



# SERIOUS INSECT PROTECTION



Unique new option with multiple modes of action to control multiple stages of target pests in specialty crops for resistance management, longer protection and improved return on investment.

## Why include CORMORAN™ in an insecticide rotation?

- Rapid knockdown action combined with extended residual control
- Dual modes of action for resistance management
- Controls all damaging stages of target insects including immatures and adults
- Two distinct modes of action providing excellent control
- Excellent rotational product

## CORMORAN™

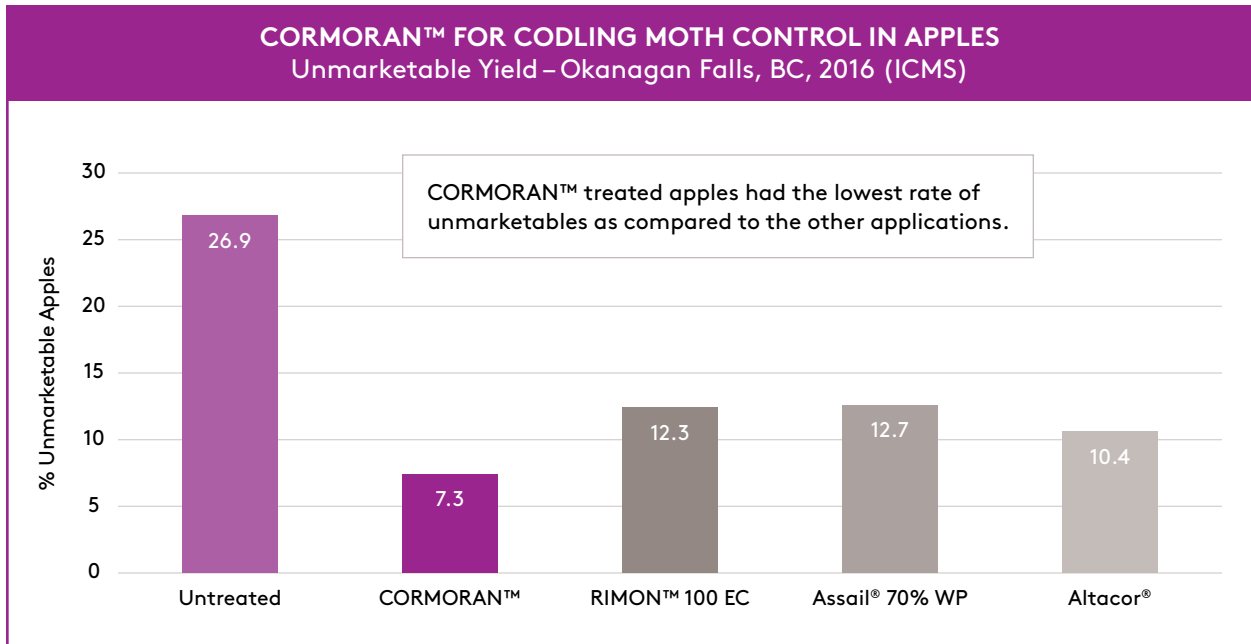
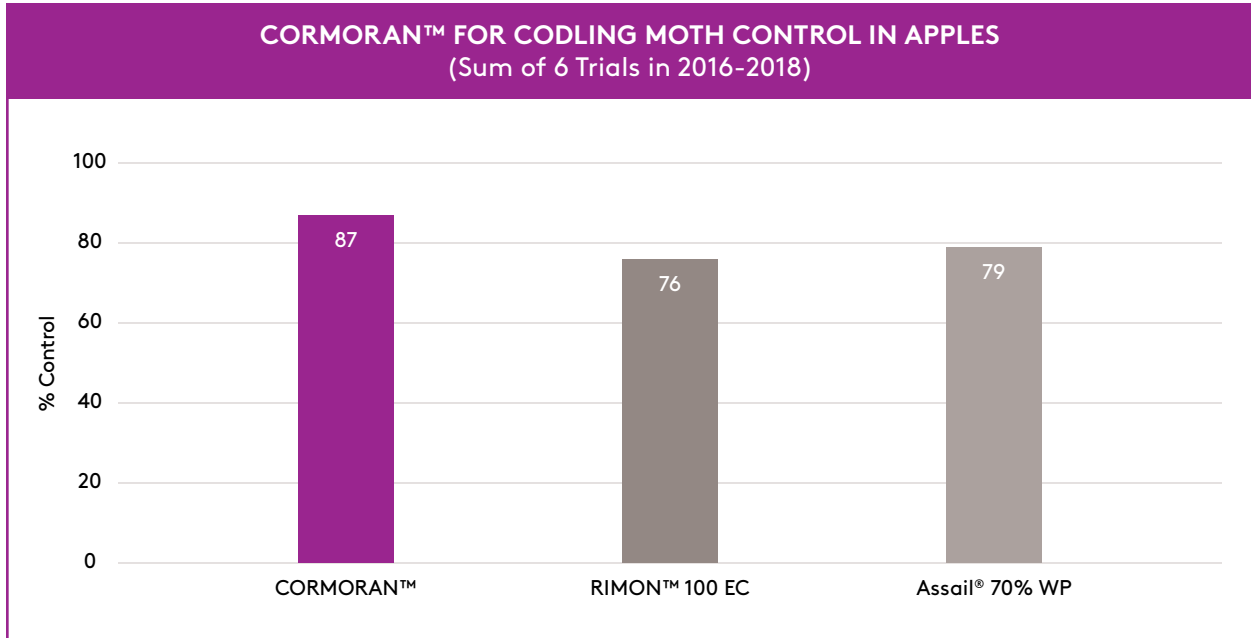
**ACTIVE INGREDIENTS:** Novaluron (100 g/L) and acetamiprid (80 g/L) EC

