	240 g/L	3
25863	CHLOROPICRIN 100	chloropicrin	f, n	raspberry, strawberry (before planting)	L	99%	2
30826	CLOSER	sulfoxaflor	i	apple, apricot, cherry, grape, hazelnut, peach, pear, pecan, plum, sweet chestnut, walnut	L	240 g/L	3
29382	CLUTCH 50 WDG	clothianidin	i	apple, apricot, cherry, grape, peach, pear, plum, strawberry	D	50%	2

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<sup>1</sup> a = Acaracide, miticide. b = Bactericide. ba = Bacterial antagonist. cp = Crop protectant. f = Fungicide. h = Herbicide. i = Insecticide. n = Nematicide. md = Mating disrupter. pgr = Plant growth regulator. s = Slug bait.

<sup>2</sup> D = Dry formulations (including wettable granule, wettable powder, water-dispersible granule). DIS = Dispenser units. EC = Emulsifiable concentrate. L = Liquid formulations (including liquid, suspension concentrate, solution, suspension, micro-emulsion). P = Particulate/pellet. WSP = Water-soluble packets.

**Table 9–4.** Pesticides Used on Fruit Crops in Ontario (cont'd)

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
29611	CONCEPT	imidacloprid + deltamethrin	i	blueberry	L	75 g/L + 10 g/L	3
30648	CONFINE EXTRA	mono- and di-potassium salts of phosphorous acid	f	blueberry, grape, strawberry	L	53%	4
24503	CONFIRM 240 F	tebufenozide	i	apple, blueberry, currant, gooseberry, pear, saskatoon berry	L	240 g/L	3
9934	COPPER 53 W	basic copper sulphate	b, f	apple, currant, gooseberry, grape, peach, pear, raspberry, strawberry, tart cherry	D	53.4%	3
19146	COPPER SPRAY	copper oxychloride	f	apple, blueberry, hazelnut, grape, peach, pear, raspberry, tart cherry, walnut	D	50%	4
31869	COSAVET DF EDGE	sulphur	a, f	apple, cherry, grape, peach, pear, plum, saskatoon berry	D	80%	3
31825	CUEVA	copper octanoate	f	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, plum, strawberry, raspberry, walnut	L	1.8%	4
30120	CYD-X	<i>Cydia pomonella</i> granulovirus	i	apple	L	0.06%	3
25651	CYGON 480-AG	dimethoate	i	blueberry, cherry, hazelnut, peach (non-bearing), pear, strawberry	EC	480 g/L	3
22478	DECIS 5 EC	deltamethrin	i	apple, blueberry, peach, pear, nectarine, strawberry	EC	50 g/L	3
28778	DELEGATE	spinetoram	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon berry, strawberry, sweet chestnut, walnut	D	25%	3
11889	DIAZINON 500 E	diazinon	i	blackberry, raspberry	EC	500 g/L	3
26508	DIPEL 2X DF	<i>Bacillus thuringiensis</i> var. <i>kurstaki</i>	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon, strawberry, sweet chestnut, walnut	D	57%	4
20553	DITHANE RAINSHIELD	mancozeb	f	apple, grape	D	75%	4
31887	DOUBLE NICKEL LC	<i>Bacillus amyloliquefaciens</i> strain D-747	b, f	apple, grape, pear, strawberry	L	1 x 10 <sup>10</sup> spores/mL	3

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<sup>1</sup> a = Acaracide, miticide. b = Bactericide. ba = Bacterial antagonist. cp = Crop protectant. f = Fungicide. h = Herbicide. i = Insecticide. n = Nematicide. md = Mating disrupter. pgr = Plant growth regulator. s = Slug bait.

<sup>2</sup> D = Dry formulations (including wettable granule, wettable powder, water-dispersible granule). DIS = Dispenser units. EC = Emulsifiable concentrate. L = Liquid formulations (including liquid, suspension concentrate, solution, suspension, micro-emulsion). P = Particulate/pellet. WSP = Water-soluble packets.

