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EC1810 Spraying Schedules for Nebraska Tree Fruits

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COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE, AND THE UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING, H. G. GOULD ASSOCIATE DIRECTOR, LINCOLN.

Spray Schedule for Apples and Pears

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The spray schedules recommended here are for apples, pears, cherries, plums, and peaches in Nebraska. These are based upon experimental evidence obtained here and in the eastern states. They ordinarily will give satisfactory control of insects and diseases which regularly occur. It is not expected, however, that they will fit all conditions in a given season or all seasons. They are simply suggestive and must be adapted to fit particular conditions.

Number, Name, and Time of Application	Materials Dilution rates based on 50 gallons of water	Pests and Diseases Controlled
1. Cluster bud--2-6 days before flower opens. (See note 3)	1. Lime-sulfur (1 1/4 gals. liquid or 4 lbs. dry) Lead arsenate 1 1/2 lbs. **or** 2. Fermate 3/4-1 lb. Lead arsenate 1 1/2 lbs. (See note 1)	Scab (apple and pear) Black rot Rust Leaf chewing insects Curculio
2. Calyx spray--immediately after petals fall. (See note 5)	Same as above except that 1/2 lb. of 50% wettable DDT powder may be added and lead arsenate reduced to 1 lb.	Same as above Codling moth
3. 1st cover spray--varies with season, normally about 10 days after calyx application.	1. Lime-sulfur (1 gal. liquid or 3 lbs. dry) Lead arsenate 1 lb. 50% DDT wettable powder 1/2 lb. **or** 2. Fermate 1 lb. plus lead arsenate and DDT as above. Spreader 1/2 lb. may be used with either of above. (See note 1)	Same as above Blotch (See note 2) Sooty Blotch Rust
4. 2nd cover spray--2 weeks later.	1. Bordeaux 1 1/2-3-50 plus lead arsenate **or** 2. Fermate 1/4-1/2 lb. plus lead arsenate 1 1/2 lbs. (See note 1)	Same as above
5. 3rd cover spray--2 weeks later	Same as above except that 1/2 lb. 50% DDT wettable powder may be added and lead arsenate reduced to 1 lb.	Same as above Green fruit worm
6. 4th cover spray--2 weeks later (See note 1)	Same as No. 5.	Same as above
7. 5th cover spray--10 days later.	Same as No. 5.	Needed on late varieties and when disease conditions are severe.
8. 6th cover spray--10 days later.	Same as No. 5.	
9. 7th cover spray--10 days later.	Same as No. 5, but omit DDT	

Notes: 1. Fermate (ferric dimethyldithiocarbamate) is a new wettable powder fungicide that is especially effective against scab, rust, and blotch of apple and leaf spot and brown rot of cherry. In eastern U. S. it has largely replaced lime-sulfur since it avoids spray injury such as sometimes occurs with lime-sulfur. Fermate can be used with either oil-lead arsenate or oil-nicotine combinations and is compatible with DDT, derris, wettable sulfurs and most spreaders. Do not use with lime.

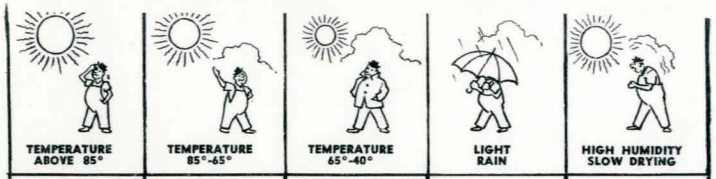
2. Where blotch is severe, Bordeaux 2-3-50 should be substituted for lime-sulfur in the third and subsequent sprays.

3. For home orchards, application numbers 1, 2, 3, and 5 are most important.

4. If scale infection is present, lime-sulfur 1 to 8 should be applied just before the leaf buds open.

5. In orchards where several varieties are found, the calyx spray is timed for the late-blooming sorts rather than the early bloomers. This application may be applied effectively for a period of 8 or 10 days. Never spray when trees are in full bloom because of the injury done to honey bees. It can be applied when 90% of the petals have fallen.

