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SPRAYS for Home Fruit Plantings

**For Control of
Insects and Diseases**

Circular 521

(Revised)

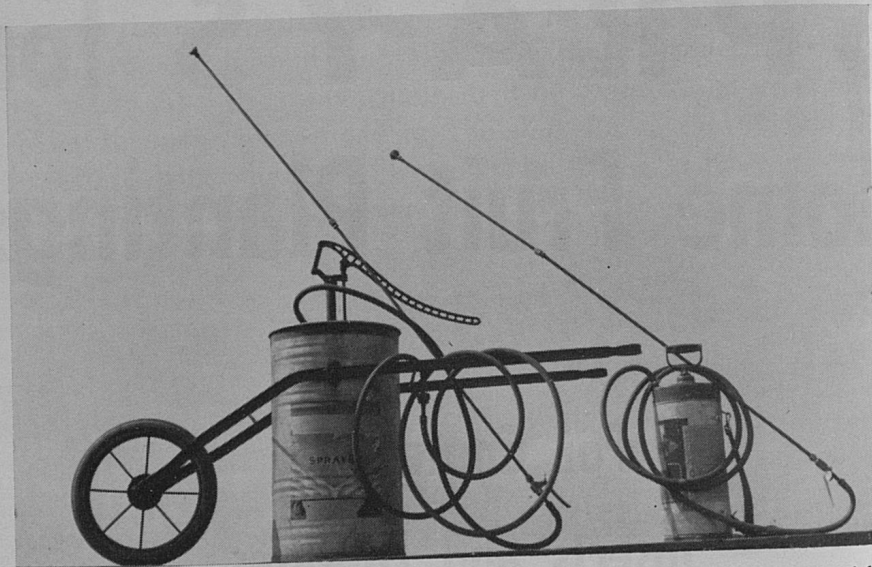
Cooperative Extension Work in Agriculture and Home Economics

College of Agriculture and Home Economics, University of Kentucky

and the U.S. Department of Agriculture, cooperating

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Suitable equipment for spraying home fruit plantings: a wheelbarrow spray at left, and a 3-gallon knapsack sprayer.

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Sprays for Home Fruit Plantings*

This circular describes insect and disease control programs that are adapted to small backyard fruit plantings and small orchards, grown primarily for home use. Two plans are suggested—the general-purpose spray mixture program for those who desire the simplest method possible, and separate spray schedules for those who desire to follow a program specifically adapted to the different kinds of fruit.

Healthy, vigorous trees and plants will yield more fruit than sickly ones. A liberal supply of mineral nutrients provided by the application of fertilizers and manure will help assure a harvest despite losses due to insects and disease. It is important, however, not to apply too much nitrogen to fruit plantings. Where too much nitrogen is present the set of fruit is reduced, and a succulent growth is produced that may be more susceptible to disease than where there is less nitrogen. This is true, for example, with fireblight on apples and pears.

PEST CONTROL BY SANITATION

Apple scab and cherry leaf spot

These diseases live over winter on the fallen leaves of these two trees. Raking and burning all of the leaves in the fall will help prevent infection of the new foliage the next spring. Of course, leaves from neglected trees in the neighborhood may serve as sources of these diseases but their effect will be relatively slight, especially if they are some distance away.

Apple, peach, and plum fruit rots

To aid in the control of all these diseases, fruits that start rotting before ripe should be removed at once from the trees (picked up if they drop), and destroyed, to help prevent spread

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of the trouble. Removal of dead and broken limbs, limbs with cankers, and mummies also helps in the program to control rots.

Curculio

Curculio beetles cause wormy fruits of peach, plums, and cherries, and often damage nearby young apple fruits. The small grayish-black snout beetle (about the size of a grape seed) with small bumps on its back, overwinters as an adult in tufts of grass, brush piles, in litters and debris in and near the trees. The beetles come out of these wintering places about the time of petal fall of peaches, and soon begin to lay eggs in the young fruits. This causes the fruits to fall. Picking up and destroying these small fruits is an excellent aid in the control of curculio. The second brood appears in late June and early July, "stinging" the half-grown to nearly grown fruits of peaches and plums, and causing them to be wormy at harvest.

Apple worms (codling moth)

Worm damage to apples can be reduced by removing and burning nearby rubbish and scraping loose bark from the tree trunk and main limbs which serve as wintering places for worms. Also, many worms can be killed by picking up and destroying dropped fruit. As the worms leave the fruit soon after it falls, the drops should be gathered and destroyed daily. Sometimes where only a few apple trees are grown, and those not near other apple plantings, the apples can be kept quite free of worms by following these precautions, but usually it is best to spray also.

Pigs or chickens under and around fruit trees help to remove and destroy dropped fruits, improving insect and disease control.

