

APPLE CALENDAR

Consult the product label for suggested water volumes. Otherwise, use enough water to ensure thorough spray coverage. Where the product rate is listed in amount/1,000 L, and if a water volume is not provided on the label, use enough water to wet the foliage to the near drip point.

Check Table 7–7, *Days to harvest intervals for products used on apples*, on page 102.

Diseases and Insects	Materials	Amount/ha trees 4.5–5.5 m high	Comments
Dormant			
San Jose scale European fruit scale Lecanium scale	• Superior 70 Oil	20 L of oil/1,000 L of water	Apply full rate of oil in 2,000–3,000 L of water/ha. 3,000 L gives best results. On large standard trees, use 90 L of oil in 4,500 L of water/ha. Test the stability of the emulsion by shaking in a jar. Do not use oil within 48 hours of freezing temperatures. Do not apply full rate of oil more than once per season. Do not use oil within 14 days of Captan or Maestro.
OIL MAY CAUSE BARK INJURY ON RED DELICIOUS, EMPIRE AND MUTSU (CRISPIN).			
Green tip up to half-inch green			
Scab protectants	• Manzate DF or Dithane DG or Penncozeb 75 DF • Polyram DF • Supra Captan 80 WDG or Maestro 80 DF • Dikar • Vanguard 75 WG • Scala SC	6.00 kg 6.00 kg see label 6.00 kg 3.75 kg 3.75 kg 6.75 kg 370 g 1.00 L	Apply fungicide before spore release and keep growing leaves covered. Alternate materials in a spray program. Read <i>Apple Scab</i> on page 117. When used in a full season program, Dikar will suppress mites. Higher water volumes help mite suppression. Consult label. Use Vanguard or Scala as protectant fungicides. Make no more than 2 applications per season, prebloom only. Vanguard and Scala do not control other foliar or fruit diseases.
Half-inch green to tight cluster			
European red mite	• Superior 70 Oil	20 L of oil/1,000 L of water	Do not apply full rate of oil more than once per season. Apply oil in 2,000–3,000 L of water/ha. 3,000 L gives best results. On large standard trees, use 90 L of oil in 4,500 L of water/ha. Test the stability of the emulsion by shaking in a jar. Apply Superior “70” Oil for the control of European red mite before overwintering eggs hatch. Usually the best timing is between Half-inch green and Tight cluster when temperatures are getting warmer. Do not use oil within 14 days of Captan or Maestro.
OIL MAY CAUSE BARK INJURY ON RED DELICIOUS, EMPIRE AND MUTSU (CRISPIN).			
Rosy apple aphid	• Pirimor 50 DF • Assail 70 WP	1.70 kg 120 g	Pirimor: Some countries have zero tolerance for Pirimor residues on fruit. Check with your packer before applying this material. Maximum 2 applications per season. Assail: Alternate with insecticides from different chemical families. Maximum of 4 applications per season.

Scab	<ul style="list-style-type: none"> • Manzate DF 6.00 kg or Dithane DG 6.00 kg or Penncozeb 75 DF see label • Polyram DF 6.00 kg • Supra Captan 80 WDG 3.75 kg or Maestro 80 DF 3.75 kg • Dikar 6.75 kg • Sovran 240 g • Nova 40 W 340 g plus Dithane DG 3.00 kg • Nova 40 W 340 g plus Polyram DF 3.00 kg • Nova 40 W 340 g plus Maestro 80 DF 1.90 kg • Nustar 100 g plus Manzate 200 DF 3.00 kg • ⁴Vangard 75 WG 370 g • ²Flint 50 WG 140 g • Scala SC 1.00 L 	<p>See <i>Apple Scab</i> on page 117.</p> <p>Sovran or Flint: Do not use Sovran or Flint earlier than Tight cluster. Apply in blocks of 2 applications, 10 days apart. Use another chemical family for 2 applications before returning to these products. Maximum 4 applications of Sovran or Flint per season. After last application of Sovran or Flint, tissue is protected from infection for 5–8 days. In conditions of rapid growth, shorten intervals between applications. Check labels for details.</p> <p>See <i>Use of Strobilurin Fungicides</i> on page 120 and <i>Use of Demethylation Inhibitor (DMI) Fungicides (sterol-inhibitors)</i> on page 120.</p> <p>See Table 4–2, <i>Fungicide/Bactericide Groupings Based On Sites Of Action</i>, on page 49.</p> <p>The following products are compatible with oil:</p> <ul style="list-style-type: none"> • Polyram DF • Dithane DG • Manzate DF <p>When mixing fungicides with oil, add fungicide to tank when $\frac{1}{4}$ to $\frac{1}{2}$ full of water and mix thoroughly. Add Superior 70 Oil last when tank is at least $\frac{3}{4}$ full of water.</p> <p>Do not use oil within 14 days of Captan or Maestro.</p> <p>Note: Oil may cause bark injury to Red Delicious, Empire and Crispin.</p>
Powdery mildew	Use one of the products listed at Tight cluster to pink .	
Oriental fruit moth	<ul style="list-style-type: none"> • Isomate M100 250 dispensers/ha • Isomate Rosso 500 dispensers/ha <p>For more information on mating disruption see <i>Oriental fruit moth</i> on page 110 and OMAFRA Factsheet <i>Mating Disruption for Management of Insect Pests</i>, Order No. 03-079 (text box)</p>	<p>Mating disruption products are not insecticides, and will not control other pests. Initial OFM population must be low for good results. Apply to square or rectangular orchard blocks at least 4 ha in size, before a given generation of OFM flight begins.</p> <p>Isomate M100: Make a 2nd application of up to 75–80 days after initial application.</p> <p>Isomate Rosso: provides control for up to 120 days.</p> <p>Regardless of the product used take note of field longevity. Do not leave the crop unprotected late in the season.</p>
Tight cluster to pink		
Tentiform leafminer	<ul style="list-style-type: none"> • Assail 70 WP 80 g • *Pounce 520 mL • *Decis 5 EC 250 mL • *Ripcord 400 EC 250 mL *Matador 120 EC 83 mL • Confirm 240 F 1.00 L • Intrepid 240 F 500 mL 	<p>Consult agriphone for timing (if available).</p> <p>Assail: Maximum 4 applications per season.</p> <p>Confirm or Intrepid: Apply at first egg hatch. Confirm suppresses leafminer populations. Continue monitoring after application. Maximum 2 applications of Confirm or Intrepid per season.</p> <p>*Pyrethroids (Pounce, Decis, Ripcord, Matador): also control spring feeding caterpillars and tarnished plant bugs. Do not apply a pyrethroid more than once per season. Pyrethroids are highly toxic to beneficial insects and may lead to outbreaks of European red mite.</p>