WEATHER FACTORS IN SPRAYING APPLES AND PEARS



Dithiocarbamates (Fermate, Zerlate, Karbam)						
Elemental Sulfur	■					Temperatures above 100° required for leaf injury; above 85° for fruit injury. Micro-fine sulfurs more injurious at high temperatures than 325 mesh sulfur.
Lime Sulfur	■			■	■	Unsafe at temperatures over 85°. Unsafe at any temperatures on wet leaves, in rain, or under slow drying.
Fixed Coppers			⊠	■	■	In rain or slow drying conditions may russet fruit. At temperatures 65°-40° early in season, apples are very sensitive to coppers.
Bordeaux			⊠	■	■	Same as fixed coppers.
Quinones				■	■	Slow drying conditions may cause burning or russetting on fruit and leaves.
Benzene Hexachloride (B.H.C.)			▨	▨	▨	May be less effective if applied under slow drying conditions at temperatures lower than 65°.
DDT	⊠				⊠	May injure fruit and leaves if applied at high temperatures together with high humidity.
Dormant Oils *	■			▨	▨	If trees are wet or if it rains before spray dries, oil may be ineffective against scale and insect eggs.
Summer Oils	■			▨	▨	Same as dormant oils. Also, if temperature is high may burn fruit and leaves.
Nicotine **			▨	▨		At cool temperatures or during rain effectiveness is decreased.
Rotenone ** Pyrethrum **			▨	▨		Same as nicotine.
Cryolite			■	■	⊠	Cool temperatures and slow drying may cause injury to fruit and leaves.
Lead Arsenate and Safener	⊠			▨	⊠	If applied during rain, material may be ineffective. Under slow drying conditions or high temperatures may injure fruit and leaves.
Calcium or Zinc Arsenate and Safener	⊠			▨	⊠	Same as lead Arsenate and Safener.

Safe — Caution

Unsafe — Less effective

*Oil Sprays should not be applied if temperature is expected to drop below 40° within 24 hours of application.

**Best to apply during conditions of rising temperature, not during falling temperature.

Spray Schedule for Stone Fruits

Spray Schedule for Cherries

Number and Time of Application	Materials Dilution rates based on 50 gallons of water		Pests and Diseases Controlled
	Fungicide	Insecticide	
1. Immediately after petals fall.	1. Fixed copper (based on 50% metallic) 3/4 lb. with 1 1/2 lbs. lime OR (WITH) 2. Fermate 1/2 lb. (See note 1) OR 3. Phygon 1/2 lb. (See note 2)	Lead arsenate 1 1/2 lbs. (See note 1) OR Benzene Hexachloride 1/4 lb. gamma isomer (See note 7)	Leaf spot Brown rot Curculio
2. 10-14 days later	Same as above		Same as above
3. 10-14 days later than No. 2	Same as above except omit insecticide.		Same as above
4. After fruit is harvested. Very important in leaf spot control to hold leaves.	On sour cherries: Bordeaux 2-3-50 or a fixed copper compound 3/4 lb. with 1 1/2 lbs. of lime and 1 oz. of spreader-sticker. On sweet cherries: Fermate 1/2 lb. with spreader-sticker. Never use copper on sweet cherries.		Leaf spot

Spray Schedule for Plums

	Fungicide	Insecticide	
1. Immediately after the shucks or husks have dropped.	1. Fixed copper (based on 50% metallic) 3/4 lbs. with 1 1/2 lbs. lime OR (WITH) 2. Fermate 1/2 lbs.	Lead arsenate 1 1/2 lbs. OR B. H. C. 1/4 lb. gamma isomer. (See note 7)	Curculio Brown rot (See note 3)
2. About 3 weeks later	Same as above		Same as above
3. About middle of July	Flotation or wettable sulfur 3 lbs. in 50 gallons of water		Brown rot

