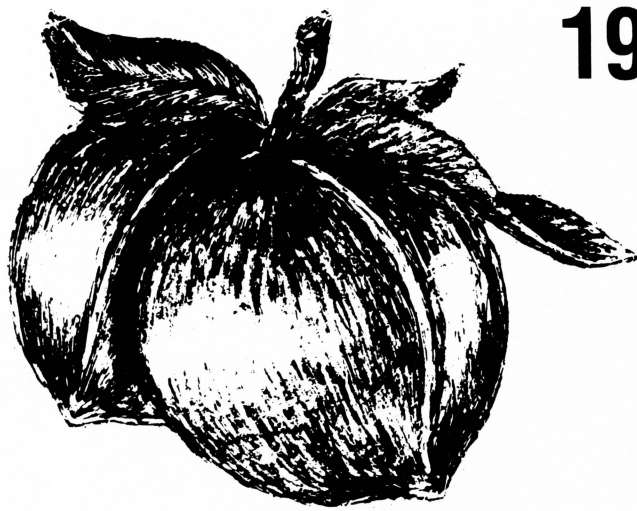


1989 Missouri Commercial Peach Spray Schedule



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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 $\frac{1}{3}$ 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 or BRAVO 500	1½ lb ½ lb 6-6-100 See comments	Not Recommended See comments	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 or BRAVO 500. Thorough coverage is essential. Use of Dichlone 3-4 weeks before bud swell (weather permitting) will reduce the incidence of Cytophora twig cankers. Use BRAVO 500 at 4½ to 6 pints per acre in 20 to 150 gal. of water.
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	¼ lb 1 lb	8 oz 1½ lb	Apply just before blossoms open. NOTE: CAPTAN, registration is uncertain for 1989. Contact your local Extension office for changes in pesticide registrations.
	or CAPTAN 50W or BRAVO 500 or ROVRAL 50W	2 lb See comments 0.25-0.5 lb	3 lb See comments 1.0-2.0 lb.	Use 4½ to 6 pints BRAVO 500 per acre in 20 to 150 gal. of water. See product label for specific use instructions.
Cattfacing Insects	PYDRIN 2.4EC or ASANA 1.9EC or POUNCE 3.2EC or AMBUSH 2.0E	2½-8 oz. 0.7-2.0 oz. 2 oz. 4 oz.	5½-16 oz. 1.7-5 oz. 4.8 oz. 8-16 oz.	These pyrethroid insecticides have good residual properties. One PRE-BLOOM spray and one post-bloom spray at SHUCK-SPLIT is recommended.

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 was used, make 2 applications: the first when 10% of the blossoms are open, and the second soon after full bloom. Or use BRAVO 500.
	Do not apply insecticides during bloom.			

SHUCK-SPLIT SPRAY

Brown Rot	USE THE SAME FUNGICIDES AND INSECTICIDES AS FOR PRE-BLOOM SPRAYS			Make application 2-3 days after all petals have fallen.
Cattfacing Insects Plum Curculio				

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 or PENNCAP-M 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. Do not use BRAVO 500 after this spray. Do not apply more than 8 pints PENNCAP-M per acre per season.
Plum Curculio	PARATHION 15W or PENNCAP-M 2FM or GUTHION 35W or IMIDAN 50W	1½ lb 1-2 pts. 1¼ lb 1½ lb	2¼ lb 3-6 pts. 1½ lb 2¼ lb	

EARLY COVER SPRAYS (7-10 DAY INTERVALS)

Brown Rot Peach Scab	BENOMYL 50W + CAPTAN 50W	¾ lb 1 lb	¾ lb 1½ lb	The first two early cover sprays are the most critical for the control of peach scab, therefore the BENOMYL + CAPTAN treatment is preferred. See above note on CAPTAN.
	or SULFUR mfw	6 lb	9 lb	
Oriental Fruit Moth	PARATHION 15W or PENNCAP-M 2FM or GUTHION 35W or DIAZINON 50W	1½ lb 1-2 pts. 1¼ lb 1 lb	2¼ lb 3-6 pts. 1½ lb 1½ 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
SUMMER SPRAYS (7 - 14 DAY INTERVALS)				
Brown Rot	CAPTAN 50W	2 lb	3 lb	See above note on CAPTAN
Oriental Fruit Moth	PARATHION 15W or PENNCAP-M 2FM or GUTHION 35W or DIAZINON 50W or CARBARYL 50W	1½ lb 1-2 pts. 1½ lb 1 lb 2 lb	2¼ lb 3-6 pts 1½ lb 1½ lb 3 lb	Do not use PARATHION or PENNCAP-M within 14 days of harvest; DIAZINON within 20 days; or GUTHION within 21 days. CARBARYL 50W (2 lbs. per 100 gal) up to 1 day before harvest for preharvest Oriental fruit moth control.
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).
Mites	OMITE 30W	1½ lb	2¼ lb	When a red spider mite problem develops, use the special spray in addition to the regular insecticide. Do not use OMITE within 14 days of harvest or more than 2 times per season.