WHETHER TO DUST OR TO SPRAY

Where trees are small and a suitable duster is available, with force enough to cover the trees, applications of dust may be made after the dormant-season spray has been applied. Some apple growers get splendid control of apple scab from frequent sulfur dusts before and during the blooming season. Some peach growers use only dusts and no sprays during the growing season.

Many combinations of dusts are commercially blended. These

are advised for use where available, rather than the use of home-mixed dusts.

For home mixing, 8 parts of finely divided sulfur (325 mesh), 1 part lime, and 1 part lead arsenate are suitable for a dust, when well mixed, and where this mixture is needed. Also, a mixture of equal parts of lime and lead arsenate is suitable for use where leaf-eating insects are to be stopped. The materials must be thoroughly mixed. This may be done by rolling the materials in a barrel, or, for smaller amounts, by mixing in a closed can with a few rocks as agitators.

When dusting, follow the same timing as with spraying except in rainy weather, when the dusts should be applied more often. The best time to apply dust is late in the evening or early in the morning when the dew is still on and there is little wind.

GENERAL-PURPOSE SPRAY

General-purpose spray mixtures available from local dealers in most areas of Kentucky have become popular with many home fruit growers. These mixtures are combinations of fungicides and insecticides suitable for use on apples, peaches, grapes, and other fruits. They are sold under such names as "One Package Fruit Spray," "All-Purpose Spray," or "Home Fruit Spray." These mixtures have proved very satisfactory for those who have a small planting of several kinds of fruit and find it desirable to use the same mixture for each summer spray. A spray mixture containing methoxychlor, malathion and captan is recommended.

The dormant sprays should be used as indicated in the schedules for different kinds of fruit (pages 8 to 9).

Because of variations in the mixtures made by different manufacturers, the directions for dilution rate given on the package should be followed carefully. However, for the timing of the sprays it may be better to follow the timing shown in the schedules for the different fruits on pages 8 to 12 of this circular, because the directions on the package are likely to apply to a wider area than Kentucky.

Some of the general-purpose mixtures are suitable for use as dusts by adding an equal amount of flour.

SOME POINTS ON USING SPRAYS AND DUSTS

1. *Complete Coverage:* Every spray or dust operation should completely cover all parts of each plant. A mature peach tree requires 4 to 5 gallons at each spraying and a good-sized apple tree 6 to 10 gallons.

2. *Purpose:* Each spray application on each type of fruit should have a definite purpose. Learn which pests are giving trouble and are to be controlled.

3. *Timing:* Spray and dust applications must be properly timed if control is to be satisfactory.

4. *Don't Experiment:* Do not experiment with new combinations of materials. Serious tree or plant damage is often caused by using improper materials or combinations.

5. *Dwarf Trees:* Small trees that are well pruned are easier to spray. This fact makes dwarf trees attractive to home fruit growers.

6. *Equipment:* Suitable equipment makes spraying more effective and more pleasant. It is not advisable to use anything smaller than the bucket type pumps or 3-gallon compressed-air sprayers. There are several types of wheelbarrow sprayers of 12 to 15 gallon size and of the larger barrel sprayer (50 gallons), all operated by hand pumps. Several satisfactory small sprayers also are available with motor driven pumps. The size of planting determines the size of equipment needed.

In spraying it is important to keep the materials in the tank well mixed in the water and to prevent settling. In small tanks where mechanical agitation is not provided, the mixture must be stirred or shaken regularly as spraying is done. Clean the spray pump and tank regularly after using.

7. *Suitable Attachments:* Nozzles that break up the spray stream into a fine mist are desired. Additional hose can be obtained and extra lengths of brass or iron tubing to make suitable spray rods of 6 to 8 feet, if needed.

8. *Measuring Devices and Mixing:* Use measuring spoons and cups and keep them especially for this purpose. Also, a good pair of scales is needed for larger quantities. All measuring should be exact. It is advisable to mix dry materials with some water and strain them through a screen into the spray tank to keep out lumps and trash that often clog the nozzles.

9. *Sources of Materials:* Materials listed are in common use in control of fruit insects and diseases over a several-state area. If your local store does not stock the materials you need (especially after you have requested them), you can order them by mail, express, or freight, from the large spray dealers over the state or from mail order houses.

10. *Caution:* Care should be exercised in mixing and using all types of sprays and dusts. Keep them away from the mouth. Don't breathe fumes, dusts or mist. Keep hands clean and keep packaged materials away from children and animals.

11. *Varieties:* In general the home fruit gardener has a much better chance for success where early ripening varieties are used, because they require fewer sprays and are bothered less with insect and disease injury.

SEPARATE SPRAY SCHEDULES

In the following spray schedules, for the sake of simplicity, only one pesticide is suggested for each pest even though there are others that would be equally effective.

Commercial orchardists will find more detailed schedules in Kentucky Circular 487, *Kentucky Spray and Dust Schedules for Commercial Fruit Plantings*.

