

Spray Calendar.

BY L. CAESAR, O. A. C., GUELPH. REVISED TO DATE FOR "THE FARMER'S ADVOCATE."

PLANT.	1ST APPLICATION.	2ND APPLICATION.	3RD APPLICATION.	REMARKS.
APPLE. Scab or black spot, canker, leaf spot, codling moth and other biting insects, scale insects, blister mite and aphids.	Shortly before the buds burst. Use A or B1.	Just before the blossoms open. Use B2 or D with a poison.	Immediately after the blossoms have all or nearly all fallen, and before the calyxes close. Use B2 or D with a poison. This is the application for codling moth.	Cut out, disinfect and paint cankered areas on trunks and large branches. In moist climates, or if the weather is wet or foggy, or if codling moth is very troublesome, give a 4th application with B2 or D, and a poison about two weeks after 3rd. For aphids, see if they are present just before leaf buds burst; if so, spray at once with kerosene emulsion or whale-oil soap.
PEAR. Scab or cracking, blight, codling moth, other biting insects, scale insects, blister mite, psylla and slug.	Shortly before the buds burst. Use A or B1.	Just before the blossoms open. Use B2 or D with a poison.	Just after blossoms have all fallen. Use B2 or D with a poison.	Cut out and burn blight as soon as seen, cutting always one foot or more below diseased areas. Disinfect tools if contaminated. In moist or in foggy or wet weather give a 4th application of B or D, and a poison about two weeks after 3rd. For psylla, spray thoroughly with kerosene emulsion or whale-oil soap as soon as leaves are open, and again week later. For slugs, spray with arsenate of lead, or dust fresh air-slaked lime over the leaves.
PLUM AND CHERRY. Black-knot, brown rot, leaf blight or shot-hole fungus, curculio, slug and aphids.	Just before buds burst. Use A or B1.	Just after fruit is set. Use B2 or D with a poison.	About 2 weeks later. Use B2 or D with a poison.	Watch for black-knot and whenever seen cut out well below diseased area and burn. If leaf blight is troublesome, give a 4th application with B2 or D about two weeks after the 3rd, and repeat as soon as fruit of cherry is picked. Destroy mummied plums in autumn. Look for aphids just before buds burst, and if present spray at once with kerosene emulsion or whale-oil soap. Treat slug as on pear. B2 or D should be used at about $\frac{1}{2}$ ordinary strength, as foliage is more tender than that of apple and pear.
PEACH. Leaf-curl, scab or black spot, yellows, little peach, curculio, borer, San Jose scale, shot-hole borer.	Before buds begin to swell. (All must be done before any sign of bursting of buds.) Use A or B1. This is the application for leaf-curl and scale.	Just after fruit is set. Use arsenate of lead alone with water for curculio if this insect is troublesome.	About 1 month after fruit is set. Use C. May omit if there is no trouble from brown rot.	If brown rot is likely to be troublesome use C again about one month before fruit ripens. Destroy mummied fruit in autumn. Remove at once and burn any tree attacked by yellows or little peach, and also all suspected trees. Dig out borers at base of tree with knife in May and again in October. For shot-hole borer cut down and burn before April all dead or dying trees or branches, and leave no brush heaps near orchard.
GRAPES. Black rot, powdery mildew, downy mildew, anthracnose, flea beetle, thrip or leaf-hopper.	When 3rd leaf is appearing. Use D.	Just before the blossoms open. Use D.	Just after fruit sets. Use D.	Spray again whenever wet weather threatens. It should always be done BEFORE, not after rain. At first sign of powdery mildew dust with sulphur. For flea beetles use poison whenever they appear. For leaf-hoppers or "thrips" use kerosene emulsion or whale-oil soap early in July to destroy nymphs. (Clean cultivation is very important, and destruction of all old mummied grapes and prunings.)
CURRENT AND GOOSEBERRY. Mildew, leaf-spot, currant worm, aphids.	Shortly before buds burst. Use A or B1.	Just before blossoms appear. Use B2 with poison.	Just after fruit is formed. Use B2 with poison.	For worms when fruit is ripening, use hellebore. Look for aphids just before buds burst; if present, spray with kerosene emulsion or whale-oil soap. Of little use to spray for these after leaves curl.
RASPBERRY AND BLACKBERRY. Anthracnose, red rust, crown gall.	Before growth begins. Use D.	When shoots are 6 or 8 inches high. Use D and add poison if caterpillars are present.		If anthracnose is very severe, set out new plantation of healthy shoots. If disease begins cut out old canes as soon as fruit is picked, also badly attacked new ones, and burn. For red rust remove and burn plants at once. No other remedy. For crown gall set out plants in fresh soil, rejecting any plant with a gall on root or crown.
STRAWBERRY. Leaf spot, white grub.	For leaf spot set out only healthy plants with no sign of disease. First season spray with D before blossoms open, and keep plants covered with mixture throughout the season. Second year spray before blossoming with D, and again soon after picking; or mow and burn over after picking. Don't take more than two crops off. Plow down at once after second crop. For white grubs dig out as soon as injury is noticed. Do not plant on land broken up from old meadow or pasture for at least three years after breaking.			
BEAN. Anthracnose and bacterial spot.	Get seed from pods showing no signs of disease. Do not work among the plants if they are wet with rain or dew. Spraying scarcely pays as a rule.			
CABBAGE, TURNIP. Flea beetles, caterpillars, root maggots, aphids.	For flea beetle on turnip, sow after June 21st, or dust plants as soon as they appear above ground with Paris green, or spray with Bordeaux and a poison. Repeat in three days. For caterpillars dust with Paris green until heads begin to form on cabbage and cauliflower, then spray with pyrethrum, 1 ounce to 2 gallons water. For root maggots use medium thick tarred felt-paper discs, putting on as soon as plants are set out, or use hellebore once a week up to July 1st, or set out plants after July 1st. For aphids use kerosene emulsion as soon as they appear.			
POTATO. Tip burn, early blight, late blight, scab, Colorado beetle, flea beetle.	Keep foliage covered with D from time plants are about 5 inches high. Take special precautions to see this is well done if weather is at all damp after about 15th July, as late blight begins about this time. Add a poison to each application when necessary. For scab, soak tubers before cutting 2 hours in formaldehyde solution, 1 pint of formaldehyde to 30 gallons of water. Spread out on grass to dry. Wash all boxes, bags or other vessels to be used in same liquid. Plant none but perfectly healthy tubers.			
TOMATO. Leaf blight, black rot, flea beetle.	Spray plants in seed-bed with D. Keep foliage in field covered with D until danger of staining fruit. Add a poison if necessary for flea beetles.			
ASPARAGUS. Rust, beetles.	For rust, let no plants, not even wild ones, mature during cutting season. Late in fall, when growth is about over, cut and burn old plants. For beetles, let poultry run in the plantation. After cutting season is over spray with arsenate of lead; repeat in two weeks. May add sticker and a little lime.			

