



# 1983 Missouri Commercial Peach Spray Schedule

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These recommendations are intended to serve as guidelines for commercial peach growers in Missouri. The pesticides and application rates listed for any given pest problem are based on their effectiveness, economy, safety and general integration into control programs for other pests present at or about the same time. The choice of which chemicals to use, when to use them, and how they are applied must be made by individual growers relative to their own experience, equipment, and special problems associated with their orchards. The effective and efficient use of all pesticides requires careful selection of the most appropriate material and the rate required, critical timing of the application(s), and uniform, thorough coverage of the trees.

## PESTICIDE SAFETY

Responsible use of pesticides also includes their safe storage and handling. Most pesticides are poisonous to people and animals. Handle them with care. Store them only in their original, labeled containers in a dry, locked location out of the reach of children and animals.

READ THE LABEL! Understand it. Know the toxicity of the material you are using and wear the appropriate protective clothing. The greatest hazard with most pesticides occurs during the loading operation before the spray is applied. With highly toxic wettable powder (WP) formulations, empty containers carefully into the tank to avoid undue exposure to the dust; with liquid formulations, avoid splashing and spillage while measuring or making additions to the spray tank.

Avoid contaminating lakes, streams or ponds with any pesticide. Do not clean sprayers or dump excess spray mixtures near any such water supply. Avoid contaminating any crop used for forage or feed by drift of sprays out of the orchard.

## RECOMMENDED RATES OF APPLICATION

The correct amount of pesticide required for control in any given orchard is that amount contained in a volume of the recommended dilute mixture which, when applied as a foliar spray is sufficient to allow some run-off. Amounts applied in excess of this volume are

wasted, and volumes of dilute spray less than that required for run-off commonly result in reduced pest control.

Most mature peach trees in full leaf (approx. 12-15 ft tall and planted up to 70 trees per acre) require an estimated 200 gallons of dilute spray per acre to achieve run-off. Trees not in full leaf, especially during the early season will require substantially less than 200 gallons per acre for run-off. Adjustments in delivery volume per acre should be made either by changing the pump discharge rate or the travel speed. Travel speed in most orchards should not exceed 3-4 mph.

Experience has shown that the same amount of chemical normally applied as a dilute spray can be applied as a low volume (LV) spray using 1/3 or less the normal dilute volume. However, since little or no run-off occurs in LV applications, less total chemical should be applied per acre than in dilute sprays in order to avoid deposits in excess of that needed for control. LV rates are generally calculated (with some exceptions) by multiplying the dilute rate by the gallons per acre of dilute spray required and then subtracting 25% to adjust for the lack of run-off.

*Excess run-off in dilute spraying and deposits in excess of that needed for control in low volume spraying are both economically and ecologically unsound.*

## PESTICIDE CERTIFICATION FOR GROWERS

Missouri's pesticide law went into effect October 21, 1976. This law requires certification for commercial and private applicators to purchase and apply restricted-use pesticides as defined by the Environmental Protection Agency. Since several pesticides used routinely by fruit growers are potential restricted-use materials, it is highly desirable that each grower become certified.

Commercial applicators (all applicators who apply pesticides for hire) must pass an examination administered by the Missouri State Department of Agriculture. Private applicators are required to attend a training program, but are not required to pass an examination. Training sessions are offered to both commercial and private applicators by the University of Missouri Cooperative Extension Service. Contact your local Extension Specialist for further information.

Timing & Major Pests Involved	Materials To Use	Dilute Rate Per 100 Gals.	Low Volume Rate Per Acre	Comments and Special Precautions
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### DORMANT SPRAYS

Leaf Curl	FERBAM 76W or DICHLONE 50W or BORDEAUX	1 1/2 lb 1/2 lb 6-6-100	Not Recommended	Apply every year during dormancy, after leaf fall but before bud swell in the spring. FERBAM or BORDEAUX may be applied with the DORMANT OIL (below) but <i>not</i> DICHLONE. Thorough coverage is essential. Use of Dichlone 3-4 weeks before bud swell (weather permitting) will reduce the incidence of Cytospora twig cankers.
Scale Insects	SUPERIOR OIL 70 sec	2-3 gal	Not Recommended	Use OIL <i>only</i> to help clean up scale infestations. Thorough applications of regular summer insecticides should keep scale under control. Apply in late winter or in early spring when very low temperatures are not likely to occur. Not effective against Terrapin scale (See "Summer Sprays").

