

# Pear Calendar

Read the label and follow all safety precautions.

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.

For resistance management, refer to *Pest Resistance to Insecticides, Fungicides, Miticides*, on page 54.

For preharvest interval, re-entry period, maximum number of applications and chemical group, see Table 10-14. *Products Used on Pears*, on page 247.

Diseases and Insects	Materials	Amount/ha	Comments
<b>Dormant</b>			
Scale insects Pear psylla	<ul style="list-style-type: none"> <li>Superior 70 Oil</li> </ul>	20 L/1,000 L water	Use 2,000–3,000 L of water/ha. Good coverage is essential. Do not apply full rate of oil more than once per season.
<b>Green tip</b>			
Scab	<ul style="list-style-type: none"> <li>Equal 65 WP</li> <li>Supra Captan 80 WDG or Maestro 80 DF</li> <li>Dikar</li> <li>Flint 50 WG</li> <li>Sovran</li> <li>Scala SC</li> </ul>	3.25 kg 3.75 kg 3.75 kg 6.75 kg 140 g 240 g 1.00 L	Start scab control early and repeat the spray if weather remains wet. <b>Captan or Maestro:</b> Do not use on d'Anjou pears. <b>Dikar:</b> if used at ten-day intervals, controls pear scab and pear psylla nymphs. It also suppresses European red mite and rust mite populations. Do not use Dikar within 45 days of harvest. Higher water volumes aid in mite suppression. <b>Sovran or Flint:</b> Apply up to two sequential sprays, followed by two or more applications of a fungicide with a different mode of action. Where disease pressure is high, use up to 360g/ha Sovran. Maximum four applications Sovran or Flint per season. <b>Scala:</b> Do not use within 72 days of harvest.
European red mite Pear psylla	<ul style="list-style-type: none"> <li>Superior 70 Oil</li> </ul>	20 L/1,000 L water	Best applied at or near Green tip for mites. Use 2,000–3,000 L of water/ha. Good coverage is essential. Oil does not control rust mite. Do not apply full rate of oil more than once per season. Do not use Captan or Maestro within 14 days of an application of Superior Oil.
Pear psylla	<ul style="list-style-type: none"> <li>Surround WP</li> </ul>	50.0 kg	Begin spray program before overwintering adults are active. Make two applications at 50 kg/ha, seven days apart, to establish a base layer. Continue applications at 7-14 day intervals. Surround may interfere with optimum bee activity. Do not apply Surround during the green cluster bud to petal fall stage. See <i>Using Surround as a Pest Management Tool</i> , on page 105.
Oriental fruit moth	<ul style="list-style-type: none"> <li>Isomate M100</li> <li>Isomate Rosso</li> </ul>	250 dispensers/ha 500 dispensers/ha	Pheromone mating disruption products will not control other pests that may be present in the orchard. Initial OFM population must be low. Use in square or rectangular orchard blocks at least 4 ha. in size. Apply before moth flight begins. For more information on mating disruption refer to <i>Oriental fruit moth</i> , on page 219 and OMAFRA Factsheets, <i>Mating Disruption for Management of Insect Pests</i> , Order No. 03-079 and <i>Mating Disruption for Management of Oriental Fruit Moth in Stone and Pome Fruit</i> , Order No. 04-029. <b>Isomate M100:</b> Make a second application 75–80 days after the first. <b>Isomate Rosso:</b> provides mating disruption for up to 120 days. In crops with long field seasons, make a second application. If desired, use both an insecticide and mating disruption for managing first generation OFM (see Petal fall).