**Table 9–4. Pesticides Used on Fruit Crops in Ontario (cont'd)**

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
29356	ECHO 90 DF	chlorothalonil	f	blueberry, peach, strawberry, tart cherry	L	90%	4
25900	ELEVATE 50 WDG	fenhexamid	f	blackberry, blueberry, cherry, currant, gooseberry, grape, peach, raspberry, strawberry	D	50%	3
29142	ENFUSE M 510	metam sodium	f, h ,n	fruit crops (before planting)	L	42%	4
30382	ENTRUST	spinosad	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, peach, pear, plum, raspberry, saskatoon berry, strawberry	L	240 g/L	4
28051	ENVIDOR 240 SC	spiroadiclofen	a	apple, apricot, blueberry, cherry, grape, hazelnut, peach, pear, pecan, plum, sweet chestnut, walnut	L	240 g/L	4
15608	EQUAL 65 WP	dodine	f	apple, cherry, pear	D	65%	4
30895	EXIREL	cyantranilprole	i	apple, apricot, blueberry, cherry, currant, gooseberry, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon berry, strawberry, sweet chestnut, walnut	L	100 g/L	3
20136	FERBAM 76 WDG	ferbam	f	apple, apricot, blackberry, blueberry, cherry, currant, grape, peach, pear, plum, raspberry	D	76%	4
32639	FITNESS	propiconazole	f	apricot, blackberry, blueberry, cherry, nectarine, peach, plum, saskatoon berry, strawberry	EC	418 g/L	3
30619	FLINT	trifloxystrobin	f	apple, apricot, cherry, hazelnut, grape, peach, pear, plum, strawberry	D	50%	4
27733	FOLPAN 80 WDG	folpet	f	apple, grape, strawberry	D	80%	4
30331	FONTELIS	penthioopyrad	f	apple, apricot, blueberry, cherry, hazelnut, peach, pear, plum, strawberry, sweet chestnut, walnut	L	200 g/L	4
24978	FORAY 48 BA	<i>Bacillus thuringiensis var. kurstaki</i>	i	apple, blueberry, pear, raspberry	L	10 BIU/kg	4
32026	FORUM	dimethomorph	f	grape	L	500 g/L	3
32139	FRACTURE	BLAD polypeptide	f	apricot, cherry, grape, peach, plum, strawberry	L	20%	4
31679	FULLBACK 125 SC	flutriafol	f	apple, grape, strawberry	L	125.08 g/L	2
27686	FUNGINEX DC	triforine	f	apple (non-bearing), blueberry, cherry, peach, plum, saskatoon berry	EC	190 g/L	3

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<sup>2</sup> D = Dry formulations (including wettable granule, wettable powder, water-dispersible granule). DIS = Dispenser units. EC = Emulsifiable concentrate. L = Liquid formulations (including liquid, suspension concentrate, solution, suspension, micro-emulsion). P = Particulate/pellet. WSP = Water-soluble packets.

