2006 Integrated Fruit Production Guide Update

In 2006, the Tree Fruit IFP guide is being updated again this year. Plans are in place for 2007 for a total reprint. The description below outlines the changes for 2006. Growers should have already updated the original guide with the 2005 update.

Chapter 1 Grower Records

- New set of records for 2006

Chapter 6 Insects and Mites

1. Description of White Grubs to be added to Miscellaneous Pests.

2. Descriptions of rosy and woolly apple aphids revised.

3. Description of the new pest, Apple clearwing moth (*Synanthedon myopaeformis*) to be added.

4. **Acramite 50WS** (50% bifenazate) recommended for control of twospotted and McDaniel spider mites (TSSM/MSM) and European red mite (ERM) in apple:
TSSM/MSM – 568 g/ha (230 g/ac) Apply only once per season
ERM - 851 g/ha (345 g/ac) Apply only once per season.

5. **Pyramite Miticide/Insecticide** (75% pyridaben) recommended for summer control of twospotted and McDaniel spider mites and European red mite in sweet and sour cherries:
TSSM/MSM – 300 - 600 g/ha (121 – 242 g/acre) Apply only once per season
ERM – 300 g/ha (121 g/acre). Apply only once per season
7 days pre-harvest interval for sweet and sour cherries.

6. **Isomate-P** recommended for control of peach tree borer in cherries, at same rates (250 dispensers /ha (100/acre)) and timing (summer) as for peaches, nectarines, plums, prunes and apricots.

7. **Success 480 SC** (480 g spinosad/L) recommended for suppression of Western flower thrips on nectarines. Apply Success between early petal fall and husk fall at a rate of 182 mL/ha (74 mL/acre) in sufficient water to ensure thorough coverage. Do not apply more than 3 times per season and allow 7-10 days between applications. Do not apply within 14 days of harvest.
Will suppress pansy spot of apples caused by thrips.

8. **Entrust 80 W** (organic formulation of spinosad) is recommended for control of leafrollers and eyespotted bud moth on all tree fruits, and also for control of western cherry fruit fly.
Rate: 109 g/ha (44 g/acre). Maximum of 3 applications per season for all uses except cherry fruit flies (maximum 4 applications). Consult pre-harvest interval table for pre-harvest intervals for the different tree fruits.

9. **Envidor 240 SC Miticide** (240 g spirodiclofen/L) is recommended for control of all stages of spider mites, European red mite and rust mites on apple, pears, apricots, cherries, peaches, prunes/plums.
Rate: 0.75 L/ha (304 mL/acre). Do not apple more than once/season. Do not apply within 7 days of harvest.

10. **Virosoft CP4** (codling moth granulovirus) is recommended for control of codling moth.
Rate - 250 mL/ha (100 mL/acre). Apply Virosoft CP4 (codling moth granulovirus) in the late afternoon or on a cloudy day in sufficient water volume to ensure thorough coverage. Apply prior to egg hatching and thereafter, another 3 times in 2-week intervals for a total of 2 applications per generation. Zero days pre-harvest interval

11. Other changes :

a) Organic Section 3 –note about use of organic formulation of spinosad (Entrust):

The OMRI-approved formulation of spinosad – Entrust 80W – is now registered for control of leafrollers and eyespotted bud moth in pome and stone fruits (maximum3 applications/season), and for control of cherry fruit flies in cherries (maximum 4 applications/season).

b) Note added about impact of spinosad on earwigs in Integrated Control Program for pear psylla and where recommended for leafrollers and eyespotted bud moth:

Success can harm earwigs and parasitic wasps exposed to direct sprays; however the threat is reduced once the residues dry.

d) Delete reference to 3M MEC and replace with Isomate CM/LR (see 2005 supplement) in Leafroller Mating disruption description:

Mating Disruption - Apply Isomate CM-LR in apples, pears and cherries at a rate of 1000 dispensers/ha (400/acre). Double the rate along margins of orchards. Read the general instructions for using mating disruption under Codling Moth (page 6-6).

e) Insert use of Agri-Mek in tentiform leafminer Chemical Control:

When tentiform leafminer abundance reaches the action level (refer to above fact sheet), apply Admire, Assail or Agri-Mek (plus 0.25% summer oil) when the leafminer population is mainly in the sap-feeder stage. A second application may be required if severe pressure continues or generations are overlapping.

Admire and Assail are in the same chemical class so rotate their use with Agri-Mek to reduce the risk of pesticide resistance development. Do not apply more than two applications of Assail or Admire either alone or alternately per season

regardless of target pest (codling moth, aphids, leafhoppers, leafminers) to avoid mite flare-up. Assail applied when codling moth is laying eggs will aid in control of codling moth.

g) Revise green peach chemical control to read:

Chemical- Field reports indicate green peach aphid is becoming more difficult to control after bud burst with currently recommend products (see Spray Schedules). Dormant oil application before bud burst still provides adequate control when applied in sufficient water to ensure thorough coverage.

Chapter 7 Diseases

Apogee (prohexadione calcium)

Apogee has been added to the fire blight section and to the apple spray calendar for fire blight suppression (p. 15-4)

Apogee (prohexadione ca) is a plant growth regulator that is registered for suppression of the shoot blight phase of fire blight on apple. Apogee does not control the blossom blight phase of fire blight, and it is not a bactericide. Apogee will suppress the shoot-blight phase of fire blight when applied 7 to 10 days prior to the onset of conditions favourable for shoot-blight development. For best results, apply when shoot growth reaches 2.5 to 7.2 cm, at a rate of 45 g/100 L of dilute spray (1350 g/ha). Depending on the cultivar and weather conditions, this may occur during bloom to petal fall. Make subsequent applications at 14-21 day intervals, up to a maximum of 4 applications per season.

Apogee is a strong growth regulator and will limit shoot extension. When using the high rate for fire blight suppression, shoot extension may be reduced more than is desired in non-vigorous plantings. Apogee is not registered for use on pear.

Do not use within 45 days of harvest.
Restricted Entry Interval: 12 hours.

Scala (pyrimethanil)

Scala has been added to the apple scab section and to the apple spray calendar, p. 15-2 and p. 15-3.

Scala is registered for use on apple and pear for early season scab control. It is best used as a protectant fungicide, but does have 48 hours of “kickback” or eradicant activity if applied immediately following an infection period. Scala has good activity during cool temperatures. Sprays are recommended at 7-12 day intervals, from green tip to petal drop. Use the higher rate under high disease pressure. Maximum 4 applications per year.

Note that Scala provides better scab protection to leaves than to fruit, thus it is not recommended for scab control after bloom. Scala is in the same class of compounds as Vangard for resistance management purposes.

Do not apply within 72 days of harvest.
Restricted entry interval: 24 hours.

Mission 418 EC (propiconazole)

Mission has been added to the spray calendars for control of brown rot (Monilinia) blossom blight and fruit rot control in peach, nectarine, plum, cherry & apricot.

Mission contains the same active ingredient as Topas (propiconazole) but at a different concentration. Thus Mission is applied at a different rate than Topas.

Mission 418 EC	Topas 250 EC
Rate for stone fruit: • 300 mL/ha • 120 mL/acre	Rate for stone fruit: • 500 mL/ha • 200 mL/acre

Do not apply within 3 days of harvest.
Restricted entry interval: 3 days.

Chapter 10 Nutrition

Page 10-9 Increase Potassium (K) levels from leaf test for apples 1.3 -1.6% levels
Page 10-11 Remove surfactant from Calcium chloride applications on pears

SOIL TESTING LABORATORIES

Norwest Soil Research Inc
104-19575 55A Avenue
Surrey, B.C. V3A 8P8
ph. 604-514-3322
Fax 604-514-3323

Pacific Soil Analysis Inc.
11720 Voyageur Way,
Richmond BC V6X 3G9
ph 604-273-8226
Fax 604-373-8082

Soilcon Laboratories Ltd.
275-11780 River Road,
Richmond BC V6X 1X7
Ph 604-278-5535
Fax 604-278-0517

M & B Research and Development Ltd
10115C McDonald Park Sidney, BC
ph 250-656-1334
Fax 250-656-0443

A&L Canada Laboratories Inc
2136 Jetstream Road
London Ont
N5V 3P5
519 457 2575
519 457 2664 (fax)

Chapter 12 Spray Thinning Growth Regulators

- Reprinted in total
- Insert new chapter and discard old
- Note changes to Stop Drop table on Page 12-5
- Don’t use NAA as a strop drop
- Addition of Apogee

Varieties

- Updated cherry variety section
- Insert appropriate pages

Chapter 15 Spray Schedules

- Replace entire chapter with new schedules

Chapter 16 References

- Replace entire chapter with new insert

Insecticide, Fungicide & Nutrient Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Pest / Disease	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Insecticide, Fungicide & Nutrient Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Pest / Disease	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Insecticide, Fungicide & Nutrient Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Pest / Disease	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Insecticide, Fungicide & Nutrient Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Pest / Disease	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Insecticide, Fungicide & Nutrient Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Pest / Disease	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Insecticide, Fungicide & Nutrient Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Pest / Disease	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Insecticide, Fungicide & Nutrient Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Pest / Disease	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Insecticide, Fungicide & Nutrient Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Pest / Disease	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Herbicide Spray Record

Sprayer Used: _____

Spray Tank Volume: _____

Application Date	Block ID / Variety	Target Weeds	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Sprayer Used: _____

Spray Tank Volume: _____

Herbicide Spray Record

Application Date	Block ID / Variety	Target Weeds	Product Used & Amount / Tank	Rate Used / ha	Spray Volume / ha	Pre-harvest Interval	Additional Notes	Applic. Initials

Ground Applied Fertilizer Record

Application Date	Block ID / Variety	Fertilizer Formula Of Nutrients	Total Amount Of Product Applied	Method Of Application	Additional Notes	Applic. Initials

Ground Applied Fertilizer Record

Application Date	Block ID / Variety	Fertilizer Formula Of Nutrients	Total Amount Of Product Applied	Method Of Application	Additional Notes	Applic. Initials

Grower's Orchard Monitoring Record

Date	Block ID / Variety	Species Monitored	Number Found	Sample Unit / Size	Observations / Notes	Monitor's Initials

Grower's Orchard Monitoring Record

Date	Block ID / Variety	Species Monitored	Number Found	Sample Unit / Size	Observations / Notes	Monitor's Initials

Irrigation Water Use Record

Application Date(s)	Block ID	Hours per Set	Days Between Sets	Additional Notes

Irrigation Water Use Record

Application Date(s)	Block ID	Hours per Set	Days Between Sets	Additional Notes

12 Spray Thinning, Growth Regulators

Spray Thinning

Tree Row Volume Spraying

Tree row volume spraying adjusts the amount of chemical required depending on the tree size or foliage volume.

Normal concentrate spraying will contribute to over-spraying if adjustments in chemical rates are not made to accommodate tree size. This is particularly critical with blossom thinning sprays, where over thinning may occur. There may also be variable results with hormone thinning materials and other growth regulators. Avoiding over-spraying will reduce risk to beneficial insects and mites and will also increase predator survival, reduce chemical residues and costs.

See page 14-15 for information on calibrating amounts needed. Your crop advisor or fieldman is able to assist you in tree row volume calculations for your orchard.

Spray Thinning of Apples

Even when pollination conditions and tree vigour are satisfactory, spray thinning apples always involves calculated risks. Inadequate fruit removal is a more common result than excessive thinning. However, some years natural fruit set may be poor and applying a fruit thinning spray may excessively reduce final fruit set and crop load.

Use naphthalene acetic acid (NAA), the amide salt of NAA (Amid Thin), 6BA (Accel) and carbaryl (Sevin XLR Plus) alone or in combination to reduce fruit set of apples.

All fruit management practices, and spray thinning in particular, may require adjustment to work well in your orchard. Keep careful records of your spray thinning results in order to make appropriate adjustments for each block and to ensure improved fruit quality. When possible, leave some trees untreated for comparison purposes. Use the table beginning on page 1-1 to record data.

Blossom Thinning

Reducing initial fruit set by blossom thinning will increase the amount of return bloom the following spring as well as improve fruit size and crop load in the current season. A foliar nutrient spray applied during bloom has proven effective in this regard. Descriptions of the specific effects of the nitrogen and sulphur containing fertilizer, ammonium thiosulphate (ATS) are on page 10-2 under Fruit Tree Nutrition. Note the precautions listed for the use of this chemical.

Post-Bloom Thinning

Time of Application

Apply Amid Thin shortly after petal fall (between 5 and 10 days after full bloom), NAA from 7 to 12 days after full bloom and Sevin XLR is effective between 10 and 25 days after full bloom and even later in some seasons. The effective timing for a NAA and Sevin XLR mixture is between 15 and 20 days after full bloom. Accel, used alone or in combination with Sevin, should be applied when king fruitlets are 5 to 10 mm in diameter, a period that may extend 7 to 21 days after full bloom.

The extent of fruit development at the time of spraying is an important consideration and in seasons when post-bloom weather is consistently warm and bright these thinners should be applied early in their recommended period. If the weather is cool and fruit development is slow they should be applied later.

When used by itself, Sevin XLR results in good fruit thinning when the largest fruits are 10-15mm in diameter and the outlook is for several days of bright and warm weather. Temperatures should reach 20° C or higher within 5 days of application.

NAA used alone should be applied when the largest fruit are 8 -10 mm in diameter and air temperatures are at least 10° C. Best uptake of NAA occurs under slow drying conditions (cloudy, humid).

When applying the mixture of NAA and Sevin XLR, apply when the conditions are most suitable for Sevin XLR.

Materials and Strength for Hormone Application

Naphthalene acetamide (**Amid Thin**) may be applied to any variety except Red Delicious where it results in the retention of 'pygmy' apples. Applying Amid Thin in less than 1700 L of water/ha (680L/acre) may not be effective since absorption of the chemical occurs only at the time of spraying. The chemical is light-inactivated so no significant additional absorption occurs if the leaves are rewetted. Slow-drying conditions favour absorption. Thinning results may not be evident for as much as three weeks after spray application.

NAA (naphthalene acetic acid) used alone tends to be less effective than Sevin, but when mixed with Sevin will strongly promote fruit thinning. NAA, however, applied somewhat earlier than Sevin or the Sevin plus NAA mixture, may prove adequate and is worthy of consideration, particularly where Sevin-induced mite build-ups have been experienced. NAA can be applied to all varieties but caution is required with Red Delicious. NAA may over-thin non-spur Red Delicious and spur-type strains may exhibit "pygmy apples". Use at least 2250 L/ha (900 L/acre) to achieve good wetting and thorough coverage and use a surfactant with NAA. See the following table for the suggested rates. This is a general suggestion and growers are encouraged to experiment with NAA. Apply higher rates on hard-to-thin varieties and lower rates on easy-to-thin varieties.

Carbaryl (**Sevin XLR Plus**) is effective on all varieties, including Red Delicious. Sevin XLR Plus is now registered for use as an apple fruit thinner and should be selected over older formulations since it is less hazardous to bees. However, all Sevin formulations can harm predatory mites. For that reason, Amid Thin should be given first consideration for post-bloom thinning of all varieties except Red Delicious. Application of Sevin to Red Delicious trees which have not reached full bearing can result in overthinning. The thinning effect of Sevin and full extent of drop may not be evident for 3-4 weeks after application. Sevin has a relatively low solubility in water. It is very important to apply Sevin in at least 1700 L/ha (680L/acre).

Sevin XLR Plus and NAA (**naphthalene acetic acid**) **mixtures** effectively thin Spartan, McIntosh, Golden Delicious, and Spur Red Delicious apples when applied 15 – 20 days after full bloom. This combination may be questionable for non-spur Red Delicious as it removes more fruit than either chemical applied singly. The suggested rates for each material are listed in the following table. This spray should be applied with at least 2250 L/ha (900 L/acre) of water to achieve good wetting and thorough coverage. To increase or decrease the activity of NAA plus Sevin mixture, increase or decrease the amount of NAA in the mixture. Do not alter the rate of Sevin.

Accel and Sevin XLR Plus mixture for post-bloom thinning and Accel for mild thinning and fruit size enhancement. Accel will increase the fruitlet thinning activity of carbaryl on a wide range of apple cultivars. Accel contains 1.8% 6-benzyladenine (also known as N-(phenyl-methyl)-1H-purine-6-amine, or 6BA) and gibberellins A_4 and A_7 (0.18%). This combination of natural plant hormones functions as a mild fruit thinner when applied when the king fruits are between 5 and 10 mm in diameter. However, the combination of Accel and carbaryl has proven more effective with Accel increasing the activity of carbaryl about 20% in an average year but often having little effect on its own.

Return flowering is improved roughly in proportion to the amount of early crop reduction achieved with Accel or the Accel plus carbaryl combination but Accel treatment has been observed to promote flower bud initiation even when little thinning has occurred.

For fruit thinning and the promotion of return flowering, apply Accel by airblast sprayer in combination with Sevin XLR Plus. Applications made when the king fruits are about 10 mm in diameter have given good results. Use sufficient spray volume to achieve complete coverage. Slow drying conditions found in the early morning or late evenings will increase uptake of the Accel active ingredients. Daytime temperatures in the 20° to 27° C range during the week following spraying will optimize the

amount of thinning and fruit size achieved with the Accel plus carbaryl combination.

Do not use NAA and Accel together in any thinning program.

The use of Accel alone to achieve some fruitlet thinning and increase fruit size may require two applications. The timing is when the king fruit is about 5 mm in diameter and again 5-7 days later.

Spray Thinning of Some New Apple Cultivars

While local experience is still being gained, mature bearing trees of all new cultivars will, likely, require thinning to maintain annual production and achieve good fruit quality. The following comments and suggestions are for those growers thinning Gala, Fuji, Jonagold as well as Ambrosia (although Ambrosia experience is much more limited).

Gala apple blooms over a long period and young trees have a tendency to flower on one-year wood. Fruit size of Gala is small to medium. An aggressive thinning program will improve fruit size and ensure an adequate return bloom. Sevin is the most suitable material but trials with Amid Thin alone or followed by Sevin could be considered. Use the rates listed in the table. Combinations of Sevin and Accel may also help improve size of Gala. Accel and NAA should not be combined in programs for Fuji due to increased risk of pygmy fruit development.

Jonagold is a triploid cultivar that should be relatively easy to thin. Amid Thin will likely be the preferred material and trials involving "dilute" sprays applied 5 - 10 days after petal fall are suggested. Sevin XLR is also suggested on a trial basis. Use the rates listed in the table.

Braeburn is easy to thin and many growers do not chemical thin this variety. If thinning is needed, a lower rate of Sevin XLR could be used.

Spray Thinning Pollinizer Trees

Trees planted strictly for pollination may be thinned more severely and otherwise managed to insure reliable flowering. A suggested thinning treatment is Amid Thin (25g/100L) plus Ethrel (125ml/100L) applied with a hand gun 5 - 10 days after bloom. Do not allow this spray to drift onto commercial varieties. Since crabapple pollinizers flower mainly on one year wood, pruning shortly after bloom also helps to maximize return bloom and can be used to control the size and shape of these trees.

SPRAY THINNING OF APPLES – HORMONE MATERIALS

Materials	Air-blast Sprayer		Dilute	Varieties
	per hectare	per acre	per 1000 L	
Amid Thin plus a non-ionic surfactant. Suggested materials are Agral 90 or Super Spred	1.40 kg 50mL/100 L 100mL/100 L	560 g 50 mL/100 L 100mL/100 L	200 g 500 mL 1000 mL	All except Delicious
Sevin XLR Plus	4.5 L	1.8 L	1.04 L	All varieties. Do not spray trees which have not reached full bearing.
Sevin XLR Plus plus Accel	4.5L 1.25 to 2.5L	1.8L 0.5 to 1.0L	1.04L 2.64L to 3.96L	All varieties. Do not spray trees which have not reached full bearing.
Sevin XLR Plus* plus NAA (3.1%) Fruitone N	4.5 L 410 g	1.8 L 164 g	1.04 L 160 g	McIntosh, Spartan, Golden Delicious, Spur Red Delicious (and hard to thin new varieties)

If Sevin XLR is used, do not add a non-ionic surfactant

Spray Thinning of Bartlett Pears

Where Bartlett set is heavy, a dilute (spray gun application) of Amid Thin often results in satisfactory fruit thinning. The optimal rate will vary from orchard to orchard. Apply Amid Thin at 13 - 21 days after full bloom. Apply only to vigorous trees with a heavy set. Thinning results may not be evident until about three weeks after spraying.

SPRAY THINNING OF BARTLETT PEARS – HORMONE MATERIALS

Material	Air-blast Sprayer		Dilute
	per hectare	per acre	per 1000 L
Amid Thin **plus** non-ionic surfactant	500 g	200 g	200 g
Suggested materials are Agral 90 and Super Spred	50mL/100 L 100mL/100 L	50 mL/100 L 100mL/100 L	500 mL 1000 mL

Stop-Drop Sprays for Apples

Tree Row Volume Spraying

See the discussion at the beginning of this section.

Apples

McIntosh and Spartan apple trees are prone to excessive preharvest fruit drop. This problem can be reduced by applying naphthalene acetic acid (NAA) or ReTain (AVG).

NAA (naphthalene acetic acid)

NAA requires uniform coverage and is most effective when applied in a high volume spray not less than 2250 L/ha or 900 L/acre. Uptake of NAA is best under warm, but slow drying conditions.

NAA takes effect about two days after application and will be effective in reducing fruit drop for a period of approximately 10 days.

NAA treatment promotes ripening of apples. Therefore, application earlier than one week before **anticipated harvest**, double spraying or late harvesting may result in soft apples at harvest.

To minimize the adverse effect of NAA and to avoid excessive fruit drop after the effective stop-drop period for NAA has been exceeded, apply NAA no earlier than 10 days prior **to anticipated harvest completion date.**

CAUTION: Take great care to avoid spray drift on to trees of a variety other than the target variety. For example, when NAA is being applied to McIntosh, there must be no spray drift on Golden Delicious, Spartan, Red Delicious or other varieties, otherwise premature ripening and softening of fruit of those later varieties will occur.

ReTain- A Harvest Management Tool for Apples

ReTain contains 15% aminoethoxyvinylglycine (AVG), a biologically derived inhibitor of ethylene production in plants. In tree fruits it prevents preharvest drop of all apple varieties prone to this problem, delaying water core development, slowing fruit ripening (e.g., softening, starch degradation) and reducing fruit cracking of Gala and other varieties. Treated apple trees can be harvested later than normal without risk of fruit drop or internal quality deterioration. There are also reports of improved fruit firmness and reduced incidence of storage scald after CA storage.

ReTain is applied four weeks before normal anticipated harvest (i.e., this timing may be five or more weeks before **actual** harvest). Experience has shown that applications slightly earlier or later than 4 weeks before harvest do not significantly affect performance.

Each package of ReTain contains 333 grams of material, or 50 grams active ingredient. The label rate for all apple cultivars is 125 g active ingredient (2.5 packages) per hectare (50 g/acre = 1 package/A) applied with enough water to thoroughly wet the fruit and foliage (about 900 L/ha, 80 gallons/acre). To achieve good coverage and efficient use of the product, tree row volume principles (see page 11-13) should be used. A properly calibrated and maintained sprayer and the addition of an organosilicone wetting agent, Sylgard 309 at 0.05%-0.1% by volume (500 - 1000 ml/1000 L) are essential ingredients of the application protocol. When high temperature (in excess of 32 degrees C) weather conditions prevail or are anticipated, the 0.05% v/v rate is recommended. Absorption of ReTain is improved by slow drying conditions. Avoid weather

conditions where spray drift onto non-target crops could occur. Do not spray if rain is forecast within the next 8 hours.

Since the benefits of ReTain relate to the inhibition of natural ethylene production, it should not be mixed with NAA or ethephon, which increase ethylene production in apple fruits.

STOP-DROP APPLICATION FOR APPLES *					
Materials	**Quantity per**			**Time to Apply**	**Duration Effectiveness from Time of Application**
	Medium Volume		**High Volume***		
	1700 L/ hectare	**680 L/ acre**	**Per 1000 L**		
NAA 3.1% powder (Fruitone N)	3 kg	1.2 g	580 g	2 days before expected drop, but not earlier than 10 days before anticipated harvest completion date.	10 days from date of application
Or NAA 5.68% liquid (Fruit Fix)	1.8 L	720 mL	340 mL	As above	As above
Retain (AVG)	445 -832 g	180-333 g		4 - 6 weeks before anticipated harvest of the treated fruit	37 to 40 days after application (7-10 days after the beginning of normal harvest of untreated fruit)
Plus Sylgard 309	0.05-0.1%	0.05-0.1%			

* See Pesticide Application Equipment page **14-14.**

***In general the use of NAA for stop drop is discouraged. It does work in controlling fruit drop, but the detrimental effect on fruit quality far outweighs the benefits. Consult your packinghouse if you intend to use this product. Consider using Retain instead.**

Other Growth Regulator Techniques

The Ethephon Early-Ripening Technique for Apples

Use Ethephon (Ethrel) to advance colouring and ripening of McIntosh and Tydeman apples, thus permitting early harvesting of treated fruit. However, successful use of ethephon requires careful attention to details of timing, spraying, harvesting and delivery of fruit to the packing-house. Therefore, growers interested in using ethephon to advance harvest are advised to contact their fieldman or crop advisor for advice on questions of suitability of their operation for adoption of this technique. They should also contact their packinghouse regarding questions of allocations, handling and receiving of ethephon-treated fruit.

