

9. Pesticides Used on Field Crops in Ontario

Table 9-1. Seed Treatments Used on Field Crops — Fungicides

LEGEND: BD= Drill Box F = Flowable FS = Flowable Concentrate LS = Liquid Suspension LOS = Live Organism Suspension P = Powder SC= Suspension Concentrate						
TRADE NAME	Active Ingredient	Chemical Group (FRAC Group)¹	Risk of Resistance Developing²	Formulation	Crops	Manufacturer
Fungicides						
Allegiance FL	metalaxyl	acylamine (4)	medium	F	canola, cereals, corn, forages, soybeans	Bayer CropScience
Anchor	carbathiin + thiram	anilide (7) + dithiocarbamates (M3)	low	F (DB)	soybeans	Arysta LifeScience
Apron FL	metalaxyl	acylamine (4)	medium	F	canola, cereals, corn, forages, soybeans	Bayer CropScience
Apron Maxx RFC	fludioxonil + metalaxyl-M	phenylpyrrole (12) + acylamine (4)	low to medium	F	dry edible beans, soybeans	Syngenta Canada Inc.
Apron Maxx RTA	fludioxonil + metalaxyl-M	phenylpyrrole (12) + acylamine (4)	low to medium	F	dry edible beans, soybeans	Syngenta Canada Inc.
Apron XL LS	metalaxyl-M	acylamine (4)	medium	LS	canola, corn, dry edible beans, forages, soybeans, wheat	Syngenta Canada Inc.
Dividend XL RTA	difenoconazole + metalaxyl-M	triazole (3) + acylamine (4)	low to medium	F	wheat	Syngenta Canada Inc.
Dynasty 100FS	azoxystrobin	strobilurin (11)	low	F	corn, dry edible beans	Syngenta Canada Inc.
EverGol Energy	penflufen + prothioconazole + metalaxyl	anilide (7) + triazole (3) + acylamine (4)	low to medium	FS	wheat, barley, oats, soybeans, corn	Bayer Crop Sciences
Gemini	triticonazole + thiram	triazole (3) + dithiocarbamate (M3)	low to medium	F	barley, oat, wheat	BASF Canada
Heads Up Plant Protectant	saponins of <i>Chenopodium quinoa</i>	plant based (not classified)	low	P	soybeans, dry beans	Heads Up Plant Protectants Inc.
ILeVO	fluopyram	SDHI (7)	low to medium	LS	soybeans	Bayer Crop Sciences
INTEGO Solo	ethaboxam	benzamides (22)	low to medium	F	barley, buckwheat, pearl millet, proso millet, oats, rye, teosinte, triticale, wheat, corn (sweet and field), popcorn. Crop Group 6: legume vegetables (succulent or dried except cowpea and field pea) Crop Group 20a: (rapeseed subgroup)	Valent Canada Inc.
Maxim 480 FS	fludioxonil	phenylpyrrole (12)	low to medium	F	corn, soybeans	Syngenta Canada Inc.

¹ Fungicide Resistance Action Committee: www.frac.info.

² Risk of resistance based on continuous use of product.

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TRADE NAME	Active Ingredient	Chemical Group (FRAC Group)¹	Risk of Resistance Developing²	Formulation	Crops	Manufacturer
Maxim Quattro	thiabendazole + fludioxonil + metalaxyl-M + azoxystrobin	benzimidazole (1) + phenylpyrrole (12) + acylamine (4) + strobilurin (11)	low to medium	F	corn	Syngenta Canada Inc.
MERTECT SC	thiabendazole	benzimidazole (1)	medium	SC	soybeans	Syngenta Canada Inc.
Proseed	fludioxonil	phenylpyrrole (12)	low to medium	F	wheat	Syngenta Canada Inc.
Rancona Pinnacle	ipconazole + metalaxyl	benzimidazole (1) + acylamine (4)	low to medium	F	barley, oat, rye, wheat, triticale	Arysta LifeScience
Raxil MD	tebuconazole + metalaxyl	triazole (3) + acylamine (4)	low to medium	F	barley, oat, wheat	Bayer CropScience
Raxil Pro MD	tebuconazole + prothioconazole + metalaxyl	triazole (3) + triazole (3) + acylamine (4)	medium	LS	wheat, barley, oats	Bayer CropScience
Raxil T	tebuconazole	triazole (3)	low to medium	F	barley, oat, wheat	Bayer CropScience
S-2200 3.2 FS	mandestrobin	strobilurin (11)	high	FS	corn, soybean, dry edible beans, canola	Valent Canada Inc.
Stamina Corn	pyraclostrobin	strobilurin (11)	high	LS	corn	BASF Canada
Thiram 75 WP	thiram	dithiocarbamates and relatives (M3)	low	P	alfalfa	Arysta LifeScience
Trilex FL	trifloxystrobin	strobilurin (11)	high	F	corn, dry edible beans, soybeans	Bayer CropScience
Vibrance Maxx RFC	metalaxyl-M + sedaxane + fludioxonil	acylamine (4) + pyrazole-carboxamide (7) + phenylpyrrole (12)	low to medium	FS	soybeans, dry beans	Syngenta Canada Inc.
Vibrance Quattro	difenoconazole + metalaxyl-m + sedaxane + fludioxonil	triazole (3) + acylamine (4) + pyrazole-carboxamide (7) + phenylpyrrole (12)	low to medium	FS	spring wheat, winter wheat, barley, oats, rye, triticale	Syngenta Canada Inc.
Vibrance XL	difenconazole + metalaxyl-M + sedaxane	triazole (3) + acylamine (4) + pyrazole-carboxamide (12)	low to medium	FS	barley, wheat, oats, rye	Syngenta Canada Inc.
Vitaflo 280	carbathiin + thiram	anilide (7) + dithiocarbamates (M3)	low	F	barley, corn, dry edible beans, flax, oat, rye, soybeans, wheat	Arysta LifeScience
Vitavax RS	carbathiin + thiram	anilide (7) + dithiocarbamates (M3)	low	F	canola, mustard, rapeseed	Bayer CropScience
Vortex FL	ipconazole	triazole (3)	medium	F	corn	Bayer CropScience