**Table 9-4.** Pesticides Used on Fruit Crops in Ontario (cont'd)

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
26842	GAVEL 75 DF	zoxamide + mancozeb	f	grape	D	8.3% + 66.7%	4
28336	GF-120 FRUIT FLY BAIT	spinosad	i	apple, blueberry, cherry, walnut	L	0.02%	4
30548	GRANUFLO-T	thiram	f	apple, peach, plum, strawberry	D	75%	3
13245	GUARDSMAN COPPER OXYCHLORIDE 50	copper oxychloride	f	apricot, blueberry, cherry, grape, hazelnut, peach, pear, raspberry	D	50%	3
29064	IMIDAN WP	phosmet	i	apple, blueberry, grape, peach, pear, plum, tart cherry	WSP	70%	3
27294	INDAR	fenbuconazole	f	apricot, blueberry, cherry, peach, plum	WSP	75%	2
30827	INSPIRE SUPER	difenoconazole + cyprodinil	f	apple, blueberry, pear	L	86 g/L + 249 g/L	2
27786	INTREPID	methoxyfenozide	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon berry, strawberry, sweet chestnut, walnut	L	240 g/L	3
32288	INTUITY	mandestrobin	f	strawberry, grape	L	43.4%	3
29352	ISOMATE-CM/OFM TT	pheromone, oriental fruit moth and codling moth	md	apple, apricot, cherry, peach, pear, plum, walnut	DIS	91.7%	4
30589	ISOMATE-DWB	pheromone, dogwood borer	md	apple, apricot, blueberry, cherry, hazelnut, peach, pear, pecan, plum, sweet chestnut, walnut	DIS	87.1%	4
27525	ISOMATE-GBM PLUS	pheromone, grape berry moth	md	grape	DIS	91.1%	4
31419	ISOMATE OFM TT	pheromone, oriental fruit moth	md	apple, apricot, cherry, peach, pear, plum	DIS	95.2%	4
30042	ISOMATE-PTB DUAL	pheromone, peachtree borer and lesser peachtree borer	md	apricot, cherry, peach, plum	DIS	87.9%	4
24030	JADE	propiconazole	f	apricot, blackberry, blueberry, cherry, peach, plum, raspberry, saskatoon berry, strawberry	EC	250 g/L	3
28641	KANEMITE 15 SC	acequinocyl	a	apple, blackberry, hazelnut, pear, pecan, raspberry, sweet chestnut, walnut	L	15.8%	3
30591	KASUMIN 2L	kasugamycin	b	apple, blackberry, cherry, pear, raspberry, saskatoon berry, walnut	L	2.0%	3

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<sup>2</sup> D = Dry formulations (including wettable granule, wettable powder, water-dispersible granule). DIS = Dispenser units. EC = Emulsifiable concentrate. L = Liquid formulations (including liquid, suspension concentrate, solution, suspension, micro-emulsion). P = Particulate/pellet. WSP = Water-soluble packets.

**Table 9–4. Pesticides Used on Fruit Crops in Ontario (cont'd)**

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
31758	KENJA 400 SC	isofetamid	f	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, peach, plum, raspberry, strawberry	L	400 g/L	3
27348	KOCIDE 2000	copper hydroxide	b, f	grape	D	53.8%	3
31433	KOPA	potassium salts of fatty acids	i	grape, hazelnut, pecan, sweet chestnut, walnut	L	47%	4
18836	KUMULUS DF	sulphur	a, f	apple, cherry, grape, peach, pear, plum, saskatoon berry	D	80%	4
9382	LAGON 480 E	dimethoate	i	blueberry, cherry, hazelnut, peach, pear, strawberry	EC	480 g/L	3
10868	LANNATE TOSS-N-GO	methomyl	i	apple	WSP	90%	2
16465	LIME SULPHUR	calcium polysulphide	a, f, i	apple, blackberry, blueberry, cherry, gooseberry, grape, peach, pear, plum, raspberry, strawberry	L	30%	4
20944	LORSBAN 50 W	chlorpyrifos	i	peach, strawberry	WSP	50%	3
30510	LUNA TRANQUILITY	fluopyram + pyrimethanil	f	apple, blueberry, currant, gooseberry, grape (wine), pear, strawberry	L	125 g/L + 375 g/L	2
26408	MAESTRO 80 DF	captan	f	apple, apricot, blackberry, blueberry, cherry, grape, peach, pear, plum, raspberry, strawberry	D	80%	3
30316	MAKO	cypermethrin	i	apple, grape, peach, pear, strawberry	EC	407 g/L	4
8372	MALATHION 85 E	malathion	i	apple, apricot, blackberry, blueberry, cherry, grape, peach, pear, plum, raspberry, strawberry	EC	85%	3
28217	MANZATE PRO-STICK	mancozeb	f	apple, grape	D	75%	3
24984	MATADOR 120 EC	lambda-cyhalothrin	i	apple, cherry, peach, pear, plum, strawberry	EC	120 g/L	2
13975	MERTECT SC	thiabendazole	f	apple, pear	L	500 g/L	4
30673	METTLE 125 ME	tetraconazole	f	gooseberry, grape, strawberry	L	125 g/L	2
14653	MICROSCOPIC SULPHUR	sulphur	f	apple, cherry, currant, gooseberry, grape, peach, pear, plum, sea buckthorn	D	92%	4
873	MICROSCOPIC WETTABLE SULPHUR	sulphur	f	apple, cherry, grape, peach, pear, plum	D	92%	4
29487	MICROTHIOL DISPERSS	sulphur	a, f	apple, cherry, grape, peach, pear, plum, saskatoon berry	D	80%	4
28095	MILSTOP	potassium bicarbonate	f	apricot, grape, nectarine, peach, plum	D	85%	4