Since an important advantage for the industry at large is the availability of high quality McIntosh early in their marketing season and since ethephon-treated fruit is not suitable for CA storage, there will be considerably less interest in receiving ethephon-treated McIntosh after the main McIntosh harvest is underway and the CA rooms are being filled.

How to use Ethephon

1. To avoid excessive fruit drop, apply NAA with ethephon in a combination treatment. A second NAA treatment, applied one week after the combination spray, may extend the protection from fruit drop, but will also accelerate fruit softening. A second NAA spray in not normally recommended.

2. Treat only red strains of McIntosh and other varieties maturing earlier than McIntosh. Striped strains may not colour well even when treated with ethephon.
3. Spray only trees in good vigour and having good-sized fruit. Early ripening may reduce tonnage compared to untreated blocks in the same orchard.
4. Fruit sprayed 2 - 4 weeks before their normal harvest date may develop desirable colour and good eating quality within 6 - 8 days of spraying, depending somewhat on prevailing temperatures. Warmer temperatures advance ripening but in some cases may retard colouring. Fruit pressure test readings recorded daily will accurately indicate the extent of fruit ripening and can be used to select the best harvest date. The precise spray date must be arrived at after consultation with your shipper since treated fruit must be harvested, delivered and in cold storage not later than 10 days following treatment. Adequate harvest help must be available. All bins of treated apples must be identified with labels (supplied by the shipper) attached to each bin. Since ripe apples soften rapidly, growers who do not follow the above instruction risk having their fruit down-graded because of over-maturity.
5. Ethephon is best applied as a high volume or gun spray. Add NAA (see following table and table above for materials and rates) in spray tank to prevent drop. Do not delay the NAA application.
6. Avoid use of ethephon (Ethrel) in mixed plantings.

ETHEPHON APPLICATION		
Material	**Preferred Application Method (high volume or gun sprayers)**	
	Tydemans	**McIntosh**
	Amount Per 100 L	**Amount Per 1000 L**
ethephon (Ethrel) **plus** NAA 5.68% liquid (Fruit Fix)	60 to 90 mL 34 mL	1.25 L 340 mL

Alternate Application Method Medium Volume – use at least 1100 L/ha (400 L/acre)				
Material	**Preferred Application Method (high volume or gun sprayers)**			
	Tydemans		**McIntosh**	
	Amount Per Hectare	Amount Per Acre	**Amount Per Hectare**	Amount Per Acre
ethephon (Ethrel) **plus** NAA 5.68% liquid (Fruit Fix)	2 to 3 L 1.8 L	0.8 to 1.2 L 1.8 L	4.25 L 1.8 L	1.7 L 720 mL

* See table on Stop-drop Applications for Apples (page 12-5) for equivalent NAA materials.

Ethephon (Ethrel) to Promote Return Bloom

Ethephon can be used alone to promote flowering on vigorous non-bearing trees. Apply 300ppm ethephon (1.25 L Ethrel 24%/1000L) in a dilute spray at 3 to 5 weeks after bloom.

Promalin

Red Delicious apples produced in some locations may lack the "typiness" demanded by certain markets. Promalin, a mixture of benzyladenine and two gibberellins, can improve fruit shape when applied as king blossoms are opening.

To improve fruit shape, apply Promalin at a rate of 1.25 - 2.3 L/ha (500 - 900 mL/acre) in a medium volume spray (2250 L/ha) (900 L/acre) or 125mL/100 L (567 mL/100 gal). Addition of a registered surfactant should prove beneficial.

PRECAUTIONS

1. Promalin is known to thin apple blossoms. Weak or frost-injured flowers appear to be particularly susceptible. On such trees, Promalin usage may also increase the amount of thinning achieved with a subsequent blossom thinning spray.
2. Where spur vigour is low or where the king blossoms have been damaged by frost, the fruit lengthening response to Promalin may be negligible.
3. Do not apply Promalin if rain is expected within 6 hours.

Gibberellic Acid Use on Sweet Cherries

The normal harvest period for sweet cherries can be delayed 5 to 7 days and several aspects of fruit quality can be improved by a single spray of gibberellic acid applied about 3 weeks before normal harvest (the straw-yellow stage of fruit maturity).

This treatment delays red colour development, increases fruit firmness and fruit size, and delays the period of maximum sensitivity to rain splitting. Gibberellic acid-treated fruit is less likely to develop the postharvest disorder known as "cherry pitting".

The registered gibberellic acid product, Falgro, contains 1g of gibberellic acid in each tablet. To prepare the recommended spray concentration of 20ppm active ingredient, dissolve 20 Falgro tablets in 1000L of water (9 tablets per 100 gal). Add 250 ml of Agral 90 non-ionic surfactant per 1000L (113ml/100gal). Apply as a high volume spray (see page 11-15) to full foliage wetness.

Apply at least 2250 L/ha (900 L/acre) of the spray mixture. Harvest the fruit at the desired shade of red skin colour. Minimum interval between last spray and harvest is 21 days.

Apogee

Apogee is a newly registered growth control product for apples. Apogee acts within apple trees to inhibit the biosynthesis of gibberellin, which results in reduced vegetative growth. Suppression of growth may last from 2 – 5 weeks following application and does not affect growth in the following year. Apogee may cause the tree to retain more fruit, so more aggressive thinning programs may be required.

Application

Apply Apogee with enough water to thoroughly cover the tree foliage. Apply the first spray at 5 cm growth stage, followed by a second application 14 - 21 days later. Refer to the following table for application rates. Consult the label for more detailed information:

APOGEE APPLICATION – APPLES		
Application Timing	**Apogee rate per 100L of dilute spray**	**Apogee rate per hectare**
Medium to high vigour (split applications) (fireblight suppression)	45 grams	1350 grams
Low to medium vigour (split applications)	27 grams	810 grams
Low vigour trees (single application)	27-45 grams	810 – 1350 grams

Fire blight Suppression

To reduce fire blight secondary infections (shoot blight), apply Apogee at 2.5cm to 7.5 cm of shoot growth and apply at intervals of 14 – 21 days up to a maximum of 4 applications per season. Rates are the same as medium to high vigour growth in the table above. Apogee does not prevent blossom infection.

Prevention of Sunburn and Heat stress in Apples and Pears

Surround WP Crop Protectant

When **Surround WP** is applied to plants, a white particle-film is formed which is infrared- and UV-light reflective. Plant surfaces treated with **Surround WP** are cooler under summer heat-load. As a result, Surround WP may reduce sunburn and heat stress on fruit and foliage.

Application:

Begin applications of **Surround WP** soon after crop thinning and before the onset of hot conditions. Make initial applications at the high rate, 4 bags per 1000 L water per hectare (50 kg in 1000 L water, a 5% solution). To ensure thorough and even coverage, make follow-up applications at the lower rate, 2 bags per 1000 L (25 kg in 1000 L water, a 2.5% solution). Surround WP dries to a white haze on plant surfaces. Make low-rate applications to maintain the visible film.

For detailed application instructions and precautions, refer to the product label.

13 VARIETIES / POLLINATION

The Okanagan Plant Improvement Company (PICO)

PICO is a company owned by the British Columbia Fruit Growers Association (BCFGA) dedicated to the improvement and commercial development of fruit varieties for the purpose of enhancing grower returns and contributing to the viability of a successful fruit industry.

The Importance of Certified Nursery Stock

Fruit growing represents a long term investment in which the trees are the basic units of production. A mistake made in selecting the stock may adversely affect productivity throughout a lifetime.

PICO operates a Certified Budwood Scheme, which is intended to provide wood that is true-to-type and free from pests and diseases for which the wood has been tested.

Growers and nurserymen should be certain the variety and strain they are propagating or planting is true to name. Propagating wood from true-to-name, indexed trees of many of the better strains of most kinds is available from the PICO Certified Budwood program at P.O. Box 6000, Summerland, B.C. V0H 1Z0; telephone 250-404-0088 or fax 250-494-7472. Email address is PICO@agr.gc.ca.

Final deadlines for ordering scion wood are as follows:

Jan 15- Winter/Spring deadline

June 1- Summer/Fall deadline

Supply depends on availability. Orders received by the dates listed will have priority.

Nursery Stock Requirements

As nursery stock supplies are frequently short it is important for growers to order trees one or two years in advance in order to acquire the desired varieties.

Plant Breeders Rights

Plant Breeders Rights (PBR) legislation offers variety discoverers and breeders an opportunity to be compensated for their efforts. Anyone who finds a new variety or limb sport which may be of interest to others should contact PICO.

The existence of PBR means that royalties will have to be paid for new varieties, but it encourages rights holders in other countries to make their varieties available in Canada, and so increases the number of options growers will have for planting. Most new varieties are now protected including those from Agriculture Canada Research Centres.

Growers are invited to test new fruit varieties that are available. Test varieties, where propagation wood is in limited supply, may be distributed in such a way that there is a trial in each district. The aim is to see how varieties perform in a range of conditions. For varieties being tested, a tester's agreement must be signed with PICO. This includes all unnamed Summerland selections, local chance seedlings, and varieties developed in other countries.

Rootstocks

Rootstocks for Apples

CLONAL ROOTSTOCKS

Malling Series

Most Malling stocks produce trees of smaller than standard size. **Malling 9 is by far the most popular stock for this purpose**. However it is important to note that these stocks are not as hardy as seedlings of hardy varieties. Malling 2 is a semi-standard tree; M.4, which is distinct from and not to be confused with MM.104, a slightly smaller tree; M.7 a semi-dwarf tree; and M.9 a dwarf tree. The M.26 stock is only slightly less vigorous than M.7. M.7 is winter tender and damage to the rootstock has occurred in some years historically. Trees on stocks of semi-standard vigour may require staking in early years, while trees on dwarf or semi-dwarf roots will require staking for the life of the planting.

MM.104 and MM.106 are so susceptible to crown rot that they are not recommended.

A number of sub-clones of M.9 (selections within the clone, usually made by nurseries for better stoolbed production) exist. Most of the M.9 root-stocks planted in the Okanagan valley in the past decade are the M.9 T337 sub-clone. Other sub-clones include Pajam1, Pajam2, RN29 (Nic29), and Fleuron 56. The "standard" M.9 sub-clone is the virus-free version of M.9 from East Malling usually called M.9 EMLA. Some M.9 sub-clones differ in vigour control. Pajam2 and Nic29 give a slightly larger tree , between M.9 and M.26 in size, and may be useful to some growers. In trials at Summerland, Pajam2 and Nic29 did not affect suckering, but in some parts of eastern North America, these two sub-clones produced more root suckers than M.9 EMLA. Trees on T337, Fleuron 56 and Pajam 1 were all about the same size as those on M.9 EMLA in trials at Summerland. None of the sub-clones listed above affect scion fruit size.

OTHER DWARFING CLONAL ROOTSTOCKS

Budagovsky 9 (B9 or Bud9) and Ottawa 3 (O.3) are more cold hardy than M.9 and lower the risk of winter injury in cold sites. Both are precocious and productive. B9 and O.3 produce trees that are slightly larger than M.9 in size but smaller than trees on M.26. Propagators report poor bud take on O.3 with scions that have a latent virus infection. If budding scions onto O.3, ensure that the scionwood is certified virus-free.

Mark is another dwarfing rootstock that tends to produce an overgrowth of tissue at the soil line. Trees on Mark tend to "runt out" even with drip irrigation. Mark also appears to induce smaller fruit size on the scion. Mark is not recommended for these reasons.

The P-series rootstocks come from Poland. Most of them are cold-hardy, except for P.16, which is only about as hardy as M.9. The P-rootstocks have not performed consistently from site to site, and caution should be exercised in choosing them. For example, in one trial at Creston, trees on P.16 performed as well as those on M.9, but in Summerland, the trees on P.16 were only as big as those on M.27, with a "runted out" appearance, low yield and small fruit. P.22 is a sub-dwarf stock, about like M.27 in vigour control, with small fruit and low yields. P.2 gave vigour control between M.9 and M.26 in Summerland, but was not very yield-efficient and sometimes had smaller fruit. It is very susceptible to fire blight. P.1 resembled M.26 in tree size, but had lower yield efficiency in Summerland trials.

Budagovsky 118 (B.118) is a vigorous rootstock, susceptible to crown rot, but with good midwinter hardiness. It is only recommended for weak scions on weak soils in areas subject to extreme midwinter low temperatures.

The rootstock breeding program at Geneva, New York, has released some rootstocks in recent years. All of them have been selected for good resistance to crown rot and fire blight. Geneva 30 (G30) pro-duces a tree larger than M.26, about like M.7, but with much higher yield efficiency, good precocity and good fruit size. **G30 must be supported.** It forms brittle graft unions with Gala scions, and without support the trees may snap at the bud union in windy conditions. Geneva 16 is said to produce a tree similar to M.9 in size, but in some trials the trees have been considerably larger. **G16 is extraor-dinarily sensitive to latent viruses.** However it is highly resistant to fire blight. It may produce more root suckers than M.9. Geneva 65 produces very small trees, about like M.27 EMLA, that are too small for most commercial users in the valley. Newer Geneva series rootstocks, in the M9 to M7 size range, are under test in Summerland.

SEEDLING ROOTSTOCKS

For economic reasons dwarfing rootstocks should be used. However if standard trees are desired, Antonovka, Wealthy or Haralson seedlings should be use. Seedlings of these varieties are expected to be more hardy than those of tender varieties such as Delicious. The "average" resistance to crown rot should be greater than that of the susceptible clonal stocks (see section on "Susceptibility of Rootstocks to Crown Rot", following).

SUSCEPTIBILITY OF ROOTSTOCKS TO CROWN ROT

The most popular growth-controlling clonal rootstocks planted in this region are susceptible to crown rot disease. Almost all of our irrigated orchard soils are infested with the fungus that causes it. There are no preventive or curative measures that are considered satisfactory. Heavy losses of trees to this disease have occurred with some of these rootstocks in individual plantings, while in other orchards with the same rootstocks losses have been negligible. There is no explanation yet for these phenomena. However, growers should be warned of the potential hazards from crown rot infection.

The rootstocks shown below are grouped in order of increasing susceptibility.

M.9, M.4, B9 Losses to crown rot of these stocks have occurred in this region, but they have been relatively rare, thus their use is recommended where their particular degree of vigour is desired.

M.26, O.3 In recent plantings of M.26 crown rot losses have been more frequent than in past years. These losses may be due to winter injury predisposing the rootstock to crown rot.

M.2, MM.111 Losses to crown rot have been more frequent with M.2 than with those rootstocks listed above, but have been serious in only a few orchards.

M.7 This stock is susceptible to crown rot and appreciable losses have occurred in some plantings.

MM.104, MM.106 These stocks are very susceptible to crown rot and heavy losses have occurred in some orchards. The risk of losses occurring in plantings of these stocks is high.

Rootstocks for Cherries

Mazzard and Mahaleb seedlings and the clonal selection of Mazzard F 12/1 are recommended as rootstocks for cherries. Colt is a new cherry rootstock that produces a tree that is similar in size to F 12/1. Winter hardiness of Colt in British Columbia is unknown, but it is reported to be more susceptible to winter injury in the nursery than Mazzard or Mahaleb in other regions. Edabriz (Tabel), a clonal Prunus cerasus rootstock developed in France, produces highly productive trees that are more dwarfed than those on Colt. Several Weiroot® (German) selections show promise in producing trees ranging in size from 30% to 60% the size of trees on F12/1. The Gisela® series are other dwarfing cherry rootstocks from Germany producing a precocious tree that vary in size from 45% to similar in size to Mazzard. Gisela 5® seems to be the most promising as the most dwarfing rootstock. **Limited information is available about these rootstocks under North American conditions. At this time, only test plantings of these rootstocks are recommended. Contact PICO for further information.**

There have been reports that some clones of Mahaleb has shown signs of incompatability with Van and some offspring of Van which would include most of the vareities from PARC. Van was a parent of Stella, Lapins, and Sweetheart. Stella, Lapins, and Sweetheart have been used a lot as seed and pollen donors for crosses.

Hardy Rootstocks for Peaches

SIBERIAN C

Siberian C is one of the hardiest rootstocks available for peach production. Siberian C is not only root hardy but induces hardiness of the flower buds and scion.

BAILEY

Bailey is an acceptable seedling rootstock that is close to Siberian C in root hardiness. Easy to germinate. Seedlings are susceptible to mildew in the nursery. It appears to be more susceptible to root lesions.

HAGGITH

Haggith is a hardy ,vigorous, rootstock for peaches that has potential.

Rootstocks for Pears

Old Home x Farmingdale clones 69 and 87 are recommended as alternatives to Bartlett seedling. Neither provides much size control but both are slightly more precocious and productive. Trials underway indicate that Quince A has potential as a rootstock in the warmer areas of the Okanagan Valley.

Varieties for Commercial and Trial Plantings in B.C.

The information in this section is not intended as specific variety recommendations but is provided to assist in selection of varieties. This information is only a small fraction of the information available on the varieties discussed. Information on other aspects of the variety and from many other sources should be taken into consideration when making a decision on varieties to plant. This information is compiled from a number of sources and local experience. The descriptions of the varieties are intended to assist growers in making planting decisions, but are not recommendations. Your packinghouse should also be consulted prior to making variety decisions. More information is available about the cultural aspects than the marketability of new varieties.

Apples – Commercial Varieties

Summer Varieties

SUNRISE

Maturity Season: Early season mid August to early September in BC

Harvest Criteria: Based on ripe eating taste and background color change from green to cream/yellow.

Fruit Description: Medium to large in size. Taste is sweet and sub-acid. Skin color is pinkish/red blush and stripes over a cream/ yellow ground. Flesh is white to cream in color.

Tree Description: Vigorous, spurry and fairly precocious.

Bloom and Pollination: Very early in the blossom season. **Pollinizers:** Makimik, Silken and perhaps McIntosh and any other diploid in the same bloom period.

Production: Very productive and precocious. Is a multiple pick variety.

Strains: None

Advantages: Early season bi-color apple.

Disadvantages: Storage life is very short.Marketing period is limited pre Gala timing. For niche markets only. Susceptible to apple scab.

Storage: Very short. Direct sales only.

Planting Trends: Current planting considered adequate. Planting in later areas will be limited to direct sales as normal retail trade will not take Sunrise once Galas are available

Comments: Market acceptability is limited. Use caution if planning on planting this variety. Niche market only.

GINGERGOLD
CANDIAN PLANT BREEDERS RIGHT 389

Maturity Season: Early Season Mid August to early September in BC

Harvest Criteria: Based on skin color change from green to yellow colour and 25% to 50% of the seeds with colour change.

Fruit Description: Taste is sweet and sub-acid. Skin color is yellow with no over color. Flesh is white to cream in color

Tree Description: Vigorous, spurry and fairly precocious.

Bloom and Pollination: Early in the blossom season. Pollinizers: McIntosh and Empire any other diploid in the same bloom period.

Production: Very productive. 1 to 2 picks.

Strains: None

Advantages: Early season yellow apple.

Disadvantages: Storage life is short. Extremely short harvest window. Very susceptible to mildew and fire blight. Unproven market acceptance.

Storage: Very short. Direct sales only.

Planting Trends: Limited planting. No new plantings at this time.

Comments: Market acceptability is limited. Use caution if planning on planting thisvariety.

SUNRISE

Maturity Season: Early Season Mid August to early September in BC

Harvest Criteria: Based on ripe eating taste and background color change from green to cream/yellow.

Fruit Description: Taste is sweet and sub-acid. Skin color is pinkish/red blush and stripes over a cream/ yellow ground. Flesh is white to cream in color.

Tree Description: Vigorous, spurry and fairly precocious.

Bloom and Pollination: Very early in the blossom season.

Pollinizers: Makimik, Silken and perhaps McIntosh and any other diploid in the same bloom period.

Production: Very productive and precocious. Can be a multiple pick variety.

Strains: None

Advantages: Early season bi-color apple.

Disadvantages: Storage life is very short. Marketing period is limited pre Gala timing. For niche markets only

Storage: Very short. Direct sales only.

Planting Trends: Current planting considered adequate. Planting in later areas will be limited to direct sales as normal retail trade will not take Sunrise once Galas are available

Comments: Market acceptability is limited. Use caution if planning on planting this variety. Niche market only.

SILKEN
CANADIAN PLANT BREEDERS' RIGHT 390

Maturity Season: Early September in BC. With or just before Gala

Harvest Criteria: Based on ripe eating taste and skin color change from green to cream. No starch conversion data has been recorded.

Fruit Description: Taste is sweet and sub-acid. Skin color is cream/ yellow, can be almost white. Flesh is white. Fruit has stem bowl russet that does not usually break over the shoulders.

Tree Description: Moderately vigorous, spurry and very precocious.

Bloom and Pollination: Very early in the blossom season.

Pollinizers : Makimik, McIntosh and any other diploid in the same bloom period.

Production: Very productive and precocious. Needs prompt and adequate thinning to ensure fruit size. 1 to 2 picks.

Strains: None

Advantages: Early season yellow apple.

Disadvantages: Storage life is limited. Market acceptability is unknown. Can develop water-core like disorder under hot conditions. Symptoms can be seen through the skin. Stem bowl russet.

Storage: Short, about 8 weeks in 1°C air.

Planting Trends: Current planting considered adequate.

Comments: Market acceptability is unknown. Use caution if planning on planting this variety. Look at this variety being a niche market variety at this time.

Early Season

GALA

Maturity Season: Early Season Late August to mid September in BC.

Harvest Criteria: Based on starch conversion and ground color change from green to creamy-white color. Starch charts are available.

Fruit Description: Taste is sweet and sub-acid with distinctive aromatics. Skin color is 40 to 90% orange red blush, stripes and flecks over cream yellow ground. Creamy yellow flesh is firm, crisp and juicy.

Tree Description: Vigorous, spurry and fairly precocious. Wood is very brittle. Caution is advised when manipulating branches during tree training.

Bloom and Pollination: Can have an extended blossom period. Pollinizers Ambrosia, Spartan, Fuji, Braeburn any other diploid in the same bloom period.

Production: Very productive. This variety needs prompt and adequate thinning to ensure good fruit size. Fruit on over-cropped trees may not mature in a timely manner. Royal and Imperial are multiple pick varieties. The new strains may 1 or 2 pick varieties

Strains: Standard Sports:
Royal and Imperial
New high Color Sports
Brookfield, Olsentwo, (Pacific), Gales, Galaxy, Mitchgla
There are many sports and strains. Contact you fieldperson for recommendations. Buckeye and other some other blush strains are not recommended.

Advantages: World known variety, accepted as a commodity type apple. BC can produce high quality fruit. Annual cropping.

Disadvantages: World production of Gala is increasing. Royal and Imperial are multiple pick varieties. Fruit size can be small. Susceptible to powdery mildew. apple scab and fire blight.

Storage: 3 1/2 months is air. Perhaps 6 months is CA

Planting Trends: Increasing in North America and the World. High colored one pick strains and sports dominate plantings.

Comments:

MCINTOSH

Maturity Season: Early September in BC, with or just after Gala.

Harvest Criteria: Dependent on the change to red in the skin over-color. Lack of red color will reduce the packout.

Fruit Description: Taste is sweet/tart and unique. Skin color is red blush over green ground. Flesh is white.

Tree Description: Moderately vigorous, and moderately precocious.

Bloom and Pollination: Flowers early in the blossom season.

Pollinizers: Makimik, Golden Delicious and any other diploid in the same bloom period.

Production: Moderately productive and precocious. Needs prompt and adequate thinning to ensure fruit size. 1 to 2 picks.

Strains: Summerland Red Mac, Morspur, Marshall, Macspur, DS 99 (RedMax) and others. Summerland Red Mac and Morspur are the recommended clones.

Advantages: "Mac" is an established variety in Canada and has a consumer following.

Disadvantages: Attaining adequate color can be a problem. Storage life is short. Stored fruit can lose pressure quickly resulting in a short shelf life. This variety is subject to stem punctures and bruising at harvest. Care in handling is essential. Suffers from pre-harvest drop. Susceptible to scab, mildew and fire blight

Storage: Short, about 8 weeks in 1°C air. Longer in CA

Planting Trends: Declining rapidly, current production is more than adequate.

Comments: While market acceptability is known over production and poor storage qualities may result in low returns. Use caution if planning on planting this variety.

HONEYCRISP
CANADIAN PLANT BREEDERS' RIGHT 1007

Maturity Season: Early Season slightly after McIntosh in BC.

Harvest Criteria: Based on skin color, fruit pressure and starch conversion. The fruit can be very slow in developing over-color. Excess nitrogen can inhibit fruit coloring.

Fruit Description: Taste is sweet and sub-acid. Skin color can be 40 to 90% pink red blush and/or stripes over green/yellow ground. Creamy yellow flesh is firm, crisp and juicy. Fruit has a dull finish and a dimpled appearance.