NOTE.—A=Home-boiled Lime-sulphur.—20 lbs. lime, 15 lbs. sulphur, 40 gallons water.
B1=Commercial Lime-sulphur.—Spring strength, about 1 gallon to 9 of water.
B2=Commercial Lime-sulphur.—Summer strength, for foliage about 1 gallon to 35 or 40 of water.
C=Self-boiled Lime-sulphur.—8 lbs. lime, 8 lbs. sulphur, 40 gallons water.
D=Bordeaux Mixture.—4, 4, 40, formula.

NOTE 2.—Homemade concentrated lime-sulphur may be substituted for commercial. For strength see formula below.

Formulæ for Insecticides.

I. POISONS (for biting insects only):

1. ARSENATE OF LEAD.—2 lbs. to 40 gals. liquid spray; 3 lbs. for potato beetles.
2. PARIS GREEN.—(a) $\frac{1}{2}$ to $\frac{1}{4}$ lb. to 40 gals.; 1 lb. for potato beetles. If used with water alone, add 1 or 2 lbs. fresh lime.
(b) 1 lb. mixed with 50 lbs. land plaster, air-slaked lime or some similar substance, for dusting on plants.
(c) Poisoned Bran.—Mix 1 lb. Paris green with 50 lbs. bran moistened with sweetened water. Scatter in evening on soil by plants for cutworms.
3. ARSENITE OF LIME.—Boil 1 lb. white arsenic and 1 lb. sal soda (crystals), with stirring, for about 15 minutes in 1 gallon water till all the arsenic is dissolved, then add 2 lbs. stone lime and let slake in boiling liquid. Add water to make up for what has evaporated. One quart of this when well stirred is sufficient for 40 gals. spray liquid. Arsenite of lime can be made in large quantities and stored. Label barrel "Poison," and be careful to keep white arsenic itself labelled "Poison." Keep barrel covered to prevent evaporation. Stir well before using.
N.B.—With Bordeaux, 1, 2 or 3 may be used; with commercial lime-sulphur, 1; the others cause burning.
4. WHITE HELLEBORE.—1 oz. to 2 gals. water, or dust undiluted over the plants. For root maggot, dust close to plants, or pour around roots.
5. CONTACT POISONS (chiefly for sucking insects).
a. KEROSENE EMULSION.—
Kerosene (coal oil).....2 gals.
Water.....1 gal.
Soft soap..... $\frac{1}{2}$ lb.