**CHEMISTRY GROUPS:** Group 4A and Group 15



# CORMORAN™

## Field Test Results





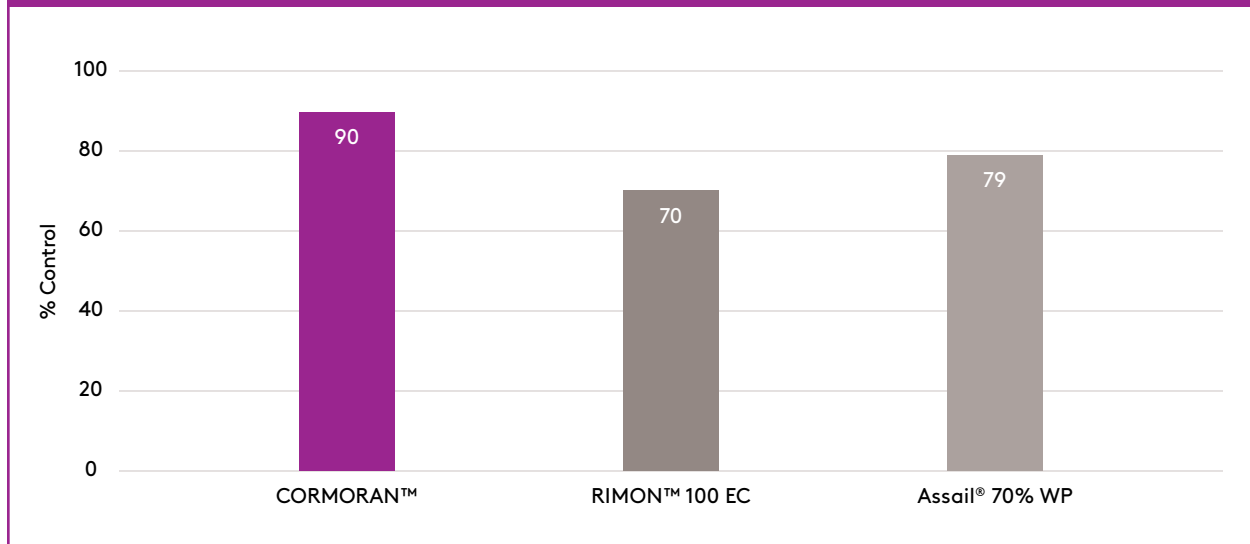
## ACTIVE INGREDIENTS

Novaluron (100 g/L) and acetamiprid (80 g/L) EC

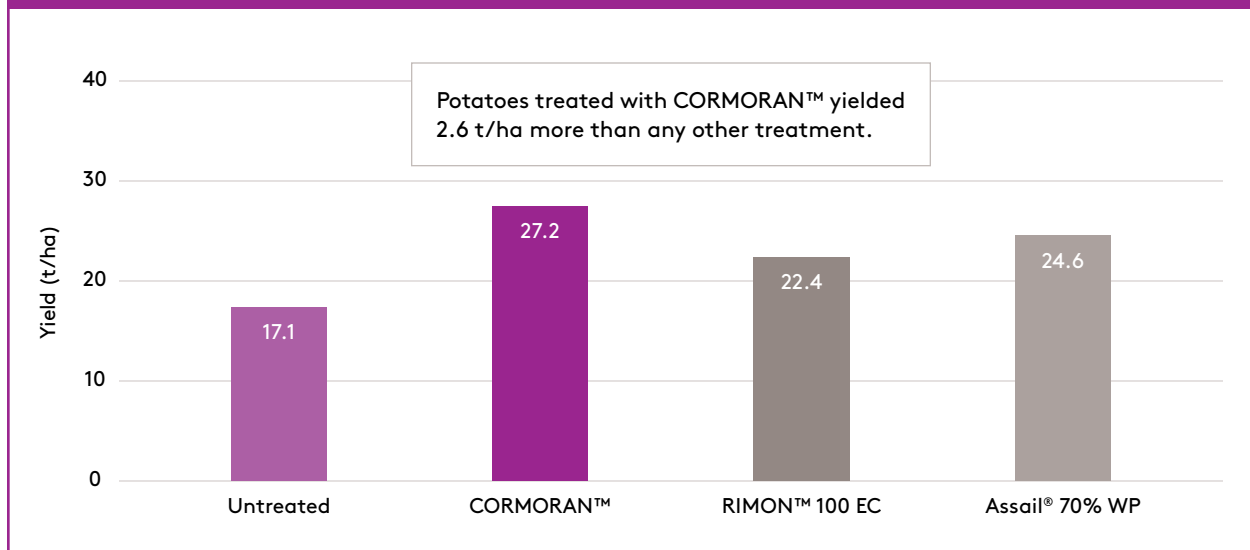
## CHEMISTRY GROUPS

Group 4A and Group 15

### CORMORAN™ FOR COLORADO POTATO BEETLE CONTROL IN POTATOES (Sum of 7 Trials in 2016-2018)



### CORMORAN™ FOR INSECT CONTROL IN POTATOES (Sum of 11 Trials in 2016-2018)



# CORMORAN™

## HOW IT WORKS

**Chitin inhibitor (Group 4A)** – targets eggs and larvae insect stages. Immatures are unable to molt, so can't mature/reproduce. **Nicotinic receptor modulator (Group 15)** – affects sucking pests systemically, preventing them from being able to feed.