### PRE-BLOOM SPRAY(S)

Brown Rot	BENOMYL 50W + CAPTAN 50W  or SULFUR mfw  or CAPTAN 50W	1/4 lb 1 lb  6 lb  2 lb	8 oz 1 1/2 lb  9 lb  3 lb	Apply just before blossoms open. BENOMYL + CAPTAN is the preferred treatment. Do not use BENOMYL alone for any disease.
Catfacing Insects	ENDOSULFAN 50W or PARATHION 15W	1 1/2 lb 1 1/2 lb	2 1/4 lb 2 1/4 lb	Catfacing insects can seriously damage developing fruits in the early season. Where these insects have been a problem in the past, two pre-bloom insecticide sprays are recommended. ENDOSULFAN is the preferred insecticide because of its more persistent residue. Since only 2 applications of this material are permitted per year, PARATHION should be used in the regular schedule for the lesser peach tree borer and other insects. (See section on borer treatments on back page.)

### BLOOM SPRAY(S)

Brown Rot	USE THE SAME FUNGICIDES AS FOR PRE-BLOOM SPRAY			If BENOMYL + CAPTAN was used in the Pre-Bloom Spray, then apply one spray with the same fungicides at full bloom. If CAPTAN or SULFUR are used, make 2 applications: the first when 10% of the blossoms are open, and the second soon after full bloom. <i>Do not apply insecticides during bloom!</i>
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### SHUCK SPLIT SPRAY

Brown Rot	USE THE SAME FUNGICIDES AS FOR PRE-BLOOM SPRAYS			Make application 2-3 days after the petals have fallen.
Catfacing Insects Plum Curculio	ENDOSULFAN 50W or GUTHION 50W or PARATHION 15W	1 1/2 lb 2/3 lb 1 1/2 lb	2 1/4 lb 1 lb 2 1/4 lb	

### SHUCK FALL SPRAY

Brown Rot	USE THE SAME FUNGICIDES AS IN PRE-BLOOM SPRAY			Apply 7-10 days after the Shuck Split Spray. Where PARATHION is used in a regular schedule and good coverage is obtained, a special spray for lesser peach tree borers is usually not necessary. The lower nozzle on each side of the airblast sprayer manifold, however, should be adjusted so that it discharges toward the trunk and lower scaffold limb crotches.
Plum Curculio	PARATHION 15W or GUTHION 50W or IMIDAN 50W	1 1/2 lb 2/3 lb 1 1/2 lb	2 1/4 lb 1 lb 2 1/4 lb	

### EARLY COVER SPRAYS (7-10 DAY INTERVALS)

Brown Rot Peach Scab	BENOMYL 50W + CAPTAN 50W  or SULFUR mfw	3/8 lb 1 lb  6 lb	3/4 lb 1 1/2 lb  9 lb	The first two early cover sprays are the most critical for the control of peach scab, therefore the BENOMYL + CAPTAN treatment is preferred.
Oriental Fruit Moth	PARATHION 15W or GUTHION 50W or DIAZINON 50W	1 1/2 lb 2/3 lb 1 lb	2 1/4 lb 1 lb 1 1/2 lb	Oriental Fruit Moth populations will be less troublesome later in the season if insecticides are applied with care at this time. <i>Observe re-entry limitations where PARATHION or GUTHION have been used in orchards before thinning!!</i>