Tree Description: Non-vigorous, spurry and fairly precocious. Growth is very weak after fruiting commences. Leaf mottling and some leaf edge necrosis are inherent in the variety. The leaf symptoms Tree is very cold hardy perhaps up to -40°C. Reports of extreme biennial bearing.

Bloom and Pollination: Flowers early to the middle of the blossom season. Pollinizers Golden Delicious, Spartan, any other diploid in the same bloom period.

Production: Moderately productive. Can be very biennial. Can suffer preharvest drop.

Strains: There are reports that there may be 2 distinct strains of Honeycrisp. One that colors well (blushed) and one that colors poorly (striped). This has not been substantiated in BC.

Advantages: New variety that is getting a good reputation for eating quality in the world. Some promotion of the variety has occurred in the world. Very limited plantings in BC

Disadvantages: Can be very biennial. Achieving color on the fruit can be difficult.Fruit size and appearance are very unstable. Keeping fruit size down to an acceptable level can be a problem. Bitter pit in large fruit. Tree is susceptible to mildew. Fruit is susceptible to soft scald in storage. Reports of internal browning in stored fruit.

Storage: 3 1/2 months is air. Perhaps 6 months is CA

Planting Trends: Increasing in North America and the World. Slow increase plantings in BC.

Comments: This variety has many challenges that growers may or may not be able or willing to

overcome. A world-wide program to remedy some of the challenges has been undertaken. Caution is advised when considering planting this variety.

GOLDEN DELICIOUS

Maturity Season: Mid to late September in BC.

Harvest Criteria: Harvest by starch conversion. Starch conversion charts are available. Do use color as a harvest indicator.

Fruit Description: The taste is sweet and slightly tart. Skin color is green/yellow with no over color. The flesh is white to cream in color.

Tree Description: Vigorous, and productive and precocious.

Bloom and Pollination: Flowers about the middle of the blossom season.

Pollinizers: Any diploid in the same blossom time. Golden is pollinized by many varieties.

Production: Very productive and precocious. Needs prompt and adequate thinning to ensure fruit size. 1 to 2 picks. Can be biennial bearing.

Strains: No specific color strains. Gibson Golden (Smoothee™) is somewhat russet resistant. Numerous spur-type clones. Spur type clones have inferior internal quality compared to non-spur types.

Advantages: "Golden" is an established variety in the world and has a consumer following. It is the most planted yellow apple. Productive. Used as pollinizer for many varieties.

Disadvantages: Skin russet can be a problem. Some biennial bearing. Can bruise at harvest, requires care in handling. Cannot be used as to pollinate first generation off-spring eg. Jonagold.

Storage: Long storage in CA

Planting Trends: Declining in the last few years, some interest developing recently.

Comments: Golden Delicious production has declined worldwide in the last few years.

Mid Season

AMBROSIA
CANADIAN PLANT BREEDERS' RIGHT 388

Maturity Season: Early to mid October in BC.

Harvest Criteria: Harvest by starch conversion only. Ambrosia starch conversion charts are available. Do not use color as a harvest indicator. Starch in the fruit of Ambrosia converts at about 1.5 units per week. This gives Ambrosia a short harvest window

Fruit Description: The taste is sweet, the flesh is crisp, juicy and aromatic. Skin color is cream/yellow ground with distinctive 40 to 80% pink/red over-color. The over-color is blush and broad faint stripes. The flesh is white to cream in color. The fruit is very clean.

Tree Description: Moderately vigorous, and very productive and precocious. Tree is very upright and spurry. Growth in the first year after budding or grafting can be slow. Well suited to super spindle plantings.

Bloom and Pollination: Flowers about middle to late in the blossom season.

Pollinizers: Gala, Spartan Granny Smith, any diploid in the same blossom time.

Production: Very productive and precocious. Needs prompt and adequate thinning to ensure fruit size. 1 to 2 picks. No reports of biennial bearing. Over cropped trees or trees treated with excessive nitrogen result in poor colored fruit.

Strains: None

Advantages: Ambrosia is a new cultivar creating grower, buyer, and consumer interest. The fruit is easy to harvest and packs well. Release of the variety in the world will be under controlled planting and production agreements. Growers are committed to promoting this variety.

Disadvantages: Short harvest window. A high percentage of the fruit is from young trees.

Storage: Moderate storage life in air and CA. Similar or less than Gala.

Planting Trends: Increasing dramatically in the last few years

8S6923 AURORA GOLDEN GALA™ CANADIAN PLANT BREEDERS' RIGHT 1652

Maturity Season: Late September to early October in BC.

Harvest Criteria: Harvest by starch taste, change in skin color to yellow, and by starch conversion. Harvest indices are being developed by PARC, PICO and the BCMAFF.

Fruit Description: Medium in size, round conic in shape. Skin color is yellow at harvest. Flesh is cream/ white in color, very crisp and very juicy. The taste is sweet and very mildly tart.

Tree Description: Moderately vigorous, and very productive and very precocious. Tree is very spurry. Well suited to super spindle plantings.

Bloom and Pollination: Flowers about middle to late in the blossom season.

Pollinizers: Gala, Spartan Granny Smith, Ambrosia any diploid in the same blossom time.

Production: Extremely productive and precocious. Needs prompt and adequate thinning to ensure fruit size and fruit maturity. 1 to 2 picks. No reports of biennial bearing. Overcropped trees or trees treated with excessive nitrogen result in poor prolonged maturity season.

Strains: None

Advantages: 8S6923 is a new cultivar from the breeding program at PARC. There are a minimum amount of trees under test in other countries. It is a new yellow apple that has a long storage life and great eating qualities. This variety to other fruit growing areas of the world in controlled production agreements. Extremely long storage and shelf life.

Disadvantages: Consumer response to another yellow apple is unknown. Can be hard to pick if trees are young. All fruit packed at this time is from young trees. Needs work on harvest indices. Packing line bruising is apparent on the fruit. Care should be taken to minimize bruising at harvest and the packing lines, by packing at least 45 days after harvest. Very new variety.

Storage: Moderate storage life in air and CA. Similar or less than Gala.

Planting Trends: Increasing dramatically in the last few years.

Comments: This variety is very new to the apple world. Caution is advised when deciding whether or not to plant this variety.

SPARTAN

Maturity Season: Mid Season, mid to late September to early October in BC.

Harvest Criteria: Based on starch conversion and red over-color

Fruit Description: Medium to large in size, globose in shape. Taste is sweet/tart, and distinctive. Skin color is 90 to 100% dark red blush over green ground. The white flesh is crisp and juicy.

Tree Description: Vigorous, spreading tree habit and fairly precocious. No spur types recognized. Has some blind wood.

Bloom and Pollination: Golden Delicious, Gala, Red Delicious any diploid in the same blossom timing.

Production: Moderately productive. I pick.

Strains: None

Advantages: Long storage life. BC grows very high quality Spartans. Very few other growing areas produce Spartan. Selling agencies have been able to maintain the price and market for the amount of Spartan grown in BC. Attaining color is usually not a problem. I pick.

Disadvantages: Blind wood can be a problem. Needs adequate thinning to maintain fruit size. Needs adequate light penetration to maintain high fruit color. Very few other growing areas produce Spartan.

Storage: Fruit has been stored for long periods in CA. Up to 9 months.

Planting Trends: Increasing recently in BC.

Comments: Spartan has maintained a decent return to growers. Spartan breakdown in storage can be controlled with Calcium dips. Avoid excessive nitrogen applications.

PINOVA

Maturity Season: Mid-season with Ambrosia.

Harvest Criteria: Based on ripe eating taste ground color changeand starch conversion

Fruit Description: Medium in size. Taste is moderately tart/sweet and aromatic. Skin color is

pinkish/red blush over a yellow/orange ground. Flesh is cream in color.

Tree Description: Moderate vigor

Bloom and Pollination: Very early in the blossom season with an extended bloom time

Pollinizers: Golden Delicious and other diploids in this period.

Production: Very productive and precocious. May require more than one pick for color.

Strains: None. Pinova has three tradenames in the US Corail, Sonata and Pinata (Piñata)

Advantages: Newer introduction in Canada. May have some promotion in the US.

Disadvantages: unique taste. Storage life can be short. Susceptible to fire blight. Attaining adequate color may be a problem.

Storage: Short if harvested at peak maturity or for high color.

Planting Trends: Planting are very limited in Canada.

Comments: Pinova is in limited production in North America. Market response is unknown art this time.

DELICIOUS (RED DELICIOUS)

Maturity Season: Mid Season in BC. Early October

Harvest Criteria: Based on starch conversion and red over-color

Fruit Description: Medium to large in size and oblong to oblong conic in shape. Taste is sweet. Skin color is 90 to 100% dark red blush and/or stripes over green ground.

Tree Description: Moderately vigorous, spurry and fairly precocious. Wood is very brittle.

Bloom and Pollination: Golden Delicious, Gala, Spartan any diploid in the same blossom timing

Production: Very productive. I or 2 picks

Strains: Many sports and strains. Striped strains are generally preferred over blush strains. Preferred strains have elongated, "typey", shape.

Advantages: Commodity apple. Heavy annual crops. Attaining color is usually not a problem. 1 pick.

Disadvantages: Consumer acceptance is declining. Large production in Washington State diminishes returns in BC. The taste of newer high color sports is suspect at beat.

Storage: Fruit has been stored for 12 months or more in CA.This does not help the variety as year old fruit is of poor quality.

Planting Trends: Declining in BC and the world.

Comments: This variety is no longer considered a viable variety in BC.

Late Season

BRAEBURN

Maturity Season: Late Season, mid to late October in BC. With Fuji.

Harvest Criteria: Based on starch conversion and red over-color.

Fruit Description: Taste is tart/sweet, and distinctive. Skin color is 25 to 50% dark red blush over green/yellow ground. The white/cream flesh is firm, crisp and juicy.

Tree Description: Low to moderate vigor, spurry habit and very precocious. Can runt out easily. Can exhibit biennial bearing.

Bloom and Pollination: Granny Smith, Gala, Ambrosia any diploid in the same blossom timing.

Production: Moderately productive.

Strains: Hidala (Hillwell ™) Canadian Plant Breeders Right 1775.

Lochbuie Red Braeburn Canadian plant Breeders' Right 1775 Untested in BC.

Advantages: Unique taste has a consumer following. Good storage potential.

Disadvantages: Weak tree can runt out. Can have a very long growing season. Storage disorders can be a problem. Susceptible to mildew, scab, bitterpit, sunburn, fire blight, and biennial bearing.

Storage: Good with very good CA potential. Can have internal browning after storage. This phenomena may be season specific.

Planting Trends: Declining rapidly in BC and the world. Hidala (Hillwell™) is a color improvement on regular Braeburn.

Comments: Braeburn can have a tendency to bitterpit, mildew, scab, fire blight watercore, internal browning, sunburn and a susceptibility to mites. Research is being conducted to find cures for the above problems.

SPA 440

NICOLA™

Maturity Season: Late season, about 5 days before Fuji.

Harvest Criteria: Based on starch conversion and background color change.

Fruit Description: Large in size. Taste is sweet with low acidity and high in aromatics. Skin color is 80% cherry-red blush over green/yellow ground. The white/cream flesh is very firm, crisp and juicy. The fruit is borne on very long this stems,

Tree Description: Low to moderately vigorous and with flat branch angles and some blind wood. Precocious and productive

Bloom and Pollination: Very late season bloom, Gala, Fuji and/or Granny Smith or any other diploid in the same bloom timing. Late blooming crab varieties.

Production: Moderate to good production.

Strains: None.

Disadvantages: Long storage and shelf life. Very limited plantings. Requires less thinning than Aurora. Late bloom may be advantageous in frost-prone sites. Keeps well in air storage without becoming waxy.

Disadvantages: Very limited plantings. Market response is unknown. Limited regional evaluation ahs been done on this variety. Some stem bowl russetting, more noticeable on first year fruit or after cool wet springs.

Storage: Very long storage potential and long shelf life.

Planting Trends: New release from PARC. Limited plantings.

Comments: SPA 440 (Nicola™) is a late season high quality apple variety. Growers interested in planting this variety are urged to contact PICO for information.

FUJI

Maturity Season: Late Season, mid to late October in BC. With Braeburn

Harvest Criteria: Based on starch conversion, taste and red over-color.

Fruit Description: Taste is sweet with little acid, and distinctive. Skin color is 25 to 50% pink/red blush over green/yellow ground. The white/cream flesh is firm, crisp and juicy.

Tree Description: Moderate vigor, non-spurry habit and very precocious. Can exhibit biennial bearing. Can be difficult to train.

Bloom and Pollination: Granny Smith, Gala, Ambrosia any diploid in the same blossom timing.

Production: Moderately productive but can bear biennially.

Strains: Many strains Fuji BC Redsport 2 is the most common in BC. Newer sports include early maturing strains: September Wonder, Auvil Early, other new strains include Kiku 8 and Myra.

Advantages: Unique taste has a consumer following. World class apple. Good storage potential. Developing markets in Canada.

Disadvantages: Can have a very long growing season. Production in China is expanding rapidly. Achieving color can be a problem. Fruit can exhibit skin russeting, sunscald, and watercore.

Storage: Good with very good CA potential and long shelf life

Planting Trends: Stable in BC and the world with the exception of China. Some interest in new strains.

Comments: The production of Fuji in China has scared a lot of growers off planting Fuji. While caution is advised in planting this variety there may be an expanding market in North America.

GRANNY SMITH

Maturity Season: Late Season, mid to late October in BC. With Braeburn. Often picked earlier. "The time to pick is when the price is right"

Harvest Criteria: Based on starch conversion, taste and market availability.

Fruit Description: Medium to large in size, round in shape. Taste is distinctively tart with some sweetness. Skin color green with conspicuous white lenticels. The white flesh is firm, crisp and juicy.

Tree Description: Vigorous, and slightly weeping in habit and precocious. Has a tendency to tip bear.

Bloom and Pollination: Fuji, Gala, Ambrosia any diploid in the same blossom timing.

Production: Very productive.

Strains: Regular Granny Smith is the only strain worth planting. Spur type Granny's are very inferior in fruit quality.

Advantages: Unique taste has a consumer following. World class apple. Good storage potential. Consumer acceptance has allowed Granny to maintain its market and returns.

Disadvantages: Can have a very long growing season. Fruit can exhibit, sunscald, and watercore. Fruit with pink/red blush may be undesirable in the market place. Moderately susceptible to apple scab, powdery mildew and fireblight.

Storage: Good with very good CA potential and long shelf life. Storage scald may develop if picked too early.

Planting Trends: Increasing moderately in the last few years in BC. The world market for green apples is stable.

Comments: Granny Smith has maintained its market share for the last few years. Solid green fruit color may be maintained if the trees are kept vigorous and fuller than super-spindle. Some markets are rejecting fruit with blush and conspicuous white lenticels.

CRIPPS PINK PINK LADY®

Maturity Season: Very late season, late October after Fuji.

Harvest Criteria: Based on pink/red over-color.

Fruit Description: Small to medium in size, conical, long oblate in shape. Taste is tart, and distinctive. Skin color is 25 to 70% pink/red blush over lime green/yellow ground. The skin of the fruit can have a dimpled (pebbled) appearance. The white/cream flesh is very firm, and somewhat dry. Fruit should be stored to achieve optimum flavor.

Tree Description: Vigorous and with upright habit and moderately precocious. Can be difficult to train. Very distinctive leaves.

Bloom and Pollination: Mid season bloom, Golden Delicious to Gala, or any other diploid in the same bloom timing. Can have very extended bloom.

Production: Moderately productive.

Strains: None. There are sports being produced in other fruit growing areas of the world, eg. Pink Kiss. They are not available here at this time.

Advantages: Unique taste has some consumer following. Good storage potential. May have a place in the tart apple market

Disadvantages: Can have a very long growing season. Very susceptible to fire-blight, and apple scab. Achieving maturity can be a problem. Fruit size can be small. Sensitive to harvest and packing bruising. Tree is not grower friendly.

Storage: Good with good CA potential and long shelf life.

Planting Trends: Limited interest in BC. Perhaps should be grown in only the earliest sites.

Comments: Pink Lady® is a registered trademark in Canada. There is an international organization dedicated to the promotion of Pink Lady apples. Caution is advised for growers; this variety matures very late in the season.

Peaches – Commercial Varieties

(in order of maturity)

EARLY REDHAVEN

Attractive red skinned variety with firm red flesh. Continues to be the main early variety but the percentage of splitstone fruit can be very high in some seasons. Early Redhaven is not a freestone variety. Winter and spring frost hardiness is adequate.

Planting Trend - Declining. A suitable replacement variety is desirable.

REDHAVEN

Attractive red skin colour with yellow flesh. Freestone when fully ripe. Redhaven continues to be the main peach variety in B.C. Volumes are usually adequate for the market. Redhaven is well adapted to the peach growing areas in B.C.

Planting Trend – Orchardists should have a specific reason for planting additional Redhaven as a production backlog can develop during the harvest season.

GLOHAVEN

A freestone variety with a dark red skin colour. Quality and yields are very good. Glohaven matures about 10 days after Redhaven. Moderately hardy.

Planting Trend - Increasing. Glohaven has proven to be a good variety for the South Okanagan.

CRESTHAVEN

Medium large fruit that is firm and ships well. The skin of Cresthaven can be tough. Cresthaven is freestone. Harvest begins in the last week of August. Cresthaven is establishing a reputation as a good variety for the late part of the season in our southern growing areas. Cresthaven is considered to mature too late for some of the northern peach producing areas.

Other Peaches

Also planted in the B.C. Interior are Angelus, Early Elberta, Flavorcrest, Golden Monarch, Harrow Diamond, and O'Henry. There is some interest in growing white fleshed peaches as a way of offering a unique product. Champion, Raritan Rose and the Paul Friday (PF®) series are in test in B.C. Contact PICO for availability. Steller Series from Jim Friday's programme Blushing Star (White Fleshed) and Rising Star.

Nectarines – Commercial Varieties

CRIMSON GOLD

Earliest variety with commercial potential that is suitable for production in B.C.'s production areas. This variety is fairly attractive but does not have high red colour. Shelf life is limited in comparison to later maturing varieties.

Planting Trend - There are only small plantings of this variety.

EARLY SUNGRAND

This is an early to mid season variety ripening mid August. The fruit is medium size, firm and has overall red skin colour. Fruit quality is good but shelf life is limited. Winter hardiness is considered to be moderate.

Planting Trend - There are small plantings only.

FIREBRITE

Relatively new variety with some trial plantings in the South Okanagan. It has bright waxy cherry red skin colour. The flesh is yellow, firm and good quality. Splitstones can be a problem for Firebrite. The tree is considered to be moderately vigorous and moderately productive but has not been fully evaluated. Recent experience indicates that this variety is difficult to grow because of disease and insect problems and the predominately small size is difficult to market.

Planting Trend - Trials.

REDGOLD

Redgold is the most planted and has proven to be the most suitable nectarine variety for the Okanagan, but matures too late for some locations. The fruit has a bright waxy red colour and clear yellow flesh. Fruit size is large. Quality is excellent and yields are high, equal to good peach varieties. Redgold has average winter hardiness and resistance to spring frost.

Other Nectarines

Varieties of nectarines that are being tried but are not fully evaluated, particularly in relation to hardiness, in the Okanagan areas include Independence, Fantasia, Flavortop, Earliscarlet, and Harblaze.

Pears – Commercial Varieties

BARTLETT

Bartlett has been the major pear variety planted in B.C. Difficulties in controlling pear psylla, declining markets and poor returns have reduced interest in Bartlett. Susceptible to fire blight.

Planting Trend- Declining. Some blocks of Bartlett have been removed.

ANJOU

Anjou has been the main winter pear grown in B.C. for many years.

Planting Trend- Declining.

BOSC

Bosc matures about 20 days after Bartlett. The tree is vigorous and productive. Stony pit virus is common in Bosc and disease free propagating wood is important. Bosc is a high quality pear and interest is increasing. Susceptible to fire blight.

Planting Trend - Increasing. Small plantings are being established.

Other Pears

CONCORDE
CANADIAN PLANT BREEDERS APPLICATION # 94 276

Bred in the U.K., a cross of Comice x Conference. PBR application filed in Canada. Contact PICO concerning availability. This variety is very susceptible to Fireblight.

HARROW SWEET

Bred in Ontario, fire blight resistant, high eating quality, matures 3 weeks after Bartlett. Subject to PBR.

Other varieties generating some interest are Comice, Conference and Aurora.

RED PEARS

Planting of red pears has stabilized. No significant plantings have been established in B.C. The market has not paid the premium prices for red pears that were anticipated.

Some red varieties of interest include:

STARKRIMSON

A red Clapp's Favourite with excellent eating quality. Short storage potential.

SENSATION

Considered to be the most promising red Bartlett.

REIMER RED

This is a Comice and Max Red Bartlett cross with excellent dessert quality fruit.

CASCADE

Another Comice and Max Red Bartlett cross that has large fruit with good yields. Dessert quality is also considered to be excellent. Cascade marks easily.

ASIAN PEARS

Interest in Asian pears has also stabilized. Very few have been planted in B.C. Like other pears, Asian pears take a long time to come into bearing and yields are lower than European pears. Asian pears, however, tend to be more precocious than European pears. Asian pears mark very easily. The varieties that

are proving to be the best for the Cashmere area (quite similar to the Okanagan) in Washington State are Hosui, Kosui, Shinseiki, Chojuro and 20th Century.

HOSUI

Medium size, completely russeted fruit.

KOSUI

Russeted light brown colour, early, good quality.

SHINSEIKI

Medium size, yellow fruit with very mild flavour.

CHOJURO

Russeted, small to medium size.

20TH CENTURY

Large greenish yellow fruit that is sweet and juicy.

A-RI-RANG

Large round fruit with a golden russet. The fruit is crisp, firm and juicy with a unique flavour. It ripens about mid October in Washington State. This variety seems to have attracted considerable interest elsewhere but little is known about how it will perform in BC

Dark Sweet Cherry Varieties

SANTINA
CDN PBR #1202

PARENTAGE STELLA X SUMMIT

TREE

Habit: Spreading to weeping
Harvest timing: 6 to 8 days before Van and Bing
Bloom timing: Middle of the bloom season
Fertility: Self-fertile

PLANTING TRENDS Increasing slightly

FRUIT CHARACTERISTICS

Fruit shape: Flattened heart
Skin colour: Dark red to black
Flesh colour: Dark red
Juice colour: Red
Stem length: Medium long
Average fruit weight: 9.5g
Natural cracking: 36%
Firmness (Durometer): 69
Soluble solids: 17%

COMMENTS

Santina is our earliest ripening variety. The fruit is medium in size and uniform in colour. The fruit responds well to GA. The tree is self-fertile, productive and somewhat weeping in habit. The flavour is moderately sweet. The variety is a good choice for the early cherry market.

SUMNUE (CRISTALINA™)
CDN PBR #318

PARENTAGE STAR X VAN

TREE

Habit: Spreading
Harvest timing: 5 to 7 days before Van and Bing
Bloom timing: Middle of the bloom season
Fertility: Non self-fertile

PLANTING TRENDS Increasing

FRUIT CHARACTERISTICS

Fruit shape: Kidney slightly compressed
Skin colour: Dark red to black
Flesh colour: Dark red
Juice colour: Dark red
Stem length: Moderately long & thick, may be picked stemless
Average fruit weight: 10.0g
Natural cracking: 29%
Firmness (Durometer): 68
Soluble solids: 17.1%

COMMENTS

The fruit of Sumnue mature early in the harvest season and are the largest in the early season category. The fruit are glossy and very attractive in a pack. The tree is spreading and productive.

SUMELE (SATIN™)
CDN PBR #1556

PARENTAGE **LAPINS X 2N-39-05**

TREE

Habit: Moderate vigour, spreading
Harvest timing: 2 days before Van and Bing
Bloom timing: Middle of the bloom season
Fertility: Non self-fertile, moderately productive

PLANTING TRENDS **For Test Only**

FRUIT CHARACTERISTICS

Fruit shape: Heart
Skin colour: Dark red, slightly mottled. Very attractive
Flesh colour: Red
Juice colour: Red
Stem: Short and thick
Average fruit weight: 10.8g
Natural cracking: 27%
Firmness (Durometer): 77
Soluble solids: 19.4%

COMMENTS

The fruit of Sumele mature early in the harvest season. Dark pigments in the fruit make them very attractive in a pack. More information on fruit quality and market response is needed.

STELLA

PARENTAGE LAMBERT X JOHN INNES SEEDLING 2420

TREE:

Habit	Vigorous
Harvest timing:	With Van and Bing
Bloom Timing:	Middle of blossom season
Fertility:	Self-fertile

PLANTING TRENDS: Declining

FRUIT CHARACTERISTICS

Fruit shape:	Lambert shape
Skin colour:	Dark red
Flesh colour:	Dark Red
Juice colour:	Red
Stem length:	Medium
Average fruit weight:	10.6 g
Natural cracking:	Moderately susceptible
Firmness:	Moderately firm

COMMENTS

It was the first commercially introduced self-fertile sweet cherry. It interpollenizes with all other cultivars. Bears heavy crops. This variety may not be of commercial acceptance.