¹ Fungicide Resistance Action Committee: www.frac.info.² Risk of resistance based on continuous use of product.

Table 9–2. Nematocides Used in the Field**LEGEND:** LOS = Live Organism Suspension

TRADE NAME	Active Ingredient	Chemical Group (FRAC Group)¹	Risk of Resistance Developing	Formulation	Crops	Manufacturer
Nematocides						
Clariva pn	<i>Pasteuria nishizawae</i>	biological (44)	low	LOS	soybean	Syngenta Canada Inc.
Votivo 240 FS	<i>Bacillus firmus</i> strain I-1582	biological (44)	low	LOS	corn	Bayer CropScience

¹ Fungicide Resistance Action Committee: www.frac.info.

Table 9–3. Seed Treatments Used on Field Crops — Fungicides with Insecticides

LEGEND: DB = Drill Box Application F = Flowable FS = Flowable Concentrate						
TRADE NAME	Active Ingredient	Chemical Group (FRAC)¹ (IRAC)²	Risk of Resistance Developing³	Formulation	Crops	Manufacturer
Fungicides with Insecticides						
Cruiser Maxx Vibrance Beans	thiamethoxam + metalaxyl-M + fludioxonil + sedaxane	neonicotinoid (4A) ² + acylamine (4) ¹ + phenylpyrrole (12) ¹ + pyrazole-carboxamide (7) ¹	low to medium	FS	soybean	Syngenta Canada Inc.
Gaucho CS	imidacloprid + carbathiin + thiram	neonicotinoid (4A) ² + anilide (7) ¹ + dithiocarbamates (M3) ¹	low to medium	F	canola, mustard, rapeseed	Bayer Crop Science
Helix Vibrance	thiamethoxam + difenconazole + metalaxyl-M + fludioxonil + sedaxane	neonicotinoid (4A) ² + triazole (3) ¹ + acylamine (4) ¹ + phenylpyrrole (12) ¹ + pyrazole-carboxamide (7) ¹	low to medium	FS	canola, rapeseed, mustard seed (condiment and oilseed)	Syngenta Canada Inc.
NipsIt SUITE Cereals	clothianidin + metalaxyl + metconazole	neonicotinoid (4A) ² + acylamine (4) ¹ + triazole (3) ¹	low to medium	F	wheat	Valent Canada Inc.
NipsIt SUITE Canola Seed Protection	clothianidin + metalaxyl + metconazole	neonicotinoid (4A) ² + acylamine (4) ¹ + triazole (3) ¹	low to medium	F	canola	Valent Canada Inc.
Prosper	clothianidin + carbathiin + thiram + metalaxyl	neonicotinoid (4A) ² + anilide (7) ¹ + dithiocarbamates (M3) ¹ + acylamine (4) ¹	low to medium	F	canola, rapeseed	Bayer CropScience

¹ Fungicide Resistance Action Committee: www.frac.info.² Insecticide Resistance Action Committee: www.irac-online.org.³ Risk of resistance based on continuous use of product.

Table 9–4. Seed Treatments Used on Field Crops — Insecticides**LEGEND:** F = Flowable FS = Flowable Concentrate

TRADE NAME	Active Ingredient	Chemical Group (IRAC) ¹	Risk of Resistance Developing ²	Formulation	Crops	Manufacturer
Insecticides						
Acceleron IX-409 ³	imidacloprid	neonicotinoid (4A)	medium to high	F	soybean	Bayer CropScience – Distributed by Monsanto Canada
Alias 240 SC	imidacloprid	neonicotinoid (4A)	medium to high	F	wheat (durum, spring, winter), barley, oats Use higher rates for fields with history of moderate-to-high wireworm pressure.	Adama Canada Limited
Cruiser 5FS	thiamethoxam	neonicotinoid (4A)	medium to high	F	barley, corn, dry edible beans, soybeans, wheat	Syngenta Canada Inc.
Cruiser 350FS	thiamethoxam	neonicotinoid (4A)	medium to high	F	barley, dry edible beans, wheat	Syngenta Canada Inc.
Fortenza	cyantraniliprole	diamide (28)	low to medium	FS	canola, mustard seed, rapeseed, oilseed mustard, including <i>B. carinata</i> , corn	Syngenta Canada Inc.
Gaucho 480FL	imidacloprid	neonicotinoid (4A)	medium to high	F	canola, seed corn only, mustard	Bayer CropScience
Lumiderm	cyantraniliprole	diamide (28)	low to medium	F	canola	DuPont Canada
Lumivia	chlorantraniliprole	diamide (28)	low to medium	FS	corn	DuPont Canada
NipsIt INSIDE 600	clothianidin	neonicotinoid (4A)	medium to high	FS	canola, rapeseed, carinata, wheat	Valent Canada Inc.
Poncho 600FS	clothianidin	neonicotinoid (4A)	medium to high	FS	canola, corn	Bayer CropScience
Sombrero 600 FS	imidacloprid	neonicotinoid (4A)	medium to high	FS	canola, mustard, rapeseed, corn, cereals, soybeans	Adama Canada Limited
Stress Shield 600	Imidacloprid	neonicotinoid (4A)	medium to high	FS	soybean, wheat, barley, oats, dry beans	Bayer CropScience