Diseases and Insects	Materials	Amount/ha	Comments
<b>Prebloom (as blossoms show white at tips)</b>			
Scab	Use one of the materials listed for scab control under Green tip. Repeat spray if weather remains wet.		
Rust mite European red mite	<ul style="list-style-type: none"> <li>Carzol SP</li> <li>Kelthane 50 W</li> </ul>	1.10 kg 3.25 kg	<b>Carzol</b> is harsh on beneficial mites and honeybees. <b>Kelthane:</b> If Kelthane has been used for four or more years, choose a different product, because resistant mites are likely present.
Pear psylla	<ul style="list-style-type: none"> <li>Guthion Solupak or Sniper</li> <li>Thiodan 50 WP or Thionex 50 W</li> <li>Pyramite</li> <li>Assail 70 WP</li> </ul>	see label see label 6.75 kg 6.75 kg 600 g 120 g	To avoid resistance problems, pyrethroids are not recommended at this time. Refer to comments at First cover. <b>Guthion or Sniper</b> also control green fruitworm. Maximum three applications per season. <b>Pyramite:</b> Maximum two applications per season. <b>Assail:</b> Maximum four applications per season. <b>Thiodan or Thionex:</b> Maximum two applications after calyx.
Green fruitworm Obliquebanded leafroller	<ul style="list-style-type: none"> <li>Dipel 2X DF or Foray 48BA</li> <li>Imidan 50 WP</li> <li>Guthion Solupak or Sniper</li> <li>Success 480 SC</li> </ul>	1.12 kg 2.80 L 3.75 kg see label see label 182 mL	<b>Dipel and Foray</b> are most effective when larvae are actively feeding and weather is warm and dry for three days after application. Make two to three applications to cover the extended emergence of overwintering larvae.
Plant bugs	<ul style="list-style-type: none"> <li>Thiodan 50 WP or Thionex 50 W</li> </ul>	4.50 kg 4.50 kg	Also helps control psylla.
<b>Bloom</b>			
There are special pollination requirements for pears. See <b>Pollination Requirements for Fruit Crops, on page 77.</b>			
<b>DO NOT APPLY INSECTICIDES WHILE PEARS ARE IN BLOOM. SEE BEE POISONING, ON PAGE 79.</b>			
Fire blight	<ul style="list-style-type: none"> <li>Streptomycin 17</li> </ul>	600 g/1,000 L	Sprays are most effective when applied dilute (high volumes of water) prior to a wetting period. Use alone for best results. Because Streptomycin 17 is UV light sensitive it is only effective for two to three days. If warm wet conditions (above 20°C) prevail, two to three sprays during bloom may be required for fire blight control. To avoid resistance use a maximum of three sprays per season. See <i>Fire blight of pear, on page 249</i> and OMAFRA Factsheet, <i>Fire blight of Apple and Pear in Ontario, Order No. 02-011.</i>
<b>Petal fall</b>			
Plum curculio	<ul style="list-style-type: none"> <li>Guthion Solupak or Sniper</li> </ul>	see label see label	
Pear psylla	<ul style="list-style-type: none"> <li>Agri-Mek 1.9% EC</li> <li>Guthion Solupak or Sniper</li> <li>Thiodan 50 WP or Thionex 50 W</li> <li>Pyramite</li> <li>Assail 70 WP</li> <li>Surround WP</li> </ul>	1.00 L see label see label 6.75 kg 6.75 kg 600 g 120 g 50 Kg	<b>Agri-Mek:</b> Do not use within 14 days of a Captan or Maestro application. Apply no later than 21 days after petal fall for best results. Apply Agri-Mek with 10 L superior oil and a minimum of 1,000 L of water/ha, when most mites are in the nymphal stage. May cause russetting to d'Anjou and other sensitive varieties. Maximum one application per season. Alternate yearly with other insecticides (e.g. Mitac). Agri-Mek will not control plum curculio. <b>Guthion or Sniper:</b> Maximum three applications per season. <b>Pyramite:</b> Maximum two applications per season. <b>Assail:</b> Maximum four applications per season. <b>Thiodan or Thionex:</b> Maximum two applications after calyx. <b>Surround</b> may interfere with optimum bee activity. Do not apply during the green cluster bud to petal fall stage. See <i>Using Surround as a pest management tool, on page 105.</i>