SONNET
CDN PBR #1201

PARENTAGE VAN X STELLA

TREE

Habit:	Moderate vigour
Harvest timing:	2 days after Van and Bing
Bloom timing:	Middle of the bloom season
Fertility:	Non self-fertile, not productive

PLANTING TRENDS Increasing marginally

FRUIT CHARACTERISTICS

Fruit shape:	Heart
Skin colour:	Bright red
Flesh colour:	Cream to light pink
Juice colour:	Clear
Stem:	Moderately long and thick
Average fruit weight:	12.4g
Natural cracking:	17%
Firmness (Durometer):	67
Soluble solids:	19%

COMMENTS

The fruit of Sonnet are very large and mature early to middle in the harvest season. The skin color is a distinctive bright red blush. The fruit responds well to GA and has a high sugar content. The tree has a tendency to set light crops and is a candidate for dwarfing root stocks. Requires adequate pollenizers.

SUMSTE (SAMBA™)
CDN PBR #1557

PARENTAGE 2S-84-10 X STELLA 16A-7

TREE

Habit:	Upright and spurry
Harvest timing:	2 days after Van and Bing
Bloom Timing:	Early in the bloom season
Fertility:	Non self-fertile

PLANTING TRENDS Stable

FRUIT CHARACTERISTICS

Fruit shape:	Heart
Skin colour:	Dark red
Flesh colour:	Red
Juice colour:	Red
Stem:	Medium
Average fruit weight:	11.4g
Natural cracking:	15%
Firmness (Durometer):	74
Soluble solids	18.6%

COMMENTS

The fruit of Sumste (Samba) matures slightly after Bing. The fruit are large with dark red, glossy skin. The tree is compact, very spurry, with average precocity.

SANDRA ROSE
CDN PBR #320

PARENTAGE 2N-61-18 X SUNBURST

TREE

Habit:	Spreading
Harvest timing:	3 to 4 days after Van and Bing
Bloom Timing:	Middle of the bloom season
Fertility:	Self-fertile

PLANTING TRENDS Increasing marginally

FRUIT CHARACTERISTICS

Fruit shape:	Round
Skin colour:	Dark red to black
Flesh colour:	Dark red
Juice colour:	Dark red
Stem:	Thick
Average fruit weight:	11.6g
Natural cracking:	17%
Firmness (Durometer):	70
Soluble solids:	20.1%

COMMENTS

The fruit of Sandra Rose mature early/mid in the harvest season. The fruit are large with glossy black skin and are very attractive in a pack. The fruit responds well to GA. The variety has finished at the top of taste panels

SUMLETA (SONATA™)
CDN PBR #317
US PLANT PATENT #11,378

PARENTAGE LAPINS X 2N-39-05

TREE

Habit:	Upright and spreading
Harvest timing:	7 days after Van and Bing
Bloom timing:	Middle of the bloom season
Fertility:	Self-fertile

PLANTING TRENDS: Stable or decreasing

FRUIT CHARACTERISTICS

Fruit shape:	Kidney/dimple on the nose end
Skin colour:	Dark red to black
Flesh colour:	Dark red
Juice colour:	Dark red
Stem length:	Thick
Average fruit weight:	12.7g
Natural cracking:	42%
Firmness (Durometer):	77
Soluble solids:	19.1%

COMMENTS

The fruit of Sumleta are very large and firm with glossy, dark skin that make a very attractive pack. The tree is very productive, vigorous and upright. The fruit has a significant nose dimple.

SYLVIA

PARENTAGE: VAN X SAM

TREE:

Habit:	Semi-compact
Harvest timing:	7 days after Van and Bing
Bloom Timing:	Very Late
Fertility:	Not self-fertile

PLANTING TRENDS: Increasing slightly

FRUIT CHARACTERISTICS

Fruit shape:	Lambert shape
Skin colour:	Dark red to black
Flesh colour:	Dark red
Juice colour:	Dark red
Stem length:	Thick
Average fruit weight:	10.7
Natural cracking:	Low
Firmness	Very firm

COMMENTS:

Good flavour that is moderately sweet. Both size and colour are uniform within a pack. The stems are notably very thick and hold up well in cold storage. It has consistently had a low percentage of splitting, and is considered tolerant to rain splitting.. Growers in Europe have reported that this selection is very tolerant to sun scalding. The tree has a very dense protective canopy that provides excellent protection for the fruit. This dense foliage may also offer protection from the rain.

LAPINS

PARENTAGE: VAn X Stella

TREE

Habit:	Vigorous, very upright.
Harvest timing:	12 to 14 days after Van and Bing
Bloom Timing:	Early/middle in the bloom season
Fertility:	Self-fertile

PLANTING TRENDS Stable

FRUIT CHARACTERISTICS

Fruit shape:	Flat round
Skin colour:	Dark red
Flesh colour:	Red
Juice colour:	Red
Stem length:	Short and thick
Average fruit weight:	10.9g
Natural cracking:	26%
Firmness (Durometer)	82
(FirmTech)	295g/mm
Soluble solids:	20.3%

COMMENTS:

The standard for the mid/late season varieties. In some years overcropping may be a problem. Wind whipping of the fruit has occurred in some years. The tree is vigorous and the natural growth habit appears to be upright with little tendency to spread. This makes tree training a challenge. The fruit has a good tolerance to rain splitting

SKEENA
CDN PBR #319
US PLANT PATENT #11,392

PARENTAGE 2N-60-7 X 2N-38-22

TREE

Habit:	Upright and spreading
Harvest timing:	12 days after Van and Bing, with Lapins
Bloom timing:	Middle of the bloom season
Fertility:	Self-fertile

PLANTING TRENDS Increasing

FRUIT CHARACTERISTICS

Fruit shape:	Kidney
Skin colour:	Dark red to black
Flesh colour:	Dark red
Juice colour:	Dark red
Stem length:	Thick
Average fruit weight:	11.6g
Natural cracking:	20%
Firmness (Durometer):	80
Soluble solids:	17%

COMMENTS

When compared to Lapins, Skeena fruit are slightly larger, slightly firmer, with thicker stems, and the tree is significantly easier to manage. This variety is gaining popularity in Canada and the world.

SWEETHEART

PARENTAGE: VAN X NEWSTAR

TREE:

Habit:	Moderate vigour, flat branch angles.
Harvest timing:	19 to 21 days after Van and Bing
Bloom Timing:	Middle in the bloom season
Fertility:	Self-fertile

PLANTING TRENDS Increasing

FRUIT CHARACTERISTICS

Fruit shape:	Round
Skin colour:	Dark red
Flesh colour:	Red
Juice colour:	Red
Stem length:	Short and thick
Average fruit weight:	10 g
Natural cracking:	26%
Firmness (Durometer)	82
(FirmTech)	295g/mm
Soluble solids:	20.3%

COMMENTS

Average fruitsize, very firm, moderately sweet with good flavour. The skin colour stays red throughout maturity Very precocious with very heavy crops. This trait could prove useful in growth control in the early years of production but overcropping may also be a problem. Observations in the field suggest that it may be susceptible to winter injury.

SYMPHONY
CDN PBR #321

PARENTAGE SWEETHEART X UNKNOWN

TREE

Habit:	Upright
Harvest timing:	22 days after Van and Bing
Bloom Timing:	Middle of the bloom season
Fertility:	Self-fertile, very productive

PLANTING TRENDS Stemless market only

FRUIT CHARACTERISTICS

Fruit shape:	Heart
Skin colour:	Red
Flesh colour:	Red
Juice colour:	Red
Stem length:	Long
Average fruit weight:	10.6
Natural cracking:	15%
Firmness (Durometer):	75
Soluble solids:	17 %

COMMENTS

This variety has a tendency to fall from the stems before or during harvest. The fruit is of poor quality. Recommended for stemless market only.

13S2009 (STACCATO™)
CDN PBR APP: # 00-2154

PATENT APP: # 60/363,547

PARENTAGE: SWEETHEART X UNKNOWN

TREE

Habit:	Upright and spreading
Harvest timing:	26 after Van and Bing, 7 days after Sweetheart
Bloom Timing:	Middle of the bloom season
Fertility:	Self-fertile

PLANTING TRENDS Increasing rapidly

FRUIT CHARACTERISTICS

Fruit shape:	Flattened heart
Skin colour:	Red to dark red
Flesh colour:	Red
Juice colour:	Red
Stem length:	Long
Average fruit weight:	11.1g
Natural cracking:	17%
Firmness: (Durometer):	78
(FirmTech):	250 g/mm
Soluble solids:	19.8%

COMMENTS

The fruit of this very late cherry variety is large, firm, and has a good tolerance to rain induced cracking. The fruit is glossy and attractive in a pack. Flower bud hardiness is similar to, or even hardier to Bing.

13S2101
CDN PBR APP #02-3216

PARENTAGE SWEETHEART X UNKNOWN

TREE

Habit:	Moderate vigor, flat branch angles.
Harvest timing:	29 days 10+ days after Sweetheart
Bloom Timing:	Middle/late in the bloom season
Fertility:	Self-fertile

PLANTING TRENDS Test only at this time

FRUIT CHARACTERISTICS

Fruit shape:	Elongated heart
Skin colour:	Red
Flesh colour:	Pink
Juice colour:	Pink
Stem length:	Very long
Average fruit weight:	10.8g
Natural cracking:	22%
Firmness (Durometer):	80
(FirmTech):	260g/mm
Soluble solids	19.3 %

COMMENTS

The fruit of 13S2101 are moderately large, very firm and have bright red skin. The fruit are glossy and make an attractive pack. The flavor Is sweet with some acidty. The fruit mature very late in the harvest season. This selection has promise as a very late season cherry. The tree is moderately vigorous with flat branch angles and produces moderate crops. This selection is being tested extensively, market response is limited.

SPC 103
CDN PBR APP: #01-2710

PARENTAGE: SWEETHEART X UNKNOWN

TREE

Habit:	Moderate vigour, flat branch angles.
Harvest timing:	29 days after Van and Bing, 10+ days after Sweetheart
Bloom Timing:	Middle/late in the bloom season
Fertility:	Self-fertile

PLANTING TRENDS Test only at this time

FRUIT CHARACTERISTICS

Fruit shape:	Flat round
Skin colour:	Dark red
Flesh colour:	Red
Juice colour:	Red
Stem length:	Short and thick
Average fruit weight:	10.7g
Natural cracking:	26%
Firmness (Durometer)	82
(FirmTech)	295g/mm
Soluble solids:	20.3%

COMMENTS:

SPC 103 is a new test selection and has been planted in limited amounts in BC. The flesh is very firm, crunchy and moderately sweet. The harvest window appears to be extensive. The tree is exceptional in habit with flat angled, well spaced branches, and produces heavy crops. More information on fruit quality and market response is required.

BLUSH (RAINIER) TYPE VARIETIES

13N0770 (STARDUST™) CDN PBR #01-2767

PARENTAGE 2N-63-20 X STELLA

TREE

Habit	Upright, spreading and vigorous
Harvest timing	12 to 15 days after Van and Bing
Bloom timing	Late in the bloom season
Fertility:	Self-fertile, very productive

PLANTING TRENDS Increasing

FRUIT CHARACTERISTICS

Fruit shape:	Flattened heart
Skin colour:	Bright red blush over yellow ground
Flesh colour:	Cream
Juice colour:	Clear
Stem length:	Short and thick
Average fruit weight:	11.5g
Natural cracking:	29%
Firmness (Durometer):	76
Soluble solids	18.7%

COMMENTS

The fruit of 13N0770 mature mid/late in the harvest season. May have to pick this variety more than once to attain maximum fruit color. A blush variety with a distinctive cream ground colour. The fruit are large, firm and somewhat split resistant. This variety has the potential to extend the "Rainier" season by 7 days.

13N0739

PARENTAGE: 2N-63-20 X STELLA

TREE

Habit:	Upright spreading
Harvest timing:	7 to 9 days after Van and Bing
Bloom Timing:	Mid season
Fertility:	Self-fertile

PLANTING TRENDS Stable

FRUIT CHARACTERISTICS

Fruit shape:	Kidney
Skin colour:	Blush type Red over yellow ground
Flesh colour:	Cream
Juice colour:	Clear
Stem length:	Short to medium
Average fruit weight:	12.2 g
Natural cracking:	34%
Firmness (Durometer):	78
(FirmTech):	254g/mm
Soluble solids:	22%

COMMENTS

Large fruit, moderately tolerant to cracking. Skin can be slightly mottled. Taste is very sweet. Cropping may be slightly low. Wind whipping bruises can be a problem

SPC 243 CDN PBR APP #01-2710

PARENTAGE SWEETHEART X UNKNOWN

TREE

Habit:	Vigorous, and upright.
Harvest timing:	22 days after Van and Bing, 3 to 4 days after Sweetheart
Bloom Timing:	Middle in the bloom season
Fertility:	Self-fertile

PLANTING TRENDS For test only at this time

FRUIT CHARACTERISTICS

Fruit shape:	Kidney
Skin colour:	Orange/red blush over a yellow ground
Flesh colour:	Yellow
Juice colour:	Clear
Stem length:	Moderately long
Average fruit weight:	10.4g
Natural cracking:	16%
Firmness (Durometer)	77
(FirmTech)	228g/mm
Soluble solids:	18.5%

COMMENTS

SPC 243 is a new test selection and has been planted in limited amounts in BC. The selection is a "Rainier" type. The fruit are firm and juicy. The taste is sweet and the flavor is considered good. More testing for fruit quality and market response is needed.

OTHER VARIETIES

These varieties are not of commercial quality for the current cherry market.

SALMO

A seedling from Lambert x Van, introduced by Summerland in 1970. A Van-type cherry maturing 7 days earlier than Van. It is one of the hardiest cultivars in the Summerland collection. It bears moderate to heavy crops, the fruit is large, fully black, relatively firm, and fair to good in flavor. The fruit is subject to moderate cracking.

SUMMIT

A Summerland selection from the cross Van x Sam named in 1973. A Lambert-type cherry, maturing about 8 days earlier than Lambert. It has produced moderate to heavy crops with consistently large to very large fruit. The flesh is fairly light in color and moderately soft; the flavor is sweet and good. Fruit cracking is slight to moderate. The tree is very tender, similar to the tree of Bing.

VAN

An open-pollinated seedling of Empress Eugenie, introduced by Summerland in 1944. It has become popular in North America and Europe and was the second most widely planted cultivar in British Columbia. The tree is vigorous, hardier than most cultivars, bears young, and is very productive. The fruit can be large; it becomes small only on overloaded trees. The round, blocky fruit with a short stem is fairly attractive with it s bright skin. The flesh is nearly black, firm, and very fine; the flavor is very good. Its texture and flavor are at least as good as Bing. The fruit may crack but always less than that of Bing. It matures at the same time as Bing or a day earlier. The tree and blossoms are hardier than Bing.

SUNBURST

A selection from the same cross as Lapins (Van x Stella) and named at the same time (1984) that matures 3 days after Van. The fruit are large and tend to be firm, dark red with good flavour and moderately sweet. There are some reports that under some conditions the fruit may be soft. It stores very well with the stems staying green and attractive. The tree is self-fertile and sets moderately heavy crops. It appears from a limited number of trees at Summerland that heavy pruning needs to be considered to maintain cropping and fruit size. The shape of the fruit tends to be slightly more rounded, similar to Bing. The fruit are considered to be tolerant to rain splitting. Observations have been made that it may be prone to Mg deficiency.

NEWSTAR

An introduction (1988) from a cross of Van x Stella from Summerland that has found a place in Europe. An early, black cherry selected from the same cross as Lapins. It matures about 3 days before Van. The fruit is moderately firm, with better than average fruit size with long stems, and the tree produces very heavy crops. It is self-fertile and susceptible to rain splitting. It is moderately sweet with a good flavour. The skin tends to pit slightly, and initial, limited studies show that it does not store well. The size can be small if crop load is allowed to be too heavy. Reports from Europe indicate that Newstar behaves quite differently under their growing conditions with good fruit size and annual cropping. It appears to be one of their more promising new varieties for the early market.

SAM

An open-pollinated seedling of the Vineland selection V-160140, introduced by Summerland in 1953. Slow in starting to bear, but mature trees can carry heavy crops. The fruit is medium in size, fully black, medium firm, with rather coarse texture and fair flavor as fresh fruit. Suitable for pollenizer variety only.

BING

Bing has excellent fruit quality but:

- is very susceptible to rain splitting.
- is less winter and spring frost hardy than other varieties.
- yields are not high.
- has higher cullage rates than other varieties.

PLANTING TREND Declining

Sour Cherries

MONTMORENCY

Care should be taken to obtain virus free planting stock since sour cherry yellows virus disease has been a problem in the past.

PLANTING TREND Stopped

Apricots – Commercial Varieties

TOMCOT

Fruit from this variety is creamy/yellow with no blush. It is more flavourful than Goldstrike or Goldbar, but the fruit is smaller. The tree is not winter hardy but is productive. The fruit ripens 3 or 4 days earlier than Goldstike. It is not considered to be a shipping cot. Tomcot is partially self fruitful.

GOLDBAR

A productive new variety from Washington that bears large, good quality fruit. The fruit is orange with some red blushing. Harvest time is 1-2 days earlier than Goldstrike. Winter injury may be a problem for this variety. Requires cross pollination.

GOLDSTRIKE

A large sized orange cot with about 20% blushing. The fruit is firm with moderate juiciness and sweetness. This variety is considered a shipper to distant markets. Requires cross pollination with Rival or Goldbar. May be subject to pitting.

RIVAL

The fruit is yellow with rosy cheeks and is oval and large sized. The flavour is mild and has a fine texture. It ripens a week after Goldstrike.

Other Varieties

There is some interest in Hargrand, a large, juicy good flavoured variety suitable for the fresh market from Ontario. Also Harglow, Harlayne and Harogem.

2E-15-5 is a medium size orange apricot that is quite firm, handles well and has very good flavour. It must be picked when full colour has developed. Matures just before Tilton. There is some interest in this Summerland Research Station selection.

PERFECTION

Perfection is an old variety that has very large fruit and ships well. Matures after Wenatchee Moorpark. Susceptible to spring frost and requires pollination. Perfection lacks flavour but is quite popular in the market and for roadside stand sales.

Planting Trend – Declining

PUI SHA SIN

Early blooming and maturing apricot. It has very large size similar to a small peach. Pui Sha Sin has excellent exotic flavour. This variety has a long harvest period and requires 4-5 harvests. The skin is tender, bruises easily and the apricot is difficult to handle. Good for local sales.

Planting Trend - Small plantings have been established, but little interest otherwise.

Older Varieties

WENATCHEE MOORPARK

Good yields but quality is not suited to today's fresh market requirements.

PLANTING TREND Trees should be removed because of market resistance.

TILTON

Not suited to fresh market requirements because of fruit size. Plant only in areas free of spring frost.

Planting Trend - Declining.

SKAHA

Fruit is large, firm and bright orange when mature. Skaha matures about 5 days before Wenatchee Moorpark. Immature fruit has poor quality.

PLANTING TREND Declining

GOLDRICH

Orange yellow waxy skin colour. Attractive large size fruit. Fruit quality is only moderate and acidic until fully mature. Goldrich ships quite well. Matures about 10 days before Wenatchee Moorpark. Subject to surface pitting. Goldrich is susceptible to apricot ring pox virus infection.

PLANTING TREND Declining

Prunes – Commercial Varieties

EARLY STRAINS (Greata or Demaris)

Cultural Information- Pollinizer branches should be grafted into Early Italian trees or pollinizers planted to improve cropping. Good pollinizers are Peach Plum, Bradshaw Greengage or Damson.

Planting Trend - Declining

LATE STRAINS

Cultural Information - Late strains of Italian prunes should be removed if they mature after September 15. Early maturity and good size are important. To achieve this, plant in warm locations, prune spurs and thin fruit.

PLANTING TREND Declining

Plums – Commercial Varieties

SANTA ROSA AND SHIRO

Both are attractive plums with good fruit size. They should be planted together for pollination at a ratio of four Santa Rosa to one Shiro. These Japanese plums require hand thinning and more than one picking. Shiro ripens 7 -10 days later and is firmer than Gold plum.

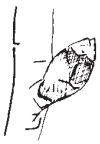
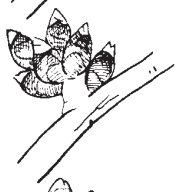
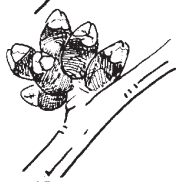
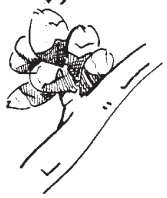
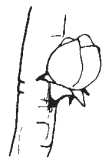
Other Varieties

Other varieties that have been suggested for planting in the past include Black Amber, June Blood, Earliblue Fiebing, Ember, Ozark Gold, Ozark Premier, Friar and Starking Delicious.

PLANTING TREND Most are small plantings for local and fruits and sales.

15 Spray Schedules

Bud Stage Development

Stage	Apple	Pear	Peach/Cot	Cherry/Plum
1 Dormant				
2 Silvertip				
3 Greentip				
4 Bud Cluster				
5 Tight Cluster				
6 Pre Pink				
7 Pink				
8 Blossom				
9 Petal Fall or Calyx				

SPRAY SCHEDULES

Metric Dosages per Hectare, and per Acre

Pre-Harvest Intervals

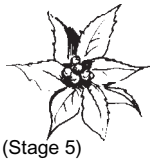
Apples

Unless otherwise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5–5.5 m high. **NOTE: Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
DORMANT TO SILVER TIP (Stage 1) (Stage 2) 	Fire Blight	copper oxychloride 50% (Copper spray)	4 kg	1.6 kg	n/a	Remove cankers by March 31. See page 7-16.
	Ambrosia beetle					See page 6-1.
15 mm GREEN TO TIGHT CLUSTER	Crown rot					See page 7-13.
	Apple scab – (1) Protectant spray	metiram (Polyram 80 DF)	6.0 kg	2.4 kg	45	WARNING – apple scab resistance. See page 7-6.
		Or mancozeb (Manzate 200 75 DF or Dithane DG 75%)	6.0 kg	2.4 kg	45	
		Or mancozeb plus dinocap (Dikar WP)	6.0kg	2.4 kg	45	
		or captan 80% WP or WDG or captan 75 DF (Maestro)	3.75 kg 4.0 kg	1.5 kg 1.6 kg	7	Do not use during bloom.
		Or kresoxim-methyl (Sovran 50% WG)	240 g	100 g	30	Caution: drift may injure cherries.
	(2) Eradicant Spray	myclobutanil (Nova 40 % WP)	340 g	140 g	14	May be tank mixed with Dithane or Polyram.
		Or flusilazole (Nustar 20 DF) plus mancozeb (Manzate 200 75 DF)	100 g 3 kg	40 g 1.2 kg	45	Use 200g/ha Nustar for mildew control.
		Or flusilazole (Nustar 20 DF) plus captan 80 % WP or plus captan 75 DF (Maestro)	100 g 1.9 kg 2 kg	40 g 750 g 800 g	77 7	Use 200 g/ ha Nustar for mildew control.
		Or trifloxystrobin (Flint 50 WG)	140 – 175 g	57 – 71 g	14	Note Flint and Sovran belong to the same class of fungicides. Avoid more than 2 consecutive applications.
 (Stage 4)		Or kresoxim-methyl (Sovran 50% WG)	360 g	150 g	30	Caution: drift may injure cherries.
		Or cyprodinil (Vangard 75 WG)	370 g	150 g	72	Maximum 2 applications full rate Vangard/season.
		Or pyrimethanil (Scala SC)	0.75-1.0 L	300-400 mL	72	Do not use after bloom
	Powdery mildew (foliage protection)	wettable sulphur (Kumulus 80 DF)	7.0 kg	2.8 kg	1	See page 7-18.
		Or thiophanate-methyl (Senator 70% WP)	2.25 kg	910 g	1	May harm predatory mites. See pages 6-12 and 7-18.
		Or trifloxystrobin (Flint 50 WG)	140 – 210 g	57 – 85 g	14	Use the higher rate during pink to bloom stages.
		Or kresoxim-methyl (Sovran 50% WG)	240-450 g	100-182 g	30	Use high rate for high disease pressure. Caution: drift may injure cherries.