¹ Insecticide Resistance Action Committee: www.irc-online.org.² Risk of resistance based on continuous use of product.³ Acceleron and other branded seed treatments may contain more than one insecticide and/or fungicide, therefore refer to product label or contact distributor for more information.

Table 9–5. Foliar Fungicides Used on Field Crops

LEGEND: Relative Acute Toxicities: High = Danger Poison Symbol Moderate = Warning Poison Symbol Low = Caution Poison Symbol								
TRADE NAME	Active Ingredient	Chemical Group (FRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Acapela	picoxystrobin	strobilurin (11)	corn: 7 soybeans: 14 wheat: See Note. oat: See Note. barley: See Note. rye: See Note. dry edible beans: 14 canola: 28	low	yes, for all crops listed	DuPont Canada	12 hr	barley, corn, dry edible beans, oats, rye, soybeans, wheat, canola Note: PHI for grain is 45 days, forage is 7 days and hay is 14 days.
Allegro 500F	fluazinam	phenylpyridinylamine (29)	soybeans: 30 dry beans: 30	moderate	yes, for all crops listed	Syngenta Canada Inc.	24 hr	soybeans and dry beans
Astound	cyprodinil + fludioxonil	aniline-pyrimidines (9) + phenylpyrrole (12)	canola: 35	low	yes	Syngenta Canada Inc.	12 hr	canola
Blanket AP	azoxystrobin + propiconazole	strobilurin (12) + triazole (3)	cereal: 45 barley: 45	moderate	yes, for all crops listed	Adama Canada	12 hr	wheat, barley
Bumper 432 EC	propiconazole	triazole (3)	canola: 60 cereals: 45 corn: 14 dry edible beans: 28 soybeans: 30	moderate	yes, for all crops listed	Adama Canada	12 hr	barley, canola, corn, dry edible beans, oat, soybeans (for seed only), wheat Note: Moderately to highly toxic to aquatic organisms.
Caramba	metconazole	triazole (3)	corn: 20 sweet corn hand: 18 sweet corn mechanical: 7 cereals: 30	low	yes, for all crops listed	BASF Canada	12 hr	barley, corn, oats, rye, soybeans, wheat
Contans WG	<i>Coniothyrium minitans</i>	biological fungicide (44)	canola: 0 dry edible beans: 0 soybeans: 0	low	ground	Bayer CropScience	0 hr	canola, dry edible beans, soybeans
Cotegra	boscalid + prothioconazole	carboxamide (7) + triazole (3)	canola and mustard: 36 dry bean: 21 soybeans: 21	moderate to high	yes, for all crops listed	BASF Canada	24 hr	dried beans, dried peas, chickpeas, lentils, soybeans, canola, rapeseed and oriental mustard
Cueva	copper octanoate	multi-site contact (inorganic) (M1)	dry edible beans: 1 soybeans: 1	low	no	Neudorff North America	4 hr	dry edible beans, soybeans
Dithane DG Rainshield	mancozeb	dithiocarbamate (M3)	wheat: 40	low	yes, for all crops listed	Dow AgroSciences	12 hr	alfalfa (for seed only), spring and winter wheat Note: Toxic to fish.

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TRADE NAME	Active Ingredient	Chemical Group (FRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Evito 480SC	fluoaxastrobin	strobilurin (11)	wheat (hay/forage): 7 wheat (grain): 40 barley (hay/forage): 7 barley (grain): 40 corn (grain): 30 corn (sweet): 7 soybeans: See Note.	low	yes, for wheat, barley, corn, soybean and potato	Arysta LifeScience	12 hr	wheat, barley, corn, soybean Note: Wheat and barley: do not apply after boot stage (Zadok's 47 and beyond). Soybean: do not apply later than R6.
Folicur 250 EW	tebuconazole	triazole (3)	barley: 36 oat: 36 soybeans: 20 wheat: 36	high	yes, for all crops listed	Bayer CropScience	12 hr	barley, oat, soybeans, wheat Note: Toxic to birds, small wild mammals, aquatic organisms and non-target plants.
Fontelis	penthiopyrad	carboxamide (7)	alfalfa: 14	low	yes, for all crops listed	DuPont Canada	12 hr	soybeans, alfalfa Note: Toxic to aquatic organisms.
Fullback 125 SC	flutriafol	piperazine (3)	soybeans: 21	low	no	FMC Corporation	12 hr	soybeans Note: Apply only to soybeans harvested for dry seed. Toxic to aquatic organisms and non-target plants.
Headline EC	pyraclostrobin	strobilurin (11)	corn: 7 dry edible beans: 7 oat: See Note. soybeans: 21 wheat: See Note.	high	yes, for all crops listed except corn	BASF Canada	12 hr	barley, corn, dry edible beans, oat, rye, soybeans, wheat Note: Do not apply to cereals after the boot stage (Zadok's 47 and beyond).
Headline AMP	pyraclostrobin + metconazole	strobilurin (11) + triazole (3)	corn: See Note. cereals: 45	high	yes, for all crops listed	BASF Canada	12 hr	Corn: (field, sweet, seed, pop), wheat (all types), oats, barley, rye, triticale. EXCEPTION: 18 days for hand harvesting. Pre-harvest interval is 20 days for field corn grain and popcorn grain. Pre-harvest interval for sweet corn cobs is 7 days for mechanical harvesting and 18 days for hand harvesting.
Lance WDG	boscalid	carboxamide (7)	canola: 21 dry beans: 21	high	yes, for all crops listed	BASF Canada	4 hr	canola, dry edible beans