- Dissolve the soap in water by slicing and boiling; take from fire and while hot pour in kerosene and churn vigorously for 5 minutes. For use dilute with 9 parts of water, so that the above 3 gals. of stock emulsion will make 30 gals. of spray mixture.
2. WHALE-OIL SOAP.—For brown or black aphids, 1 lb. in 4 gals. For green aphids, thrip and leaf-hopper, 1 lb. in 5 gals.
3. TOBACCO WATER.—Boil 1 lb. refuse tobacco in 2 gals. water for 1 hour; make up for water that evaporates.
4. PYRETHRUM (or Insect Powder):
Pyrethrum powder.....1 oz.
Water.....2 to 3 gals.
Dry Mixture.—Mix thoroughly 1 part by weight of pyrethrum with 4 of cheap flour, and keep in air-tight vessel for 24 hours before dusting over plants.
Note.—Pyrethrum is useless if left exposed to the air.
5. LIME-SULPHUR WASH. (See under fungicides.)

Formulæ for Fungicides.

I. BORDEAUX MIXTURE:

1. BORDEAUX MIXTURE:
Copper sulphate (bluestone).....4 lbs.
Unslaked lime.....4 lbs.
Water.....40 gals.
Dissolve the copper sulphate in a wooden or brass vessel with hot water, pour into a barrel and add cold water to make 20 gals.; slake the lime, preferably with hot water, add cold water to make 20 gallons. Stir both barrels well, and pour lime into copper sulphate barrel. (Never mix concentrated milk of lime and copper sulphate solutions.)
A stock solution of each may be made and kept indefinitely if not mixed: Dissolve 40 lbs. copper sulphate in 40 gals. water by suspending just below the surface of the

water in a coarse sack. Each gallon of the liquid will now contain 1 lb. copper sulphate. Slake any desired quantity of lime and put into a box or barrel in shaded place, or sunk in the ground. Keep covered with small amount of water to exclude the air. Calculate how much is required for 4 lbs. lime if well stirred.

To test Bordeaux mixture, let a drop of ferrocyanide of potassium solution fall into a little of the mixture when ready. If this causes it to turn reddish brown, add more lime until no change takes place.

II.—LIME-SULPHUR WASH:

1. HOME-BOILED (for use on dormant wood only).
Fresh stone lime.....20 lbs.
Sulphur (Rour or flowers).....15 lbs.
Water.....40 gals.
Slake 20 lbs. of lime in about 15 gals. boiling water in a kettle or other boiling outfit. While slaking add the 15 lbs. sulphur made into a paste by the addition of a little water. Boil vigorously, with stirring, for 1 hour. Dilute to 40 gals. with cold or hot water. Strain and apply at once.

2. COMMERCIAL.—This is for use either on dormant wood or on foliage. For the former use at the strength of about 1 gal. to 9 gals. of water; for the latter 1 gal. to 35 or 40 gals. of water. Dilute to 40 or 50 gals. for cherry.

3. HOMEMADE CONCENTRATED LIME-SULPHUR.—This may be used as a substitute for commercial lime-sulphur, but is only about 2 as strong as a rule. For preparation, see issue of March 9th, 1911.

4. SELF-BOILED (chiefly for use on peach foliage).
Fresh stone lime.....8 lbs.
Sulphur (Rour or flowers).....8 lbs.
Water.....40 gals.

Best prepared in quantities of 24 lbs. at a time to get sufficient heat. Place 24 lbs. lime in a half barrel, add enough cold water to start it slaking well and to keep the sulphur off the bottom. Dust the 24 lbs. sulphur over the lime, having first worked the sulphur through a screen to break lumps; then add whatever further amount of water is necessary to complete the slaking. Stir well with a hoe to prevent the lime caking on the bottom. As soon as the slaking is over, add enough cold water to cool the whole mass and prevent further combination. Strain into spray tank. Keep well agitated while spraying.

III.—DISINFECTANTS (for pruning tools and for wounds on trees):

One pt. formaldehyde diluted to 2 gals. with water; or corrosive sublimate, 1 part to 1,000 by weight = 1 tablet to 1 pt. of water. Apply with a swab on end of a stick.

CAUTION.—Corrosive sublimate is a deadly poison to man or beast if taken internally. It will also corrode iron or metal, so use in glass or wooden vessel. Formaldehyde is not poisonous.

STICKER.

Resin.....2 lbs.
Sal soda (crystals).....1 lb.
Water.....1 gal.

Boil together till a clear brown color, which takes from 1 to 1½ hours. Cook in iron kettle in an open place. Add the above to 40 gals. Bordeaux for use on smooth foliage like onions, cabbage or asparagus. If used with arsenate of lead, Paris green, or arsenite of lime, add 1 or 2 lbs. of fresh lime to every 40 gallons of spray.