Timing & Major Pests Involved	Materials To Use	Dilute Rate Per 100 Gals.	Low Volume Rate Per Acre	Comments and Special Precautions
<b>SUMMER SPRAYS (7 - 14 DAY INTERVALS)</b>				
Brown Rot	CAPTAN 50W	2 lb	3 lb	Do not use PARATHION within 14 days of harvest; DIAZINON within 20 days; or GUTHION within 21 days. MALATHION 25W (2½ lb per 100 gal) can be used up to 7 days of harvest and CARBARYL 50W (2 lbs. per 100 gal) up to 1 day before harvest for preharvest Oriental fruit moth control.
Oriental Fruit Moth	PARATHION 45W	½ lb	2¼ lb	
	or GUTHION 50W or DIAZINON 50W or CARBARYL 50W	⅔ lb 1 lb 2 lb	1 lb 1½ lb 3 lb	
Terrapin Scale	DIAZINON 50W	1 lb	1½ lb	Make terrapin scale spray applications at 10-day intervals beginning with the last week of May and continuing through June. DIAZINON may be used to within 20 days of harvest (Terrapin scale is a problem in S.E. Missouri only). When a red spider mite problem develops, use the special spray in addition to the regular insecticide. Do not use KELTHANE or OMITE within 14 days of harvest or OMITE more than 2 times per season. PLICTRAN should be used only 2 times at a 10-day interval.
Mites	OMITE 30W	1½ lb	2¼ lb	
	or PLICTRAN 50W or KELTHANE 35W	6 oz 1 lb	9 oz 1½ lb	

## PRE-HARVEST SPRAYS

Brown Rot Rhizopus Rot	BOTRAN 75W	¾ lb	1½ lb	Apply 1-2 days before harvest. BOTRAN is more effective than either CAPTAN or BENOMYL against Rhizopus rot. Either of the tank mixes will give excellent control of both Rhizopus and brown rot. CAPTAN alone offers little protection against post-harvest decay.
	+ BENOMYL 50W	¼ lb	¾ lb	
or BOTRAN 75W	¾ lb	1½ lb		
+ CAPTAN 50W	1 lb	1½ lb		

## BORER TREATMENTS, POST-HARVEST DECAY, FUNGICIDE RESISTANCE

### Peach Tree Borer Control.

A single application of LORSBAN 4E (3 qts. per 100 gallons) is recommended for the control of the peach tree borer. Make the application in mid-May in southeast Missouri and in early June in other parts of the state. Thoroughly wet all bark areas from ground level to scaffold limbs. Do not allow spray to contact the fruit. Do not use more than once per season nor within 14 days of harvest. All weeds and grass should be cleared from around the trunks before any borer sprays are applied.

### Lesser Peach Tree Borer Control.

Where PARATHION is used in a regular spray schedule as recommended, special sprays for the lesser peach tree borer are usually not necessary. PARATHION applications should begin with the shuck split spray and are most effective when used on 7-day intervals.

In ENDOSULFAN was not used in the pre-bloom sprays and a lesser peach tree borer problem exists, applications of ENDOSULFAN 50W (1 ½ lb per 100 gallons) should be made. Apply the first spray in mid-May in southeast Missouri and in early June in other parts of the state. Thoroughly wet the scaffold limbs and trunk. Make a repeat application in 3 weeks. Do not use more than twice during the fruiting season nor within 30 days of harvest. *An additional application should be made in August after harvest in southeast Missouri only.*

Peach trees damaged by winter injury, hail, mechanical equipment, or those in a generally weakened condition are very susceptible to attack by the lesser peach tree borer. Narrow angle crotches in the scaffold branches are good entry points for the borer. Vigorous, well-pruned trees are the best insurance against lesser borers.

### Control of Post-Harvest Decay.

Both brown rot and Rhizopus rot can be especially troublesome post-harvest diseases. In addition to an effective spray program during the season, the following sanitation

measures are recommended to reduce losses due to post-harvest decay: 1) use only clean containers for harvesting and packing; 2) remove infected fruits from trees at harvest but do not place them in harvesting containers; 3) remove all overripe and rotting fruit from packing and storage areas; and 4) add chlorine to all water used in the packing operation.

Water used for washing, hydrocooling, and dumping in the packing house should contain 100 to 120 ppm chlorine (approx. 1 ½ lb of 65% CALCIUM HYPOCHLORITE per 1000 gallons of water = 120 ppm). Under constant use, an additional ½ to ¾ lb of 65% CALCIUM HYPOCHLORITE should be added per 1000 gallons every 4 to 5 hours to maintain effective chlorine levels. No more than two such additions should be made for any given supply of water. Flush and replace chlorinated water in supply tanks daily. *Continued use of the same water without appropriate chlorine adjustments OR with excessive additions of calcium hypochlorite will seriously reduce the effectiveness of the solution and may damage the fruit.*

If BENOMYL and/or BOTRAN are used for additional protection, these should be applied only in the brushing or in the waxing operation. BENOMYL is not effective against Rhizopus rot. A combination of both BENOMYL and BOTRAN appears to be the most satisfactory for the control of both brown rot and Rhizopus rot. Follow label instructions.