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TRADE NAME	Active Ingredient	Chemical Group (FRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Nufarm Propiconazole	propiconazole	triazole (3)	canola: 60 cereals: 45 corn: 14 dry edible beans: 28	moderate	yes, for all crops listed	Nufarm Agriculture Inc.	12 hr	barley, canola, corn, dry edible beans, oat, soybeans (for seed only), wheat Note: Moderately to highly toxic to aquatic organisms.
Overall 240 SC	iprodione	dicarboximide (2)	canola: 14	low	yes, for all crops listed	Adama Canada	12 hr	canola
Priaxor	pyraclostrobin + fluxapyroxad	strobilurin (11) + carboxamide (7)	alfalfa: 14 sweet corn: 7 corn (field, seed, pop): 21 soybeans: 21 grasses: 14 canola: 21 dry bean: 30 cereals: no later than end of flowering	moderate	yes, for all crops listed	BASF Canada	12 hr	alfalfa, barley, corn, rye, soybeans, wheat, bluegrasses, fescues, ryegrasses grown for seed, canola, dry beans, mustard
Proline 480 SC	prothioconazole	triazole (3)	barley: 30 canola: 36 corn: 14 oat: 30 soybeans: 20 wheat: 30	low	yes, for all crops listed	Bayer CropScience	24 hr	barley, canola, corn (field and seed), oat, soybeans, wheat Note: Toxic to aquatic organisms and non-target terrestrial plants.
Propulse	fluopyram + prothioconazole	benzamide-pyridine (7) + triazole (3)	dry edible beans: 14	low	ground	Bayer CropScience Inc.	24 hr	dry edible beans Note: Toxic to birds. Toxic to aquatic organisms.
Prosaro XTR	prothioconazole + tebuconazole	triazole (3)	barley: 36 wheat: 36 oats: 36	low	yes	Bayer CropScience	12 hr	barley, wheat, oats, rye, triticale, canary seeds Note: Toxic to birds, small wild mammals, aquatic organisms and non-target plants.
Quadris	azoxystrobin	strobilurin (11)	canola: 30 dry edible beans: 15 seed corn: 7 soybeans: 15	low	yes, for all crops	Syngenta Canada Inc.	when dry	canola, seed corn, dry edible beans, soybeans Note: Toxic to aquatic organisms.
Quash	metconazole	triazole (3)	canola: 45 dry edible beans: 21	low	yes	Valent Canada Inc.	12 hr	canola, dry beans

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TRADE NAME	Active Ingredient	Chemical Group (FRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Quilt	azoxystrobin + propiconazole	strobilurin (11) + triazole (3)	barley: See Note. corn: 14 corn for silage: 30 dry edible beans: 30 soybeans: 30 wheat: See Note.	moderate	yes, for all crops listed	Syngenta Canada Inc.	12 hr	barley, oat, soybeans, wheat Note: Do not apply to cereals after the boot stage (Zadok's 47 and beyond). Toxic to aquatic organisms and non-target terrestrial plants.
Rovral WP	iprodione	dicarboximide (2)	canola: 14 dry edible beans: 14	low	yes, for all crops listed	FMC Corporation	12 hr	canola, dry edible beans
S-2200 4 SC	mandestrobin	strobilurin (11)	canola: 12 hr	low	yes	Valent Canada Inc.	12 hr	Note: Do not apply more than 1 application per year.
Senator 70 WP	thiophanate-methyl	benzimidazole (1)	dry edible beans: 14	low	yes, for all crops listed	Engage Agro	12 hr	white beans
Serenade OPTI	<i>Bacillus subtilis</i> QST 713 strain	biological fungicide (44)	canola: 0 dry edible beans: 0 soybeans: 0	low	yes, for canola	Bayer Crop Science Inc.	4 hr	canola/mustard, dry edible beans, soybeans
Stratego PRO	prothioconazole + trifloxystrobin	strobilurin (11) + triazole (3)	cereals: 45 corn: 30 soybeans: 20	low	yes	Bayer Crop Science Inc.	24 hr	wheat, barley, oats, rye, triticale, millet, soybeans, corn
Tilt 250 E	propiconazole	triazole (3)	canola: 60 cereals: 45 corn: 14 dry edible beans: 28 soybeans: 30	low	yes, for all crops listed	Syngenta Canada Inc.	12 hr	barley, canola, corn, dry edible beans, oat, soybeans, wheat Note: Toxic to aquatic organisms and non-target terrestrial plants. Toxic to fish.
Topnotch	azoxystrobin + propiconazole	strobilurin (11) + triazole (3)	barley: See Note. corn: 14 corn for silage: 30 dry edible beans: 30 soybeans: 30 wheat: See Note.	moderate	yes, for all crops listed	ADAMA	12 hr	barley, oat, soybeans, wheat Note: Do not apply to cereals after the boot stage (Zadok's 47 and beyond). Toxic to aquatic organisms and non-target terrestrial plants.