Scab	Use one of the fungicides listed at Half-inch green to tight cluster . See also <i>Control Of Apple Scab Under Adverse Weather Conditions</i> on page 121.		
Powdery mildew	<ul style="list-style-type: none"> • Nova 40 W 340 g • Nustar 200 g • Sovran 240 g • Dikar 6.75 kg • Microscopic sulphur see label • Kumulus DF 22.50 kg • Flint 50 WG 140 g 		<p>Begin application at tight cluster and continue to First summer spray. If powdery mildew was prevalent the previous year, apply fungicides beginning at Green tip. Additional sprays beyond First summer spray may be needed on susceptible varieties or if disease pressure is severe. See Table 7–14, <i>Examples Of Apple Cultivars Susceptible To Key Diseases</i>, on page 122.</p> <p>Nova or Nustar: Maximum 4 applications per season. See <i>Use Of Demethylation Inhibitor (DMI) Fungicides (sterol-inhibitors)</i> on page 120.</p> <p>Flint or Sovran: Maximum 4 applications per season. See <i>Use Of Strobilurin Fungicides</i> on page 120</p> <p>Sulphur or Kumulus: Do not use on Delicious because these products can cause an increase in red mite and scale insect populations.</p>
Cedar apple rust Quince rust	<ul style="list-style-type: none"> • Ferbam 76 WDG see label • Dikar 6.75 kg • Polyram DF 6.00 kg • Dithane DG 6.00 kg or Penncozeb 75 DF see label • Nova 40 W 340 g plus Dithane DG 3.00 kg • Flint 50 WG 140 g 		<p>Include in each spray up to and including First summer spray.</p> <p>Ferbam may cause russetting on Golden Delicious and other sensitive varieties.</p> <p>Nova: Maximum 4 applications per season.</p> <p>Flint: Maximum 4 applications per season.</p>
Plant bugs	<ul style="list-style-type: none"> Ripcord 400 EC 250 mL Matador 120 EC 104 mL 		The application of pre-bloom or petal fall pyrethroids to manage tentiform leafminer will suppress tarnished plant bugs
Spring-feeding caterpillars Green fruitworm	<ul style="list-style-type: none"> • Imidan 50 WP 3.75 kg • Guthion Solupak see label or Sniper see label • Zolone Flo 2.00 L 		<p>This spray is not necessary if a pyrethroid was applied for tentiform leafminer.</p> <p>Do not apply Zolone more than 3 times per season.</p>
Pink			
Scab	Use one of the fungicides listed at Half-inch green to tight cluster . See <i>Control Of Apple Scab Under Adverse Weather Conditions</i> on page 121.		
Black Rot	<ul style="list-style-type: none"> • Maestro 80 DF 3.75 kg • Supra Captan 80 WDG 3.75 kg 		Do not use oil within 14 days of Maestro or Captan.
European red mite	<ul style="list-style-type: none"> • Carzol SP 1.10 kg 		<p>Miticides are most effective when used alone.</p> <p>Carzol is harsh on beneficial mite species and bees. Application before Petal fall is preferred.</p>
Rosy apple aphid	<ul style="list-style-type: none"> • Pirimor 50 DF 1.70 kg • Assail 70 WP 120 g • Zolone Flo 2.00 L 		<p>Preferred time for control. See section on <i>Bee Poisoning</i> on page 79.</p> <p>Pirimor: Maximum 2 applications per season. Some countries have zero tolerance for Pirimor residues on fruit. Check with your packer before applying this material.</p> <p>Assail : Maximum 4 applications per season.</p> <p>Zolone: Maximum 3 applications per season.</p>

Obliquebanded leafroller	<ul style="list-style-type: none"> • *Dipel 2X DF 1.12 kg or *Foray 48BA 2.80 L or *Bioprotec CAF 4.00 L • Success 480 SC 182 mL • Confirm 240 F 1.00 L 	<p>See <i>Obliquebanded leafroller</i> on page 109. When applied for leafroller control, these products also control other caterpillars.</p> <p>In most commercial orchards obliquebanded leafroller (OBLR) populations are resistant to organophosphate insecticides. Cross resistance to pyrethroids and Confirm has been documented in some populations. In orchards where pesticide resistance is suspected, use <i>Bacillus thuringiensis</i> (<i>B.t.</i>) (Dipel, Foray or Bioprotec), or the naturolyte insecticide Success 480 SC.</p> <p>Success: Monitor populations and re-apply as necessary on a 7–10 day schedule. Spray solution should be above pH 6.0. Maximum 3 applications per season.</p> <p>Confirm: Accurate timing of Confirm is important. See label for specific timing. Maximum 2 applications times per season.</p> <p>*Bt products (Dipel, Foray, Bioprotec): Make 2 applications of B.t. products at 5–7 day intervals if activity of the larvae is extended. For best results when using B.t. products, acidify spray mix to below pH 7.0 and apply at dusk or on overcast days</p>
	<p>Avoid treating sequential generations with the products from the same chemical family. See Table 4–1, <i>Insecticide And Miticide Groups Based On Sites Of Action</i>, on page 48.</p>	