Apples Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
TIGHT CLUSTER (Continued)  (Stage 5)	Powdery mildew (Continued)	Or myclobutanil (Nova 40% WP)	340 g	140 g	14	Note Nova and Nustar belong to the same class of fungicides. Rotate with other fungicides.
		Or flusilazole (Nustar 20 DF)	200 g	80 g	77	
	San Jose Scale, European fruit scale	dormant oil (100-220 vis)	35-90 L	14.2-36.4 L	n/a	See pages 6-20 and 6-21.
	European red mite	dormant oil (100-220 vis)	45L	18.2 L	n/a	See pages 6-12 and 15-22.
	Aphids	dormant oil (200-220 vis)	60 L	24 L	n/a	See pages 6-1 – 6-4 and Dormant Oil, page 15-22.
		Or Diazinon 50% WP plus dormant oil (200-220 vis)	3.0 kg 60 L	1.2 kg 24 L	14	
	Green Fruitworms	dormant oil plus azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP)☠	45 L 2.75 kg	18.2 L 1.1 kg	21	See page 6-8. Will also control Bruce spanworm, and susceptible leafroller larvae present.
PINK (See Bee Poisoning, page 13-18) (Stage 7) 	European fruit scale	Diazinon 50% WP	5.5 kg	2.2 kg	14	See page 6-20.
	Codling moth	Isomate-C-Plus (dispensers) Or Isomate-CM/LR	1000	400	0	See page 6-6 for instructions on proper installation.
	Threelined and Obliquebanded Leafrollers	tebufenozide (Confirm 240 F)	1L	405 mL	14	Do not use Confirm if control with Guthion or Sniper has been poor in the past.
	Eyespotted bud moth, Fruitworms	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP)☠	2.75 kg	1.1kg	21	
		Or diazinon (Diazinon 50% WP)	4.5 kg	1.8 kg	14	
	Apple scab – (1) Protectant spray	Metiram (Polyram 80 DF)	6.0 kg	2.4 kg	45	WARNING: apple scab resistance. See page 7-6.
		Or mancozeb (Manzate 200 75 DF or Dithane DG 75%)	6.0 kg	2.4 kg	45	
		Or mancozeb plus dinocap (Dikar WP)	6.0 kg	2.4kg	45	
		Or captan 80% WP or WDG or captan 75 DF (Maestro)	3.75 kg 4.0 kg	1.5 kg 1.6 kg	7	Do not use during bloom.
		Or kresoxim-methyl (Sovran 50% WG)	240 g	100 g	30	Caution: drift may injure cherries.
	Apple scab – (2) Eradicant Spray	myclobutanil (Nova 40% WP)	340 g	140 g	14	May be tank mixed with Dithane, Polyram or Maestro.
		Or flusilazole (Nustar 20 DF) plus mancozeb Manzate 200 75DF)	100g 3 kg	40 g 1.2 kg	77 45	Use 200 g/ha Nustar for mildew control.
		Or flusilazole (Nustar 20 DF) Plus captan 80% WP or plus captan 75DF (Maestro)	100 g 1.9 kg 2 kg	40 g 750 g 800 g	77 7	Use 200 g/ha Nustar for Mildew control.
		Or trifloxystrobin (Flint 50 WG)	140 – 175 g	57 – 71 g	14	Avoid more than 2 consecutive applications.
		Or kresoxim-methyl (Sovran 50% WG)	360 g	150 g	30	Caution: drift may injure cherries.
		Or cyprodinil (Vangard 75WG)	370 g	150 g	72	Maximum 2 applications full rate Vangard per season.
		Or pyrimethanil (Scala SC)	0.75-1.0 L	300-400 mL	72	Do not use after bloom.

☠ CAUTION — Very Toxic

Apples Continued

NOTE: Always read the product label prior to use. Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
PINK (Continued)	Powdery mildew	wettable sulphur (Kumulus 80 DF)	7.0 kg	2.8 kg	1	See page 7-18.
		Or thiophanate-methyl (Senator 70% WP)	2.25 kg	910 g	1	May harm predatory mites. See pages 6-13 and 7-18.
		Or myclobutanil (Nova 40% WP)	340 g	140 g	14	
		Or flusilazole (Nustar 20 DF)	200 g	80 g	77	
		Or trifloxystrobin (Flint 50 WG)	140 – 210 g	57 – 85 g	14	Use the higher rate during pink to bloom stages.
		Or kresoxim-methyl (Sovran 50% WG)	240-450 g	100-182 g	30	Use high rate for high disease pressure. Caution: drift may injure cherries.
		Or lime sulphur 22%	12.5 L/1000 L.		n/a	Lime sulphur may injure "sulphur shy" varieties or may cause injury during hot temperatures. May harm predatory mites.
BLOSSOM	Crown rot	fosetyl-al (Aliette 80% WDG)	5.0 kg	2.0kg	30	See page 7-13 for instructions
	Leafrollers, Fruitworms	*Bacillus thuringiensis* (Foray 48BA or Dipel 2X DF or Bioprotec CAF)	4.0 L 1.675 kg 4.0 L	1.6 L 678 g 1.6 L	0	See pages 6-7 to 6-12. Will also control bud moth.
	Fire blight (blossom infection)	streptomycin sulfate (Streptomycin 17)	100 ppm = 600 g of Streptomycin 17 per 1000 L of water.		50	Apply at blossom stage if weather conditions favour blossom infection. See page 7-16
	Fire blight (shoot blight)	prohexadione calcium (Apogee Plant Growth Regulator)	1350 g (or 45 g/100L dilute spray)	546 g	45	For suppression of shoot blight, apply at 2.5 to 7.5 cm of new shoot growth. Will also reduce shoot growth. See pages 7-16 and 12-7.
PETAL-FALL OR CALYX (Stage 9) 	Threelined and Obliquebanded Leafrollers, Bud moth	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	2.75 kg	1.1 kg	21	See pages 6-4, 6-8 and Bee Poisoning, page 13-21
	Threelined and Obliquebanded Leafrollers	Or tebufenozide (Confirm 240F) Or methoxyfenozide (Intrepid 240F)	1 L 0.75 L	405 mL 304 mL	14	Maximum applications per season: Confirm 4, Intrepid 2. See precaution about resistance p. 6-10 to 6-12
	Leafrollers	Or Isomate-CM/LR (dispensers)	1000	400	0	See pages 6-10, 6-12 for more information. Install before first moth flight.
	Leafrollers, Bud moth	Or spinosad (Success 480 SC Or Entrust 80 W)	182 mL 109 g	74 mL 44 g	7	Do not apply more than 3 times per season. Will reduce pansy spot.
	Leafrollers, Fruitworms	*Bacillus thuringiensis* (Foray 48 BA or Dipel 2X DF or Bioprotec CAF)	4.0 L 1.675 kg 4.0 L	1.6 L 678 g 1.6 L	0	See pages 6-8 and 6-13. Will also control bud moth.
	Leafhopper	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.4 kg	1.4 kg	15	See page 6-25. Will also Control green fruitworms. See page 6-8.
		Or imidacloprid (Admire 240 FL)	200 mL	81mL	7	Will also suppress aphids and leafminer. Do not apply either product alone or alternately more than twice/season.
		Or acetamiprid (Assail 70 WP)	80 – 120 g	32 – 48 g	7	
	Campylomma	diazinon (Diazinon 50% WP)	2.25 kg	910 g	14	See page 6-15. Ensure thorough coverage.
		Or imidacloprid (Admire 240 FL)	380 mL	154 mL	7	Will also control aphids and leafhoppers.
	European fruit scale San Jose scale	diazinon (Diazinon 50% WP)	5.5 kg	2.2 kg	14	See page 6-20, 6-21

☠ CAUTION — Very Toxic

Apples Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (Days)	Precautions and Notes
PETAL-FALL OR CALYX (Continued)	European red mite, McDaniel and Twospotted spider mites	clofentezine (Apollo 50% SC)	300-600 mL	120-240 mL	21	Do not apply more than once per season or beyond 14 days after petal fall. See page 6-12.
		Or bifenazate (Acramite 50 WS)	568 – 851 g	230 - 345 g	7	Use higher rate for European red mite.
		Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Only once per season.
		Or pyridaben (Pyramite 75 WP)	300 – 600 g	120 – 240 g	25	Use higher rate against spider mites. Do not apply more than twice per season
	Apple rust mite	Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Only once per season.
		Or pyridaben (Pyramite 75 WP)	300 g	120 g	25	Do not apply more than twice per season
	Apple scab - (1) Protectant Spray	metiram (Polyram 80 DF)	6.0 kg	2.4 kg	45	WARNING: apple scab resistance. See page 7-6.
		Or mancozeb (Manzate 200 75 DF or Dithane DG 75%)	6.0 kg	2.4 kg	45	
		Or mancozeb plus dinocap (Dikar WP)	6.0 kg	2.4 kg	45	
		Or captan 80% WP or WDG or captan 75 DF (Maestro)	3.75 kg 4.0 kg	1.5 kg 1.6 kg	7	Do not use during bloom
		Or kresoxim-methyl (Sovran 50% WG)	240 g	100 g	30	Caution: drift may injure cherries.
	(2) Eradicant Spray	myclobutanil (Nova 40% WP) plus mancozeb (Dithane DG)	340 g 3.0 kg	140 g 1.2 kg	14 45	Protection with ½ rate Dithane or captan may not last beyond 5 days. See Nova scheduling page 7-6.
		Or myclobutanil (Nova 40% WP) plus metiram 80% (Polyram DF)	340 g 3.0 kg	140 g 1.2 kg	14 45	Protection with ½ rate Dithane or captan may not last beyond 5 days. See Nova scheduling page 7-6.
		Or myclobutanil (Nova 40% WP) plus captan 80% WP or captan 75% DF (Maestro)	340 g 1.8 kg 2.0 kg	140 g 750 g 800 g	14 7	Do not use captan during bloom.
		Or flusilazole (Nustar 20DF) plus mancozeb (Manzate 200 75 DF)	100 g 3 kg	40 g 1.2 kg	77 45	Use 200 g/ha Nustar for mildew control.
		Or flusilazole (Nustar 20 DF) plus captan 80% WP or plus captan 75 DF (Maestro)	100 g 1.9 kg 2 kg	40 g 750 g 800 g	77 7	Use 200g/ha Nustar for mildew control.
		Or trifloxystrobin (Flint 50 WG)	140 – 175 g	57 – 71 g	14	Avoid more than 2 consecutive applications.
		Or kresoxim-methyl (Sovran 50% WG)	360 g	150 g	30	Caution: drift may injure cherries.
	Powdery mildew	Or wettable sulphur (Kumulus 80 DF)	7.0 kg	2.8 kg	1	See page 7-18.
		Or thiophanate-methyl (Senator 70% WP)	2.25 kg	910 g	1	May harm predatory mites. See pages 6-12 and 7-18.
		Or lime sulphur 22%	12.5 L/1000 L.		n/a	Lime sulphur may injure "sulphur shy" varieties or may cause injury during hot temperatures. May harm predatory mites. See page 6-12.
		Or trifloxystrobin (Flint 50 WG)	140 – 210 g	57 – 85 g	14	Use the higher rate during pink to bloom stages. Avoid more than 2 consecutive applications.
		Or kresoxim-methyl (Sovran 50% WG)	240-450 g	100-182 g	30	Use high rate for high disease pressure. Caution: drift may injure cherries.
		Or myclobutanil (Nova 40% WP)	340 g	140 g	14	
	Fire blight (shoot blight)	prohexadione calcium (Apogee Plant Growth Regulator)	1350 g (or 45 g/100L dilute spray)	546 g	45	For suppression of shoot blight, apply at 2.5 to 7.5 cm of new shoot growth with subsequent applications at 14-21 day intervals. Max. 4 sprays/yr. Will also reduce shoot growth. See pages 7-16 and 12-7.

Apples Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
PETAL-FALL OR CALYX (Continued)	Powdery Mildew	Or flusilazole (Nustar 20 DF)	200g	80 g	77	
	Leafminer	imidacloprid (Admire 240 FL)	340 mL	154 mL	7	See page 6-22. Will also control aphids, leafhoppers and campylomma. See note below.
		Or acetamiprid (Assail 70 WP)	80 – 120 g	32 – 48 g	7	Do not apply more than twice per season alone or alternately with Admire.
		Or abamectin (Agri-Mek 1.9 EC)	750 mL	303 mL	28	Apply with 10 L summer oil/ha; do not apply more than twice per season.
		Or methoxyfenozide (Intrepid 240F)	500 mL	200 mL	14	Apply at first egg hatch of first generation.
SUMMER	Codling moth	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	1.4-2.2 kg	570-890 g	14	See page 6-5. Use higher rate where control has been poor in the past or where populations are high.
		Or phosmet (Imidan 50% WP)	3.25-3.75 kg	1.3 - 1.5 kg	1	
		Or phosalone (Zolone F500)	2 L	810 mL	30	
		Or tebufenozide (Confirm 240 F)	1 L	405 mL	14	Maximum applications per season: Confirm, 4; Intrepid, 2.
		Or methoxyfenozide (Intrepid 80W)	1 kg	405 g	14	
		Or acetamiprid (Assail 70 WP)	240 g	97 g	7	Do not apply more than twice per season alone or alternately with Admire. Will also control aphids, leafminer and leafhoppers.
		Or granulovirus (Virosoft CP4)	250 mL	100 mL	0	See page 6-6 for instructions on use.
	Powdery mildew					See page 7-18. Jonagold is sensitive to sulphur.
	Apple scab – (1) Protectant spray	metiram (Polyram 80 DF)	6.0 kg	2.4 kg	45	WARNING: apple scab resistance. See page 7-6. Do not apply mancozeb or metiram within 45 days of harvest.
		Or mancozeb (Manzate 200 75 DF or Dithane DG 75%)	6.0 kg	2.4 kg	45	
		Or mancozeb plus dinocap (Dikar WP)	6.0 kg	2.4 kg	45	
		Or captan 80% WP or WDG Or captan 75 DF (Maestro)	3.75 kg 4.0 kg	1.5 kg 1.6 kg	7	
		Or kresoxim-methyl (Sovran 50% WG)	240 g	100 g	30	Caution: drift may injure cherries.
	(2) Eradicant spray	myclobutanil (Nova 40% WP) plus mancozeb 75% (Dithane DG)	340 g 3.0 kg	140 g 1.2 kg	14 45	Protection with ½ rate Dithane or captan may not last beyond 5 days. See Nova scheduling page 7-6.
		Or myclobutanil (Nova 40% WP) plus metiram 80% (Polyram DF)	340 g 3.0 kg	140 g 1.2 kg	14 45	Protection with ½ rate Dithane or captan may not last beyond 5 days. See Nova scheduling page 7-6.
		Or myclobutanil (Nova 40% WP) plus captan 80% WP or captan 75% DF (Maestro)	340 g 1.8 kg 2.0 kg	140 g 750 g 800 g	14 7	
		Or flusilazole (Nustar 20DF) plus mancozeb (Manzate 200 75 DF)	100 g 3 kg	40 g 1.2 kg	77 45	Use 200 g/ha Nustar for mildew control. Do not apply within 77 days of harvest.
		Or flusilazole (Nustar 20 DF) plus captan 80% WP or plus captan 75 DF (Maestro)	100 g 1.9 kg 2 kg	40 g 750 g 800 g	77 7	
		Or trifloxystrobin (Flint 50 WG)	140 – 175 g	57 – 71 g	14	Avoid more than 2 consecutive applications.
		Or kresoxim-methyl (Sovran 50% WG)	360 g	150 g	30	Do not apply more than 4 times per season. Caution: drift may injure cherries.
	Fire blight					See page 7-16.

Apples Continued

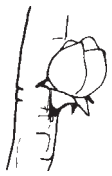
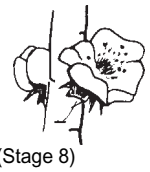
NOTE: Always read the product label prior to use. Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
SUMMER (Continued)	Leafhopper, rosy, woolly and apple aphids	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	Will also control rust mite. See pages 6-2, 6-3 and 6-25.
		imidacloprid (Admire 240 FL)	200 mL	81 mL	7	Will also control leafminer. Do not apply more than twice per season alone or alternately.
		Or acetamiprid (Assail 70 WP)	80 – 120 g	32 – 48 g	7	
	Obliquebanded and Threelined leafrollers	Methoxyfenozide (Intrepid 80W)	0.75 L	304 mL	14	Maximum applications per season: Confirm, 4: Intrepid,2. See precaution about 6-10 to 6-12. Both products will aid in control of bud moth.
		Or tebufenozide (Confirm 240 F)	1 L	405 mL	14	
	Leafrollers, Bud moth	Mating disruption (Isomate CM-LR)	1000 disp.	400 disp.	0	See p. 6-12 for more precautions on use.
		Spinosad (Success 480 SC Or Entrust 80W)	182 mL 109 g	74 mL 44 g	7	Do not apply Success or Entrust more than 3 times per season.
	Obliquebanded and Threelined leafrollers, Bud moth	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	1.4 kg	570 g	14	See descriptions of leafrollers and bud moth.
		Or diazinon (Diazinon 50% WP)	4.5 kg	1.8 kg	14	
	Rosy, woolly and apple aphids	Dimethoate* (Cygon 480 EC or Lagon 480 E)	4.25 L	1.7 L	14	*Non-bearing trees only. See page 6-2 and Spray injury page 15-22.
		Or malathion (Malathion 50% EC or Malathion 25% WP	5.5 L 11 kg	2.2 L 4.5 kg	3	
	Apple and rosy aphids	imidacloprid (Admire 240 FL)	230 mL	93 mL	7	Will also control leafminer and leafhoppers. Do not apply more than twice per season alone or alternately.
		Or acetamiprid (Assail 70 WP)	80 – 120 g	32 – 48 g	7	
	San Jose scale	diazinon (Diazinon 50% WP or Diazinon 500 EC)	5.5 kg 5.5 L	2.2 kg 2.2 L	14	For control of crawlers. See page 6-21.
	European red mite, McDaniel and Two-Spotted spider mites, Rust mite	dicofol (Kelthane 50% WP)	4.25 kg	1.7 kg	7	Use Kelthane only once per season.
		Or abamectin (Agri-Mek)	750 mL	300 mL	28	Apply with 0.25% superior oil. Will also control rust mites.
		Or pyridaben (Pyramite 75% WP)	300 – 600 g	120 – 240 g	25	See page 6-13 for explanation of rates.
		Or bifenazate (Acramite 50 WS)	568 – 851 g	230 - 345 g	7	Not for rust mite control. Use higher rate for European red mite.
		Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Only once per season.
	Leafminer	imidacloprid (Admire 240 FL)	380 mL	154 mL	7	Will also control aphids and leafhoppers. Do not apply more than twice per season alone or alternately. See page 6-22.
		Or acetamiprid (Assail 70 WP)	80 – 120 g	32 – 48 g	7	
		Or abamectin (Agri-Mek 1.9 EC)	750 mL	300 mL	28	Apply with 0.25% superior oil. Will also control mites.
	Apple pin-point scab	ferbam 76 WDG	5.0 kg	2.0 kg	7	Dilute rate: 1-2 kg/1000 L
		Or ziram 85 W	5.0 kg	2.0 kg	1	
		Or captan 80% WP or WDG or captan 75 DF (Maestro)	3.75 kg 4.0 kg	1.5 kg 1.6 kg	7	
	Bull's-eye rot, perennial canker					See page 7-12.
	Crown rot	fosetyl-al (Aliette 80% WDG)	5.0 kg	2.0 kg	30	See page 7-13.
FALL	Crown rot	fosetyl-al (Aliette 80% WDG)	5.0 kg	2.0 kg	30	See page 7-13.

☠ CAUTION — Very Toxic

Apricots

Unless otherwise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5–5.5 m high. **NOTE: Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
DORMANT  (Stage 1)	San Jose scale	dormant oil (100-220 vis.)	35-90 L	14.2-36.4 L	n/a	See page 6-21.
	Lecanium scale, Green peach aphid	dormant oil (200-220 vis.)	70 L	28.3 L	n/a	
PINK  (Stage 7)	Brown rot	captan 80% WP or WDG or captan 75 DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
BLOSSOM  (Stage 8)	Brown Rot	captan 80% WP or WDG or captan 75 DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or cyprodinil (Vangard 75 WG)	370 g	150 g	2	
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Note Indar and Topas/ Mission belong to the same class of fungicides. See table 16-4.
		Or propiconazole (Topas 250E or Mission 418 EC)	500 mL 300 mL	200 mL 120 mL	3	
PETAL – FALL	Leafrollers	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP ☠)	2.75 kg	1.1 kg	21	See Bee Poisoning page 13-21.
		Or spinosad (Success 480 SC or Entrust 80 W)	182 mL 109 mL	74 mL 44 mL	14	Do not apply more than 3 times per season.
	Leafrollers, Fruitworms	*Bacillus thuringiensis* (Dipel 2X DF or Bioprotec)	1.675 kg 4.0 L	678 g 1.6 L	0	Add sticker-spreader to Dipel improve rain fastness. See pages 6-8 to 6-12.
	Peach twig borer	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP ☠	2.75 kg	1.1 kg	21	See pages 13-18 and 6-17.
		Or endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP)	3.25 kg	1.3 kg	15	
		Or diazinon (Diazinon 50% WP or Diazinon 50% EC)	4.5 kg 4.5 L	1.8 kg 1.8 L	10	Add 10 L/1000 L of light medium summer oil to Diazinon spray mixture.
	Brown rot	captan 80% WP or WDG or captan 75 DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Note Indar and Topas/ Mission belong to the same class of fungicides. See table 16-4.
		Or propiconazole (Topas 250E or Mission 418 EC)	500 mL 300 mL	200 mL 120 mL	3	

☠ CAUTION — Very Toxic

Apricots Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
HUSK – FALL	Coryneum blight	ziram	8 kg	3.2 kg		Do not use ferbam later than husk fall stage. See page 7-15.
		Or ferbam	6.75 kg	2.7 kg	21	
	Peach twig borer	azinphos-methyl (Guthion 50% WP☠ or Sniper 50% WP)☠	2.75 kg	1.1 kg	21	See page 6-17.
		Or endosulfan (Endosulfan 50% WP☠ or Thiodan 50% WP)☠	3.25 kg	1.3 kg	15	
SUMMER	Aphids	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	Ensure thorough coverage.
		Or diazinon (Diazinon 50 WP or Diazinon 50% EC)	4.5 kg 4.5 L	1.8 kg 1.8 L	10	
	Obliquebanded and Threelined Leafrollers	Or azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP ☠)	1.4 kg	570 g	21	See page 6-10.
		Or spinosad (Success 480 SC or Entrust 80W))	182 mL 109 mL	74 mL 44 mL	14	Do not apply more than 3 times per season.
	Earwigs					Baiting and trunk sprays. See page 6-26.
	San Jose scale	diazinon (Diazinon 50WP or Diazinon 50% EC)	5.5 kg 5.5 L	1.8 kg 1.8 L	10	See page 6-21. Ensure thorough coverage.
	Shothole borer					Cultural control. See page 6-22.
	Peach twig borer	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP☠)	3.25 kg	1.3 kg	15	See page 6-17.
		Or azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP ☠)	2.75 kg	1.1 kg	21	
	European red mite, McDaniel spider mite	dicofol (Kelthane 50% WP)	4.25 kg	1.7 kg	14	Apply only once per season.
		Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Apply only once per season.
	Brown Rot	captan 80% WP or WDG or captan 75DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or cyprodinil (Vangard 75 WG)	740 g	300 g	2	
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Note Indar and Topas/ Mission belong to the same class of fungicides. See table 16-4.
		Or propiconazole (Topas 250E or Mission 418 EC)	500 mL 300 mL	200 mL 120 mL	3	

☠ CAUTION — Very Toxic

Apricots Continued

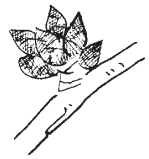
NOTE: Always read the product label prior to use. Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per		Pre-harvest Interval (days)	Precautions and Notes
			Hectare	Acre		
SUMMER (Continued)	Peach tree borer	endosulfan (Thiodan 50% WP or Endosulfan 50% WP)☠	See Notes	See Notes	15	Mix 1.5 kg/1000 L and apply to tree trunk and crotches when first moths caught in pheromone traps. Repeat in 4 weeks. See page 6-17.
		Pheromone dispensers (Isomate-P)	250-625	100-250	0	Apply prior to moth emergence. See p. 6-17.
	Lecanium scale	malathion 50% EC or malathion 25 % WP	5.5 L 11 kg	2.2 L 4.5 kg	7	
FALL	Coryneum blight	fixed copper 50 %WP	9 kg	3.6 kg	n/a	Apply in early September.
	Shothole borer					Cultural control. See page 6-22.

☠ CAUTION — Very Toxic

Cherries

Unless otherwise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5–5.5 m high. **NOTE: Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
DORMANT  (Stage 1)	Black cherry aphid	dormant oil (200-220 vis)	65 L	26 L	n/a	See Little Cherry, page 7-22.
	San Jose scale	dormant oil (100-220 vis)	35- 90 L	14.2- 36.4 L	n/a	See page 6-21.
	Ambrosia beetle					Cultural control. See page 6-1.
	Shothole borer					Cultural control. See page 6-22.
GREEN TIP TO PINK  (Stage 2)  (Stage 7)	Black cherry aphid, Eyespotted bud moth	diazinon (Diazinon 50% WP)	4.5 kg	1.8 kg	10	See Bee Poisoning, Page 13-21.
	Rust mite, Black cherry aphid	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg 3.25 kg	1.3 kg 1.3 kg	15	
BLOSSOM  (Stage 8)	Brown rot	fenhexamid (Elevate 50 WDG)	1.7 kg	690 g	1	Avoid more than 2 consecutive applications
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or captan 80% WP or captan 75DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	Use 1.75 kg/ha (700g/acre) of Rovral on large, mature trees
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Indar, Nova, Topas and Mission belong to the same class of fungicides. Rotate with fungicides with different modes of action.
		Or myclobutanil (Nova 40 W)	340 g	140 g	1	
		Or propiconazole (Topas 250E or Mission 418 EC)	500 mL 300 mL	200 mL 120 mL	3	
		Or chlorothalonil (Bravo 500)	5.0- 9.0 L	2.0- 3.6 L	40	Do not apply Bravo after shuck split. Use higher rate for trees over 6 m in height.
		Or triforine (Funginex 10% EC)	2.5 L	1 L	See Notes	Do not apply after bloom.
		Or thiophanate-methyl (Senator 70% WP)	1.75 kg	710 g	1	
PETAL-FALL	Apple mealybug					See Little Cherry page 7-22
	Leafrollers, Fruitworms	*Bacillus thuringiensis* (Dipel 2X DF or Foray 48BA or Bioprotec CAF)	1.675 kg 4.0 L 4.0 L	678 g 1.6 L 1.6 L	0	See pages 6-8 to 6-12. Will also control bud moth.
	Eyespotted bud moth	diazinon (Diazinon 50% WP	4.5 kg	1.8 kg	10	
	Leafrollers, bud moth	Or spinosad (Success 480 SC or Entrust 80W))	182 mL 109 g	74 mL 44 g	7	Do not apply more than 3 times per season.