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TRADE NAME	Active Ingredient	Chemical Group (FRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Trivapro A + Trivapro B	azoxystrobin + propiconazole + benzovindiflupyr	strobilurin (11) + triazole (3) + pyrazole-carboxamide (7)	corn: 14 soybeans: 30 wheat: 45 oats: 45 barley: 45 rye: 45	low	yes, for all crops listed	Syngenta Canada Inc.	12 hr	corn, soybeans, wheat, oats, barley, rye Note: Do not apply to cereals beyond head half emerged.
Twinline	pyraclostrobin + metconazole	strobilurin (11) + triazole (3)	wheat: 45 oats: 45 rye: 45 barley: 45	high	yes, for all crops listed	BASF Canada	6 days	barley, rye, oats, wheat Note: Do not apply to cereals after flowering. Note: Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 6 days. Toxic to aquatic organisms, non-target terrestrial plants and small wild mammals.
Vertisan	penthiopyrad	carboxamide (7)	corn: 7 soybeans: 14 wheat: 45 barley: 45 oat: 45 dry edible beans: 21 canola: 21	low	yes, for all crops listed	DuPont Canada	12 hr	Note: Do not apply to cereals after flowering. Toxic to aquatic organisms.

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Table 9–6. Foliar Insecticides Used on Field Crops

LEGEND: Relative Acute Toxicities: High = Danger Poison Symbol Moderate = Warning Poison Symbol Low = Caution Poison Symbol								
TRADE NAME	Active ingredient	Chemical Group (IRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Ambush 500EC	permethrin	pyrethroid (3A)	canola: 1 corn: 1	low	yes	Amvac Chemical Corporation	when dry	Note: Low mammalian toxicity. Very toxic to fish and bees.
Bioprotec CAF	<i>Bacillus thuringiensis</i>	bacterial toxin (11A)	corn: 1	low	ground	United Agri Products Canada Inc.	4 hr	field corn
Closer	sulfoxaflor	sulfoximines (4C)	corn: 14	low	yes	Dow AgroSciences	12 hr	corn
Concept	imidacloprid + deltamethrin	neonicotinoid (4A) + pyrethroid (3A)	soybeans: 20	low	yes, for all crops listed	Bayer CropScience	24 hr	soybeans Note: Toxic to bees and fish.
Coragen	chlorantraniliprole	diamide (28)	alfalfa: 0 dry edible beans: 1 field corn: 14 seed corn: 1 grass forages: 0 canola and mustard: 1 soybeans: 1	low	yes, see Note.	DuPont Canada	12 hr	alfalfa, dry edible beans, field and seed corn, grass forages (seed production only) Note: aerial application for field and seed corn, soybeans and dry edible beans; ground application for canola, alfalfa and grass forages Toxic to certain beneficials. Toxic to aquatic organisms.
Cygon 480 EC	dimethoate	organophosphorus (1B)	alfalfa: 28 canola: 21 dry edible beans: 7 forages: 2 soybeans: 30	moderate	yes, for all crops listed	FMC Corporation	48 hr	alfalfa, canola, dry edible beans, forages, soybeans Note: Toxic to bees. Moderately to highly toxic to aquatic organisms.
Decis 5.0 EC	deltamethrin	pyrethroid (3A)	canola: 14 corn: 5	high	yes, for all crops listed except corn	Bayer CropScience	12 hr	barley, canola, corn, mustard, oat, wheat Note: Toxic to bees for 1 day after application. Toxic to fish, aquatic organisms and beneficial insects.
Delegate	spinetoram	spinosyn (5)	cereals: 21 soybeans: 28	low	no	Dow AgroSciences Canada	12 hr	corn, barley, oat, rye, soybeans, wheat Note: Toxic to bees and certain beneficials.