### Resistance to Fungicides.

The use of BENOMYL exclusively for the control of brown rot and/or peach scab has led to the development of resistance to this fungicide by the pathogens involved. To date, BENOMYL resistance in either of these fungi is not known to occur in Missouri. Prudent use of BENOMYL in tank mixtures with other effective fungicides (CAPTAN, BOTRAN) is recommended to reduce the chances for resistance to develop. Do not use BENOMYL alone to control any disease.

## PEACH PESTICIDE TOLERANCES, DAYS TO HARVEST, AND OTHER LABEL RESTRICTIONS<sup>[1]</sup>

Compound	Tolerance <sup>[2]</sup>	Interval <sup>[3]</sup>	Compound	Tolerance <sup>[2]</sup>	Interval <sup>[3]</sup>
Benomyl	15	N TL	Guthion [4]	2	21
Botran	20	1	Imidan	10	14
Captan	50	N TL	Kelthane	10	14
Carbaryl	10	1	Lorsban [5]		14
Diazinon	0.75	20	Malathion	8	7
Dichlone	3	7	Omite [5]	7	14
Endosulfan [5]	2	30	Parathion [4]	1	14
Ferbam	7	21	Plictran [5]	4	N TL

[1] All references are for use on peaches only. Many compounds have different limitations on other crops. READ THE LABEL!

[2] Allowable residues at harvest expressed in parts per million (ppm). Sulfur, copper, and dormant oils are exempt from a tolerance.

[3] Time in days between last application and harvest. NTL = no time limitation.

[4] Do not permit workers to re-enter orchard within 24 hrs. after application of GUTHION or 48 hrs. after PARATHION unless they wear protective clothing. For all other pesticides, no unprotected farm worker re-entry until the spray dries or the dust settles.

[5] Do not apply LORSBAN more than once, OMITE more than twice or PLICTRAN more than 3 times per season. Do not apply ENDOSULFAN more than twice during the fruiting season, except in S.E. Missouri where a third application may be made in August after harvest for lesser peach tree borer.

## Missouri Poison Control Centers\*

City	Poison Control Center	Telephone	City	Poison Control Center	Telephone
Cape Girardeau	Southeast Missouri Hospital 701 Lacy 63701	(314)651-6235	Rolla	Phelps Co. Memorial Hospital 1000 W. 10th Street 65401	(314)364-3100 Ext. 136 or 137
Columbia	University of Missouri Medical Center 807 Stadium Road 65212	(314)882-4141	Springfield	Lester E. Cox Medical Center 1423 N. Jefferson St. 65802	(417)831-9746 or 1-(800)-492-4824
Hannibal	St. Elizabeth's Hospital 109 Virginia Street 63401	(314)221-0414 Ext. 101/83		St. John's Hospital 1235 East Cherokee 65804	(417)885-2115 Emer. Rm.
Joplin	St. John's Medical Center 2727 McClelland Blvd 64801	(417)781-2727 Ext. 393	St. Joseph	Methodist Hospital and Medical Center 8th & Faraon Streets 64511	(816)271-7580 or 232-8481
Kansas City	Children's Mercy Hospital 24th & Gilham Road 64108	(816)234-3000	St. Louis	Cardinal Glennon Children's Memorial Hospital 1465 S. Grand Blvd. 63104	(314)772-5200
Kirkville	Kirkville Osteopathic Hospital 800 W. Jefferson St. 63501	(816)626-2266		St. Louis Children's Memorial Hospital 500 S. Kingshighway 63110	(314)454-6099
Poplar Bluff	Lucy Lee Hospital 330 N. 2nd Street 63901	(314)785-7721	West Plains	West Plains Memorial Hospital 1103 Alaska Avenue 65775	(417)256-9111 Ext. 258 or 259

\*In the case of accidental poisoning involving a pesticide, follow the first aid directions printed on the label of the container and consult your physician immediately. Additional information concerning treatment and course of action can be obtained from your nearest poison control center.

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