☠ CAUTION — Very Toxic

Cherries Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of bud stage development, see page 15-1. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
PETAL-FALL (continued)	Brown rot	fenhexamid (Elevate 50 WDG)	1.7 kg	690 g	1	See page 7-10. Avoid more than 2 consecutive applications
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or captan 80% WP or captan 75DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	Use 1.75 kg/ha (700 g/acre) of Rovral on large, mature trees.
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Indar, Nova, Topas and Mission belong to the same class of fungicides. Rotate with fungicides with different modes of action.
		Or myclobutanil (Nova 40 W)	340 g	140 g	1	
		Or propiconazole (Topas 250E or Mission 418 EC)	500 mL 300 mL	200 mL 120 mL	3	
		Or thiophanate-methyl (Senator 70% WP)	1.75 kg	710 g	1	
		Or chlorothalonil (Bravo 500)	5.0–9.0 L	2.0 – 3.6 L	40	Do not apply Bravo after shuck split. Use higher rate for trees over 6 m in height.
HUSK-FALL	Powdery mildew	wettable sulphur (Kumulus 80 DF)	7.0 kg	2.8 kg	1	See powdery mildew, page 7-18
		Or pyraclostrobin (Cabrio 20% EG)	670 g	270 g	10	Use tank mixes with caution
		Or myclobutanil (Nova 40 W)	340 g	140 g	1	
SUMMER	Black cherry aphid	diazinon (Diazinon 50% WP)	4.5 kg	1.8 kg	10	Will also control pear sawfly (cherry slug). See page 6-27.
		Malathion 50% EC	1.25 - 1.8 L	500 - 728 mL	3	Malathion may injure some varieties of cherries.
	Cherry fruit fly	dimethoate (Cygon 480 EC or Lagon 480 E)	2.25 L	910 mL	21	See spraying restriction, pages 15-22 and 6-23. Will also control cherry fruitworm, pear sawfly (cherry slug) and apple mealybug. See Little Cherry, page 7-22.
		Or azinphos-methyl (Guthion 50 WP☠, Sniper 50 WP☠	1.7 – 2.3 kg	0.7 – 0.9 kg	15	
		Or imidacloprid (Admire 240 F)	233 mL	94 mL	10	Do not apply more than 2 times per season. Will also control aphids and mealybug.
		Or diazinon (Diazinon 50% WP)	4.5 kg	1.8 kg	10	Ensure thorough coverage.
		Or spinosad (Entrust 80W)	109 g	44 g	7	Do not apply more than 4 times per season.

Cherries Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of bud stage development, see page 15-1. Unless other wise stated, dosages recommended are in quantitiesof the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
SUMMER (Cont'd)	Cherry fruit fly, Cherry (pear) slug, Obliquebanded and Threelined leafrollers	carbaryl (Sevin XLR Plus)	2.3 L	930 mL	2	May harm predatory mites. May leave visible residue on fruit. See page 6-23.
	Leafrollers, Bud moth	spinosad (Success 480 SC or Entrust 80 W))	182 mL 109 g	74 mL 44 g	7	Do not apply more than 3 times per season against leafrollers.
	Peach tree borer	Isomate-P (dispensers)	250-625	100-250	0	Apply before first moth flight. See page 6-17.
	Rust mites, Black cherry aphid	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	
	Rust Mites	Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	For control of rust mite; will control other mites present.
	European red mite, McDaniel and Two-spotted spider mites	Pyridaben (Pyramite 75 WP)	300 – 600 g	120 – 240 g	7	Only one application per season.
		Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Will also control rust mites.
	Brown rot	fenhexamid (Elevate 50 WDG)	1.7 kg	690 g	1	Avoid more than 2 consecutive applications
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or captan 80% WP or WDG or captan 75DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	Use 1.75 kg/ha of Rovral on large, mature trees.
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Indar, Nova, Topas and Mission belong to the same class of fungicides. Rotate with fungicides with different modes of action.
		Or myclobutanil (Nova 40 W)	340 g	140 g	1	
		Or propiconazole (Topas 250E or Mission 418 EC)	500 mL 300 mL	200 mL 120 mL	3	Do not apply more than twice to fruit
		Or thiophanate-methyl (Senator 70% WP)	1.75 kg	710 g	1	
	Powdery mildew	Or pyraclostrobin (Cabrio 20% EG)	670 g	270 g	10	Use tank mixes with caution. 10-day pre-harvest interval
		Or myclobutanil (Nova 40 W)	340 g	140 g	1	
POST-HARVEST	Post-harvest decay, Rhizopus rot (post-harvest)	Dichloran (Allisan 75W)				Post-harvest treatment of sweet cherries fruit, applied at sorting.
	Cherry fruit fly	dimethoate (Cygon 480 EC or Lagon 480 E)	2.25 L	910 mL	n/a	Will also control apple mealybug, pear sawfly (cherry slug). See page 6-23.
	Apple mealybug*					*See Little Cherry, page 7-22.
	McDaniel and Two-spotted spider mites	dicofol (Kelthane 50% WP)	4.25 kg	1.7 kg	n/a	Apply only once per season.
	Shothole borer					Cultural control, see page 6-22.

☠ CAUTION — Very Toxic

Peaches

Unless otherwise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5–5.5 m high. **NOTE: Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
DORMANT  (Stage 1)	Peach leaf curl (See also leaf curl, fall treatment)	ferbam	6.75 kg	2.7 kg	21	Apply early, before oil sprays & before bud swell. See page 7-18.
		Or lime-sulphur	175 L	71 L	1	
		Or chlorothalonil (Bravo 500)	5.0-7.0 L	2.0-2.8 L	60	
	Coryneum blight					See page 7-15. Prune out cankers on twigs and small branches
	San Jose scale, green peach aphid	Dormant oil (100-220 vis.)	35-90 L	14.2 - 36.4 L	n/a	Apply at bud-swell stage.
	Lecanium scale, green peach aphid	dormant oil (200-220 vis.)	70 L	28.3 L	n/a	Apply at bud-swell stage.
	Peach silver mite (rust mite), green peach aphid	lime-sulphur	175 L	71 L	1	
PINK  (Stage 6)	Peach twig borer	endosulfan (Endosulfan 50% WPN or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	See page 6-17.
		Or azinphos-methyl (Guthion 50% WP ☠ or Sniper 50 % WP) ☠	2.75 kg	1.1 kg	21	
		or phosmet (Imidan 50% WP)	3.4 – 6 kg	1.4 – 2.4 kg	1	
	Peach twig borer	deltamethrin (Decis 5% EC)	200 mL	80 mL	1	Decis is harmful to beneficial insects and mites.
 (Stage 7)	European red mite and Twospotted spider mite	clofentezine (Apollo SC)	300 – 600 mL	120 – 240 mL	21	Apply at first sign of mite activity. See pages 6-13 to 6-15.
BLOSSOM  (Stage 8)	Brown rot	fenhexamid (Elevate 50 WDG)	1.7 kg	690 g	1	Avoid more than 2 consecutive applications
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or thiophanate-methyl (Senator 70% WP)	1.75 kg	710 g	1	
		Or captan 80% WP or WDG or captan 75 DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Indar, Nova, Topas and Mission belong to the same class of fungicides. Rotate with fungicides with different modes of action.
		Or myclobutanil (Nova 40 WP)	340 g	140 g	1	
		Or propiconazole (Topas 250 E or Mission 418 EC	500 mL 300 mL	200 mL 120 mL	3	
		Or cyprodinil (Vangard 75 WG)	370 g	150 g	3	

☠ CAUTION — Very Toxic

Peaches Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1. Unless other wise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
BLOSSOM (Continued)	Brown Rot (Continued)	Or cyprodinil (Vangard 75 WG) plus myclobutanil (Nova 40 WP)	370 g 340 g	150 g 140 g	2 1	
		Or cyprodinil (Vangard 75 WG) plus iprodione (Rovral 50 WP)	370 g 840 g	150 g 340 g	2 1	
		Or triforine (Funginex 19% EC)	2.5 L	1.0 L	See Notes	Do not apply after blossom.
		Or chlorothalonil (Bravo 500)	5.0-9.0 L	2.0-3.6 L	60	Use higher rate for trees over 6 m tall or if weather warm and wet.
PETAL-FALL	Peach twig borer, leafrollers	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP ☠)	2.75 kg	1.1 kg	21	
	Peach twig borer	phosmet (Imidan 50% WP)	3.4 - 6 kg	1.4 – 2.4 kg	1	
		Or diazinon (Diazinon 50%WP	4.5 kg	1.8 kg	20	
	Leafrollers, Fruitworms	*Bacillus thuringiensis* (Dipel 2X DF or Bioprotec CAF)	3.35 kg 4.0 L	1.4 kg 1.6 L	0	See pages 6-8 and 6-12.
	Leafrollers, bud moth	Or spinosad (Success 480 SC Or Entrust 80 W)	182 mL 109 g	74 mL 44 g	14	Do not apply more than 3 times per season.
	Peach twig borer	deltamethrin (Decis 5% EC)	200 mL	80 mL	1	Decis is harmful to beneficial insects and mites.
	Lygus bugs, Peach twig borer	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	See page 6-17, 6-27.
	European red mite, Twospotted spider mite	clofentezine (Apollo SC)	300 – 600 mL	120 – 240 mL	21	See pages 6-13 to 6-15.
		Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Do not apply more than once per season.
	Brown rot	fenhexamid (Elevate 50 WDG)	1.7 kg	690 g	1	Avoid more than 2 consecutive applications
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or thiophanate-methyl (Senator 70% WP)	1.75 kg	710 g	1	
		Or captan 80% WP or WDG or captan 75DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Indar, Nova, Topas and Mission belong to the same class of fungicides. Rotate with fungicides with different modes of action.
		Or myclobutanil (Nova 40WP)	340 g	140 g	1	
		Or propiconazole (Topas 250 E or Mission 418 EC	500 mL 300 mL	200 mL 120 mL	3	

☠ CAUTION — Very Toxic

Peaches Continued

NOTE: Always read the product label prior to use. Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1. Unless other wise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
PETAL FALL (Continued)	Brown Rot (Continued)	Or chlorothalonil (Bravo 500)	5.0-9.0 L	2.0-3.6 L	60	Use higher rates for trees over 6 m tall.
HUSK-FALL	Coryneum blight	ferbam	9 kg	3.6 kg	21	
		Or ziram	8 kg	3.2 kg	21	
	Green peach aphid	pirimicarb (Pirimor 50DF)	560 g	227 g	60	Do not apply after husk fall or more than once per season
	Powdery mildew	wettable sulphur (Kumulus 80 DF)	7.0 kg	2.8 kg	1	See page 7-18. Apply at husk fall and again in 2 weeks
		Or myclobutanil (Nova 40W)	340 g	140 g	1	
SUMMER	Stink bugs	endosulfan (Endosulfan 50% WP or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	
	Earwigs					Baiting and trunk sprays, see page 6-26.
	Peach tree borer	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	See Notes	See Notes	15	Mix 1.5 kg/1000 L; apply to tree trunk and crotches when first moths are caught in pheromone traps. Repeat in 4 weeks. See page 6-17.
		Or Isomate-P (dispensers)	250-625	100-250	0	Apply before moth emergence. See page 6-17.
	Peach twig borer	azinphos-methyl (Guthion 50% WP ☠ or APM 50% WP ☠ or Sniper 50 % WP) ☠	2.75 kg	1.1 kg	21	See page 6-17.
		Or endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	
		or phosmet (Imidan 50% WP)	3.4 - 6 kg	1.4 – 2.4 kg	1	
	Mealy plum aphid, green peach aphid	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	
	San Jose scale	diazinon (Diazinon 50% WP or Diazinon 50% EC)	5.5 kg 5.5 L	2.2 kg 2.2 L	20	See page 6-21.
	Obliquebanded and Threelined Leafrollers	Or azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	1.4 kg	570 g	21	See pages 6-8 to 6-12.
	Leafrollers, bud moth	Or spinosad (Success 480 SC or Entrust 80 W))	182 mL 109 g	74 mL 44 g	14	Do not apply more than 3 times per season.
	European red mite, Twospotted spider mite	dicofol (Kelthane 50% WP)	4.25 kg	1.7 kg	14	Do not apply more than once per season.
		Or formetanate hydrochloride (Carzol SP) ☠	1.1 kg	445 g	21	Harmful to predatory mites and insects. Do not apply more than once per season.
		Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Do not apply more than once per season.

☠ CAUTION — Very Toxic

Peaches Continued

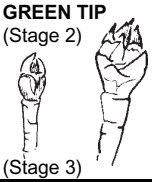
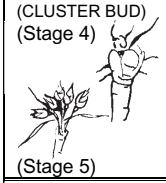
NOTE: Always read the product label prior to use. Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1. Unless other wise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
SUMMER (Continued)	European red mite, Twospotted spider Mite	Or clofentezine (Apollo SC)	300 – 600 mL	120 – 240 mL	21	Apply at first sign of mite activity.
	Peach silver mite (rust mite)	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	
		Or spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Do not apply more than once per season.
	Lecanium scale	malathion (Malathion 50% EC or malathion 25% WP)	5.5 L 11 kg	2.2 L 4.5 kg	7	Apply in August or early September.
	Brown rot	captan 80% WP or WDG or captan 75DF (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	See page 7-10.
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	Use 1.75 kg/ha of Rovral on large trees.
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Indar, Nova and Topas belong to the same class of fungicides. Rotate with fungicides with different modes of action.
		Or myclobutanil (Nova 40 W)	340 g	140 g	1	
		Or propiconazole (Topas 250 E or Mission 418 EC	500 mL 300 mL	200 mL 120 mL	3	Do not apply more than twice to fruit
		fenhexamid (Elevate 50 WDG)	1.7 kg	690 g	1	Avoid more than 2 consecutive applications
		Or boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or cyprodinil (Vangard 75 WG)	740 g	300 g	3	Do not apply Vangard more than twice to fruit.
		Or cyprodinil (Vangard 75 WG) plus myclobutanil (Nova 40 WP)	370 g 340 g	150 g 140 g	3 1	
		Or cyprodinil (Vangard 75 WG) plus iprodione (Rovral 50 WP)	370 g 840 g	150 g 340 g	3 1	
	Shothole borer					Cultural control. See page 6-22.
	Rhizopus rot, fruit decay	dichloran (Botran 75% WP)	5 kg	2.0 kg	10	Apply 18 and 10 days before harvest.
	Post-harvest decay, Rhizopus rot, brown rot (post-harvest)	dichloran (Allisan 75W)				For freezing or canning peaches. Spray or dip peaches in Allisan suspension. See page 7-21.
FALL (75-100% leaf drop)	Peach leaf curl	fixed copper 50% WP (Copper oxychloride)	2 kg	800 g	n/a	A spring dormant spray may also be required. See page 7-18.
		Or chlorothalonil (Bravo 500)	5.0-7.0 L	2.0-2.8 L	n/a	
	Coryneum blight	fixed copper 50% WP (Copper oxychloride)	9 kg	3.6 kg	n/a	Apply in September, after harvest.
	Shothole borer					See page 6-22

☠ CAUTION — Very Toxic

Pears

Unless otherwise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5–5.5 m high. **NOTE: Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
DORMANT  (Stage 1)	Pear leaf blister mite, Pear rust mite, and Pear psylla	lime-sulphur plus dormant oil (200-220 vis.)	125 L 70 L	50 L 28.3 L	n/a	Order lime-sulphur early.
		Or endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠ plus dormant oil (200-220 vis.)	3.25 kg 70 L	1.3 kg 28.3 L	n/a	
	Fire blight					See page 7-16. Remove cankers from trees by March 31.
SILVER TIP TO GREEN TIP (Stage 2)  (Stage 3)	Pear Psylla	dormant oil (100 vis)	20 L	8.1 L	n/a	
		Or amitraz (Mitac WP) ☠	1.65-3.35 kg	0.67-1.36 kg	14	See page 6-18. Toxic to some predatory insects.
	Lygus bugs	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	Apply at first signs of buds dripping. Dripping buds in March are a sign of lygus bugs and not pear psylla. See page 6-27.
TIGHT CLUSTER (CLUSTER BUD) (Stage 4)  (Stage 5)	European red mite	dormant oil (100-220 vis)	45 L	18.2 L	n/a	Do not use dormant oil more than twice pre bloom.
	San Jose scale, European fruit scale	dormant oil (100-220 vis.)	35-90 L	14 - 36 L	n/a	See page 6-21. Do not use dormant oil more than twice pre bloom.
		Or dormant oil (100-220 vis.) plus Diazinon 50% WP	45 L 4.5 kg	18 L 1.8 kg	n/a 14	
PINK See Bee Poisoning, page 3-3.  (Stage 7)	Leafrollers, Fruitworms	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	2.75 kg	1.1 kg	21	
		Or *Bacillus thuringiensis* (Dipel 2X DF or Foray 48BA or Bioprotec CAF) (leafrollers only)	1.675 kg 4.0 L 4.0 L	678 g 1.6 L 1.6 L	0	See pages 6-8 to 6-12 for use of lower rates. Will also control bud moth.
	Leafrollers, Bud moth	Or spinosad (Success 480 SC or Entrust 80 W))	182 mL 109 g	74 mL 44 g	7	Do not apply more than 3 times per season.
	Fruitworms	diazinon (Diazinon 50% WP)	4.5 kg	1.8 kg	14	
	Eyespotted bud moth	diazinon (Diazinon 50% WP	4.5 kg	1.8 kg	14	
	Codling moth	Isomate-C Plus (dispensers) or Isomate-CM/LR (dispensers)	1000	400	0	See discussion page 6-6 on proper installation.
		Or acetamiprid (Assail 70 WP)	240 g	100 g	7	Do not apply more than twice per season.
	Pear Psylla	amitraz (Mitac WP) ☠	1.65-3.35 kg	0.67-1.36 kg	14	See page 6-18. Toxic to some predatory insects.
	Powdery mildew	lime-sulphur	90 L	36.4 L	1	See pages 16-22 and 7-18.
		Or wettable sulphur (Kumulus 80 DF)	7.0 kg	2.8 kg	1	See page 7-18.
		Or trifloxystrobin (Flint 50 WG)	140 – 210	57 – 85	14	Avoid more than 2 consecutive applications.
		Or Kresoxim methyl (Sovran 50% WG)	240 – 360 g	100 - 150 g	30	Use high rate for high disease pressure. Caution: Drift may injure cherries.
		Or thiophanate-methyl (Senator 70% WP)	2.25 kg	910 g	1	May harm predatory mites. See page 6-13.
	European red mite, pear rust mite	formetanate hydrochloride (Carzol 92% SP) ☠	1.1 kg	450 g	1	See page 6-13. Harmful to predatory mites and insects.

☠ CAUTION — Very Toxic

Pears Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1. Unless other wise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
BLOSSOM	Fire blight	fixed copper 50% WP	1.75 kg	710 g	n/a	Use on Bartletts only. See page 7-16.
		Or Streptomycin 17 WP	2.0 kg	810 g	30	May be used on all varieties. See page 7-16.
	Leafrollers Fruitworms	*Bacillus thuringiensis* (Dipel 2X DF or Foray 48 BA or Bioprotec CAF)	1.675 kg 4.0 L 4.0 L	678 g 1.6 L 1.6 L	0	See pages 6-7 and 6-8 for use of lower rates. Will also control bud moth.
CALYX	Leafrollers, Green fruitworms	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	2.75 kg	1.1 kg	21	
		Bacillus thuringiensis (Dipel 2X DF or Foray 48 BA or Bioprotec CAF)	1.675 kg 4.0 L 4.0 L	678 g 1.6 L 1.6 L	0	See pages 6-8 to 6-13 for use of lower rates. Will also control bud moth.
	Obliquebanded and Threelined leafrollers	tebufenozide (Confirm 240 F)	1 L	405 mL	14	Will also control bud moth. See p. 6-13 about risk of resistance.
	Leafrollers, bud moth	Or spinosad (Success 480 SC or Entrust 80 W))	182 mL 109 g	74 mL 44 g	7	Do not apply more than 3 times per season.
	San Jose scale	diazinon (or Diazinon 50% WP)	5.5 kg	2.2 kg	14	See page 6-21.
SUMMER	Pear psylla	Insecticidal Soap			0	Use a minimum of 2240 L of spray mixture per hectare (900 L/acre).
		Or amitraz (Mitac WP) ☠	1.65 – 3.35 kg	0.67- 1.36 kg	14	See page 6-18. Toxic to some predatory insects.
		Or pyridaben (Pyramite)	600 – 720 g	243 – 291 g	25	Maximum 2 applications
	Pear psylla, pear rust mite, mites	abamectin (Agri-Mek)	750 – 500 mL	300 – 600 mL	28	Must be applied with 0.25% oil. See page 6-18.
	Mites, Rust mites	Spirodiclofen (Envidor 240 SC)	750 mL	300 mL	7	Only one application per season.
	Codling moth	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	1.4- 2.4 kg	570- 971 g	14	See page 6-5. Use higher rate where control has been poor in the past or where populations are high.
		Or phosmet (Imidan 50% WP)	3.25- 3.75 kg	1.3- 1.5 kg	1	
		Or phosalone (Zolone F500)	2 L	810 mL	30	
		Or acetamiprid (Assail 70 WP)	240 g	100 g	7	Do not apply more than twice per season.
	Pear rust mite	wettable sulphur (Kumulus 80 DF)	6.0 kg	2.4 kg	1	See page 6-14.
		Or pyridaben (Pyramite)	200 g	81 g	25	Maximum 2 applications
	European red mite, McDaniel and Twospotted spider mites	formetanate hydrochloride (Carzol 92% SP) ☠	1.1 kg	450 g	1	Will also control pear rust mite. See page 6-13 to 6-15.
		Or dicofol (Kelthane 50% WP)	4.25 kg	1.7 kg	7	Use Kelthane only once per season.
		Or clofentezine (Apollo 50 SC)	300 – 600 mL	120 – 240 mL	21	Do not apply more than once per season or within 21 days of harvest.
		Or pyridaben (Pyramite)	300 – 600 g	120 – 240 g	25	Use the higher rate for spider mites. Will also control rust mites.
	San Jose scale	diazinon (Diazinon 50% WP or Diazinon 50% EC)	5.5 kg 5.5 L	2.2 kg 2.2 L	14	See page 6-21.
	Fire blight					See page 7-16.
	Obliquebanded and Threelined leafrollers	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	1.4 kg	570 g	14	Will also control bud moth.
		Or tebufenozide (Confirm 240 F)	1 L	405 mL	14	Will also control bud moth. See p. 6-13 about risk of resistance.
	Leafrollers	Isomate-CM/LR (dispensers)	1000	400	0	See p. 6-10, 6-12 for more information on use. Apply before first moth flight.
	Leafrollers, bud moth	Or spinosad (Success 480 SC or Entrust 80 W))	182 mL 109 g	74 mL 44 g	7	Do not apply more than 3 times per season.
	Eyespotted bud moth	Or diazinon (Diazinon 50% WP)	4.5 kg	1.8 kg	14	

☠ CAUTION — Very Toxic

Prunes and Plums

Unless otherwise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5–5.5 m high. **NOTE: Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1.