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LEGEND: Relative Acute Toxicities: High = Danger Poison Symbol Moderate = Warning Poison Symbol Low = Caution Poison Symbol								
TRADE NAME	Active ingredient	Chemical Group (IRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Dipel 2X DF	<i>Bacillus thuringiensis</i>	bacterial toxin (11A)	corn: 1	low	no	Valent BioSciences	4 hr	corn, timothy
Endigo	thiamethoxam + lambda-cyhalothrin	neonicotinoid (4A) + pyrethroid (3A)	soybeans: 30	high	yes, for all crops listed	Syngenta Canada Inc.	12 hr	soybeans Note: Toxic to bees and certain beneficials.
Force 3.0G	tefluthrin	pyrethroid (3A)	Planting time only.	moderate	no	Syngenta Canada Inc.	12 hr	corn Note: Toxic to birds and small wild mammals. Toxic to aquatic organisms.
Imidan 50 WP	phosmet	organophosphorus (1B)	alfalfa: 7	high	no	Gowan Company	5 days	alfalfa Note: Toxic to bees. Toxic to birds and small wild mammals. Toxic to aquatic organisms.
Intrepid	methoxyfenozide	diacylhydrazines (18)	corn: 21 dry beans: 7	low	no	Dow AgroSciences	12 hr	corn, dry edible beans Note: Toxic to aquatic organisms.
Lagon 480 EC	dimethoate	organophosphorus (1B)	alfalfa: 28 canola: 21 cereal: 2 dry edible beans: 7 soybeans: 30	moderate	yes, for all crops listed	Loveland Products Canada Inc.	48 hr	alfalfa, canola, cereals, dry edible beans, soybeans Note: Toxic to bees. Moderately to highly toxic to aquatic organisms.
Lannate Toss-N-Go 90 SP	methomyl	carbamate (1A)	canola: 8 cereals: 20	high	yes, for all crops listed	DuPont Canada	24 hr	canola, cereals Note: Toxic to bees.
Lorsban 4 E	chlorpyrifos	organophosphorus (1B)	canola: 21 corn: 70 wheat: 60 barley: 60 oats: 60	high	yes, for all crops listed except corn	Dow AgroSciences	24 hr	canola, cereals, corn Note: Toxic to bees, beneficials, birds and wildlife and extremely toxic to fish and aquatic organisms.
Lorsban 15 G	chlorpyrifos	organophosphorus (1B)	corn: 70	high	no	Dow AgroSciences	24 hr	corn Note: Toxic to bees, beneficials, birds and wildlife and extremely toxic to fish and aquatic organisms.

¹ Insecticide Resistance Action Committee: www.irac-online.org.

Table 9–6. Foliar Insecticides Used on Field Crops

LEGEND: Relative Acute Toxicities: High = Danger Poison Symbol Moderate = Warning Poison Symbol Low = Caution Poison Symbol								
TRADE NAME	Active ingredient	Chemical Group (IRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Mako	cypermethrin	pyrethroid (3A)	barley: 45 canola: 30 corn: 5 wheat: 30	low	yes, for corn and bertha armyworm in canola no, for wheat, barley and all other canola uses	Engage Agro	12 hr	barley, canola, corn, wheat Note: Toxic to bees and other beneficial insects. Very toxic to fish and aquatic organisms.
Malathion 500 EC	malathion	organophosphorus (1B)	alfalfa: 7 cereals: 7 corn: 7 dry edible beans: 3	low	no	United Agri Products Canada	12 hr	alfalfa, cereals, corn, dry edible beans, soybeans Note: Toxic to bees and certain beneficial insects. Less effective below 20°C.
Matador 120 EC	lambda-cyhalothrin	pyrethroid (3A)	canola: 7 field and seed corn: 21 silage corn: 14 dry edible beans: 14 soybeans: 14 wheat: 28	high	yes, for all crops listed	Syngenta Canada Inc.	24 hr	alfalfa, barley, canola, corn, dry edible beans, oat, soybeans, wheat Note: Toxic to bees.
Movento	spirotetramat	tetronic and tetramic acid derivatives (23)	soybean: 21	low	yes	Bayer CropScience	12 hr	soybean Note: Toxic to bee brood. Toxic to certain beneficial insects. Toxic to aquatic organisms.
Oberon	spiromesifen	tetronic acids (23)	field corn: 30 silage corn: 5	low	yes	Bayer CropScience	12 hr	corn (field and silage) Note: Toxic to bee brood. Toxic to certain beneficial insects.
Pounce 384 EC	permethrin	pyrethroid (3A)	canola: 1 corn: 1 cereals: 1	low	ground only, unless noted in label	FMC Corporation	when dry	canola, cereals, corn, flax, sunflowers Note: Very toxic to bees.

¹ Insecticide Resistance Action Committee: www.irac-online.org.