Diseases and Insects	Materials	Amount/ha	Comments
Oriental fruit moth	<ul style="list-style-type: none"> <li>Decis 5 EC</li> <li>Assail 70 WP</li> </ul>	<p>250 mL</p> <p>240 g</p>	<p>Begin applications at egg hatch, usually three to six days after peak OFM flight as indicated by regional trap catches. Alternate products from different families. See Table 10-14. <i>Products used on Pears</i>, to prevent the development of resistance.</p> <p><b>Decis:</b> Maximum three sprays per season.</p> <p><b>Assail:</b> Maximum of four applications per season.</p>
Rust mite European red mite	<ul style="list-style-type: none"> <li>Carzol SP</li> <li>Kelthane 50 W</li> <li>Envidor 240 SC</li> </ul>		<p>To control rust mite and prevent russetted fruit, apply a miticide at prebloom or petal fall. Alternate miticides.</p> <p><b>Carzol</b> is harsh on beneficial mites and honeybees.</p> <p><b>Kelthane:</b> If Kelthane has been used for four or more years, choose a different product, because resistant mites are likely present.</p>
Leaf spots Scab	Use one of the fungicides listed for scab at Green tip.		If wet weather persists, additional sprays will be needed for scab control before first cover. Where there is a problem, spray at petal fall and first cover. A dilute spray is necessary for good control.
<b>Special spray (when monitoring indicates the need at petal fall)</b>			
Codling moth	<ul style="list-style-type: none"> <li>Imidan 50 WP</li> <li>Guthion Solupak or Sniper</li> <li>Assail 70 WP</li> </ul>	<p>3.75 kg</p> <p>see label</p> <p>see label</p> <p>170 g</p>	For sites with a history of codling moth damage, apply one of these insecticides. Codling moth might be a problem if pear plantings are located near wild apple, pear and other hosts infested with codling moth. Use codling moth timing as recommended for apple.
<b>First cover (about June 25)</b>			
Pear psylla	<ul style="list-style-type: none"> <li>Mitac WP</li> <li>Thiodan 50 WP or Thionex 50 W</li> <li>Guthion Solupak or Sniper</li> <li>Decis 5 EC</li> <li>Ripcord 400 EC</li> <li>Pounce</li> <li>Matador 120 EC</li> <li>Agri-Mek 1.9% EC</li> <li>Pyramite</li> <li>Assail 70 WP</li> <li>Surround WP</li> </ul>	<p>2.50 kg</p> <p>6.75 kg</p> <p>6.75 kg</p> <p>see label</p> <p>see label</p> <p>350 mL</p> <p>175 mL</p> <p>520 mL</p> <p>83 mL</p> <p>1.0 L</p> <p>600 g</p> <p>120 g</p> <p>50 Kg</p>	<p>Apply when the majority of the population is in early instar stages.</p> <p>Where plum curculio is a later season problem, use one of the materials recommended at petal fall.</p> <p><b>Mitac:</b> Use only when populations of psylla are high, e.g., greater than 25 active per sucker. Mitac also controls European red mite. For resistance management, maximum one application per year.</p> <p><b>Decis, Ripcord, Pounce, Matador:</b> Resistance to these pyrethroid insecticides is widespread.</p> <p><b>Agri-Mek:</b> Apply no later than 21 days after petal fall. Apply with 10 L Superior Oil and a minimum of 1,000 L of water/ha. Apply when most mites are in the nymphal stage. May cause russetting to d'Anjou and other sensitive varieties. Do not use oil within 14 days of a Captan or Maestro application.</p> <p><b>Surround:</b> See <i>Using Surround as a Pest Management Tool</i>, on page 105.</p>
Scab	Use one of the fungicides listed under <i>Green tip</i> , on page 243. Reduce rate of Equal to 2.25 kg/ha in cover sprays.		
Obliquebanded leafroller	<ul style="list-style-type: none"> <li>Dipel 2X DF or Foray 48BA</li> <li>Guthion Solupak or Sniper</li> <li>Imidan 50 WP</li> <li>Success 480 SC</li> </ul>	<p>1.12 kg</p> <p>2.80 L</p> <p>see label</p> <p>see label</p> <p>3.75 kg</p> <p>182 mL</p>	Resistance to the organophosphates such as Imidan and Guthion is becoming more widespread. All of these products will only suppress leafroller populations.
<b>Special spray (when monitoring indicates the need at first cover)</b>			
Blister mite	<ul style="list-style-type: none"> <li>Sevin XLR</li> <li>Thiodan 50 WP or Thionex 50 W</li> </ul>	<p>6.25 L</p> <p>4.50 kg</p> <p>4.50 kg</p>	