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<sup>2</sup> D = Dry formulations (including wettable granule, wettable powder, water-dispersible granule). DIS = Dispenser units. EC = Emulsifiable concentrate. L = Liquid formulations (including liquid, suspension concentrate, solution, suspension, micro-emulsion). P = Particulate/pellet. WSP = Water-soluble packets.

**Table 9–4. Pesticides Used on Fruit Crops in Ontario (cont'd)**

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
28953	MOVENTO 240 SC	spirotetramat	i	apple, apricot, blueberry, blackberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon berry, sweet chestnut, walnut	L	240 g/L	4
30263	MUSTGROW	oriental mustard seed meal	f, n	apple, apricot, blackberry, cherry, hazelnut, peach, pear, pecan, plum, raspberry, strawberry, sweet chestnut, walnut	P	100%	3
31284	NEALTA	cyflumetofen	a	apple, grape, pear, strawberry	L	200 g/L	3
25135	NEXTER	pyridaben	a, i	apple, cherry, grape, peach, pear, raspberry, strawberry	WSP	75%	3
22399	NOVA	myclobutanil	f	apple, blackberry, blueberry, cherry, currant, gooseberry, grape, peach, pear, raspberry, saskatoon berry, strawberry	WSP	40%	3
28905	OBERON FLOWABLE	spiromesifen	a, i	strawberry	L	240 g/L	3
28146	OPAL	potassium salts of fatty acids	a, i	apple, apricot, blueberry, cherry, grape, hazelnut, peach, pear, pecan, plum, raspberry, strawberry, sweet chestnut, walnut	L	47%	4
14225	ORTHENE 75% SP	acephate	i	saskatoon berry	D	75%	3
30241	PENNCOZEB 75 DF RAINCOAT	mancozeb	f	apple, grape	D	75%	3
28877	PERM-UP EC	permethrin	i	apple, grape, peach, pear, plum	EC	384 g/L	3
30449	PHOSTROL	mono- and di-basic sodium, potassium and ammonium phosphites	f	apple, blueberry, currant, gooseberry, grape, pear, raspberry, strawberry	L	53.6%	4
28715	PIC PLUS FUMIGANT	chloropicrin	f, n	strawberry, raspberry	L	85.1%	2
20087	POLYRAM DF	metiram	f	apple, grape	D	80%	4
16688	POUNCE 384 EC	permethrin	i	apple, grape, peach, pear, plum	EC	384 g/L	4
27985	PRISTINE WG	boscalid + pyraclostrobin	f	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, peach, pear, plum, raspberry, saskatoon berry, strawberry	D	25.2% + 12.8%	2
31959	PRIWEN	spiroxamine	f	grape	EC	500 g/L	3

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**Table 9–4. Pesticides Used on Fruit Crops in Ontario (cont'd)**