Bloom

**DO NOT APPLY INSECTICIDES WHILE APPLE TREES ARE IN BLOOM.
SEE BEE POISONING ON PAGE 79.**

Scab	<ul style="list-style-type: none"> • Polyram DF 6.00 kg • Supra Captan 80 WDG 3.75 kg or Maestro 80 DF 3.75 kg • Dikar 6.75 kg • Manzate DF 6.00 kg or Dithane DG 6.00 kg or Penncozeb 75 DF see label • Sovran 240 g • Nova 40 W 340 g plus Dithane DG 3.00 kg • Nova 40 W 340 g plus Polyram DF 3.00 kg • Nova 40 W 340 g plus Maestro 80 DF 1.90 kg • Nustar 100 g plus Manzate 200 DF 3.00 kg • Flint 50 WG 140 g 	<p>See <i>Control Of Apple Scab Under Adverse Weather Conditions</i> on page 121.</p> <p>Sovran or Flint: Do not use earlier than Tight cluster. Apply in blocks of 2 applications, 10 days apart. Use another chemical family for 2 applications before returning to these products. See Table 4–2, <i>Fungicide/Bactericide Groupings Based On Sites Of Action</i>, on page 49. After last application of Sovran or Flint, tissue is protected from infection for 5–8 days. In conditions of rapid growth, shorten intervals between applications. Check label for details. Maximum 4 applications Sovran or Flint per season.</p> <p>See <i>Use Of Strobilurin Fungicides</i> on page 120 and <i>Use Of Demethylation Inhibitor (DMI) Fungicides (sterol-inhibitors)</i> on page 120.</p>
	Fire blight	

Blight on page 114 for details.

Late Bloom/Early Petal Fall

Fire blight (Suppression of shoot blight stage)	· Apogee	1.35 kg	<p>Apogee is a plant growth regulator that reduces vegetative growth in the tree, making the tree less susceptible to fire blight infections of shoots. Apogee has no impact on blossom blight or the fire blight bacteria. Apogee should be applied in late bloom or early petal fall when shoots are 2.5 to 5.5 cm long. Accurate timing of application is critical. Apogee will help suppress fire blight infections from this point on. Re-apply spray 14-21 days later.</p> <p>In plantings with low vigour, a reduction in shoot growth caused by the high rate of Apogee for fire blight suppression, may be undesirable.</p> <p>For more information on the use of Apogee to manage fire blight refer to “<i>Management Notes</i>”, pg 115.</p>
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Petal fall (Calyx) when most petals have fallen

Scab Use one of the fungicides recommended at **Bloom**. See *Control Of Apple Scab Under Adverse Weather Conditions* on page 121.

Black Rot Use one of the fungicides listed at **Pink**.

Tentiform leafminer	<ul style="list-style-type: none">• Agri-Mek 1.9% EC• Admire 240 F• Assail 70 WP• *Pounce• *Decis 5 EC• *Ripcord 400 EC• *Matador 120 EC• Lannate	<ul style="list-style-type: none">750 mL380 mL80 g520 mL250 mL250 mL83 mL1.60 kg	<p>Agri-Mek: Apply when first sap-feeding mine is detected, no later than 21 days after petal fall. Apply with 10 L of Superior 70 Oil and a minimum of 1,000 L of water/ha. Agri-Mek plus oil may cause russetting to Golden Delicious and other light-skinned cultivars. Do not use Agri-Mek plus oil within 14 days of Captan or Maestro application. Maximum 1 application Agri-Mek per season. Agri-Mek plus oil is best applied alone. Also controls ERM and TSSM.</p> <p>Admire or Assail: Apply when sap feeders are present. Will also control other sap-feeding insects at this timing. Alternate Assail or Admire with insecticides from different chemical families. Maximum 4 applications Assail per season. Maximum 2 applications Admire per season.</p> <p>*Pyrethroids (Pounce, Ripcord, Decis Matador): In years where leafminer egg hatch is delayed, a pyrethroid can be applied at petal fall when first sap-feeding mine is detected. This treatment also controls tarnished plant bug and spring feeding caterpillars. Do not apply pyrethroids more than once per season. Pyrethroids are highly toxic to beneficial insects, and</p>
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may lead to outbreaks of European red mite.

Lannate: Apply when first tissue-feeding mine is detected on the upper surface of the cluster leaves. Do not apply to Early McIntosh or Wealthy varieties.

Rosy apple aphid	<ul style="list-style-type: none"> • Admire 240 F • Assail 70 WP • Pirimor 50 DF • Zolone Flo 	<p>230 mL 120 g 1.70 kg 2.00 L</p>	<p>Admire or Assail applied at this time also control other sap feeding insects. Maximum 4 applications Assail per season. Maximum 2 applications Admire per season.</p> <p>Pirimor: Some countries have zero tolerance for Pirimor residues on fruit. Check with your packer before applying this material. Maximum 2 applications per season.</p>
Mullein leaf bug	<ul style="list-style-type: none"> • Admire 240 F • Diazinon 50 W • Lannate 	<p>380 mL 3.25 kg 1.60 kg</p>	<p>Timing is critical. Admire applied at this time also controls green apple aphid, rosy apple aphid, white apple leafhopper, and tentiform leafminer. Maximum 2 applications Admire per season.</p>
Oystershell scale San Jose scale	<ul style="list-style-type: none"> • Guthion Solupak or Sniper 	<p>see label see label</p>	<p>Apply when the crawlers are active.</p>
Plum curculio	<ul style="list-style-type: none"> • Guthion Solupak or Sniper • Imidan 50 WP • Zolone Flo • Surround WP 	<p>see label see label 3.75 kg 3.00 L 50.0 kg</p>	<p>Guthion, Sniper, Imidan, and Zolone: will provide subsequent control of caterpillars.</p> <p>Surround: Make 2 applications, 7 days apart, at 50 kg/ha, to establish a base layer. Continue at 7-14 day intervals, using a reduced rate of 25 kg/ha, to maintain even coverage of developing fruits. See <i>“Using Surround as a Pest Management Tool”</i> page 104.</p>
European apple sawfly	<ul style="list-style-type: none"> • Guthion Solupak or Sniper 	<p>see label see label</p>	<p>Apply as a special spray to orchards where there has been a history of damage.</p>