REGISTERED CROPS	KEY INSECTS CONTROLLED	
<ul style="list-style-type: none"> <li>• Alfalfa (grown for seed)</li> <li>• Apples</li> <li>• Brassica leafy greens (crop subgroup 4-13B)</li> <li>• Bushberries (crop subgroup 13-07B)</li> <li>• Head and stem brassica vegetable crops (crop group 5-13)</li> <li>• Peppers (bell and non-bell)</li> <li>• Potatoes</li> <li>• Strawberries</li> <li>• Stone fruits (crop group 12-09)</li> <li>• Sweet corn</li> </ul>	<ul style="list-style-type: none"> <li>• Alfalfa looper</li> <li>• Alfalfa plant bug</li> <li>• Aphids</li> <li>• Apple maggot</li> <li>• Armyworm</li> <li>• Blueberry flea beetle</li> <li>• Blueberry gall midge (Cranberry tip worm)</li> <li>• Blueberry maggot</li> <li>• Blueberry spanworm</li> <li>• Cabbage looper</li> <li>• Cherry fruit fly (suppression)</li> <li>• Cherry fruitworm</li> <li>• Codling moth</li> <li>• Colorado potato beetle</li> <li>• Cranberry fruitworm</li> <li>• Diamondback moth</li> <li>• Dogwood borer</li> <li>• European apple sawfly</li> </ul>	<ul style="list-style-type: none"> <li>• European corn borer</li> <li>• Green fruitworm</li> <li>• Gypsy moth</li> <li>• Imported cabbageworm</li> <li>• Japanese beetle</li> <li>• Leafhopper</li> <li>• Leafroller</li> <li>• Lesser appleworm</li> <li>• Lygus bug</li> <li>• Mullein plant bug</li> <li>• Oriental fruit moth</li> <li>• Plum curculio</li> <li>• Strawberry clipper weevil</li> <li>• Strawberry rootworm</li> <li>• Swede midge</li> <li>• Tarnished plant bug</li> <li>• Tentiform leafminer</li> <li>• Thrips</li> </ul>
<b>APPLICATION RATES AND PACKAGING</b>	<ul style="list-style-type: none"> <li>• 2 x 10.08 L</li> <li>• Varies by crop and pest, see label for complete details.</li> </ul>	
<b>WATER VOLUME</b>	200–1000 L/ha by ground	
<b>RAINFASTNESS</b>	Avoid application when heavy rain is forecast.	



## ACTIVE INGREDIENTS

Novaluron (100 g/L) and acetamiprid (80 g/L) EC

## CHEMISTRY GROUPS

Group 4A and Group 15

### CROP STAGING AND RATES

Crop	Insects Controlled	Rate (ml/ha)	Application Instructions
Apples	Leafhopper, Tentiform leafminer	700	Do not apply more than 6.9 L/ha per season. Apply in a minimum finished spray volume of 1000 L/ha by ground. Repeat applications if needed to maintain control, but do not make applications less than 12 days apart. Preharvest interval of 14 days.
	Aphids	700 – 1050	
	Gypsy moth, Japanese beetle, Mullein bug	840 – 1260	
	Green fruitworm	1050	
	Apple maggot, Codling moth, European apple sawfly, Oriental fruit moth, Plum curculio	1050 – 1260	
	Lesser appleworm, Tarnished plant bug	1260	
	Dogwood borer	1500	
Potatoes	Colorado potato beetle	440 – 700	Do not apply more than 1.68 L/ha per season. For Colorado potato beetle, do not apply more than twice to a single generation, and do not apply to successive generations. Apply in a minimum finished spray volume of 200 L/ha by ground. Minimum re-application interval of 7 days. Preharvest interval of 7 days. Do not apply more than once every 10 – 14 days.
	Armyworm, Cabbage looper	440 – 750	
	Leafhopper	490 – 750	
	Aphids, European corn borer	650 – 750	
Stone fruits (crop group 12-09): American plum, Apricot, Beach plum, Black cherry, Canada plum, Cherry plum, Chicksaw plum, Chinese jujube, Damson plum, Japanese apricot, Japanese plum, Klamath plum, Nanking cherry, Nectarine, Peach, Plum, Prune plum, Plumcot, Sloe, Sweet cherry, Tart cherry and cultivars, varieties and/or hybrids of these commodities	Oriental fruit moth (Ontario only)	1450 – 2100	4 applications per season. Adequate spray coverage is essential for optimum control. Apply in a minimum finished spray volume of 1000 L/ha. Use the high rate under heavy pest pressure. Do not apply during bloom. The first application and follow-up applications, if required, should be applied when treatment thresholds have been reached as indicated by monitoring with pheromone traps in conjunction with degree days. Consult your local extension specialist for advice. The emergence of 3 <sup>rd</sup> or 4 <sup>th</sup> generations of OFM is less synchronized than the 1 <sup>st</sup> and 2 <sup>nd</sup> generations. Alternate with other insecticides for 3 <sup>rd</sup> or 4 <sup>th</sup> generations to delay the development of insecticide resistance in pest populations. Minimum re-application interval of 10 days. Preharvest interval of 7 days.
	Cherry fruit fly (suppression, cherry only), Plum curculio (under high plum curculio pest pressure, the level of damage reduction may be limited to suppression)	2100	