Diseases and Insects	Materials	Amount/ha	Comments
<b>Summer sprays</b>			
Pear psylla	<ul style="list-style-type: none"> <li>Mitac WP</li> <li>Guthion Solupak or Sniper</li> <li>Thiodan 50 WP or Thionex 50 W</li> <li>Decis 5 EC</li> <li>Ripcord 400 EC</li> <li>Pounce</li> <li>Matador 120 EC</li> <li>Pyramite</li> <li>Assail 70 WP</li> <li>Surround WP</li> </ul>	2.50 kg see label see label 6.75 kg 6.75 kg 350 mL 175 mL 520 mL 83 mL 600 g 120 g 50 kg	Apply when majority of the population is in early instar stages. <b>Mitac:</b> For resistance management, use only once per season and when populations of psylla are high, e.g., greater than 25 active/sucker. Mitac also controls European red mite. <b>Guthion</b> is the most effective summer insecticide to control codling moth, if it should become a problem. Do not exceed maximum number of applications for any product. See Table 10-14. <i>Products used on Pears</i> , on page 247. See <i>Using Surround as a Pest Management Tool</i> , on page 105.
Codling moth	<ul style="list-style-type: none"> <li>Imidan 50 WP</li> <li>Guthion Solupak or Sniper</li> </ul>	3.75 kg see label see label	Codling moth can be a problem if pear plantings are located near wild apple, wild pear and other hosts infested with codling moth. Mitac and Agri-Mek in pear psylla programs provide no protection of fruit against codling moth. For sites with a history of codling moth damage, apply one of these insecticides. Use codling moth timing as recommended for apple.
Mites	<ul style="list-style-type: none"> <li>Kelthane 50 W</li> <li>Carzol SP</li> <li>Pyramite</li> <li>Envidor 240 SC</li> </ul>	3.25 kg 1.10 kg 300 g 0.75 L	Examine orchards for red mite and rust mite injury about July 15–20 or 10–15 days after using a pyrethroid. Check preharvest intervals on page 247. Alternate miticides. <b>Carzol</b> is harsh on beneficial mites.
<b>Second cover</b>			
Scab	Use one of the fungicides listed under <i>Green tip</i> . Reduce rate of Equal to 2.25 kg/ha in cover sprays. Check preharvest intervals on page 247.		
Sooty blotch	<ul style="list-style-type: none"> <li>Supra Captan 80 WDG or Maestro 80 DF</li> <li>Flint 50 WG</li> </ul>	3.75 kg 3.75 kg 140 g	Repeat spray for sooty blotch two weeks later. Do not use Captan or Maestro on d'Anjou pears.
<b>Special sprays (when monitoring indicates the need about mid-Aug. and early Sept.)</b>			
Codling moth	<ul style="list-style-type: none"> <li>Guthion Solupak or Sniper</li> <li>Imidan 50 WP</li> <li>Assail 70 WP</li> </ul>	See label see label 3.75 kg 170 g	Codling moth can infest pear as maturation and ripening begins. Bosc pears can be heavily infested and may require two preharvest sprays about two weeks apart.
Oriental fruit moth	<ul style="list-style-type: none"> <li>Decis 5 EC</li> <li>Assail 70 WP</li> </ul>	250 mL 240 g	For Bosc, d'Anjou and Bartlett a spray seven to ten days prior to harvest is recommended in orchards adjacent to or near peaches.
Obliquebanded leafroller	<ul style="list-style-type: none"> <li>Dipel 2X DF or Foray 48BA</li> <li>Guthion Solupak or Sniper</li> <li>Imidan 50 WP</li> <li>Success 480 SC</li> </ul>	1.12 kg 2.80 L see label see label 3.75 kg 182 mL	
<b>Postharvest treatment</b>			
Blue mould	<ul style="list-style-type: none"> <li>Mertect SC</li> </ul>	500 mL/ 500 L water	For use in dip tank or drencher. Continuous agitation required. Follow label instructions. Does not control any blue mould ( <i>Penicillium</i> ) or grey mould ( <i>Botrytis</i> ), which is resistant to benzimidazole fungicides (e.g., Benlate).

## Guidelines for Protecting Young Non-Bearing Pear Plantings

The following program provides protection when needed for newly planted trees.

To improve pest control, remove neglected fruit trees in the area, select intercrops carefully, if used, and maintain a clean, weed free environment.

To determine the appropriate rate for small trees, see the product label, and refer to OMAFRA Factsheet, *Guide for Spraying Tree Fruits*, Order No. 00-035. Additional products are listed in the calendar for bearing fruits.

Diseases and Insects	Materials	Comments
Fire blight	• Streptomycin 17	Avoid excess nitrogen applications. Conduct regular leaf analysis. See <i>Fire blight of pear</i> , on page 249 and OMAFRA Factsheet, <i>Fire Blight of Apple and Pear in Ontario</i> , Order No. 02-011.
Pear psylla	• Thiodan 50 WP or Thionex 50 W	If nymphs are observed, spray when 75% of the petals have fallen in nearby bearing orchards.
Leaf-feeding insects	• Imidan 50 WP	Apply at any time when small caterpillars are feeding.
Pear psylla (summer broods)	• Thiodan 50 WP or Thionex 50 W	Target early nymphal stages.
European red mite	• Carzol SP • Envidor 240 SC	Check foliage frequently and spray if seven to ten mites/leaf are observed or at first sign of leaf bronzing.

TABLE 10-14. Products Used on Pears

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 the application of the pesticide and work in the treated crop without protective equipment. If no re-entry period is stated on the label, assume 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 the preservation of beneficial insects.