European red mite	<ul style="list-style-type: none"> • Agri-Mek 1.9% EC • Apollo SC • Carzol SP • Acramite 50 WS • Envidor 240 SC 	<p>750 mL 300 mL 1.10 kg 851 g or 3.75 pouches 750 mL</p>	<p>Do not apply any miticide more than once per season Agri-Mek: Apply when mites are in the nymph stage, no later than 21 days after petal fall. Apply with 10 L Superior 70 Oil and a minimum of 1,000 L of water /ha. Agri-Mek plus oil may cause russetting to Golden Delicious and other light-skinned varieties. Do not use Agri-Mek plus oil within 14 days of a Captan or Maestro application. Ideally, alternate yearly with other early season miticides (e.g., Superior 70 Oil, Apollo). Agri-Mek also controls tentiform leafminer. Apollo kills mite eggs. Apply when mites are mostly in the egg stage and before there are more than 3 active mites per leaf. Thorough coverage is essential for good control. Apply Apollo alone in a minimum of 1,100 L of water/ha. Carzol is harsh on beneficial insects, mites and bees. Envidor has slow activity and results may not be apparent for up to 1 week.</p>
Blister spot	<ul style="list-style-type: none"> • Aliette WDG 	2.00 kg	<p>Begin applications at petal fall with 1–2 subsequent sprays at 7 day intervals. Do not mix with copper compounds. Maximum 3 applications per season.</p>
Obliquebanded leafroller	<ul style="list-style-type: none"> • *Dipel 2X DF or *Foray 48BA or *Bioprotect CAF • Success 480 SC • Confirm 240 F • Lannate • Intrepid 240 F 	<p>1.12 kg 2.80 L 4.00 L 182 mL 1.00 L 1.60 kg 500 mL</p>	<p>See <i>Obliquebanded leafroller</i> on page 109. When applied for leafroller control, these products also control other caterpillars.</p> <p>In most commercial orchards obliquebanded leafroller (OBLR) populations are resistant to organophosphate insecticides. Cross resistance to pyrethroids, Confirm and Intrepid has been documented in some populations. In orchards where pesticide resistance is suspected use <i>Bacillus thuringiensis</i> (<i>B.t.</i>) (Dipel, Foray or Bioprotect), or the naturolyte insecticide Success 480 SC. Avoid treating sequential generations with the products from the same chemical family. See Table 4–1, <i>Insecticide And Miticide Groups Based On Sites Of Action</i>, on page 48.</p> <p>Success: Monitor populations and re-apply as necessary on a 7–10 day schedule. Spray solution should be above pH 6.0. Maximum 3 applications per season.</p> <p>Confirm or Intrepid: Accurate timing of Confirm and Intrepid is important. See label for specific timing. Maximum 2 applications per season.</p> <p>Lannate: Lannate is most effective on 4th and 5th instar larvae. Maximum 1 application per season.</p> <p>*B.t. products (Dipel, Foray, Bioprotect) Make 2 applications of at 5–7 day intervals if activity of the larvae is extended. For best results when using B.t. products, acidify spray mix to below pH 7.0 and apply at dusk or on overcast days.</p>

Oriental fruit moth	<ul style="list-style-type: none"> • Intrepid 240 F • *Decis 5 EC • Assail 70 WP 	<p>1.00 L 250 mL 240 g</p>	<p>See <i>Oriental Fruit Moth</i> on page 110. Apply as a special spray to orchards where there is a history of damage. Timing is critical for effective control, use monitoring results to adjust spray timing. Begin applications at peak egg hatch based on pheromone trap counts and degree days. Assail: Maximum 4 applications per season. * Pyrethroids (Decis) Maximum one pyrethroid per season. Pyrethroids are highly toxic to beneficial insects and may lead to outbreaks of European red mite. Use only as a last resort. Intrepid: Apply 2-3 days earlier than conventional pesticides.</p>
Powdery mildew	Use one of the fungicides listed at Tight cluster to pink .		
First summer spray (7–10 days after Petal fall (Calyx))			
Scab	Use one of the fungicides recommended at Bloom. An extra scab spray may be required between Petal fall (calyx) and First summer spray . See <i>Control Of Apple Scab Under Adverse Weather Conditions</i> on page 121.		
Plum curculio	Use one of the insecticides listed under Petal fall (calyx) .		
Fire blight	• Streptomycin 17	600 g/1,000 L	Apply up to 14 days after petal fall to control shoot blight especially if blossom blight has occurred.
European red mite	<ul style="list-style-type: none"> • Apollo SC • Agri-Mek 1.9% EC • Acramite 50 WS • Envidor 240 SC 	<p>300 mL 750 mL 851 g or 3.75 pouches 0.75 L</p>	<p>Do not apply any miticide more than once per season. Miticides are best applied alone. Apollo: Apply no later than 14 days after petal fall. Apollo kills mite eggs. Apply when mites are mostly in the egg stage and before there are more than 3 active mites per leaf. Thorough coverage is essential for good control. Apply Apollo alone in a minimum of 1,100 L of water/ha. Agri-Mek: Apply when mites are in the nymph stage, no later than 21 days after petal fall. Apply with 10 L of Superior 70 Oil and a minimum of 1,000 L of water/ha. Agri-Mek plus oil may cause russetting to Golden Delicious and other light-skinned cultivars. Do not use Agri-Mek plus oil within 14 days of Captan or Maestro application. Maximum 1 application per season. Ideally, alternate yearly with other early season miticides (e.g., Superior 70 Oil, Apollo). Agri-Mek also controls tentiform leafminer. Acramite: is not effective on rust mites. Envidor: is effective in managing apple rust mites. Activity is slow; control may not be apparent for up to 1 week.</p>
See <i>Pest Resistance to Insecticides, Fungicides, Miticides</i> on page 54			