Time of Application	Pest or Disease	Material	Amount per		Pre-harvest Interval (days)	
			Hectare	Acre		
DORMANT  (Stage 1)	Rust mites	lime-sulphur plus dormant oil (200-220 vis.)	130 L 70 L	52.6 L 28.3 L	n/a	See page 6-14.
	San Jose scale	dormant oil (100-220 vis.)	35- 90 L	14.2- 36.4 L	n/a	See page 6-20.
	Ambrosia beetle					Cultural control. See page 6-1.
PINK  (Stage 7)	Eyespotted bud moth	azinphos-methyl (Guthion 50% WP ☠ or Sniper 50% WP) ☠	2.75 kg	1.1 kg	15	
		Or diazinon (Diazinon 50% WP)	4.5 kg	1.8 kg	10	
BLOSSOM  (Stage 8)	Brown rot	boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or thiophanate-methyl (Senator 70% WP)	1.75 kg	710 g	1	
		Or captan 80% WP or WDG or captan 75 DF Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	Note Indar and Topas/Mission belong to the same class of fungicides. See table 16-4.
		Or propiconazole (Topas 250E or Mission 418 EC)	 500 mL 300 mL	 200 mL 120 mL	3	
		Or cyprodinil (Vangard 75 WG)	370 g	150 g	2	Maximum 2 applications To blossom stage
		Or triforine (Funginex 19% EC)	2.5 L	1 L	See Notes	Do not apply after blossom.
	Leafrollers, Fruitworms	*Bacillus thuringiensis* (Dipel 2X DF or Bioprotec CAF)	 1.675 kg 4.0 L	 678 g 1.6 L	0	See pages 6-8 to 6-12. Will also control bud moth.
PETAL FALL	Brown rot	boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	
		Or captan 80% WP or WDG or captan 75DG (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	

☠ CAUTION — Very Toxic

Prunes and Plums Continued

NOTE: **Always read the product label prior to use.** Ensure your sprayer is regularly calibrated and properly operated. See page 14-14. For illustrations of budstage development, see page 15-1. Unless other wise stated, dosages recommended are in quantities of the commercial product for full-sized trees 4.5 – 5.5 m high.

Time of Application	Pest or Disease	Material	Amount per Hectare	Amount per Acre	Pre-harvest Interval (days)	Precautions and Notes
PETAL FALL (Continued)	Brown Rot (Continued)	Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	
		Or propiconazole (Topas 250E or Mission 418 EC)	500 mL 300 mL	200 mL 120 mL	3	
	Leafrollers, Fruitworms	*Bacillus thuringiensis* (Dipel 2X DF or Bioprotec CAF)	1.675 kg 4.0 L	678 g 1.6 L	0	See pages 6-8 to 6-13. Will also control bud moth.
	Leafrollers, bud moth	Or spinosad (Success 480 SC or Entrust 80 W))	182 mL 109 g	74 mL 44 g	7	Do not apply more than 3 times per season.
SUMMER	Aphids	diazinon (Diazinon 50%	4.5 kg	1.8 kg	10	
	Peach tree borer	endosulfan (Thiodan 50 WP ☠ or Endosulfan 50 WP) ☠	See Notes	See Notes	15	Mix 1.5 kg/ 1000 L: apply to tree trunk and crotches when first moths are caught in pheromone traps. Repeat in 4 weeks. See page 6-17.
		Or Isomate-P (pheromone dispensers)	250-625	100-250	0	Apply before moth emergence. See page 6-17.
	Rust mites	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	
	McDaniel and two-spotted spider mites					Consult crop management Advisor.
	Leafhoppers	endosulfan (Endosulfan 50% WP ☠ or Thiodan 50% WP) ☠	3.25 kg	1.3 kg	15	
	Shothole borer					Cultural control. See page 6-22.
	Brown rot	boscalid (Lance 70% WDG)	370 g	150 g	0	Avoid more than 2 consecutive applications
		Or thiophanate-methyl (Senator 70% WP)	1.75 kg	710 g	1	May harm predatory mites. See page 6-13.
		Or captan 80% WP or WDG Or captan 75DG (Maestro)	3.5 kg 4.0 kg	1.4 kg 1.6 kg	2	
		Or iprodione (Rovral 50% WP)	1.5 kg	610 g	1	
		Or fenbuconazole (Indar 75 WSP)	140 g	57 g	1	
		Or propiconazole (Topas 250E or Mission 418 EC)	500 mL 300 mL	200 mL 120 mL	3	Do not apply more than twice to fruit.
		Or cyprodinil (Vangard 75 WG)	740 g	300 g	2	Do not apply more than twice to fruit.
	Leafrollers, bud moth	Spinosad (Success 480 SC or Entrust 80 W))	182 mL 109 mL	74 mL 44 g	7	Do not apply more than 3 times per season.

☠ CAUTION — Very Toxic

Spray Injury

When two or more chemicals are combined in the tank, they should be used promptly, otherwise injury to trees or decrease in effectiveness of the chemicals may result. This is especially true where emulsions and wettable powders are used together.

Tank mixes of emulsified concentrate (liquid) formulations and wettable powder formulations may cause injury. When using emulsified concentrates, always read the warnings on the manufacturer's label.

Spray injury may arise from a variety of causes. Improper operation of sprayers, excess dosage of chemicals, sudden weather change during or following spraying, sprays applied at low volume, or spraying during extremely hot periods, (32°C or higher) may cause either fruit or foliage injury.

NOTE: Always read the product label for precautions and limitations before mixing and applying.

Azinphos-methyl (Guthion, Sniper) ☠ — May cause defoliation on cherries; also bleached spots on Van fruit.

Calcium Chloride — Spray injury can occur. Note the following:

1. Compatible with wettable powder formulations of Basudin, Diazinon, dithiocarbamates, Thiodan ☠, Endosulfan ☠, Imidan, Guthion ☠, Sniper ☠, APM ☠, and with Zolone.
2. Do not mix with spray oils or emulsifiable concentrate formulations of pesticides.
3. Do not add spreaders, stickers or emulsifiers unless specific instructions for their use are given.
4. Sprays should be applied promptly and not left in the spray tank longer than necessary.
5. Not compatible with magnesium, zinc or other plant nutrient minerals.
6. Not compatible with captan, carbaryl (Sevin), dimethoate (Cygon, Lagon), thiophanate-methyl (Senator).

Captan — Do not apply captan or Maestro in combination with or immediately before or closely following oil sprays. Do not use with strongly alkaline materials such as spray lime, lime-sulphur, Bordeaux mixture or calcium chloride.

Copper — Copper applied to Anjous and apples may cause fruit russeting. A speckled russeting of Bartletts may occur when copper is applied under wet conditions.

Cyprodinil (Vangard) — May cause injury and defoliation to certain varieties of cherry, including Bing and Lapins. Avoid drift onto cherries. Clean Vangard residues from spray tanks before spraying cherries.

Diazinon (Basudin, Diazinon) — May cause an unsightly deposit on cherries if used as wettable powder. Do not use wettable powder on cherries within 30 days of harvest. Do not apply emulsifiable concentrates to cherries during very hot weather.

Dimethoate (Cygon, Lagon) — When painted on the trunk full strength may injure the bark of trees 3 years or younger. Lapins, Sam and Stella cherries are susceptible to leaf burning. Excessive dosage and poor spray application may cause leaf burning.

Dinitros — Do not apply or allow drift on peaches and apricots.

Dodine (Equal) —May cause russeting on Golden Delicious if applied under cool, wet conditions.

Dormant Oil — Dormant Oil must emulsify properly with water in the spray tank or phytotoxicity may result. Leaf and flower buds, terminal twigs or even whole branches may be killed due to lack of emulsification.

Use emulsifiable concentrate (EC) or flowable formulations of pesticides in oil, if possible. If wettable powder (WP) is to be used, add wettable powder or wettable powder slurry to tank when 1/4 to 1/2 full of water and mix thoroughly. Add the required amount of dormant oil under constant agitation.

Always test dormant oil before using. In a straight-sided glass jar, add 1 part of dormant oil to 10 parts of the water that will be used in the spray tank. Shake vigorously for 30 seconds and let stand for 3 minutes. If the oil and water separate so that clear oil is visible in the upper layer, return the oil to the supplier.

Apply only one oil spray per season on apples. Do not apply oils when temperatures are above 32°C or below 4°C, or when temperatures are likely to fall below freezing before the spray is dry.

☠ **CAUTION — Very Toxic**

Ferbam — If used after husk-fall on stone fruit, may make the fruit unmarketable owing to discolouration. Fall applications may injure peaches.

Kresoxim-methyl (Sovran) — Sovran may cause serious injury and defoliation to certain varieties of cherry, including Van and Sweetheart. Avoid drift onto cherries. Clean Sovran residues from spray tanks before spraying cherries.

Phosmet (Imidan) — Avoid drift onto apricots and cherries because of possible leaf injury and defoliation.

Iron Sprays — Sprays of 1 kg/1000L iron chelate applied by gun-sprayer have successfully controlled iron deficiency, but have sometimes caused blemishes on pears and cherries especially when applied during the heat of the day. Iron chelate sprays are most effective and least hazardous when applied by concentrate machine (550-850 L/ha). Do not spray to dripping, and apply early in the growing season. Iron sprays should be applied separately.

Lime-sulphur — May cause injury (leaf yellowing, browning and defoliation), particularly if applied in calyx or first cover spray without previous application in the pink spray. Lime-sulphur must not be applied to wet foliage. Do not apply to apricots. Do not apply during hot weather (over 27 °C).

Malathion — May cause injury to apricot or cherry foliage.

Oils — See special cautions below. Apply only one spray per year to apples.

Sulphur (wettable) — Though less likely to cause damage than lime-sulphur, may, under British Columbia Interior weather conditions, cause "burning" of foliage. Fruit "scald" may result if applied during very high temperatures. Do not exceed recommended dosages. Sulphur is phytotoxic to apricots and Anjou pears. Do not apply within 30 days of an oil spray. Jonagold fruit is more sensitive to sulphur injury than other varieties.

Use tree row volume (TRV) when spraying dwarf trees. Do not apply sulphur to Jonagold in hot weather or when hot weather is expected.

Special Cautions

The following chemicals should not be tank-mixed with oil and not used before or after oil within the time periods specified because of the danger of burning.

Dormant Period

Zinc sulphate — allow zinc to dry before applying oil.

15 mm Green to Tight-Cluster Period

Do not apply within 1 week of oil —Sulphur, or Lime-sulphur. Apply only one oil spray per year on apples.

16 Reference Tables

Pre-harvest Intervals

The Pest Management Regulatory Agency (PMRA) sets and monitors the Maximum Residue Levels (MRL) of pesticides registered in Canada for application to food crops. Dosages and practices recommended in this guide should not result in residues on fruit at harvest exceeding these MRLs. Similar spray-residue laws are in effect in other countries which import our fruit. In some countries the levels of spray residues allowed on fruit differ from Canadian tolerances. In such instances the requirements of the main importing country have sometimes been used if more restrictive than Canadian standards.

Growers are warned that fruit having residue levels in excess of allowable limits may be seized under the Food and Drug Act. Furthermore, fruit with too high a chemical residue indicates excessive dosages were used or that the minimum days between last spray and harvest were not observed. Consult the table for the minimum days required between last spray and harvest for pesticides as recommended in this guide. Application on unregistered pesticides can lead to prosecution under the Pest Control Products Act.

Visible spray residue will prevent the marketing of fruit even if the chemical residue is below tolerance. The following table lists the minimum number of days between the last spray and harvest (pre-harvest interval) for pesticides recommended in the Guide. See footnotes at the end of the table regarding number of applications per season and other precautions.

Pre-Harvest Intervals

Trade Name(s)	Active Ingredient	Apple	Apricot	Sweet Cherry	Sour Cherry	Peach	Pear	Plum Prune
Insecticides & Miticides								
Acramite	bifenazate	7[1]	X	X	X	X	X	X
Admire	imidacloprid	7[2]	X	10	10	X	X	X
Agri-Mek	abamectin	28[1]	X	X	X	X	28[1]	X
Ambush	permethrin	X	X	X	X	X	14	X
Apollo	clofentezine	21	X	X	X	21	21	X
Assail	acetamiprid	7	X	X	X	X	7	X
Belmark	fenvalerate	X	X	X	X	X	60	X
Bioprotec	*Bacillus thuringiensis*	0	0	0	0	0	0	0
Carzol ☠	formetanate hydrochloride[4]	1	X	X	X	21[1]	1	X
Confirm	tebufenozide[4]	14	X	X	X	X	14	X
Cygon	dimethoate[5]	28	X	21	21	X	14	X
Decis	deltamethrin	1[3]	X	X	X	1[1]	7[3]	X
Diazinon	diazinon	14	10	10	X	20	14	10
Dipel	*Bacillus thuringiensis*	0	0	0	0	0	0	0
Endosulfan ☠	endosulfan	15	15[2]	15[2]	X	15[2]	15	15[2]
Entrust	spinosad	7[3]	14[3]	7[4]	7[4]	14[3]	7[3]	7[3]
Envidor	spirodiclofen[1]	7	7	7	7	7	7	X
Foray	*Bacillus thuringiensis*	0	X	X	X	X	0	X
Guthion ☠	azinphos-methyl	14[8]	21	15	X	21	14	15
Imidan	phosmet	1	X	X	7	1	1	1
	(1 day for apples and pears sold in Canada)							
Intrepid	methoxyfenozide	14[2]	x	x	x	x	x	x
Kelthane	dicofol[1]	7	14	7	X	14[1]	7	7
Lagon	dimethoate[5]	28	X	21	21	X	14	X
Lime Sulphur	lime sulphur	X	X	X	X	1	1	dormant
Malathion	malathion	3	7	3	X	7	3	3
Matador	lambda-cyhalothrin	7[1]	7[1]	X	X	X	X	X
Mitac ☠	amitraz	X	X	X	X	X	14	X

Pre-Harvest Intervals Continued

Trade Name(s)	Active Ingredient	Apple	Apricot	Sweet Cherry	Sour Cherry	Peach	Pear	Plum Prune
Oils	oils	0	0	0	0	0	0	0
Pirimor	pirimicarb[1]	35[2]	X	X	X	60[1, 7]	X	X
		(Do not apply to apples for export to U.S.A.)						
Pyramite	pyridaben	25[2]	X	7[1]	7[1]	X	25[2]	X
Ripcord	cypermethrin	7	X	X	X	X	7	X
Safer's	soap	X	X	X	X	X	0	X
Sevin XLR Plus	carbaryl	11	5	2	X	2	11	2
Sniper ☠	azinphos methyl	14	21	15	X	21	14	15
Success	spinosad	7[3]	14[3]	7[4]	7[4]	14[3]	7[3]	7[3]
Thiodan ☠	endosulfan	15	15[2]	15[2]	X	15[2]	15	15[2]
Virosoft	granulovirus	0	X	X	X	X	X	X
Zolone	phosalone	30	X	14	14	30	30	30
Fungicides								
Aliette	fosetyl al	30[3]	X	X	X	X	X	X
Botran	dichloran	X	X	X	X	10	X	X
Bravo 500	chlorothalonil	X	X	40 [3,7]	40 [3,7]	60 [3,7]	X	X
Cabrio	pyraclostrobin	X	10	10	10	10	X	10
Captan	captan	7	2	2	5	2	7	2
Dithane DG	mancozeb[6]	45	X	X	X	X	X	X
Easout	thiophanate- methyl	1	X	1	1	1	X	1
Elevate	fenhexamid	X	X	1	1	1	X	X
Equal	dodine	7	X	X	X	X	7	X
Ferbam	ferbam	7	21	4	X	21	7	7
Fixed copper	copper oxychloride	See label for timing. Not registered on sweet cherry.						
Flint	trifloxystrobin	14	X	X	X	X	14	X
Funginex	triforine	Peaches, cherries, prunes, plums; do not apply after blossom.						
Indar	fenbuconazole	X	1	1	1	1	X	1
Kumulus DF	sulphur	1	X	1	X	0	1	X
Lance	boscalid	X	0	0	0	0	X	0
lime-sulphur	lime-sulphur	n/a	X	dormant	X	1	1	dormant
Maestro	captan	7	2	2	5	2	7	2
Manzate 200 DF	mancozeb[6]	45	X	X	X	X	X	X
Mission 418EC	propiconazole	X	3	3	3	3	X	3
Nova	myclobutanil	14	X	1	1	1	X	X
Nustar	flusilazole	77	X	X	X	X	X	X
Polyram	metiram[6]	45	X	X	X	X	X	X
Ridomil	metalaxyl	Use only on non-bearing apple trees.						
Rovral	iprodione	X	1	1	1	1	X	1
Scala	pyrimethanil	72	X	X	X	X	72	X
Senator	thiophanate- methyl	1	X	1	1	1	X	1
Sovran	kresoxim-methyl	30	X	X	X	X	30	X
Streptomycin	streptomycin	50	X	X	X	X	30	X
Topas	propiconazole	X	3	3	3	3	X	3
Vangard	cyprodinil	72	2	X	X	2	X	2
Ziram	ziram	1	Peaches, apricots do not apply after husk-fall stage.					
Herbicides								
Amitrol -T	amitrol	30	X	X	X	X	X	X
Dual[1]	metolachlor	apple, apricot, cherry, pear, plum: apply in spring only						
Ignite	glufosinate	40	X	40	40	40	40	40
Laredo	glyphosate	30	X	30	X	30	30	30
Poast	sethoxydim	30	X	X	X	30	30	X
Prowl 400[1]	pendimethalin	apple, peach, cherry, apricot: apply in spring only						
Roundup	glyphosate	30	X	30	X	30	30	30
Touchdown	glyphosate	30	X	30	30	30	30	30
Wrangler	glyphosate	30	X	30	X	30	30	30
Growth Regulators								
Activol	gibberellic acid	X	X	21	21	X	X	X
Apogee	prohexadione calcium	45	X	X	X	X	X	X
Fruit-Fix	NAA	5	X	X	X	X	X	X
Fruitone N	NAA	5	X	X	X	X	X	X

[1] Apply only once per season.
[2] Do not apply more than twice per season.
[3] Do not apply more than three times per season.
[4] Do not apply more than four times per season.
[5] Preharvest interval of 14 days for apples sold in Canada.
[6] Some packing houses may require a longer pre-harvest interval for EBDC fungicides (Manzate, Dithane, Dikar, Polyram).
[7] Do not apply after husk fall.
[8] 21 days if last application is more than 2.24 kg/ha.
[x] Not registered or not recommended.

Relative Toxicities and Re-Entry Intervals of Pesticides

Pesticides can be toxic to humans. The degree of toxicity (LD_{50}) is determined by feeding (oral LD_{50}) or applying to skin (dermal LD_{50}) the active ingredient to rats and rabbits. The lower the LD_{50} , the more poisonous the pesticide active ingredient. Pesticides are rated as to their toxicity by their LD_{50} values.

V = Very toxic **M** = Moderately Toxic **S** = Slightly Toxic

Check product Material Safety Data Sheets (MSDS's) available upon request from chemical suppliers for specific LD_{50} values.

Toxicity	Oral LD_{50}	Dermal LD_{50}
Very Toxic	0 to 50	0 to 200
Moderately toxic	51 to 500	201 to 1,000
Slightly toxic	over 500	over 1,000

Re-Entry Intervals

The re-entry intervals listed in the tables below indicate the number of hours (h) or days that you or your workers must wait after spraying before the treated block can be entered without wearing personal protective equipment. Some pesticide labels indicate a re-entry period or a range of re-entry periods for different activities. WCB regulations also apply to many farms, and require 24 hours for slightly toxic pesticides and 48 hours for moderately or very toxic pesticides before re-entry regardless of activity. The following tables list both the label and WCB re-entry periods. Refer to product labels for more detail, including personal protective equipment needed to enter treated blocks before the re-entry interval is over. **Use the re-entry period on the label if it is longer than the WCB requirements.**

FUNGICIDES							
Trade Name	Common Name	Oral Toxicity	Dermal Toxicity	Re-entry Interval (Label)[2]	Re-entry Interval (WCB)	Applicator Certificate Required by	
						Environment	WCB
Aliette	fosetyl al	S	S	dry[1]	24 h	no	no
Botran	dichloran	S	S		24 h	no	no
Bravo	chlorothalonil	S	S	48 h	48 h	no	no
Cabrio	pyraclostrobin	S	S	dry[1] - 10 days[4]	48 h	no	no
Captan	captan	S	S		24 h	no	no
Dikar	mancozeb + dinocap	S	S	48 h	24 h	no	no
Dithane DG	mancozeb	S	S		24 h	no	no
Dithane M45	mancozeb	S	S		24 h	no	no
Elevate	fenhexamid	S	S	4 h	24 h	no	no
ferbam	ferbam	S	S		24 h	no	no
fixed copper	fixed copper	M	S		48 h	no	yes
Flint	trifloxystrobin	S	S	12 h – 4 days	24 h	no	no
Funginex	triforine	S	S		24 h	no	no
Indar	fenbuconazole	S	S	12 h	24 h	no	no
Kumulus DF	wettable sulphur	S	S		24 h	no	no
Lance	boscalid	S	S	4 h	24 h	no	no
lime sulphur	lime sulphur	S	S		24 h	no	no
Manzate 200	mancozeb	S	S		24 h	no	no
Nova	myclobutanil	S	S	dry[1]	24 h	no	no
Nustar	flusilazole	S	S	12 h	24 h	no	no
Polyram	metiram	S	S		24 h	no	no
Ridomil	metalaxyl	S	S		24 h	no	no
Rovral	iprodione	S	S		24 h	no	no
Scala	Pyrimethanil	S	S	24 h	24 h	No	no
streptomycin	streptomycin	S	S	24 h -14 days[3]	24 h	no	no
Senator	thiophanate-methyl	S	S		24 h	no	no
Sovran	kresoxim-methyl	S	S	7 days	24 h	no	no
Topas	propiconazole	S	S	3 days	24 h	no	no
Vangard	cyprodinil	S	S	3 days	24 h	no	no
ziram	ziram	S	S		24 h	no	no

[1] Workers should not enter treated areas until the residues have dried

[2] A blank square indicates there is no re-entry period indicated on the product label

[3] No re-entry within 24 hours. No contact with treated plants within 7 days without protective equipment. No hand thinning for 14 days.

[4] No re-entry until residues have dried. No hand harvesting, thinning or pruning for 10 days.

HERBICIDES – REGULATORS/THINNERS – RODENTICIDES/REPELLENTS

Trade Name	Common Name	Oral Toxicity	Dermal Toxicity	Re-entry Interval (Label)[2]	Re-entry Interval (WCB)	Applicator Certificate Required by	
						Environment	WCB
Herbicides							
Basagran	bentazon	S	S		24 h	no	no
Casoron	dichlobenil	S	S		24 h	no	no
Dual	metolachlor	S	S	12 h	24 h	no	no
Gramoxone ☠	paraquat	M	M	24 h	48 h	no	yes
Ignite	glufosinate	S	S		24 h	no	no
Laredo	glyphosate	S	S		24 h	no	no
Lexone	metribuzin	S	S		24 h	no	no
Lontrel	clopyralid	S	S		24 h	no	no
Poast	sethoxydim	S	S		24 h	no	no
Princep	simazine	S	S		24 h	no	no
Prowl 400	pendimethalin	S	S		24 h	no	no
Round-up	glyphosate	S	S	12 h	24 h	no	no
Sencor	metribuzin	S	S		24 h	no	no
Sinbar	terbacil	S	S		24 h	no	no
Terraklene ☠	paraquat plus simazine	M	M		48 h	no	yes
Touchdown	glyphosate	S	S		24 h	no	no
Venture 25G or L	fluazifop-p-butyl	S	S		24 h	no	no
Wrangler	glyphosate	S	S		24 h	no	no
Growth Regulators and Spray Thinners							
Accel	gibberellins + benazladenine	S	S		24 h	no	no
Activol	gibberellic acid	S	S		24 h	no	no
Amid Thin	napthalene acetamide	S	S		24 h	no	no
Apogee	prohexadione ca	S	S	12 h	24 h	no	no
Ethrel	ethephon	S	S		24 h	no	no
Fruit Fix	NAA	S	S		24 h	no	no
Fruitone N	NAA	S	S		24 h	no	no
NAA	NAA	S	S		24 h	no	no
Rodenticides and Deer Repellents							
Deer-Away	putrescent egg solids	S	S		24 h	no	no
Gopher Getter ☠	strychnine	V			48 h	yes	yes
Ground Force ☠	chlorophacinone	V			48 h	no	yes
Ramik Brown ☠	diphacinone	V	V		48 h	no	yes
ZP ☠	zinc phosphide	V	S		48 h	no	yes
Rodent Bait ☠	zinc phosphide	V	S		48 h	no	yes
Rodent Pellets ☠	zinc phosphide	V	S		48 h	no	yes
Rozol ☠	chlorophacinone	V			48 h	no	yes
Tree Guard	denatonium benzoate	S	S	dry[1]	24 h	no	no

[1] Workers should not enter treated areas until the residues have dried

INSECTICIDES

Trade Name	Common Name	Oral Toxicity	Dermal Toxicity	Re-entry Interval (Label)[2]	Re-entry Interval (WCB)	Applicator Certificate Required by	
						Environment	WCB
Acramite	bifenazate	S	S	12 h	24 h	No	no
Admire	imidacloprid	M	S	24 h	48 h	no	yes
Agri-Mek	abamectin	V	S	dry[1]	48 h	no	yes
Ambush	permethrin	S	S	dry[1]	24 h	no	no
APM 50 ☠	azinphos-methyl	V	V	2 – 15 days	48 h	yes	yes
Apollo	clofentezine	S	S		24 h	no	no
Assail	acetamiprid	S	S	12 h	24 h	no	no
Basudin	diazinon	M	S	24 h	48 h	no	yes
Belmark	fenvalerate	M	S	dry[1]	48 h	no	yes
Bioprotec	*Bacillus thuringiensis*	S	S	0	24 h	no	no
Carzol ☠	formetanate hydrochloride	V	S		48 h	no	yes
Confirm	tebufenozide	S	S		24 h	no	no
Cygon	dimethoate	M	M		48 h	no	yes
Cymbush	cypermethrin	M	S		48 h	no	yes
Diazinon	diazinon	M	S	24 h	48 h	no	yes
Dipel	*Bacillus thuringiensis*	S	S	0	24 h	no	no
Decis	deltamethrin	M	S		48 h	no	yes
Endosulfan ☠	endosulfan	V	M		48 h	no	yes
Entrust	spinosad	S	S		24 h	no	no
Envidor	spirodiclofen	S	S	12 h	24 h	no	no
Foray 48B	*Bacillus thuringiensis*	S	S	0	24 h	no	no
Guthion ☠	azinphos-methyl	V	V	2 - 14 days	48 h	yes	yes
Imidan	phosmet	M	S		48 h	no	yes
Intrepid	methoxy-phenozide	S	S	dry[1]	24 h	no	no
Lagon	dimethoate	M	M		48 h	no	yes
Malathion	malathion	S	S		24 h	no	no
Matador	cyhalothrin-lambda	M	S	24 h	48 h	no	yes
Mitac ☠	amitraz	S	S		24 h	yes	yes
Morestan	chinomethionat	S	S		24 h	no	no
Pirimor	pirimicarb	M	M		48 h	no	yes
Pounce	permethrin	S	S	dry[1]	24 h	no	no
Pyramite	pyridaben	S	S	24 h	24 h	no	no
Ripcord	cypermethrin	M	S		48 h	no	yes
Sevin	carbaryl	M	S		48 h	no	yes
Sniper ☠	azinphos-methyl	V	V	2 – 15 days	48 h	yes	yes
Success	spinosad	S	S		24 h	no	no
Thiodan ☠	endosulfan	V	M		48 h	no	yes
Virosoft	virus	S	S	4 h	24 h	no	no
Zolone	phosalone	M	S	24 h	48 h	no	yes

[1] Workers should not enter treated areas until the residues have dried

[2] A blank square indicates there is no re-entry period indicated on the product label

Chemical Classification and Environmental Impact Rating of Pesticides

For the pesticide products recommended in this Guide, the following table lists the Trade Names, Chemical Names, Chemical Family and Chemical Group Number as well as the Environmental Impact Quotient (EIQ) rating for each pesticide. The column titled Notes indicates those chemicals for which resistance (R) is present in one or more pest populations (insect, mite, plant disease, or weed) in the Interior fruit-growing areas.

