

Table 1. Characteristics of Codling Moth Control Products – Orchards-Current to March 2022 – Always Refer to Label

This table presents information on control products recommended for the control of codling moth using air-blast sprayer application to commercial pome fruit plantings. Applicators are encouraged to only apply control products when codling moth adults reach recommended action thresholds. **Always read the product labels before mixing and applying any control product. Avoid use of products from the same Group against consecutive codling moth generations. Check organic status with your certifying body.**

Product	Group No.	Rate/ha	Stable pH	Target life stage	Max. appl'ns/year	Spray Interval (days)	Label REI	PHI (days)	General Notes
Imidan 50-WP Instapak (Phosmet)	1 B	3.75 kg	5 – 6	Larvae	2	14-21	12 hrs to 9 days	22	Strong, long-lasting larvacide. Apply when egg hatch begins. Adjust tank pH to 5.5. Suitable when spray coverage is challenging. Also controls obliquebanded/threelined leafroller, bud moth, apple aphid, San Jose scale.
Assail 70 WP (acetamiprid)	4	120-240 g	5 - 6	Eggs, larvae	2 or 960 g	12-14	2-6 days	7	Strong larvacide, with some ovicide activity when applied over eggs. Apply Assail or Calypso when egg hatch begins. Assail provides better fruit protection while Calypso is more economical. Choose Assail when pest pressure is high. Both products also control aphids, leafhoppers, leafminer, and pear psylla. Apply max of 2 times/season to avoid mite problems (REI 2 days for scouting, 6 days for hand thinning).
Calypso 480 SC (thiacloprid)	4	290 - 440 mL	5 - 9	Eggs, larvae	3 or 875 mL	14-21	12 hr	30	Combination of 2 active ingredients. Suitable for targeting codling moth plus leaf rollers, aphids (including woolly), San Jose scale, and campylocoma.
TwinGuard (sulfoxafur+spinetoram)	4C, 5	500 g	5 – 9	Larvae	2	14	12 hr	7	Larvacide, apply after eggs begin hatching. Also controls all leafroller and bud moth larvae when present. Some control of twospotted spider mite.
Delegate WG (spinetoram)	5	420 g	5 - 9	Larvae	3	14	12 hr	7	Will suppress codling moth, but not necessarily control it to economically acceptable levels. Controls leafrollers and bud moth. Organic certified.
Entrust (spinosad)	5	364 mL	6 - 9	Larvae	3	7-10	4 hr	7	Very effective against eggs and larvae. Apply before and during egg laying. Do not apply more than 2x times/season to avoid mite problems.
Rimon 10 EC (novaluron)	15	0.9 – 1.4 L	5 - 9	Eggs, larvae	4 or 11.0 L	10-14	12 hr	14	Larvacide with little activity against eggs. Also effective against obliquebanded, threelined leafrollers and bud moth, but not fruittree or European leafrollers. Use only under low codling moth pressure.
Confirm 240 F (tebufenozide)	18	1L	5 - 9	Larvae	4	10-14	12 hr	14	Very effective against eggs and larvae. Apply at same timing as Group 15. Also effective against obliquebanded, threelined and bud moth larvae, but not fruittree or European leafroller. Use for high codling moth pressure.
Intrepid 240 F (methoxyfenozide)	18	1L	5 - 9	Eggs, larvae	2	14-21	12 hr	14	Apply just prior to egg hatch and reapply as needed. Also controls leafroller, fruitworm and bud moth larvae.
Altacor (chlorantraniliprole)	28	145 - 215 g	5 - 9	Eggs, larvae	3	10-14	12 hr	5	Apply just prior to egg hatch and reapply as needed. Also controls leafroller and bud moth larvae, rosy apple aphid, and leafhopper.
Exirel (cyantraniliprole)	28	500-750 mL	5-9	Larvae	4	10-14	12 hr	3	Apply just prior to egg hatch and reapply as needed. Also controls Obliquebanded leafroller.
Vayego 200 SC (Tetraniliprole)	28	225 mL	5-9	Larvae	3	10-14	12 hr	7	Apply just prior to egg hatch and reapply as needed. Toxic to bees. Do not use more than 2 times/generation. Also controls obliquebanded leafroller.
Harvanta 50SL (cyclaniliprole)	28	1.2-1.6 L	5-9	Larvae	3	10-14	12 h	7	Virus specific to codling moth, will not affect other insects. Takes 3-7 days to kill larvae, turning them white (i.e. stings may still occur). Virus residue degrades rapidly in sunlight, lasting only 5-8 days. Apply in evenings if possible. Do not mix with copper. 6-7 applications/generation at full rate required under high codling moth pressure. Rotate virus brands between generations to manage resistance. Store below 5°C. Organic status varies.
Virosoft (CpGv-4)	U	250 mL	5 - 8	Larvae	NA	5-7	4 hr	0	
CYD-X (CpGv-M)	U	100-250 mL	7-8.5	Larvae	NA	7-8	4 hr	0	
Madex HP (CpGv-22)	U	50-100 mL	5.5-8.5	Larvae	NA	6-8	4 hr	0	