Two-spotted spider mite	<ul style="list-style-type: none"> • Apollo SC • Agri-Mek 1.9% EC • Acramite 50 WS • Envidor 240 SC 	<p>300 mL 750 mL 567 g or 2.5 pouches 0.75 L</p>	<p>Do not apply any miticide more than once per season. Miticides are best applied alone.</p> <p>Apollo: Apply no later than 14 days after petal fall. Apollo kills mite eggs. Apply when mites are mostly in the egg stage and before there are more than 3 active mites per leaf. Thorough coverage is essential for good control. Apply Apollo alone in a minimum of 1,100 L of water/ha. Maximum 1 application per season.</p> <p>Agri-Mek Apply when mites are in the nymph stage, no later than 21 days after petal fall. Apply with 10 L of Superior “70” Oil and a minimum of 1,000 L of water/ha. Agri-Mek plus oil may cause russetting to Golden Delicious and other light-skinned cultivars. Do not apply within 14 days of Captan or Maestro application. Maximum 1 application per season. Ideally, alternate yearly with other early season miticides (e.g., Superior “70” Oil, Apollo). Agri-Mek also controls tentiform leafminer.</p> <p>Acramite is not effective on rust mites.</p> <p>Envidor is effective in managing apple rust mites. Activity is slow; control may not be apparent for up to 1 week.</p> <p>See <i>Pest Resistance to Insecticides, Fungicides, Miticides</i> on page 54.</p>
Rosy apple aphid	<ul style="list-style-type: none"> • Admire 240 F • Assail 70 WP • Pirimor 50 DF • Zolone Flo 	<p>230 mL 120 g 1.70 kg 2.00 L</p>	<p>Admire or Assail applied at this time also control green apple aphid and white apple leafhopper.</p> <p>Admire: Maximum 2 applications per season.</p> <p>Assail: Maximum 4 applications per season.</p> <p>Pirimor 50 DF: Some countries have zero tolerance for Pirimor residues on fruit. Check with your packer before applying this material.</p>
Powdery mildew	Use one of the fungicides listed under Tight cluster to pink.		
Blister spot	<ul style="list-style-type: none"> • Copper 53 W • Aliette WDG 	<p>3.00 kg 2.00 kg</p>	<p>Copper 53W : To reduce the incidence of blister spot lesions on Crispin and other sensitive varieties, apply up to 3 applications beginning 10 days after Petal fall. Use hydrated lime as a safener (to reduce the risk of phytotoxicity) at a rate of 6 kg per 1 kg of Copper 53W per 1,000 L of water. Apply 3,000 L of water/ha.</p> <p>Aliette: Begin applications at petal fall with 1–2 subsequent sprays at 7 day intervals. Maximum 3 applications per season. Do not mix with copper compounds.</p>
Oriental fruit moth	<ul style="list-style-type: none"> • Isomate M 100 • Isomate Rosso 	<p>250 dispensers/ha 500 dispensers/ha</p>	<p>See <i>Oriental Fruit Moth</i> on page 110 .Refer to mating disruption comments listed under Half-inch green to tight cluster.</p> <p>Apply a 2nd application of Isomate M 100 75–80 days following the 1st application.</p> <p>Isomate Rosso will provide control for up to 120 days.</p>
Subsequent summer sprays			
Scab	Until the end of the primary scab season use one of the fungicides recommended at Bloom. For summer (secondary) scab control, use one of the following:		

	<ul style="list-style-type: none"> • Supra Captan 80 WDG or Maestro 80 DF 3.75 kg (1.9) • Dikar WP 3.75 kg (1.9) • Polyram DF 6.75 kg • Manzate DF or Dithane DG 6.00 kg (4.5) • or Penncozeb 75 DF 6.00 kg (4.5) 	see label	<p>If scab is controlled in your orchard use the lower rate given in brackets.</p> <p>If secondary lesions develop, see <i>Deactivation Of Established Scab Lesions</i> on page 121. Do not apply Polyram, Dikar, Manzate 200, Dithane or Penncozeb within 45 days of harvest.</p>
Sooty blotch Fly speck	<ul style="list-style-type: none"> • Supra Captan 80 WDG or Maestro 80 DF 3.75 kg • Flint 50 WG 3.75 kg 	140 g	<p>Repeat application of Captan or Maestro in 2 weeks. Captan or Maestro at full rates, provide protection against black rot.</p> <p>Flint: Maximum 4 applications per season.</p>
Codling moth	<ul style="list-style-type: none"> • Imidan 50 WP 3.75 kg • Guthion Solupak or Sniper see label • Zolone Flo 2.00 L • Confirm 240 F 1.00 L • Assail 70 WP 170 g • Intrepid 240 F 1.00 L 	see label	<p>Timing is critical for effective control. Use pheromone traps to time sprays.</p> <p>Guthion and Sniper: Also control scale crawlers.</p> <p>Zolone: Also controls aphids.</p> <p>Confirm and Intrepid: Also suppress leaf-feeding caterpillars, but do not control apple maggot. Accurate timing of Confirm/Intrepid is important. Apply at first egg hatch. See label for specific timing. Intrepid or Confirm should be applied 2-3 days earlier than conventional pesticides. Maximum 2 applications per season.</p> <p>Assail: Maximum 4 applications per season.</p>
Oriental fruit moth	<ul style="list-style-type: none"> • Isomate M 100 250 dispensers/ha • Isomate Rosso 500 dispensers/ha 		<p>See <i>Oriental Fruit Moth</i> on page 110. Refer to mating disruption comments listed under Half-inch green to tight cluster.</p> <p>Apply a 2nd application of Isomate M100, 75–80 days following 1st application.</p> <p>Isomate Rosso provides control for up to 120 days.</p>
Apple maggot	<ul style="list-style-type: none"> • Imidan 50 WP 3.75 kg • Guthion Solupak or Sniper see label • Zolone Flo 3.00 L • Sevin XLR 6.25 L • Diazinon 50 W see label • Surround WP 50.00 kg 	see label	<p>See <i>Apple Maggot</i> on page 105. Use trap catches to time the first spray. Make subsequent applications at 14–21 day intervals or as required based on monitoring.</p> <p>Begin Surround applications well before 1st maggot flies are trapped in commercial orchards, and continue at 7-14 day intervals to maintain even coverage of fruit. Use 50 kg/ha for the 1st two applications of the season, continue at 25 kg/ha. See “<i>Using Surround as a Pest Management Tool</i>” page 104.</p>
Special summer sprays			
Blister spot	<ul style="list-style-type: none"> • Copper 53 W 3.00 kg • Aliette WDG 2.00 kg 		See comments on blister spot control under First summer spray .
Green apple aphid Rosy apple aphid	<ul style="list-style-type: none"> • Admire 240 F 230 mL • Assail 70 WP 120 g • Pirimor 50 DF 1.70 kg • Zolone Flo 2.00 L • Thiodan 50 WP or Thionex 50 W 4.50 kg • Diazinon 50 W see label 	see label	<p>Admire: Maximum 2 applications per season.</p> <p>Assail: Maximum 4 applications per season.</p> <p>Zolone also controls woolly apple aphid. Diazinon, and Zolone also control codling moth and apple maggot (check rates). Pirimor, Admire, Assail, Thiodan, and Thionex also control white apple leafhopper.</p> <p>Some countries have zero tolerance for Pirimor residues on fruit. Check with your packer before applying this material.</p>