Spray Schedule for Peaches

1. Immediately after the shucks or husks fall.	1. Flotation or wettable sulfur 4 lbs. OR 2. Phygon 1/2 lb. OR 3. Zerlate 3/4-1 lb. (See note 4)	Add lead arsenate 1 lb. and stone lime 3 lbs. (See note 6)	Curculio Brown rot (See note 5)
2. About 2 weeks later	Same as above		Curculio Brown rot Scab

Notes: 1. Fermate (ferric dimethyldithiocarbamate) is a wettable fungicide that is especially effective against scab and rust of apple and leaf spot and brown rot of cherry. In eastern U. S. it has largely replaced lime-sulfur because it gives no spray injury as sometimes occurs with lime-sulfur. Fermate can be used with either oil-lead arsenate or oil-nicotine combinations and is compatible with DDT, derris, wettable sulfurs and most spreaders but should not be used with lime.

2. Phygon is another new wettable powder which has proved effective against brown rot and leaf spot of cherries and brown rot of peaches. It is compatible with lead arsenate and DDT.

3. If plum pocket infection was bad the preceding season, lime-suifur 1 1/2 to 50, or Bordeaux 4-4-50, should be applied just before the flower buds open.

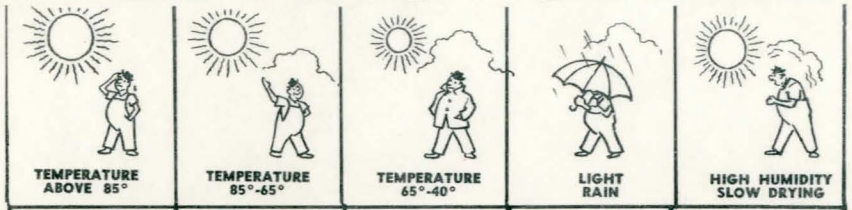
4. Zerlate is a new wettable powder useful against brown rot and scab. It is compatible with all common insecticides.

5. If peach leaf curl was present the preceding year, a special spray of 5-5-50 Bordeaux or 2 1/2 to 3 gallons of lime-sulfur to 50 gallons of water should be applied just before the buds swell.

6. Commerical peach growers should investigate zinc lime sprays to lessen damage to buds and twigs from lead arsenate.

7. The gamma isomer of benzene hexachloride is the only part with insecticidal value. Keep the dust away from mouth and eyes. Always wash your hands thoroughly after handling this material. Never use benzene hexachloride later than 30 days before harvest or it will leave an off-flavor in the fruit.

WEATHER FACTORS IN SPRAYING AND DUSTING STONE FRUITS



Dithiocarbamates (Fermate, Zerlate, Karbam)						
Elemental Sulfur						
Lime Sulfur	Unsafe			Caution		Sulfur burn injuring fruit and leaves of temperatures over 85°. Injury may also occur in light rain. Not safe on peaches after leaves begin to expand except just before harvest.
Fixed Coppers				Unsafe	Caution	Humid slow drying conditions may result in injury to fruit and leaves. Not safe to use on peaches during growing season. Sweet cherries more susceptible than sours.
Bordeaux				Unsafe	Caution	Same as fixed coppers but somewhat more unsafe.
Benzene Hexachloride (B.H.C.)			Less effective	Less effective	Less effective	May be less effective if applied under slow drying conditions at temperatures lower than 65°.
DDT	Caution			Caution	Caution	May injure fruit and leaves if applied at high temperatures together with high humidity.
Dormant Oils *	Unsafe			Less effective	Less effective	If trees are wet or if it rains before spray dries, oil may be ineffective against scale and insect eggs.
Nicotine **			Less effective	Less effective		At cool temperatures or during rain effectiveness is decreased.
Rotenone ** Pyrethrum **			Less effective	Less effective		Same as nicotine.
Lead Arsenate	Caution			Unsafe	Caution	Under slow drying conditions or high temperatures may injure fruit and leaves.

Safe — Caution — Unsafe — Less effective

*Oil Sprays should not be applied if temperature is expected to drop below 40° within 24 hours of application.

**Best to apply during conditions of rising temperature, not during falling temperature.