Table 2. Summary of Risks to Human and Environmental Health by Codling Moth Control Products

This table summarizes the toxicity and safety of the recommended codling moth control products. Applicators should consult this table when selecting control products in order not to disrupt or interfere with observed beneficial insects (bees, ladybugs, lacewings, etc.) or nearby water courses. All the products except Imidan are generally accepted as reduced risk to humans and the environment; however personal protective equipment should still be worn when making applications as stated on product labels.

Product	Oral Toxicity (LD ₅₀)	Dermal Toxicity (LD ₅₀)	EIQ ¹	Bee Toxicity ²	EIQ Field Use Rating ³	Label buffers ⁴ (m)	Rainfastness on fruit ⁵		General Notes
							12.5 mm	25 mm	
Imidan 50 WP (Phosmet)	Moderate	Low	32.82	I	61.54	25	S	S	Toxic to most beneficial insects by direct and residual contact.
Assail 70 WP (acetamiprid)	Low	Low	28.73	III	0.8 – 1.6	30	S	I	Toxic to predatory mites
Calypso 480 SC (thiacloprid)	Low	Low	31.33	IV	1.4 – 2.2	20	S	I	Toxic to lacewings.
TwinGuard (sulfoxaflur+ spinetoram)	Low	Low		I		See BZ calculator	-	-	TOXIC TO BEES. Safe for most beneficial insects and mites.
Delegate WG (spinetoram)	Low	Low	27.78	III	1.0	30	S	S	Moderate to high toxicity to predatory mites.
Entrust (spinosad)	Low	Low	14.38	III	0.4	1	S	S	Toxic to earwigs and adult parasitic wasps.
Rimon 10 EC (novaluron)	Low	Low	14.33	I	1.3 – 2.0	65	S	I	Moderate to high toxicity to predatory mites.
Confirm 240 F (tebufenozide)	Low	Low	16.44	IV	1.3	15	I	-	Safe to all beneficials
Intrepid 240 F (methoxyfenozide)	Low	Low	32.08	IV	2.56	4	S	-	Safe for all beneficials
Altacor (chlorantraniliprole)	Low	Low	18.34	IV	0.3 – 0.5	5	S	S	Toxic to certain beneficial insects.
Exirel (cyantraniliprole)	Low	Low	14.67	I	0.7– 1.1	3	S	S	Toxic to certain beneficial insects.
Harvanta 50SL (cyclaniliprole)	Low	Low	-	I	-	3	-	-	Toxic to certain beneficial insects.
Vayego (Tetraniliprole)	Low	Low	-	I	-	25-35	-	-	Good Rainfastness.
Virosoft/CYD-X/Madex HP (virus)	Low	Low	0	IV	0	0	-	-	Extremely safe; specific for codling moth larvae.

¹ The EIQ measures a number of factors that affect how an active ingredient can impact human health and the environment. For more information on how the EIQ is calculated, go to www.nysipm.cornell.edu/publications/eiq

² Bee toxicity ratings: I, do NOT apply on any blooming crops or plants; II, apply in evening after bees have stopped foraging; III, apply in late evening after bees have stopped foraging until early morning before they start foraging; IV, can be applied any time with reasonable safety to bees.

³ EIQ Field Use Rating: EIQ x % ai of product x rate (kg or L)/1000 L

⁴ Buffer distances recommended on product labels for late-growth stage application by air-blast sprayers near freshwater habitats less than 1 metre deep.

⁵ Rainfastness on fruit 1 day after application: S = Sufficient residue to kill larvae; I = insufficient residue to kill larvae; - = no data. (Source: Dr. John Wise (Michigan State Univ.).)