Pesticide Resistance Management

The Pest Management Regulatory Agency (PMRA) developed a numerical classification system for fungicides, herbicides and insecticides/miticides based on their primary site of action. The complete list is available at http://www.hc-sc.gc.ca/pmra-arla/english/pdf/dir/dir9906-e.pdf. Use these Chemical Group numbers or letters to select pesticides as part of a pesticide resistance management program. Do not repeat the use pesticides with the same Group Number as this practice will select for resistant individuals or strains within a population. Pest resistance to one product within a class or number group with a single site of action will lead to resistance to all products within that class or group. Also refer to the tables on *Relative Toxicity of Pesticides* and on *Relative Toxicity Rating of Insecticides and Miticides to Common Beneficial Mites and Insects* for additional information on the pesticide(s) of interest.

Environmental Impact Quotient (EIQ)

The EIQ value is based on eight environmental parameters: the effect of pesticides on applicators, pickers, consumers, groundwater, fish, birds, bees and beneficial insects and mites (Kovach et al, Cornell University, NY, 1992). For more detailed information on the rating of the pesticides for each parameter, consult the table posted at http://www.nysipm.cornell.edu/publications/EIQ.html (New York Integrated Pest Management Program) from which the EIQ values were obtained for the table below.

The Field EIQ Rating gives a range of values that show the comparative environmental impact of the pesticides when applied following the recommended rates in this Guide. The Field EIQ Rating = EIQ x % active ingredient x rate/ha (L or kg) x the number of applications. The total Field EIQ Rating for a given pest management program is the total of the Field EIQ Ratings of the pesticides used.

Product Trade Name	Chemical Name	Chemical Class (Group Number)	EIQ	Field Rates (ha)	Field EIQ Rating	Notes
Insecticides/ Miticide						
Acramite 50 WS	bifenazate	Carbazate **(25)**	14.8	568 – 851 g	4.2 – 6.3	
Admire 240 FL	imidacloprid	Chloronicotine **(4)**	34.9	200 – 380 mL	1.7 – 3.2	
Agri-Mek 1.9 EC	abamectin	Avermectin **(6)**	38	750 – 1500 mL	0.5 - 1	
Apollo SC	clofentezine	Tetrazine **(7)**	26.3	300 – 600 mL	4 - 8	
Assail 70 WP	acetamiprid	Chloronicotine **(4)**				
Bioprotec CAF	*Bacillus thuringiensis*	Bt **(11)**	7.9	4 L	0.4	
Carzol 92S	formetanate hydrochloride	Carbamate **(1A)**	21.5	1.1 kg	21	
Confirm 240F	tebufenozide	Benzoic acid hydrazide **18)**	17.8	1 L	17	R
Cygon 480 EC	dimethoate	Organophosphate **(1B)**	74.0	2.25 – 4.25 L	80 – 151	
Decis FL	deltamethrin	Pyrethroid **(3)**	25.7	200 mL	0.26	
Diazinon 50 W	diazinon	Organophosphate **(1B)**	43.4	2.25 – 5.5 kg	48.8 - 119.4	R
Dipel 2X DF	*Bacillus thuringiensis*	Bt **(11)**	7.9	1.675 kg	0.4	
Endosulfan 50 WP☠	endosulfan	Cyclodiene **(2A)**	42.1	3.25 kg	68.4	
Envidor 240 SC	spirodiclofen	Tetronic acid **(23)**	-	750 mL	-	
Foray 48BA	*Bacillus thuringiensis*	Bt **(11)**	7.9	4 L	0.4	
Guthion 50 WP☠	azinphos-methyl	Organophosphate **(1B)**	44.9	1.4 – 2.75 kg	31.4 – 61.7	R
Imidan 50 WP	phosmet	Organophosphate **(1B)**	23.9	3.25 – 6.0 kg	39 – 72	
Intrepid 240F	methoxyfenozide	Benzoic acid hydrazide **(18)**	33.4	0.75 – 1 L	12 – 16	R
Insecticidal Soap	fatty acids	Soap	19.5	20– 50 L/1000L	166 – 197	
Kelthane 35 WP	dicofol	Diphenylethane **(3)**	29.9	4.4 kg	45 – 95	R
Lagon 480 EC	dimethoate	Organophosphate **(1B)**	74.0	2.25 – 4.25 L	80 – 151	
Malathion 50 EC	malathion	Organophosphate **(1B)**	23.2	5.5 L	64	
Mitac 50 WP ☠	amitraz	Triazapentadiene **(19)**	23.3	1.65 – 3.35 kg	19.2 - 39	
Pirimor 50 DF	pirimicarb	Carbamate **(1A)**	16.7	560 g	4.7	
Pyramite 75 WP	pyridaben	Pyridazinone **(21)**	25.8	200 – 720 g	3.9 – 13.9	
Sevin XLR Plus	carbaryl	Carbamate **(1A)**	21.7	2.3 – 4.5 L	22 – 43.2	
Sniper 50 WP☠	azinphos-methyl	Organophosphate **(1B)**	44.9	1.4 – 2.75 kg	31.4 – 61.7	R
Success 480 SC	spinosad	Spinosyn **(5)**	17.7	182 mL	1.5	
Surround	Kaolin clay	inorganic	8.0			
Thiodan 50 WP☠	endosulfan	Cyclodiene **(2A)**	42.1	3.25 kg	68.4	
Virosoft CP4		granulovirus	-	250 mL		
Zolone F500	phosalone	Organophosphate **(1B)**	24.4	2 L	24	

Product Trade Name	Chemical Name	Chemical Class (Group Number)	EIQ	Field Rates (ha)	Field EIQ Rating	Notes
Fungicides						
Aliette 80% WDG	fosetyl al	Organo-tin **(U)**	11.3	5 kg	45.2	
Botran 75% WP	dichloran	Chlorophenyl **(14)**	35.9	5.0 kg	135	
Bravo 40.4%	chlorothalonil	Chloronitrile **(M)**	40.1	5.0 - 9.0 L	81- 145.8	
Cabrio 20%	pyraclostrobin	Strobilurin **(11)**		0.67 g		
Captan 80%	captan	Phthalimide **(M)**	15.8	1.8 - 3.75 kg	22.8 – 47.4	
Copper oxychloride (fixed copper)	copper oxychloride	Inorganic copper **(M)**		2 – 9 kg		
Copper sulphate 53%	copper sulphate	Inorganic copper **(M)**	47.8	1.0 - 4.0 kg	25 - 101	
Dithane 75% DG	mancozeb	Dithiocarbamate **(M)**	14.6	3.0 - 6.0 kg	32.9 – 65.7	
Elevate 50%	fenhexamid	Hydroxyanilide **(17)**	11.7	1.7 kg	9.9	
Equal 65%	dodine	Guanidine **(M)**	34.9	3.25 kg	74	R
Ferbam 76%	ferbam	Dithiocarbamate **(M)**	28.8	5.0 - 6.75 kg	109 - 148	
Flint 50%	Trifloxystrobin	Strobilurin **(11)**	30.9	140 – 210 g	2.1 – 3.2	
Funginex 190 g/L	triforine	Piperazine **(3)**	41.2	2.5 L	19.6	
Indar 75%	fenbuconazole	Triazole **(3)**		140 g		
Kumulus 80% DF	sulphur	Inorganic sulphur **(M)**	45.5	7.0 kg	255	
Lance 70%	boscalid	Anilide **(7)**		370 g		
Lime-sulphur 22%	sulphur	Inorganic sulphur **(M)**		22 – 175 L		
Maestro 75% DF	captan	Phthalimide **(M)**	15.8	2.0 kg - 4.0 kg	23.7 – 47.4	
Manzate 200 75% DF	mancozeb	Dithiocarbamate **(M)**	14.6	3.0 – 6.0 kg	32.9 – 65.7	
Nova 40% W	myclobutanil	Triazole **(3)**	33	340 g	4.5	
Nustar 20% DF	flusilazole	Triazole **(3)**	32.9	100 g	0.7	
Polyram 80 DF	metiram	Dithiocarbamate **(M)**	40	3.0 – 6.0 kg	96 - 192	
Ridomil 240 g/L	metalaxyl	Acylamine **(4)**	29.2	0.25 mL/tree	0.03/tree	
Rovral 50% WP	iprodione	Dicarboximide **(2)**	11	0.84 – 1.75 kg	4.6 – 9.6	
Senator 70% WP	thiophanate-methyl	Benzimidazole **(1)**	20.7	1.75 - 2.25 kg	25.4 – 32.6	R
Sovran 50% WG	kresoxim-methyl	Strobilurin **(11)**	11.7	240 - 360 g	1.4 – 2.1	
Streptomycin 18.7%	streptomycin	Antibiotic **(18)**	18.7	2.0 kg	6	R
Topas 25%	propiconazole	Triazole **(3)**	27.5	500 mL	3.4	
Vangard 75%	cyprodinil	Anilinopyrimidine **(9)**	21.9	370 g – 740 g	6.2 – 12.5	
Wettable sulphur 92%	Sulphur	Inorganic sulphur **(M)**	45.5	7.0 kg	293	
Zineb 85%	zineb	Dithiocarbamate **(U)**	44.0	1.25 kg	44	
Ziram 85%	ziram	Dithiocarbamate **(U)**	25.8	5.0 kg	109.7	
Herbicides						
2,4-D Amine 600	2,4-D	Phenoxy **(4)**	56.3	1.7 L	45	
Amitrole – T	amitrole	Triazole **(11)**	19.0	11 – 17 L	48 – 75	
Basagran Forte	bentazon	Benzothiadiazole **(6)**	20.3	2.25 L	22	
Casoron 4G	dichlobenil	Nitrile **(20)**	20.8	110 – 175 kg	915 - 1456	
Devrinol 50 WP	napropamide	Amide **(15)**	12.6	9 kg	56.7	
Dual Magnum	metolachlor	Acetanilide **(15)**	22	1.25 – 1.75 L	27 – 37.7	
Venture 25G	fluazifop-p-butyl	Oxy-phenoxy-acid ester **(1)**	44.0	1 – 2 L	5 – 10	
Gramoxone☠	paraquat	Bipyridyllum **(22)**	31	5.5 L	34.1	
Ignite	glufosinate	Phosphorylated amino acid **(10)**	28.25	3 – 5 L	12.7 – 21	
Kerb 50W	propyzamide	Amide **(15)**	36.0	4.5 kg	81	
Laredo	glyphosate	Phosphanoglycine **(9)**	15.3	2.25 – 12 L	12.7 – 64.7	
Lexone 750 DF	metribuzin	Triazine **(5)**	28.4	1 kg	21.3	
Lontrel	clopyralid	Picolinic acid **(4)**	18.1	0.56 L	3.5	
Poast Ultra	sethoxydim	Cyclohexanone **(1)**	27.5	0.3 – 2.7 L	4 – 33	
Princep Nine-T	simazine	Triazine **(5)**	15.7	1.1 – 3.5 kg	16 – 48	R
Prowl 400	pendimethalin	Dinitroaniline **(3)**	29.7	4.2 – 4.8 L	50 – 57	
Roundup	glyphosate	Phosphanoglycine **(9)**	15.3	2.25 – 12 L	12.7 – 64.7	
Simadex 500	simazine	Triazine **(5)**	15.7	2 – 6 L	16 – 32	R
Simazine 80W	simazine	Triazine **(5)**	15.7	1.25 – 4.0 L	16 – 48	R
Sinbar 80W	terbacil	Uracil **(5)**	16.8	0.6 – 3.0 kg	20 – 40	
Touchdown	glyphosate	Phosphanoglycine **(9)**	15.3	2.25 – 12 L	12.7 – 64.7	
Venture	fluazifop-p-butyl	Oxy-phenoxy-acid ester **(1)**	44.0	1 – 2 L	4.4 – 8.8	
Wrangler	glyphosate	Phosphanoglycine **(9)**	15.3	2.25 – 12 L	12.7 – 64.7	

U = unknown site of action M = multi-site action

Pesticide Sprays and Water pH

The pH of water can adversely affect the performance of some pesticides if the spray mixture soon after mixing. Leaving the spray mixture in the tank overnight or for the day due to inclement weather can result in some pesticides breaking down. The result is less chemical applied and less control than expected.

pH is the measure of acidity or alkalinity of solutions. A scale of 0-14 is used to indicate whether the solution is neutral (7), acidic (0 – 6) or alkaline (8 – 14). Most pesticides break down faster in alkaline water, and, conversely, are most effective when mixed in acidic water. This break down is caused by a reaction called alkaline hydrolysis and this reaction is affected by pH. In most cases the pesticide is broken down to non-toxic forms. pH affects many organophosphate and carbamate insecticides. The table below lists some pesticides for which information is available on their sensitivity to water pH. The half-life values may not be valid when two or more pesticides are mixed.

Check the pH of the spray water frequently from any water source throughout the season. Use indicator paper or a pH meter to check water pH. If tank mixing another pesticide or nutrient product, check the pH after the products have been thoroughly mixed and adjust pH accordingly. Sprays containing lime or lime sulphur and fixed-copper fungicides should not be acidified. Algae can change water pH as well as pH of water from reservoirs can change over time.

Always read the label for any precautions with respect to alkaline water. **Apply pesticides soon after mixing in the spray tank and avoid mixed pesticides left in the spray tank overnight.**

PRODUCT	Optimum pH	Half Life/ Time for 50% Hydrolysis (Breakdown)
Insecticides		
Acramite	<7	pH 9 = 2 h; pH 7 = 20 h; pH 5 = 5.5 days
Admire	7.5	Greater than 31 days at pH 5 - 9
Agri-Mek	6 - 7	Stable at pH 4 – 7.5
Apollo		pH 7 = 34 hrs; pH 9.2 = 4.8 hrs
Assail	5 - 6	Unstable below 4 and above 7
Avaunt		Stable for 3 days at pH 5 – 10
Carzol	5	Not stable in alkaline water; use within 4 hours of mixing.
Cygon	5	pH 9 = 48 min; pH 6 = 12 hrs; pH 4.5 = 20 hrs
Decis		no data
Diazinon	7	pH 5 = 2 wks; pH 7 = 10 wks; pH 8 = 3 wks; pH 9 = 29 days
Dipel	6	Unstable in pH above 8
Endosulfan		70% loss after 7 days at pH 7.3 – 8
Entrust	7	Stable at pH 6 - 9
Foray 48B	6	Unstable above pH 8
Guthion		pH 9 = 12 hrs; pH 7 = 10 days; pH 5 = 17 days
Imidan	5	pH 8 = 4 hrs; pH 7 < 12 hrs; pH 5 = 7 days
Kelthane	5.5	pH 9 = 1hr; pH 7 = 5 days; pH 5 = 20 days
Lagon	5	pH 9 = 48 min; pH 6 = 12 hrs; pH 4.5 = 20 hrs.
Malathion	5	pH 9 = 5 hrs; pH 8 = 19 hrs; pH 8 = 3 days; pH 6 = 8 days
Matador	6.5	Stable pH 5 – 9
Mitac	5	pH 9 = 1.5hrs; pH 7 = 15hrs; pH 5 = 35 hrs
Pyramite		Stable at pH 4 – 9
Sevin XLR	7	pH9 = 24 hrs; pH 8 = 2-3 days; pH7 = 24 days; pH6 = 100 days.
Sniper		See Guthion
Success	7	Stable at pH 6 – 9
Thiodan	6.5	70% loss after 7 days at pH 7.3 to 8
Zolone	6	pH 9 = 9 days; stable pH 5 – 7
Fungicides		
Aliette	6	Stable at pH 4.0 to 8.0
Bravo 500	6 - 7	Stable over wide range of pH
Captan	5	pH 8 = 10 min; pH 7 = 8 hrs; pH 5 = 32 hrs.
Dithane DG	6	Most stable at pH 5.5 to 6; pH 5 – 9 = 1- 2 days.
Elevate	5.5 – 6.5	
Equal		Incompatible with calcium products.
Funginex	7	Stable to pH 10 or 11
Ridomil		pH 5 – 9 = more than 4 weeks.
Rovral		Chemical breakdown could take place in high pH.
Senator		Do not combine with products that are high alkaline.
Topas		Stable from pH 5 – 9
Herbicides		
Devrinol	5.5 - 7	
Gramoxone		Not stable in pH above 7
Ignite	5.5	
Laredo	5.5	
Poast	7	Stable in pH 4.0to 10
Princep	5 – 7	pH 4.5 = 20 days; pH 5 = 90 days; pH 9 = 24 days
Prowl		Stable from pH 5 - 10
Roundup	5	
Touchdown	5 - 7.5	
Wrangler	5 - 6	

Relative Toxicity Rating of Insecticides and Miticides to Common Beneficial Mites and Insects*

Beneficial insects and mites provide biological control of several important pests of tree fruits such as European red mite, rust mites, spider mites, aphids, tentiform leafminer, apple mealybug, pear psylla and leafrollers. The preservation of native biological control agents is an essential component of IPM programs designed to keep mites, pear psylla and leafminer below damaging levels. Unfortunately some of the pesticides used in orchards can be harmful to these beneficial organisms, either through direct contact with the sprays or with the moist spray residues. In most cases pesticides are not harmful to beneficials once the residues are dry. Some pesticides will eliminate beneficials while others will reduce their numbers (suppress), allowing their populations to rebound in the absence of further disruptive sprays. To take full advantage of the biological control services provided by these beneficial insects and mites, growers should become familiar with the identity of the beneficials, their life cycles, and know what pesticides are harmful to them.

The table below lists the toxicity (L = low; M = moderate; H = high) of some pesticides to some common beneficial insects and mites. Use this table to select the product(s) least toxic to the beneficials 'working' in your orchard. These ratings are a guide only – individual populations of beneficials can vary in their susceptibility due to exposure history to the pesticides.

Control Product	Rate/ha	Western Predatory Mite	Leafminer Parasitoid (*Pnigalio Flavipes*)	Leafroller Parasitoid (*Colpoclypeus florus*)	Ladybugs	Lacewings	Mullein Bug (*Campylomma verbasci*)	*Deraeocoris brevis*	Pirate bugs
Acramite	0.5 – 0.8 kg	L	-	-	-	-	-	-	-
Admire 240 F	0.2 – 0.5 L	L	L	M	L - M	L	M – H	-	-
Agri-Mek	0.7 – 1.5 L	H	L	M	M	-	M	-	-
Apollo SC	0.3 – 0.6 L	L	L	L	L	L	L	L	L
Assail 70 WP	80 – 240 g	L - M							
Bioprotec CAF	2.7 – 5.4 L	L	L	L	L	L	L	L	L
Carzol 92S	1.7 kg	M – H	-	H	L	-	-	-	-
Confirm 240 F	1.3 L	L	L	L	L	L	L	L	L
Diazinon 50 W	4.5 kg	L	-	H	H	-	H	-	-
Dimethoate 2.7	5.4 L	L – M	-	H	H	-	-	-	-
Dipel 2X DF	1.675 kg	L	L	L	L	L	L	L	L
Foray 48BA	4.0 L	L	L	L	L	L	L	L	L
Guthion 50 W	2.2 kg	L	L	H	H	M - H	M - H	M - H	L - M
Imidan 70 WP	3.4-6 kg	L	L	H	H	L	L - M	L - M-	L
Intrepid	0.5 – 1 kg	L	L	L	-	-	-	-	-
Mitac	3.4 kg	H	-	M - H	L	L	L	M	L - M
Pyramite 75 W	0.2-0.4 kg	L – M	-	-	-	-	-	-	-
Sevin 50 WP	2.2 kg	M – H	L	H	H	L	-	-	-
Success 2 L	0.4-0.7 L	L	M - H	M - H	L	L	L	L	L
Thiodan 50 W	3.4 kg	L	M	M	M – H	L - M	M - H	M - H	M - H

* This table is compiled from published references and reports from local crop/pest management specialists.

Relationship Between Fruit Size and Shipping Container Counts

CHERRIES		
Row size	**Imperial**	**Metric**
13	13/64”	20.6 mm
12	54/64”	21.4 mm
11.5	57/64”	22.6 mm
11	61/64”	24.2 mm
10.5	1”	25.4 mm
10	1-3/64”	26.6 mm
9.6	1-7/64”	28.2 mm
9	1-11/64”	29.8 mm

PEACHES & APRICOTS		
Row size	**Imperial**	**Metric**
30	3-5/16”	85.3 mm
36	3-1/8”	80.7 mm
42	2-15/16”	75.5 mm
48	2-13/16”	71.3 mm
50	2-3/4”	70.2 mm
54	2-11/16”	69.0 mm
56	2-5/8”	66.5 mm
60	2-5/8”	66.5 mm
66	2-9/16”	65.5 mm
72	2-7/16”	62.5 mm
80	2-5/16”	58.8 mm
84	2-3/16”	55.6 mm

PEARS				
Count	**Bartlett**		**Anjou**	
	Imperial	**Metric**	**Imperial**	**Metric**
80	3”	76.2 mm	2-15/16”	74.6 mm
90	2-15/16”	74.6 mm	2-7/8”	73.0 mm
100	2-7/8”	73.0 mm	2-13/16”	71.1 mm
105	2-27/32”	72.0 mm		
110	2-13/16”	71.1 mm	2-3/4”	69.9 mm
120	2-3/4”	69.9 mm	2-11/16”	67.9 mm
135	2-5/8”	66.7 mm	2-9/16”	64.8 mm
150	2-1/2”	63.5 mm	2-1/2”	63.5 mm
165	2-3/8”	60.3 mm	2-7/16”	61.6 mm
180	2-5/16”	58.7 mm	2-3/6”	58.7 mm

APPLES				
Count	**Golden and Red Delicious**		**All Other Varieties**	
	Imperial	**Metric**	**Imperial**	**Metric**
48	3-3/4”	95.3 mm	3-3/4”	95.3 mm
56	3-5/8”	92.1 mm	3-5/8”	92.1 mm
64	3-1/2”	88.9 mm	3-1/2”	88.9 mm
72	3-3/8”	85.7 mm	3-7/16”	86.9 mm
80	3-1/4”	82.6 mm	3-3/8”	85.7 mm
88	3-1/8”	79.4 mm	3-1/4”	82.6 mm
100	3”	76.2 mm	3-1/16”	77.4 mm
113	2-7/8”	73.0 mm	2-15/16”	74.6 mm
125	2-13/16”	71.1 mm	2-7/8”	73.0 mm
138	2-3/4”	69.9 mm	2-3/4”	69.9 mm
150	2-11/16”	67.9 mm	2-5/8”	66.7 mm
163	2-9/16”	64.8 mm	2-9/16”	64.8 mm
175	2-1/2”	63.5 mm	2-1/2”	63.5 mm
198	2-3/8”	60.3 mm	2-3/8”	60.3 mm