# CORMORAN™

Crop	Insects Controlled	Rate (ml/ha)	Application Instructions
Peppers (bell and non-bell)	Colorado potato beetle	440 – 700	Do not apply more than 2.63 L/ha per season. Apply in a minimum finished spray volume of 200 L/ha by ground. For Colorado potato beetle, do not apply more than twice to a single generation and do not apply to successive generations. Repeat applications if needed to maintain control, but do not make applications less than 7 days apart. Preharvest interval of 7 days.
	Aphids	490	
	European corn borer	650 – 750	
	Armyworm, Cabbage looper	440 – 750	
Strawberries	Aphids, Leafhopper	500 – 750	3 applications per season. Adequate spray coverage is essential for optimum control. Apply in a minimum finished spray volume of 200 L/ha by ground. Begin application when insect populations reach recognized economic threshold levels. Consult the provincial extension service or professional consultants or other qualified authorities to determine the appropriate threshold levels for treatment in your area. Use the high rate under heavy pest pressure. Do not apply more than once every 10 – 14 days. Preharvest interval of 1 day. Do not apply during bloom.
	Strawberry clipper weevil, Tarnished plant bug	900	
Brassica (cole) leafy vegetables (crop group 5): Broccoli, Chinese broccoli, Broccoli raab (rapini), Brussels sprouts, Cabbage, Chinese cabbage (bok choy or napa), Chinese mustard cabbage (gai choy), Cauliflower, Cavalo broccoli, Collards, Kale, Kohlrabi, Mizuna, Mustard greens, Mustard spinach, Rape greens and cultivars, varieties and/or hybrids of these commodities	Alfalfa looper, Armyworm, Cabbage looper, Diamondback moth, Imported cabbageworm	440 – 750	Do not apply more than 1.68 L/ha per season. Apply in a minimum finished spray volume of 200 L/ha by ground. Repeat applications if needed to maintain control, but do not make applications less than 7 days apart. Preharvest interval of 7 days.
	Aphids	650 – 750	
	Lygus bug, Swede midge	740	
Leafy vegetables – Brassica leafy greens (crop subgroup 4): Arugula, Broccoli raab, Chinese broccoli, Abyssinian cabbage, Seakale cabbage, Bok choy (Chinese cabbage), Collards, Garden cress, Upland cress, Hanover salad, Kale, Maca, Mizuna, Mustard greens, Radish leaves, Rape greens, Wild rocket, Shepherd's purse, Turnip greens, Watercress, as well as cultivars, varieties and hybrids of these commodities	Aphids	650 – 750	3 applications per season. Apply in a minimum finished spray volume of 200 L/ha by ground. Repeat applications if needed to maintain control, but do not make applications less than 7 days apart. Preharvest interval of 7 days. Do not apply more than once every 7 – 10 days.