Table 9–6. Foliar Insecticides Used on Field Crops

LEGEND: Relative Acute Toxicities: High = Danger Poison Symbol Moderate = Warning Poison Symbol Low = Caution Poison Symbol								
TRADE NAME	Active ingredient	Chemical Group (IRAC)¹	Pre-Harvest Interval (days)	Relative Acute Toxicities	Aerial Application	Manufacturer	Restricted Entry Interval	Use and Notes
Pyrifos 15G	chlorpyrifos	organophosphorus (1B)	Planting time only.	low	no	United Agri Products Canada Inc.	24 hr	corn Note: Toxic to bees, beneficials, birds and wildlife and extremely toxic to fish and aquatic organisms.
Pyrinex 480 EC	chlorpyrifos	organophosphorus (1B)	canola: 21 cereals: 60 corn: 70	low	yes, for all crops listed except corn	United Agri Products Canada Inc.	24 hr	canola, cereals, corn Note: Toxic to bees, beneficials, birds and wildlife and extremely toxic to fish and aquatic organisms.
Sevin XLR Plus	carbaryl	carbamate (1A)	alfalfa: 2 barley: 28 corn: 1 dry edible beans: 5 oat: 14 wheat: 14	moderate	yes, for all crops listed except beans and canola	Bayer CropScience	12 hr	alfalfa, canola, cereals, corn, dry edible beans Note: Toxic to bees.
Silencer 120 EC	lambda-cyhalothrin	pyrethroid (3A)	barley: 28 canola: 7 corn: 14 dry edible beans: 14 oat: 28 soybeans: 21	high	yes, for all crops listed except soybeans and beans	Adama Canada	24 hr	pyrethroid Note: Toxic to bees.
Sivanto Prime	flupyradifurone	butenolides (4D)	soybean: 21 dry edible beans: 7 corn: 21	low	yes	Bayer CropScience	12 hr	soybean, dry edible beans, corn Note: Toxic to bees and certain beneficial insects. Toxic to aquatic organisms.
Thuricide HPC	<i>Bacillus thuringiensis</i>	bacterial toxin (11A)	timothy: 0	low	yes	Valent Biosciences	4 hr	timothy
Transform WG	sulfoxaflor	sulfoximines (4C)	barley: 14 canola: 14 wheat: 14	low	yes	Dow AgroSciences	12 hr	barley, wheat, canola Note: Toxic to bees and certain beneficial insects.
Voliam Xpress	lambda-cyhalothrin + chlorantraniliprole	pyrethroid (3A) + diamide (28)	silage corn: 14 field and seed corn: 21 soybeans: 21 dry edible beans: 14	high	yes, for all crops listed	Syngenta Canada Inc.	24 hr	field, seed and silage corn, soybeans, dry edible beans Note: Toxic to bees and certain beneficials. Toxic to aquatic organisms.

¹ Insecticide Resistance Action Committee: www.irac-online.org.

Table 9–7. Bt Corn Products/Traits Currently Available in Canada — as of April 2017

LEGEND: Target Pests: BCW = black cutworm CEW = corn earworm CRW = corn rootworm ECB = European corn borer FAW = fall armyworm WBC = western bean cutworm
Herbicide Tolerance: GT = glyphosate tolerant LL = Liberty Link/glyphosate tolerant RR2 = Roundup Ready/glyphosate tolerant
Refuge: IR = Integrated Refuge, where refuge hybrid seed has been pre-mixed with Bt hybrid seed in the bag

Trade Name	Transgenic Component	Transgenic Events	Target Pests		Herbicide Tolerance ¹	Refuge %	Refuge Location	EU-Approved
			Above Ground	In Soil				
AGRISURE® PRODUCTS								
Agrisure® CB/LL	Cry1Ab	Bt, 11	ECB	—	LL	20%	400 m	Y
Agrisure® GT/CB/LL	Cry1Ab	Bt11, GA21	ECB	—	GT LL	20%	400 m	Y
Agrisure® 3000GT	Cry1Ab, mCry3A	Bt11, GA21, MIR604	ECB	CRW	GT LL	20%	adjacent	Y
Agrisure Viptera® 3110	Vip3A, Cry1Ab	Bt11, GA21, MIR162	BCW, CEW, ECB, FAW, WBC	—	GT LL	20%	400 m	Y
Agrisure Viptera® 3111	Vip3A, Cry1Ab, mCry3A	Bt11, GA21, MIR604, MIR162	BCW, CEW, ECB, FAW, WBC	CRW	GT LL	20%	adjacent	Y
Agrisure Viptera® 3220	Cry1Ab, Vip3A, Cry1F	Bt11, GA21, TC1507, MIR162	BCW, CEW, ECB, FAW, WBC	—	GT	5%	IR	N ²
Agrisure® 3122	Cry1Ab, mCry3A, Cry1F, Cry34Ab1/Cry35Ab1	Bt11, GA21, DAS-59122-7, MIR604, TC1507	BCW, ECB, FAW	CRW	GT	5%	IR	Y
Agrisure® 3120	Cry1Ab, Cry1F	Bt11, GA21, TC1507	BCW, ECB, FAW	—	GT	5%	IR	N ²
GENUITY® PRODUCTS								
Genuity® VT Double PRO® (GENVT2P)	Cry1A.105, Cry2Ab2	MON89034, NK603	CEW, ECB, FAW	—	RR2	5%	IR	Y
Genuity® VT Triple PRO® (GENVT3P)	Cry1A.105, Cry2Ab2, Cry3Bb1	MON88017, MON89034	CEW, ECB, FAW	CRW	RR2	10%	IR	Y
Genuity® SmartStax® (GENSS) (Monsanto) or SmartStax® (Dow)	Cry1A.105, Cry2Ab2, Cry1F, Cry3Bb1, Cry34Ab1/Cry35Ab1	MON88017, MON89034, TC1507, DAS59122-7	BCW, CEW, ECB, FAW	CRW	LL RR2	5%	adjacent (2-row minimum) or IR	Y
HERCULEX® PRODUCTS								
Herculex® 1 (HX1)	Cry1F	TC1507	BCW, ECB, FAW	—	LL	20%	400 m	Y
Herculex® 1 (HX1) w RR2	Cry1F	TC1507, NK603	BCW, ECB, FAW	—	LL RR2	20%	400 m	Y
Herculex® XTRA (HXX)	Cry1F, Cry34Ab1/Cry35Ab1	TC1507, DAS59122-7	BCW, ECB, FAW	CRW	LL	20%	adjacent	Y
Herculex® XTRA (HXX) w RR2	Cry1F, Cry34Ab1/Cry35Ab1	TC1507, DAS59122-7, NK603	BCW, ECB, FAW	CRW	LL RR2	20%	adjacent	Y

¹ Herbicide tolerances listed are for the non-Integrated Refuge products. Integrated Refuge products may have different herbicide tolerances, and herbicide selection should be based on the properties of the refuge hybrid.

