SPRAYs THAT PAY

VICTOR LEGGO & FARMERS LTD
222 QUEEN STREET, MELBOURNE, CI.
3rd EDITION:

Owing to the constant demand for copies of "Sprays That Pay" we have printed this Third Edition, which has been revised and enlarged, in an endeavour to give the orchardist the latest information on sprays.

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SPRAYS THAT PAY

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SPRAYING.

Fruit trees, small fruits, vegetables, etc., are attacked by fungous diseases and insect pests and it is therefore necessary to spray to combat them. The first thing to do before spraying is to diagnose the type of insect pest or fungous disease.

If the grower cannot recognise them specimens should be forwarded to the district horticultural officer, or to Department of Agriculture in the capital of your State.

Label all specimens with your name and address and send full particulars of the extent and history of the trouble. These identification services, as well as helpful advice on control measures, are free.

The crop parasites for which spraying is necessary are broadly divided into two classes:—

Insect Pests.
Fungous Diseases.

The sprays used for Insect Pests are Insecticides and the sprays used for Fungous Diseases are Fungicides.

INSECTICIDES.

Insecticides may be divided into two classes, as follow:—

(a) Food Poisons.
(b) Contact Sprays.

FOOD POISONS.

Food poisons are such sprays as Arsenate of Lead and Calcium Arsenate, and are for the control of pests which actually bite or chew their food, the poison being taken into the insect’s body.

Pests which can be controlled in this way are Codling Moth, Caterpillars, Cut-worms, Wire-worms, Slugs, Beetles, Borers, etc.

CONTACT SPRAYS.

Contact sprays are Prepared White Oil, White Oil Emulsion, Ovicidal Wash (Tar Distillate), (each of these three sprays sterilize the eggs), Nicotine Sulphate, Concentrated Liquid Lime Sulphur, Red Spraying Oil and Benzol Emulsion.

These sprays are composed of substances which destroy the insect from the outside, or, in other words, by contact. They are either caustic or penetrating in their effect, and are used against those insects which suck the plant sap instead of eating the foliage or fruit.

Such insects are Aphids, Thrips, Scale, Mites, etc.

FUNGICIDES.

Fungi are minute plants which have no organs capable of creating plant tissue from the elementary substances of the soil and air, like other plants. They live as parasites on living matter and deprive the host plant of its nourishment, causing what is known as Fungous Disease. Without proper
protection the host plant is either entirely destroyed or is unable to bring a profitable crop to maturity.

The more common forms of Fungal Diseases are Mildew, Leaf and Fruit Spots, Rots, Blight and Scab.

The majority of Fungi causing these diseases live within the host plant, and for this reason it is very difficult to reach and destroy them after the plant has become infected.

Spraying with Fungicides should be Preventive rather than Curative. Once the plant is attacked with Fungus the disease cannot be cured by any method. Spraying prevents it developing and affecting unattacked parts of the tree.

If such diseases are prevalent in a district, it is advisable to spray as a preventive and not to wait until the trouble occurs.

The choice of the most suitable of the above-mentioned sprays for the control of a certain insect or Fungus will depend upon—

1. The structure or life habit of the pest.
2. The relative cost and effectiveness of the materials.
3. The ease with which they can be applied.
4. The character of the host plant.
5. Weather conditions.

ANALYSIS.

Every batch of Fruit Spray manufactured by us is sampled and analysed by our chemists before being packed into containers, and a record is kept of these analyses and of all packages emanating from each batch.

The principal object of these precautions is that the orchardist may with confidence rely on the spraying materials supplied by us being absolutely uniform and chemically correct, and if applied under suitable conditions and according to the recommendations given in this booklet, can be relied upon to give complete satisfaction.

The value of the fruit to be protected by spraying is much greater than the cost of the spraying material, and in all cases the cost of application exceeds the cost of the spray itself.

In view of this we recognise the necessity for the spray being of the highest possible quality.

GENERAL DIRECTIONS.

Local conditions vary greatly throughout Australia and it is impossible to give directions suitable for every particular district. The directions given for each of our sprays are those that have been carefully followed in most districts. They are intended, however, merely as a guide, and it may be necessary, under some circumstances, for the dilutions to be altered slightly to meet climatic conditions; if in doubt, it is advisable before commencing spraying to consult the district horticultural officer.
SOME REASONS FOR SPRAYING FAILURES.