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
28359	PROLINE 480 SC	prothioconazole	f	blueberry, currant, gooseberry, saskatoon berry	L	480 g/L	3
32534	PROPERTY 300 SC	pyriofenone	f	grape	L	300 g/L	3
27666	PURESpray GREEN SPRAY OIL 13 E	mineral oil	f, i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, plum, raspberry, saskatoon berry, strawberry, sweet chestnut	L	99%	4
30164	PYGANIC EC 1.4 II	pyrethrins	i	blueberry, grape, raspberry	EC	1.4%	4
23705	PYRINEX 480 EC	chlorpyrifos	i	hazelnut, strawberry	EC	480 g/L	3
26153	QUADRISS FLOWABLE	azoxystrobin	f	hazelnut, strawberry	L	250 g/L	3
30402	QUASH	metconazole	f	apricot, blueberry, cherry, currant, elderberry, hazelnut, nectarine, peach, plum, sea buckthorn	WSP	50%	3
28328	QUILT	azoxystrobin + propiconazole	f	blueberry	L	75 g/L + 125 g/L	3
29755	QUINTEC	quinoxifen	f	apricot, cherry, grape, peach, plum, strawberry	D	250 g/L	3
30654	RAMPART	mono- and di-potassium salts of phosphorous acid	f	blackberry, grape	L	53%	4
30199	REGALIA MAXX	<i>Reynoutria sachalinensis</i> extract	f	apple, apricot, blueberry, cherries, grape, peach, plum, strawberry	L	20%	3
29074	REVUS	mandipropamid	f	grape	L	250 g/L	3
28474	RIDOMIL GOLD 480 SL	metalaxyl-m and s-isomer	f	non-bearing apple, blueberry, raspberry, strawberry	L	480 g/L	3
28893	RIDOMIL GOLD MZ 68 WG	metalaxyl-m and s-isomer + mancozeb	f	grape	D	4% + 64%	3
28881	RIMON 10 EC	novaluron	i	apple, apricot, blueberry, cherry, currant, gooseberry, peach, plum, saskatoon berry, strawberry	EC	10%	2
15213	ROVRAL WP	iprodione	f	apricot, cherry, grape, nectarine, peach, plum, raspberry, strawberry	D	500 g/kg	3
28011	SCALA SC	pyrimethanil	f	apple, blueberry, gooseberry, grape, pear, raspberry, strawberry	L	400 g/L	3
29528	SCHOLAR 230 SC	fludioxonil	f	apple, apricot, cherry, peach, pear, plum, strawberry	L	230 g/L	2

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**Table 9–4.** Pesticides Used on Fruit Crops in Ontario (cont'd)

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
32096	SENATOR 50 SC	thiophanate-methyl	f	apple, cherry, nectarine, peach, pear, plum, raspberry, strawberry	L	500 g/L	4
31697	SERCADIS	fluxapyroxad	f	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, peach, pear, plum, raspberry, strawberry	L	300 g/L	2
31666	SERENADE OPTI	<i>Bacillus subtilis</i> strain QST 713	f	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, peach, pear, plum, raspberry, saskatoon berry, strawberry	D	1.31 x 10 <sup>10</sup> CFU/g	3
27876	SEVIN XLR	carbaryl	i	blackberry, blueberry, raspberry	L	466 g/L	3
29052	SILENCER 120 EC	lambda-cyhalothrin	i	apple, cherry, peach, pear, plum, strawberry	EC	120 g/L	2
31091	SIROCCO	potassium bicarbonate	f	apricot, grape, peach, plum	D	85%	4
31452	SIVANTO PRIME	flupyradifurone	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, hazelnut, peach, pear, pecan, plum, raspberry, saskatoon berry, strawberry, sweet chestnut, walnut	L	200 g/L	3
30025	SLUGGO PROFESSIONAL	ferric phosphate	s	fruit crops	P	0.28%	4
26257	SOVRAN	kresoxim-methyl	f	apple, pear, grape	D	50%	4
10305	STREPTOMYCIN 17	streptomycin sulphate	b, f	apple, pear	D	25.2%	4
26835	SUCCESS	spinosad	i	apple, apricot, blackberry, blueberry, cherry, currant, gooseberry, grape, pear, peach, plum, raspberry, saskatoon berry, strawberry	L	480 g/L	4
9542	SUPERIOR 70 OIL E	mineral oil	a, i	apple, apricot, blueberry, peach, pear, plum, saskatoon berry, tart cherry	EC	99%	4
14981	SUPERIOR 70 OIL	mineral oil	a, i	apple, apricot, blueberry, peach, pear, plum, tart cherry	EC	99%	4
24613	SUPRA CAPTAN 80 WDG	captan	f	apple, apricot, blackberry, blueberry, cherry, grape, peach, pear, plum, raspberry, strawberry	D	80%	3
27469	SURROUND WP	kaolin	cp, i	apple, apricot, cherry, grape, hazelnut, peach, pear, pecan, plum, raspberry, strawberry, sweet chestnut, walnut	D	95%	4
28189	SWITCH 62.5 WG	cyprodinil + fludioxonil	f	blackberry, blueberry, currant, gooseberry, grape, raspberry, saskatoon berry, strawberry	D	37.5% + 25%	3