² Stack is not approved, but all single traits have approval in the EU.

Any edits or updates required on this table can be directed to: Tracey Baute, Field Crop Entomologist, OMAFRA.

Table 9–7. Bt Corn Products/Traits Currently Available in Canada — as of April 2017

LEGEND: Target Pests: BCW = black cutworm CEW = corn earworm CRW = corn rootworm ECB = European corn borer FAW = fall armyworm WBC = western bean cutworm
Herbicide Tolerance: GT = glyphosate tolerant LL = Liberty Link/glufosinate tolerant RR2 = Roundup Ready/glyphosate tolerant
Refuge: IR = Integrated Refuge, where refuge hybrid seed has been pre-mixed with Bt hybrid seed in the bag

Trade Name	Transgenic Component	Transgenic Events	Target Pests		Herbicide Tolerance ¹	Refuge %	Refuge Location	EU-Approved
			Above Ground	In Soil				
OPTIMUM® PRODUCTS								
Optimum® Intract® Insect Protection	Cry1F, Cry1Ab	NK603, TC1507, MON810	BCW, ECB, FAW	—	LL RR2	5%	400 m	N
Optimum® AcreMax®	Cry1F, Cry1Ab	NK603, TC1507, MON810	BCW, ECB, FAW	—	LL RR2	5%	IR	N
Optimum® Intract® Xtra	Cry1F, Cry1Ab, Cry34Ab1/Cry35Ab1	NK603, TC1507, MON810, DAS59122-7	BCW, ECB, FAW	CRW	LL RR2	20%	adjacent	N
Optimum® AcreMax® XTreme	Cry1F, Cry1Ab, Cry34Ab1/Cry35Ab1, mCry3A	NK603, TC1507, MON810, DAS59122-7, MIR604	BCW, ECB, FAW	CRW	LL RR2	5%	IR	N
Optimum® AcreMax® Xtra	Cry1F, Cry1Ab, Cry34Ab1/Cry35Ab1	NK603, TC1507, MON810, DAS59122-7	BCW, ECB, FAW	CRW	LL RR2	10%	IR	N
SWEET CORN PRODUCTS								
Performance Series	Cry1A.105, Cry2Ab2, Cry3Bb1	MON88017, MON89034	CEW, ECB, FAW	CRW	RR2	No refuge required if stubble destroyed within 30 days		Y

¹ Herbicide tolerances listed are for the non-Integrated Refuge products. Integrated Refuge products may have different herbicide tolerances, and herbicide selection should be based on the properties of the refuge hybrid.

² Stack is not approved, but all single traits have approval in the EU.

Any edits or updates required on this table can be directed to: Tracey Baute, Field Crop Entomologist, OMAFRA.

Table 9–8. Pesticides Used in Field Crops That Affect Cholinesterase Levels in Blood

Active Ingredient	Trade Name
carbaryl	Sevin XLR
chlorpyrifos	Lorsban 15 G Lorsban 4E Pyrinex 480 EC Pyrifos 15G
dimethoate	Cygon 480 Lagon 480
malathion	Malathion 500 EC
methomyl	Lannate Toss-N-Go
phosmet	Imidan 50 WP
terbufos	Counter

Table 9–9. High Toxicity of Insecticides to Honeybees

Trade Name	Active Ingredient
Group 1 – Very toxic. Do not apply to flowering crops or weeds.	
Ambush 500EC Pounce 384 EC	permethrin
Closer	sulfoxaflor
Concept	imidacloprid + deltamethrin
Cygon 480 EC Lagon 480 EC	dimethoate
Decis 5.0 EC	deltamethrin
Delegate WG	spinetoram
Delegate	spinetoram
Endigo	thiamethoxam + lambda-cyhalothrin
Imidan 50 WP	phosmet
Lorsban 15 G Lorsban 4E Pyrifos 15G Pyrinex 480 EC	chlorpyrifos
Mako	cypermethrin
Malathion 500 EC	malathion
Matador 120 EC Silencer 120 EC	lambda-cyhalothrin
Movento 240 EC	spirotetramat
Sevin XLR	carbaryl
Transform WG	sulfoxaflor
Voliam Xpress	lambda-cyhalothrin + chlorantraniliprole
Group 2 – Apply only during late evening or early morning.¹	
Lannate Toss-N-Go	methomyl
Group 3 – Low toxicity	
Coragen	chlorantraniliprole
Dipel 2X DF	<i>Bacillus thuringiensis</i>
Intrepid	methoxyfenozide
Lumiderm	cyantraniliprole
Oberon	spiromesifen
Thuricide HPC	<i>Bacillus thuringiensis</i>

¹ Unusually low temperatures at time of application may cause insecticides to remain toxic up to 20 times longer than during warm weather. High temperatures in the early morning or late evening may extend active foraging by bees.