Other Kentucky extension circulars which may be of interest are Circular 471, *Raspberry Culture in Kentucky*, and Circular 267, *Cherries for Kentucky*.

The foregoing circulars may be obtained from your county agricultural agent, or by writing to the College of Agriculture and Home Economics, University of Kentucky, Lexington.

APPLE AND PEAR

No.	Time to apply	To control diseases and insects	Material	Amount to use in					Remarks
				1 gal.	3 gal.	15 gal.	50 gal.		
1	Dormant	Scales Red mite eggs	3% Oil emulsion or 3% Miscible oil	1/2 c	1 1/2 c	7 1/2 c	1 1/2 gal	If rosy aphids are also a problem, add a dinitro material to the oil emulsion or use DN 289.	
2	Pink bud spray ¹ (just before bloom)	Apple scab Cedar rust	Ferbam or Dry lime-sulfur	3 T	1/2 c	2 c	1 lb	Very important	
2A	Bloom spray	Apple and pear blight	Streptomycin ²	1/2 t	1 1/2 t	3 T	9 T	Omit if blight is not serious.	
3	Calyx spray (when most of petals have fallen)	Apple scab Cedar rust Codling moth	Ferbam or Wettable sulfur and Arsenate of lead	3 T 5 T	1/2 c 1 c	2 c 1 1/3 lb	1 lb 4 lb		
4	Three weeks after petals fall	Apple scab Codling moth	Captan and Lead arsenate or DDT, 50% W.P.	2 T 2 T	1/2 c 6 T	1/2 lb 2 c	1 lb 1 1/2 lb	DDT note. Where codling moth has been controlled satisfactorily with lead arsenate, use that material.	
5	Two weeks after spray No. 4	Scab codling moth	Same	Same	Same	Same	Same	For difficult codling moth locations, use DDT in sprays 4, 5, 6.	
6	About July 1 in western Ky. and July 10 in central Ky.	Scab codling moth	Same	Same	Same	Same	Same		

¹ Where scab has been serious on Delicious and others, an extra spray should be applied as soon as green tips appear.

² Streptomycin for spraying is sold under trade names such as Agrimycin, Agristrep, etc.

Notes: (a) Early ripening apples are harvested before the second brood of codling moth and more likely to be worm-free than late varieties.

(b) Orchard mites are likely to infest apples where DDT is used. Aramite 1 lb to 50 gal will control mites.

(c) To mix Ferbam or Captan with water, first add a small amount of water and stir to a smooth paste, before adding the full amount of water.

Abbreviations used in these tables: t = 1 level teaspoon; T = 1 level tablespoon; c = 1 level cup or 1/2 pint; W.P. = wettable powder.

(c) To mix Ferbam or Captan with water, first add a small amount of water and stir to a smooth paste, before adding full amount of water. t = 1 level teaspoon; T = 1 level tablespoon; c = 1 level cup or 1/2 pint; W.P. = wettable powder.

PEACHES, PLUMS, APRICOTS

No.	Time to apply	To control diseases and insects	Material	Amount to use in					Remarks
				1 gal.	3 gal.	15 gal.	50 gal.		
1	Dormant	Scale Peach leaf curl	Dry lime sulfur	20 T 1/2 c	1 1/2 c	4 lb	12 lb	Apply before buds burst. February is a good time. Leaf curl a pest only on peaches.	
2	When blooms are opening freely	Brown rot Blossom blight	W. sulfur Dieldrin, 25% W.P.	3 T 2 t	1/2 c 2 T	1 lb 3 oz	3 lb 1/2 lb	Omit if brown rot is not serious.	
3	Shuck fall (when most of the shucks have fallen from young peaches)	Brown rot Peach scab Curculio (peach worm)	W. sulfur Dieldrin, 25% W.P.	3 T 2 t	1/2 c 2 T	1 lb 3 oz	3 lb 1/2 lb	Always important.	
4	Two weeks after No. 3	Same	Same	Same	Same	Same	Same		
5	Early July in W. Ky.; July 20 in N. and E. Ky.	Brown rot Curculio	W. sulfur Chlordane, 50% W.P.	3 T 2 T	1/2 c 6 T	1 lb 5 oz	3 lb 1 lb		
6	3 weeks before Elberta harvest	Brown rot Oriental fruit moth	W. sulfur DDT, 50% W.P.	3 T 2 T	1/2 c 6 T	1 lb 1/3 lb	3 lb 1 lb		

Note: Extra sulfur sprays helpful if rot is serious.

Peach Tree Borer. Prevent infestation by spraying or painting the trunk and larger branches with DDT July 1, August 1, and September 1, at rate of 6 T. of 50% wettable DDT to one gallon of water, or treat trees about October 1 with P.D.B. crystals in a circle two inches from base of tree at ground level after removing grass, etc. Use at rate of one ounce on mature trees, 1/2 ounce on trees 3 years old and 1/4 ounce on younger trees. Cover with mound of earth about 4 inches deep and remove mound 3 weeks later.