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**Table 9–4. Pesticides Used on Fruit Crops in Ontario (cont'd)**

Registration Number	TRADE or BRAND Name *	Common Name/ Active Ingredient	Use <sup>1</sup>	Crop Registrations	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
28351	SYLLIT 400 FL	dodine	f	apple, cherry, nectarine, peach, pear	L	402 g/L	4
27435	TANOS 50 DF	famoxadone + cymoxanil	f	blackberry, raspberry	D	25% + 25%	3
19346	TILT 250 E	propiconazole	f	apricot, blackberry, blueberry, cherry, peach, plum, raspberry, saskatoon berry, strawberry	EC	250 g/L	3
30910	TIMOREX GOLD	tea tree oil	f	blueberry, grape, raspberry, strawberry	EC	23.8%	3
30468	TIVANO	citric acid + lactic acid	b, f	grape, strawberry	L	10.73 g/L + 21.37 g/L	4
30392	TORRENT 400 SC	cyazofamid	f	blackberry, grape, raspberry	L	34.5%	4
31442	TWINGUARD	sulfoxaflor + spinetoram	i	apple, apricot, cherry, peach, pear, plum	D	20% + 20%	3
28795	UP-CYDE 2.5 EC	cypermethrin	i	apple, grape, peach, pear, plum, strawberry	EC	250 g/L	3
29128	VAPAM HL	metam sodium	f, h, n	fruit crops (before planting)	L	42%	4
32408	VEGOL CROP OIL	canola oil	i, a, f	apple, apricot, blueberry, blackberry, cherry, currant, gooseberry, grape, hazelnut, nectarine, peach, pear, pecan, plum, raspberry, saskatoon berry, strawberry, sweet chestnut, walnut	EC	96%	4
32108	VELUM PRIME	fluopyram	n, f	strawberry	L	500 g/L	2
26533	VIROSOFT CP 4	<i>Cydia pomonella</i> granulovirus	i	apple	L	4 x 10 <sup>13</sup> OBs/L	4
29765	VIVANDO SC	metrafenone	f	cherry, grape, peach	L	300 g/L	2
17995	VYDATE L	oxamyl	i, n	apple (non-bearing), raspberry	L	240 g/L	2
29984	WARHAWK 480 EC	chlorpyrifos	i	hazelnut, strawberry	EC	480 g/L	3
30321	ZAMPRO	dimethomorph + ametoctradin	f	grape	L	225 g/L + 300 g/L	3

\* Mention of a TRADE or BRAND name does not constitute a guarantee or warranty of the product by the Ontario Crop Protection Committee or the Ontario Ministry of Agriculture, Food and Rural Affairs.