PRE-HARVEST SPRAYS

Brown 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. See above note on CAPTAN.
Rhizopus Rot	+ BENOMYL 50W	¼ lb	¾ lb	
	or BOTRAN 75W + CAPTAN 50W or ROVRAL 50W	¾ lb 1 lb 0.25-0.5 lb	1½ lb 1½ lb 1.0-2.0 lb.	See product label for specific use instructions.

BORER TREATMENTS, POST-HARVEST DECAY, HERBICIDES

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. If using pheromone traps to monitor peach tree borers, apply Lorsban two weeks after first borer moths are caught. Make the application in mid-June in southeast Missouri and in early July 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 15W or PENNCAP-M 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 fall spray and are most effective when used on 7-day intervals. Use no more than 8 pints of PENNCAP-M per acre per season.

If a lesser peach tree borer problem exists, applications of ENDOSULFAN 50W (1½ 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. 1½ 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.

pendamethalin (Prowl)	2-4 qts. 4E	Registered for non-bearing trees only. Controls annual grasses and some broadleaf weeds.
diuron (Karmex)	2½ lbs. 80W	Use on trees established at least 3 years in the orchard. Do not use diuron on sandy soils.
terbacil (Sinbar)	2 lbs. 80W	Use on trees established at least 3 years in the orchard.
pronamide (Kerb)	2-8 lbs 50W	Apply in fall after harvest, but before leaves drop. Controls winter annuals and perennial grasses.
dichlobenil (Casoron) (Norosac)	150 lbs. 4G	Apply from Nov. 15 to Feb. 15.
oxyfluorfen (Goal)	10 pts. 1.6E	Apply only to dormant trees from mid Nov. to early Feb. Controls broadleaf weeds, but can be tank mixed with other herbicides to control grass weeds. Use a non-ionic surfactant with this herbicide. (Oxyfluorfen can also be used as a post-emergence spray at 2½-10 pts/A).

Post-emergence Bearing Trees	paraquat (Gramoxone)	3-5 pts.	For control of emerged annual grasses and weeds. Can be used in combination with Princep for residual weed control.
Non-bearing Trees	sethoxydim (Poast)	1½-2½ pts.	Apply 1½ pints for grasses up to 6 in. tall, 2½ pints for grasses up to 12 in. tall. Combine with 2½ pints of oil concentrate per acre. Do not harvest fruit within 1 year of treatment.
	fluazifop-butyl (Fusilade)	1 pint	Apply to annual grasses less than 8 inches tall and perennial grasses less than 6 inches tall. Use ½ pint of non-ionic surfactant per acre mixed with herbicide.

PEACH PESTICIDES, DAYS TO HARVEST, AND OTHER LABEL RESTRICTIONS [1]

Compound	Interval [2]	Compound	Interval [2]
Asana	21	Kelthane	14
Benomyl	NTL	Lorsban [4]	14
Botran	1	Malathion	7
Bravo	[1]	Mycosshield	21
Captan	NTL	Omite [4]	14
Carbaryl	1	Parathion [3]	14
Diazinon	20	Pennacp-M	14
Dichlone	7	Plictran [4]	NTL
Endosulfan [4]	30	Pounce	7
Ferbam	21	Pydrin	14
Guthion [3]	21	Rovral	NTL
Imidan	14		

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

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

[3] 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.

[4] Do not apply LORSBAN more than once, OMITE more than twice 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.

PEACH HERBICIDES

Category	Chemical	Rate per acre sprayed area	Comments
Pre-emergence			
Newly planted	metolachlor (Dual)	2-4 pts. 8E	Do not apply to trees planted less than 30 days or before soil has settled in the planting hole. Primarily controls grass weeds.
	napropamide (Devrinol)	8 lbs. 50W	Controls germinating weeds up to 6 weeks.
	oryzalin (Surflan)	5 lbs. 75W	Controls grass weeds. Do not apply until soil has settled.
Established	simazine (Princep)	3 lbs. 80W	Primarily controls broadleaf weeds, but can be mixed with other herbicides for broad spectrum control. Do not apply to trees planted in the orchard less than one year.
	norflurazon (Solicam)	2½-5 lbs. 80DF	Primarily controls grass weeds. Do not use norflurazon until 6 months after planting.

This information is for educational purposes only. References to commercial products or trade names does not imply endorsement by the Cooperative Extension Service or bias against those not mentioned.

Missouri Poison Control Hotline 1-800-392-9111

All Poison Control Centers are coordinated through Cardinal Glennon Memorial Hospital in St. Louis, MO. This facility has a 24-hour Poison Control Hotline staffed by professionals. The Center will refer you to your closest Poison Control Hospital for treatment.

*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.