Woolly apple aphid	<ul style="list-style-type: none"> • Pirimor 50 DF • Malathion 25 W • Zolone Flo 	<p>1.70 kg see label 2.00 L</p>	<p>Use high volumes of water and ensure spray contacts trunk and scaffold limbs. Repeat application in 14 days if woolly apple aphid is still present. Pirimor: Also controls white apple leafhopper. Some countries have zero tolerance for Pirimor residues on fruit. Check with your packer before applying this material. Zolone: Effective only if used in a cover spray program.</p>
White apple leafhopper	<ul style="list-style-type: none"> • Admire 240 F • Pirimor 50 DF • Carzol SP • Sevin XLR • Thionex 50 W 	<p>200 mL 1.70 kg 1.10 kg 3.10 L 2.60 kg</p>	<p>Spray when nymphs are present (2–5 per leaf). There are 2 generations of nymphs per season, in mid-June and early August. Control of adults is very difficult. Admire: When applied for 1st generation, also controls green apple aphid and rosy apple aphid. Maximum 2 applications per season. Assail : Applied at a rate of 120 g/ha for aphids will control leafhoppers. Pirimor: Some countries have zero tolerance for Pirimor residues on fruit. Check with your packer before applying this material.</p>
Potato leafhopper	<ul style="list-style-type: none"> • Thionex 50 W 	<p>2.60 kg</p>	<p>Assail applied at a rate of 120 g/ha for aphids will also control leafhoppers..</p>
Tentiform leafminer	<ul style="list-style-type: none"> • Admire 240 F • Assail 70 WP • *Pounce • *Decis 5 EC • *Ripcord 400 EC • *Matador 120 EC 	<p>380 mL 80 g 520 mL 250 mL 250 mL 83 mL</p>	<p>Admire or Assail: Apply when populations are mainly in the sap-feeder stage. Admire: Maximum 2 applications per season. Assail: Maximum 4 applications per season *Pyrethroids: Use is discouraged for summer generations of tentiform leafminer. These products do not control larvae within the mines. Pyrethroids are highly toxic to beneficial insects and may lead to outbreaks of European red mite.</p>
Dogwood borer Apple bark borer	<ul style="list-style-type: none"> • Pounce plus Superior Oil 	<p>22 mL/100 L water with 2 L oil</p>	<p>Soak the trunk. Make 2 applications at 2–3 week intervals when adults are flying (late June–early August).</p>

Obliquebanded leafroller	<ul style="list-style-type: none"> • *Dipel 2X DF or *Foray 48BA or *Bioprotec CAF • Success 480 SC • Confirm 240 F 	<p>1.12 kg 2.80 L 4.00 L 182 mL 1.00 L</p>	<p>When applied for leafroller control, these products also control other leaf-feeding caterpillars.</p> <p>In most commercial orchards obliquebanded leafroller (OBLR) populations are resistant to organophosphate insecticides. Cross resistance to pyrethroids, Confirm and Intrepid have been documented in some populations. In orchards where pesticide resistance is suspected, use <i>Bacillus thuringiensis</i> (<i>B.t.</i>) (Dipel, Foray or Bioprotec), or the naturolyte insecticide Success 480 SC to control OBLR.</p> <p>Avoid treating sequential generations with the products from the same chemical family. See Table 4–1, <i>Insecticide And Miticide Groups Based On Sites Of Action</i>, on page 48.</p> <p>Success: Monitor populations and re-apply as necessary on a 7–10 day schedule. Make no more than 3 applications. Spray solution should be above pH 6.0</p> <p>Confirm: Apply a 2nd spray 10–14 days after the 1st application. Accurate timing of Confirm is important. See label for specific timing. Maximum 2 applications per season.</p> <p>*Bt products: Make 2 applications of B.t. products at 5–7 day intervals if activity of the larvae is extended. For best results acidify spray mix to below pH 7.0 and apply at dusk or on overcast days.</p>
Oriental fruit moth	<ul style="list-style-type: none"> • Assail 70 WP • *Decis 5 EC • Intrepid 240 F 	<p>240 g 250 mL 1.00 L</p>	<p>Apply as a special spray to orchards where there has been a history of damage. Timing is critical for effective control, use monitoring results to adjust spray timing. Begin applications at peak egg hatch based on pheromone trap counts and degree days.</p> <p>Rotate between products in different chemical families to deter the development of pesticide resistance. See Table 4–1, <i>Insecticide And Miticide Groups Based On Sites Of Action</i>, on page 48.</p> <p>*Pyrethroids: Maximum one application per season. Pyrethroids are highly toxic to beneficial insects and may lead to outbreaks of European red mite. Use only as a last resort.</p>
European red mite	<ul style="list-style-type: none"> • Pyramite • Acramite 50 WS • Envidor 240 SC • Kelthane 50 W • Carzol SP 	<p>300 g 851 g or 3.75 pouches 0.75 L 3.25 kg 1.10 kg</p>	<p>Use established spray thresholds to time miticide applications (see Table 7-9 <i>Activity of Miticides Registered on Apple and /or Pear in Ontario</i>, on page 109. Miticides are best used alone. Use a minimum of 1,000 L/ha of water when applying summer miticides. Apply each miticide only once per season to delay development of resistance. Resistance to miticides is increasing in Ontario orchards. See <i>Pest Resistance to Insecticides, Fungicides, Miticides</i> on page 54</p> <p>Pyramite: Most effective against immature stages (but not eggs).</p> <p>Carzol : Harsh on beneficial mite species.</p> <p>Envidor: Has slow activity; control may not be apparent for up to 1 week.</p> <p>For rust mite, use Envidor, Pyramite, or Kelthane.</p>