## ACTIVE INGREDIENTS

Novaluron (100 g/L) and acetamiprid (80 g/L) EC

## CHEMISTRY GROUPS

Group 4A and Group 15

Crop	Insects Controlled	Rate (ml/ha)	Application Instructions
Sweet corn	Aphids	500 – 700	2 applications per season. Begin applications when treatment thresholds have been reached as determined by local monitoring. Consult professional consultants or other qualified authorities to determine appropriate threshold levels of treatment in your area. Adequate spray coverage is essential to obtain optimum control. Apply in a minimum finished spray volume of 200 L/ha by ground. Use the higher rate for heavy infestations or dense foliage. Minimum re-application interval of 21 days. Preharvest interval of 10 days.
Bushberries (crop group 13-07B): Aronia berry, Blueberry (highbush), Chilean guava, Cranberry (highbush), Currant (black, buffalo, red), Elderberry, European barberry, Gooseberry, Honeysuckle (edible), Huckleberry, Jostaberry, Juneberry (Saskatoon berry), Lingonberry, Native currant, Salal, Sea buckthorn and cultivars, varieties and/or hybrids of these commodities	Aphids, Blueberry gall midge (cranberry tipworm)	750	3 applications per season. Apply in a minimum finished spray volume of 200 L/ha by ground. Repeat applications if needed to maintain control, but do not apply more than once every 10 – 14 days. Preharvest interval of 8 days. Some phytotoxic symptoms to foliage in the form of mottled chlorosis may be observed when CORMORAN™ is applied to blueberries under conditions of high temperatures and/or drought stress, particularly during periods of new, tender shoot growth. Such phytotoxic symptoms will not occur on future growth, and will not affect fruiting or yields. Higher spray volumes and lower spray concentration will minimize the risk of transient phytotoxic symptoms on newly expanded foliage.
	Japanese beetle	700	
	Blueberry maggot	1200 – 1400	
	Blueberry flea beetle, Blueberry spanworm, Strawberry rootworm, Cherry fruitworm, Cranberry fruitworm, Thrips	1400	
Alfalfa (grown for seed)	Alfalfa plant bug, Lygus bug	750 – 900	2 applications per season. Apply in a minimum finished spray volume of 200 L/ha by ground. Apply prior to bloom up to the time when 50% of seed pods are ripe. Begin when adults and/or 4 – 5 <sup>th</sup> instar nymphs have reached economic threshold levels for your area. Use the higher rate for heavier infestations. Do not make more than 2 applications per season. Minimum re-application interval of 7 days. Preharvest interval of 14 days. Do not exceed 1.8 L product per ha per season. Do not cut treated fields for hay/forage. Do not graze treated fields.

# CORMORAN™

## MIXING INSTRUCTIONS

1. Be sure sprayer is clean and not contaminated with any other materials or crop injury or sprayer clogging may result.
2. Fill tank ½ full with clean water.
3. Start agitation.
4. Be certain that the agitation system is working properly and creates a rippling or rolling action on the liquid surface.
5. Pour product directly from container into partially filled spray tank.
6. Continue filling tank. Increase agitation if necessary to maintain surface action.
7. Maintain continuous agitation during mixing and application to assure uniform suspension. If mixture sits without agitation for extended periods, agitate the mixture for at least 10 minutes before use.

## CROP ROTATIONS

There are no rotational crop plant restrictions for this product.

## PRE-HARVEST INTERVALS

- Strawberries: 1 day
- Brassica leafy vegetables (crop group 5 and subgroup 4), Peppers, Potatoes, Stone fruits: 7 days
- Bushberries (crop group 13-07B): 8 days
- Sweet corn: 10 days
- Alfalfa (grown for seed), Apples: 14 days

## STORAGE

- Store in original, tightly closed container.
- Do not ship or store near food, feed, seed and fertilizers.
- Store in cool, dry, locked, well-ventilated area without floor drain.
- Keep away from fire or open flame, or other sources of heat.
- Store above 2 C. DO NOT FREEZE. Frozen product may crystallize and not go back into solution.



## QUICK TIPS

Consider early applications. The best timing for CORMORAN™ is just prior to the first generation egg hatch. Make sure to get adequate coverage of the targeted pests. Scout regularly.