CHERRIES (Sweet and Sour)

No.	Time to apply	To control diseases and insects	Material	Amount to use in					Remarks
				1 gal.	3 gal.	15 gal.	50 gal.		
1	As soon as petals fall.	Leaf spot Curculio	Ferbam Lead arsenate	3 T 2 T	1/2 c 6 T	2 c 1/3 lb	1 lb 1 lb	If curculio (wormy cherries) have not been a problem, leave out the lead arsenate.	
2	Two weeks later	Leaf spot Curculio	Same	Same	Same	Same	Same		
3	Two weeks later	Leaf spot	Ferbam	2 1/2 T	7 T	2 c	1 lb		
4	Immediately after harvest	Leaf spot	Same	Same	Same	Same	Same		

CURRANTS AND GOOSEBERRIES

1	When leaves first appear	Leaf spot Currant worms	Ferbam Lead arsenate	3 T 2 T	1/2 c 6 T	2 c 1/3 lb	1 lb 1 lb	Dormant spray note: Where scale is a problem apply a dormant oil spray before growth starts, using same materials as on apples.
2	Just after harvest	Same	Same	Same	Same	Same	Same	
3	Just after harvest	Leaf spot	Ferbam	(Use as in above sprays)				

STRAWBERRIES

1	Early March—or as soon as crown borer becomes active.	Crown borer ¹	1% Parathion or 5% DDT + 5% Chlordane dust	Applied at rate of 30 pounds per acre				
2	At general bloom	Crown borer ¹ Cattacing bugs Weevil, etc.	Same	Same				
3	Fruit Spray	Fruit rots	Captan	2 T	6 T	2 c	1 lb	

¹Note regarding new plantings: Where new plantings are near old crown borer infested areas, just after planting make four to five dust applications, at 2 to 3-week intervals, using a garden type puff duster.

²Parathion: A solution prepared on the container should be strictly followed, or the material should not be used.

Note: Parathion should be added to the water, first add a small amount of water to the Ferbam and stir thoroughly, and then add the parathion.

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Parathion: All precautions printed on the container should be strictly followed, or the material should not be used.

Note: To apply Ferbam with water, first add a small amount of water to the Ferbam and stir vigorously, making a smooth paste, before adding the full amount of water.

GRAPES

No.	Time to apply	To control diseases and insects	Material	Amounts to apply for					Remarks
				1 gal.	3 gal.	15 gal.	50 gal.	1 lb	
1	When new growth is 1 inch long	Black rot Fleabeetle	Ferbam DDT, 50% W.P.	2½ T 1½ T	7 T 4½ T	2 c 1½ c	1 lb 1 lb	This spray very important where black rot losses have been serious.	
2	When first blooms open	Black rot	Ferbam	2½ T	7 T	2 c	1 lb	NOTE: The incubation period of grape black rot is 6 to 8 weeks. Hence additional spraying after rotting sets in is of little value. The early sprays are important.	
3	When blooming has finished	Black rot	Ferbam	2½ T	7 T	2 c	1 lb		
4	When grapes are size of small peas (two weeks after No. 3)	Black rot Berry moth Leaf hopper	Ferbam DDT, 50% W.P.	2½ T 1½ T	7 T 4½ T	2 c 1½ c	1 lb 1 lb		

Note: To mix Ferbam with water, first add a small amount of water to the Ferbam and stir vigorously, making a smooth paste, before adding the full amount of water.

If desired, Captan may be used instead of Ferbam, at the same rate.

RASPBERRIES

No.	Time to apply	To control diseases and insects	Material	Amounts to apply for					Remarks
				1 gal.	3 gal.	15 gal.	50 gal.		
1	When new leaves are just unfolding	Anthraco-nose	Liquid lime-sulfur or dry lime-sulfur	2 c 1 1/4 c	6 c 4 c	2 1/2 gal 5 lb	6 1/2 gal 15 lb	Cover old canes and new growth completely.	
2	When new shoots at base of plants are 3 to 5 inches high.	Anthraco-nose	Ferbam	1 1/2 T	7 T	2 c	1 lb	Make special effort to cover the new growth coming up from the ground.	
3	Repeat every 10 days until blooming.	Anthraco-nose	Ferbam	Same	Same	Same	Same		
4	After harvest is completed and old canes removed.	Anthraco-nose	Ferbam	Same	Same	Same	Same	Removal of old canes helps prevent spread to new canes.	

Note: To mix Ferbam with water, first add a small amount of water to the Ferbam and stir vigorously, making a smooth paste, before adding the full amount of water.
If desired, Captan may be used instead of Ferbam, at the same rate.

