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## Oregon Apple and Pear Spray Recommendations for 1933

Prepared by

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# Oregon Apple and Pear Spray Recommendations for 1933

THE following emergency information is being sent out to Oregon apple and pear growers because of the recent Federal ruling regarding the need of removing lead residue, as well as arsenic residue, from fruit, and because of the known fact that oil spray remaining on the fruit at harvest time makes lead removal very difficult and often impossible.

Oil sprays also definitely interfere with the use of established spray programs that have been developed in Oregon as a result of many years of experimental investigation and growers' experiences. In sections where fungous diseases, such as scab or mildew, are major problems, it is questionable whether oils should be used in connection with codling-moth control. Growers should carefully consider these problems in their individual orchards before starting the season's spraying activities.

It has long been known that oil usage cannot follow earlier sulfur-containing applications without the danger of causing serious leaf and fruit drop. This applies especially to the Hood River Valley and sections west of the Cascades (except in the Rogue River Valley) where fungous disease control is often as important as insect control.

Furthermore, oil seriously complicates the subsequent removal of the lead arsenate combination because, at present, none of the known solvents that can be used in washing the fruit will remove lead effectively when oil is present.

It is therefore suggested that the grower, before applying his spray program for the season, carefully consider the information given in the following paragraphs.

**Arsenate of lead.** In spite of its limitations, arsenate of lead is still the most satisfactory insecticide for use in codling-moth control.

**Summer oils.** Mineral oil sprays combined with lead arsenate have proved of value, but their use complicates the removal of spray residue. These summer oils, when used, are employed in the early cover sprays, being especially effective at the height of the egg-laying period. In this combination straight cut oils having a viscosity of 60 to 75 Saybolt and a sulfonation test of not less than 85 have proved satisfactory. Straight cut oils are blends of continuous distillation fractions and not mixtures of heavy oils and very light fractions such as kerosene. Oils having a viscosity exceeding 55 have produced injury to Newtown apples and other susceptible varieties.

**Summer oil specifications.** Oils are sold commercially under the designations "medium," "light-medium" and "light" and should meet the following specifications:

1. *Medium:* 40 to 49 per cent of the oil should distill at 636° F.; not more than 10 per cent should distill at 540° F.; not less than 80 per cent should distill at 725° F.

Viscosity: 65 to 75 Saybolt.

Sulfonation test: Not less than 85.

2. *Light-medium*: 50 to 64 per cent of the oil should distill at 636° F.; not more than 10 per cent should distill at 530° F.; not less than 80 per cent should distill at 715° F.

Viscosity: 60 to 66 Saybolt.

Sulfonation test: Not less than 85.

Newtown and other susceptible varieties of apples have developed severe injury around the calyx when the light-medium or medium grades of oil have been used. It is necessary, therefore, to use on these varieties a light oil having a viscosity of between 50 and 55 Saybolt.

The distillation range specification for this oil is as follows:

3. *Light*: 65 to 100 per cent of the oil should distill at 636° F.; not more than 10 per cent should distill at 520° F.; and not less than 80 per cent should distill at 665° F.

Viscosity: 50 to 55 Saybolt.

Sulfonation test: Not less than 85.

Oils which do not meet the aforementioned specifications are likely further to complicate the spray residue removal.

**Dosage.** Mineral oils may be used at the rate of one gallon of emulsion to 100 gallons of water, particularly when red spider-mites are present, although there is evidence that  $\frac{1}{2}$  gallon to 100 gallons is enough for codling-moth. The lead arsenate in this combination should be used at the rate of 2 pounds to 100 gallons. Lime or a spreader containing hydrated lime ( $\frac{1}{2}$  pound per 100 gallons) should be used in the lead arsenate and oil emulsion mixture.

For pears, the best results for mite control are obtained when  $1\frac{1}{4}$  gallons of emulsion to 100 gallons of spray solution are used; for apples, not more than one gallon of emulsion should be used.

**Number of oil applications.** If oils in combination with lead arsenate are used for codling-moth control, the number of applications in which oil is used should not exceed *two* because of possible injury and spray residue difficulties.

**Time of oil application.** Oils in combination with lead arsenate should be applied during the height of the egg-laying period of the spring brood of codling-moth, usually in the second and third cover sprays. It must be remembered, however, that if sulfur sprays are applied *after* the dormant period, no oil can be used safely in codling-moth control. This will prevent the use of any summer oil sprays for codling-moth control where scab is a serious problem.

**Latest date for oil: July 1.** Because of difficulty in removing spray residue, especially the lead residue, the oil and lead arsenate combination should not be used after July 1. Where red spider-mite cannot be controlled before this date, consult the county agricultural agent or the local experiment station for advice.

## Spray Program for Apples and Pears

This schedule is prepared to meet maximum spraying requirements. It does not follow that this outline is needed in all orchards, or in fact in any single orchard. It may be used as a basis for pest control work in all apple and pear orchards in Oregon. Consult county agents and experiment station investigators for satisfactory modifications to meet your particular needs.