Two-spotted spider mite	<ul style="list-style-type: none"> • Pyramite • Kelthane 50 W • Carzol SP • Acramite 50 WS • Envidor 240 SC 	600 g 3.25 kg 1.10 kg 567 g or 2.5 pouches 0.75 L	Use established spray thresholds to time miticide applications. See Table 7-9 <i>Activity of Miticides Registered on Apple and / or Pear in Ontario</i> , on page 109. Miticides are best used alone. Use a minimum of 1,000 L/ha of water when applying summer miticides. Apply each miticide only once per season to delay development of resistance. Resistance to miticides is increasing in Ontario orchards. See <i>Pest Resistance to Insecticides, Fungicides, Miticides</i> on page 54 Pyramite: Most effective against immature stages (but not eggs). Carzol : Harsh on beneficial mite species. Envidor: Has slow activity; control may not be apparent for up to 1 week.
Pinpoint and storage scab	Use one of the fungicides recommended for secondary scab in Subsequent summer sprays . Do not use fungicides closer than the stated interval to harvest. (See Table 7-7, <i>Days To Harvest Intervals For Products Used On Apples</i> , on page 102.)		
Preharvest sprays			
Botrytis and Penicillium (suppression) storage diseases	<ul style="list-style-type: none"> • Scala SC 	2.00 L	Apply Scala two weeks before harvest. Summer applications of Captan and Maestro provide some protection against storage rots.
Postharvest treatment			
Blue mould Grey mould	<ul style="list-style-type: none"> • Mertect SC 	0.5 L/500 L	For use in dip tank or drencher. Continuous agitation is required. Follow label instructions. Does not control blue mould (Penicillium) or grey mould (Botrytis), that are resistant to benzimidazole fungicides. Summer applications of Captan and Maestro provide some protection against storage rots.

Guidelines for Protecting Non-Bearing Apple Plantings

The following program is designed to offer limited protection when needed for newly planted trees. It is not intended for protection of bearing orchards. To minimize pest pressure, remove neglected fruit trees in the area, and control weeds. Alternate materials are available as shown in the calendar for bearing fruits.

Diseases and Insects	Materials	Comments
Early spring		
Phytophthora collar rot		See <i>Phytophthora Collar Rot</i> on page 116.
First spray		
Powdery mildew	<ul style="list-style-type: none"> • Nova 40 W • Nustar • Sovran • Flint 50 WG • Dikar 	

Scab	<ul style="list-style-type: none"> • Dikar • Manzate DF or Dithane DG or Penncozeb 75 DF • Polyram DF • Supra Captan 80 WDG or Maestro 80 DF 	When green tissue shows. Repeat at 7–10 day intervals if wet weather occurs until late June.
Prebloom		
Tentiform leafminer	<ul style="list-style-type: none"> • Assail 70 WP • *Pounce • *Decis 5EC • *Ripcord 400 EC • *Matador 120 EC • Confirm 240 F • Intrepid 240 F 	* Do not apply pyrethroids more than once per season. Pyrethroids are highly toxic to beneficial insects and may lead to outbreaks of European red mite.
Leaf-feeding caterpillars	<ul style="list-style-type: none"> • Imidan 50 WP • Guthion Solupak or Sniper • Zolone Flo 	Before blossoms open in adjacent bearing orchards. Apply when caterpillars are small. Include with a fungicide spray. Not necessary if a pyrethroid was used for tentiform leafminer.
Bloom		
Fire blight	<ul style="list-style-type: none"> • Streptomycin 17 	Avoid overstimulating growth. See <i>Fire Blight</i> on page 114.
Post Bloom		
Leaf curling midge	Ripcord 400 EC	
Summer sprays		
Leaf-feeding insects	<ul style="list-style-type: none"> • Imidan 50 WP • Guthion Solupak or Sniper • Zolone Flo 	This spray will also control potato leafhopper.
Aphids	<ul style="list-style-type: none"> • Admire 240 F • Assail 70 WP • Pirimor 50 DF • Thiodan 50 WP or Thionex 50 W • Diazinon 50 W 	Spray if insects become abundant at any time.
White apple leafhopper	<ul style="list-style-type: none"> • Admire 240 F • Assail 70 WP • Pirimor 50 DF • Thionex 50 W 	
Potato leafhopper	<ul style="list-style-type: none"> • Thionex 50 W • Thiodan 50 WP • Assail 70 WP 	
Tentiform leafminer	<ul style="list-style-type: none"> • Admire 240 F • Assail 70 WP • Vydate L 	Vydate is very toxic to applicator. Timing is critical. If mines are visible on underleaf surface, consult crop consultant.

Mites	<ul style="list-style-type: none"> • Pyramite • Kelthane 50 W • Carzol SP • Acramite 50 WS • Envidor 240 SC 	Check foliage frequently for mite injury. Spray if more than 10 mites per leaf are observed or at first sign of leaf bronzing.
Buffalo treehopper		Follow clean cultivation practices or remove legumes from cover crop.
Phytophthora collar rot	See <i>Phytophthora Collar Rot</i> on page 116.	
Root lesion nematode	See <i>Nematodes</i> on page 60 and <i>Nematode Suppression After Planting</i> , page 62.	