<sup>1</sup> a = Acaracide, miticide. b = Bactericide. ba = Bacterial antagonist. cp = Crop protectant. f = Fungicide. h = Herbicide. i = Insecticide. n = Nematicide. md = Mating disrupter. pgr = Plant growth regulator. s = Slug bait.

<sup>2</sup> D = Dry formulations (including wettable granule, wettable powder, water-dispersible granule). DIS = Dispenser units. EC = Emulsifiable concentrate. L = Liquid formulations (including liquid, suspension concentrate, solution, suspension, micro-emulsion). P = Particulate/pellet. WSP = Water-soluble packets.

**Table 9–5.** Thinners and Plant Growth Regulators Used on Fruit Crops in Ontario

Registration Number	TRADE or BRAND Name *	Common Name/Active Ingredient	Use <sup>1</sup>	Formulation <sup>2</sup>	Guaranteed Active	Ont. Class
28042	APOGEE	prohexadione calcium	PGR	D	27.5%	4
32167	BLUSH	prohydrojasmon	PGR	L	5.25%	4
29210	CILIS PLUS	6-benzylaminopurine	PGR, TH	L	2.0%	4
11580	ETHREL	ethephon	PGR	L	240 g/L	4
16027	FRUIT FIX CONCENTRATE	1-naphthaleneacetic acid	PGR	L	5.68%	4
27653	FALGRO TABLET	gibberellic acid	PGR	tablet	1.0 g/tablet	4
31460	FRUITONE L	1-naphthaleneacetic acid	PGR	L	3.1%	4
32752	HARVISTA 1.3 SC	1-methylcyclopropene	PGR	L	1.3%	4
28851	MAXCEL	6-benzyladenine	PGR, TH	L	1.9%	4
29187	PERLAN	6-benzylaminopurine (BA), gibberellins A <sub>4</sub> + A <sub>7</sub> (GA)	PGR	L	1.8% BA + 1.8% GA	4
16636	PROMALIN SL	benzyladenine (BA), gibberellins A <sub>4</sub> + A <sub>7</sub> (GA)	PGR	EC	1.8% BA + 1.8% GA	4
25609	RETAIN	aviglycine hydrochloride	PGR	D	15%	3
27876	SEVIN XLR	carbaryl	TH	L	466 g/L	3

\* Mention of a BRAND or TRADE name does not constitute a guarantee or warranty of the product by the Ontario Crop Protection Committee or the Ontario Ministry of Agriculture, Food and Rural Affairs.

<sup>1</sup> PGR = Plant growth regulator. TH = Thinner.

<sup>2</sup> D = Dry formulation (including wettable granule, wettable powder). EC = Emulsifiable concentrate. L = Liquid formulation (including solution).

## Pesticide Classification in Ontario

Under the *Pesticides Act* and Regulation 63/09, the Ontario Ministry of the Environment and Climate Change classifies federally registered pesticides into one of 12 classes. Each class has defined education, licensing and/or permit requirements and restrictions on its use and sale in Ontario. Pesticides are classified on the basis of their toxicity, environmental or health hazard, persistence, concentration, how they are used and their container size. The classification of each product in the publication can be found in Table 9–4. *Pesticides Used on Fruit Crops in Ontario*, page 415 and Table 9–5. *Thinners and Plant Growth Regulators Used on Fruit Crops in Ontario*, on this page.

Class 2 and 3 pesticides are the most hazardous. Regulation 63/09 of the *Pesticides Act* makes it mandatory for farmers to be certified to buy and use Class 2 or 3 pesticides on their farms. Pesticide storage requirements also vary by class. Detailed descriptions of each classification can be found at: [ontario.ca/pesticides](http://ontario.ca/pesticides).

A farmer can become certified by attending a one-day Grower Pesticide Safety Course and passing the certification examination. To become a certified farmer, visit the Ontario Pesticide Education Program website at [www.opecp.ca](http://www.opecp.ca) or call 1-800-652-8573.