**Spray thoroughly.** Although the Oregon Agricultural Experiment Station has recommended that the grower "spray thoroughly and at the proper time" since 1889, lack of control still can be traced in many instances to lack of thoroughness in the application of the spray.

Time of application	Pest or disease	Spray material and strength
<b>Dormant spray.</b> As winter buds swell just before opening.	San Jose scale, blister-mite and spider-mites, except common red spider-mite	Lime sulfur 12 to 100, or miscible oil, 4 to 6 per cent actual oil, or quick-breaking emulsion, 3½ per cent actual oil
	Apple leaf-roller	Use miscible oil as above or bordeaux oil. Footnote (1)
	Apple scab	Plow under old leaves.
<b>Pre-pink or green bud stage spray.</b> Little leaves separating just enough to expose blossom bud cluster.	Scab and powdery mildew	Lime sulfur 3½ to 100.
	Pear thrips	1 pint nicotine sulfate to 100 gallons of spray. Footnote (2)
	Aphids on apples	Add nicotine sulfate ¼ pint to 100 gallons of spray. Footnote (2)
<b>Pink or pre-blossom spray.</b> Just before blossoms open.	Scab and mildew	Lime sulfur 2½ to 100
	Pear thrips	1 pint nicotine sulfate to 100 gallons of spray. Footnote (2)
	Fruit worms and bud moth	Add lead arsenate 4 pounds to 100 gallons of spray

Time of application	Pest or disease	Spray material and strength
<b>Calyx spray.</b> After $\frac{3}{4}$ petals have fallen. Before apple calyx closes on central fruit in cluster	Scab and mildew.	Lime-sulfur 2½ to 100*
	Codling-moth (on apple only)	Lead arsenate 2 or 3 pounds to 100 gallons. Footnote (3)
	Leaf roller where infestation is moderate	Lead arsenate 4 pounds to 100 gallons.
	Fruit worms	Lead arsenate 3 or 4 pounds to 100 gallons if omitted in pink spray.
<b>First cover spray.</b> About fifteen days after petals fall. Footnote (4)	Scab and mildew	Lime-sulfur 2 to 100*
	Codling-moth and pear slug	Lead arsenate 3 pounds to 100 gallons.
<b>Second cover spray for worms.</b> Approximately 10 to 15 days later. Footnote (4)	Codling-moth	Lead arsenate 2 or 3 pounds to 100 gallons. Footnote (5)
	Scab and mildew	Non-caustic or wettable sulfur spray.
<b>Third cover spray.</b> Approximately 10 to 15 days later. Footnote (4)	Codling-moth	Lead arsenate 2 or 3 pounds to 100 gallons. Footnote (5)
<b>Fourth cover spray.</b> Second brood spray. Middle-late July. Foot-note (4)	Codling-moth	Lead arsenate 2 or 3 pounds to 100 gallons.
<b>Fifth cover spray.</b> Mid-August. Footnote (4)	Codling-moth (may usually be omitted on pear)	Lead arsenate 2 or 3 pounds to 100 gallons.
	Anthracnose canker and apple rots	Bordeaux 4-4-50
<b>Sixth cover spray.</b> Necessary only in certain sections. Footnote (4)	Codling-moth	Lead arsenate 3 pounds to 100 gallons.

\*Ordinary lime-sulfur is likely to russet the skin of some varieties of pears like d'Anjou, Comice and Howell, and may cause burning of apples when hot weather comes on. Under such circumstances, substitute any reliable non-caustic or "wettable" sulfur spray or sulfur dust.

(1) If bordeaux is combined with oil, increase actual oil 1 per cent (5 to 7 per cent actual oil).

(2) Add  $\frac{1}{2}$  pound casein spreader to each 100 gallons of spray before putting in nicotine.

(3) 3 pounds recommended when codling-moth is controlled with difficulty. When lead is combined with lime sulfur, either use hydrated lime (1 pound to 100) or a spreader containing lime. Where calyx injury may occur, add 1 pound hydrated lime with the arsenical to each 100 gallons of spray.

(4) Consult local county agent or Experiment Station for timing the sprays.

(5) With oil use 2 pounds, without oil use 3 pounds where codling-moth is controlled with difficulty. Use of spreader is optional. With the oil-lead combination, add hydrated lime or spreader containing lime,  $\frac{1}{2}$  pound to each 100 gallons.

## Supplementary Control Measures

**Chemically treated bands.** The use of chemically treated bands placed around the tree trunks about June 1 is recommended where codling-moth control is a serious problem. To be effective, the loose bark should be scraped from the larger branches and trunks to a distance of one or two inches below the ground line before placing the bands. If this is done during the winter or early spring, and the loose bark burned, many worms will be destroyed.

**Orchard and packing-shed sanitation.** Coarse trash, such as boards, broken boxes, pruning wood, etc., on the ground in and near the orchard and around packing sheds should be removed and destroyed. Wherever possible, fruit containers should be placed in packing sheds and the packing sheds should be tightly closed during the spring and summer in order to prevent the many moths which emerge from reaching the orchard. The careful collection and destruction of wormy fruit at thinning time, the prompt destruction of windfalls during the summer and of all culls after harvest, will aid in reducing infestation and the carryover for the following season.

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