Table 7–7. Products used on apples

Use this table as a guide, but refer to product label for specific information.

The **preharvest interval** is the number of days between the last spray and first harvest.

The **re-entry period** is the minimum interval that must be observed between applying the pesticide and working in the treated crop without protective equipment. If no re-entry period is stated on the label, assume that the spray solution must be dry before re-entry can occur.

The **maximum number of applications** is the labelled maximum number for the growing season, and may be higher than what is recommended for resistance management or for preserving beneficial insects.

Product name	Common name	Chemical family or sub-group	Insecticide group	Fungicide group	Preharvest interval	Minimum re-entry period	Maximum number of applications per season
Acramite 50 WS	bifenazate	carbazate	25		7 days	12 hours	1
Admire 240 F	imidacloprid	neonicotinoid	4		7 days	24 hours	2
Agri-Mek 1.9% EC	abamectin	avermectin	6		28 days	—	1
Aliette WDG	fosetyl al	phosphonate		33	30 days	—	3
Apogee	prohexadione calcium				45 days	12 hours	4; (do not exceed 5.4 kg/ha)
Apollo SC	clofentezine	tetrazine	10		No later than 14 days after petal fall	—	1
Assail 70 WP	acetamiprid	neonicotinoid	4		7 days	12 hours	4
Bioprotec CAF	<i>Bacillus thuringiensis</i> var kurstaki	Bt microbial	11		1 day	—	—
Carzol SP	formetanate hydrochloride	carbamate	1A		1 day	—	4.48 kg/ha after calyx
Confirm 240 F	tebufenozide	ecdysone agonist	18		14 days	—	4
Copper 53 W	tri-basic copper sulphate	inorganic		M1	30 days	—	3
Decis 5 EC	deltamethrin	synthetic pyrethroid	3		1 day	—	3
Diazinon 50 W	diazinon	organophosphate	1B		14 days	—	—
Dikar	mancozeb + dinocap	dithiocarbamate		M2	45 days	48 hours	—
Dipel 2X DF	<i>Bacillus thuringiensis</i> var	Bt microbial	11		1 day	—	—

Product name	Common name	Chemical family or sub-group	Insecticide group	Fungicide group	Preharvest interval	Minimum re-entry	Maximum number of applications per season
	kurstaki						
Dithane DG	mancozeb	dithiocarbamate		M2	45 days	—	—
Envidor 240 SC	spirodiclofen	tetronic acid derivative	23		7 days	12 hours	1
Ferbam 76 WDG	ferbam	dithiocarbamate		M2	7 days	—	—
Flint 50 WG	trifloxystrobin	strobilurin		11	14 days	12 hours except 4 days for hand-thinning	4
Foray 48BA	<i>bacillus thuringiensis</i> var kurstaki	Bt microbial	11		1 day	—	—
Funginex 190 EC	triforine	piperazine		3	Non-bearing only	—	3-5
Guthion Solupak	azinphosmethyl	organophosphate	1B		14 or 21 days depending on rate	14 days	4
Imidan 50 WP	phosmet	organophosphate	1B		1 day	48 hours	—
Intrepid 240 F	methoxyfenozide	ecdysone agonist	18		14 days		2L product/ha
Kelthane 50 W	dicofol	diphenylethane	3		7 days	—	1
Kumulus DF	sulphur	inorganic		M1	1 day	—	—
Lannate	methomyl	carbamate	1A		8 days	24 hours	—
Maestro 80 DF	captan	phthalimide		M3	7 days	48 hours	—
Malathion 25W	malathion	organophosphate	1B		3 days		
Manzate DF	mancozeb	dithiocarbamate		M2	45 days	—	—
Matador 120 EC	cyhalothrin lambda	synthetic pyrethroid	3		7 days	24 hours	3
Microscopic Wettable Sulphur	sulphur	inorganic		M1	1 day		—
Nova 40 W	myclobutanil	triazole (DMI)		3	14 days		
Nustar	flusilazole	DMI		3	77 days	12 hours	4
Penncozeb 75 DF	mancozeb	dithiocarbamate		M2	45 days	24 hours	—
Pirimor 50 DF	pirimicarb	carbamate	1A		35 days	24 hours	2
Polyram DF	metiram	dithiocarbamate		M2	45 days	—	—
Pounce	permethrin	pyrethroid	3		7 days	—	—
Pyramite	pyridaben	pyridazinone	21		25 days	24 hours	2

Product name	Common name	Chemical family or sub-group	Insecticide group	Fungicide group	Preharvest interval	Minimum re-entry	Maximum number of applications per season
Ridomil Gold 480 EC	metalaxyl-m	acylamine		4	non-bearing only	—	3
Ripcord 400 EC	cypermethrin	pyrethroid	3		7 days	—	2–3
Scala SC	pyrimethanil	anilinopyrimidine		9	14 days (Botrytis), 72 days (scab)	24 hours for hand labour	5
Sevin XLR	carbaryl	carbamate	1A		11 days	—	—
Sniper	azinphosmethyl	organophosphate	1B		14 days	14 days	4
Sovran	kresoxim-methyl	strobilurin		11	30 days	48 hours	4
Streptomycin 17	streptomycin sulphate	antibiotic		25	50 days	7 days	max. 5.4 kg/ha
Success 480 SC	spinosad	naturalyte	5		7 days	12 hours	3
Superior 70 Oil	mineral oil				—	—	1 (full rate)
Supra Captan 80 WDG	captan	phthalimide		M3	7 days	48 hours	
Surround WP	kaolin						
Thiodan 50 WP	endosulfan	chlorinated cyclodiene	2A		15 days	—	2 applications after calyx
Thionex 50 W	endosulfan	chlorinated cyclodiene	2A		15 days		3
Vanguard 75 WG	cyprodinil	anilinopyrimidine		9	72 days	72 hours	2
Vydate L	oxamyl	carbamate	1A		Non-bearing only	48 hours	—
Zolone Flo	phosalone	organophosphate	1B		30 days	24 hours	3