Product name	Common name	Group	Preharvest interval (days)	Minimum re-entry	Maximum # of applications/season
Agri-Mek 1.9% EC	abamectin	avermectin	28		1 or 2 – max 1.5L/ha
Assail 70 WP	acetamiprid	neonicotinoid	7	12 hours	4
Carzol SP	formetanate hydroxychloride	carbamate	1		4.48 kg/ha after calyx
Decis 5 EC	deltamethrin	pyrethroid	7		3
Dikar	mancozeb + dinocap	dithiocarbamate	45	48 hours	
Dipel 2X DF	<i>Bacillus thuringiensis</i>	B.t. microbial	1		
Equal 65 WP	dodine	guanidine	7		
Envidor 240 SC	spirodiclofen	tetrionic acid derivative	7	12 hours	1
Flint 50 WG	trifloxystrobin	strobilurin	14	12 hours*	4
Foray 48 BA	<i>Bacillus thuringiensis</i>	B.t. microbial	1		
Guthion Solupak	azinphosmethyl	organophosphate	14–21**	14 days	3
Imidan 50 WP	phosmet	organophosphate	1		
Kelthane 50 W	dicofol	diphenylethane	7		1
Maestro 80 DF	captan	phthalimide	7	48 hours	
Matador 120 EC	cyhalothrin-lambda	pyrethroid	7	24 hours	1
Mertect SC	thiabendazole	benzimidazole	postharvest		
Mitac W	amitraz	triazapentadiene	14		2
Pounce	permethrin	pyrethroid	7		
Pyramite	pyridaben	pyridazinone	25	24 hours	2
Ripcord 400 EC	cypermethrin	pyrethroid	7		2

TABLE 10-14. Products Used on Pears (cont'd)

Product name	Common name	Group	Preharvest interval (days)	Minimum re-entry	Maximum # of applications/season
Scala SC	pyrimethanil	anilinopyrimidine	72	24 hours	4
Sevin XLR	carbaryl	carbamate	11		
Sniper	azinphosmethyl	organophosphate	14–21**	14 days	3
Sovran	kresoxim-methyl	strobilurin	30	48 hours	4
Streptomycin 17	streptomycin	antibiotic	30	7 days***	3
Success 480 SC	spinosad	spinosyn	7		3
Superior 70 Oil	mineral oil		use prebloom		
Supra Captan 80 WDG	captan	phthalimide	7	48 hours	
Surround WP	kaolin		0		
Thiodan 50 WP	endosulfan	chlorinated cyclodiene	15		2
Thionex 50 W	endosulfan	chlorinated cyclodiene	15		3

\* except 4 days for thinning    \*\* depends on rate, see label    \*\*\* may be more or less for some tasks, see label

## Notes on Pear Diseases

### Blue mould and grey mould in stored pears

Under certain conditions rot can develop on pears in storage. Disease organisms are common in and around grading lines, work areas and storages. Fungi causing blue mould (*Penicillium*) and grey mould (*Botrytis*) are spread in air currents and by water.

Infection of pears most commonly occurs after harvest through stem punctures, wounds, skin breaks and heavy bruises. These fungi can be transferred from contaminated bins, water used for dipping or drenching, and grading equipment.

Rot develops faster if the infected pears are delayed going into storage, cooled slowly in storage, stored for a longer period or held at warm temperatures after removal from storage.

#### Reducing disease development

- Handle fruit carefully in and after harvest to minimize stem punctures, skin breaks and bruises. This greatly reduces the number of infection sites on the fruit.
- At storage facilities, lift truck operators must move the bins with a minimum of jolting and dropping.
- Refrigerate fruit as quickly as possible. Adequate refrigeration capacity for each storage room is required. Modern refrigeration facilities and controlled atmospheres reduce incidence of fruit rot.
- Remove and dispose of rotted fruit from the premises carefully and frequently. Good sani-

tation, which includes washing storage bins, greatly reduces the dispersal and spread of disease organisms.

- Change the water used for dipping or drenching frequently. This reduces the accumulation of fungal spores in the water and greatly reduces the risk of fruit infection.

### Fabraea leaf spot

#### Identification

Fabraea leaf spot, caused by the fungus *Fabraea maculata*, has increased in Ontario pear orchards recently. The disease is particularly severe in warm, wet and humid growing seasons after mild winters and wet springs.

Fruit and leaves are susceptible to infection throughout the growing season. In the spring, reddish-purple pinpoint spots appear on both the lower and upper surface of young leaves. The spots enlarge and become brown and necrotic, sometimes surrounded by a yellow chlorotic halo. Severely infected leaves turn yellow and drop prematurely. Sunken brown lesions may form on fruit and cause it to crack.

#### Period of activity

The disease overwinters on leaves and in superficial twig cankers. Spores are dislodged and spread by rain splash. Infections occur within 8–12 hours, depending on the length of the leaf wetness period and temperature. Lesions appear seven days after infection.