1. Failure to spray at the correct time. Fungicides are Preventives and should be applied as such. After the disease has developed it may be too late to save the crop.

2. Spraying when the sun is very hot may cause scald to fruit and foliage.

3. Spraying during or just after a shower or heavy dew results in much of the value of the spray being lost. When the leaves are dry, the spray is more effective.

4. The applying of Winter strength spray in Summer may cause severe burning, or the application of Summer strength spray in Winter may be too weak to be effective.

5. Failure to spray every tree.

6. Spraying while trees are in full bloom may injure the blossoms and may also poison bees, which assist in the pollination.

7. Faulty application. If the spray is applied hurriedly, the fruit and foliage may in consequence be not properly protected.

8. The neglect of Orchard Sanitation. This is a very important point and particular care should be taken to collect all mummies; after pruning burn all cuttings, and when ploughing make a thorough clean job. Free all packing sheds and surroundings from the codling moth grubs, dip all cases for two minutes in boiling water to which one lb. of washing soda has been added to every 20 gallons of water.

"VALLO" ARSENATE OF LEAD.

Arsenate of Lead is the best control for Codling Moth, Pear Slug, Curculio Beetle, Caterpillars, Dicky Rice (on oranges), Worms, Borers and all kinds of leaf eating insects.

In "Vallo" Arsenate of Lead the proportions are accurately balanced so as to give the highest chemical efficiency, and the process of manufacture is such that the particles are in the finest possible state of division, ensuring maximum cover and adhesiveness.

IMPORTANT.

"Vallo" Arsenate of Lead has a soluble arsenic oxide content of considerably less than half (½) per cent., thus giving complete immunity from damage to fruit and foliage.

RECOMMENDATIONS FOR USE.

Arsenate of Lead Paste. By the addition of water thin the Paste down and pour into the partly filled spray vat with the agitator working. Then add the required quantity of water.

Arsenate of Lead Powder. By adding a little water bring the powder to a thin Paste, and with the agitator running, pour into the partly filled spray vat and make up the required gallonage by adding water.
DILUTIONS.
Arsenate of Lead Paste.
5 lb. to 80 gallons of water.
Arsenate of Lead Powder.
2½ lbs. to 80 gallons of water.
For remarks on—
(1) "Vallo" Arsenate of Lead Paste and "Vallo" Concentrated Liquid Lime Sulphur,
and
(2) "Vallo" Arsenate of Lead Paste and Prepared White Oil or White Oil Emulsion
as combined sprays, see Pages 14 and 22 respectively.

WHEN TO SPRAY FOR CODLING MOTH.
Codling Moth is undoubtedly the major insect pest of apples and pears and therefore its effective control deserves some particular consideration.

1. The Calyx Spray—
This spray is necessary to prevent infection of the fruit at the calyx end, therefore, the spray must be applied before the calyx closes. A thorough calyx spray will then ensure protection of the fruit at this point for the remainder of the season. In cool districts this calyx spray may be omitted unless lures indicate early, high, moth population.

Codling Moth Control—When to apply the Calyx Spray.
Left, too early; centre, the correct stage; and right, too late.

Apples:
Apply the spray when the majority of petals have fallen. For varieties in which the petal fall extends over a week or more, two calyx sprays are recommended, the first when three-quarters of the petals have fallen, and the second eight to ten days later.
Pears:
Advantage is taken of the fact that the calyx of pears closes slowly and can be more effectively filled with arsenate of lead two to three weeks after petal fall.

2. The Cover Sprays—
In order to be most effective, the cover sprays must be timed according to moth activity. Codling moth activity varies because:

(a) According to seasonal conditions and locality there may be one, two, or three, broods of moths, each of five to eight weeks duration.
(b) Each brood reaches a maximum activity two to four weeks after its commencement.
(c) Egg laying is profoundly affected by temperatures, the most favorable conditions for egg laying being warm evenings when temperatures are in the vicinity of 60 deg. F.

By using ten lures scattered throughout the orchard it is possible to determine easily and accurately, the activity of moths throughout the season. Lures are wide-mouthed jars of about one pint capacity, containing a 10 per cent. solution of any one of the following materials—Sweet wine (port type or sweet wine lees), apple juice, cider, golden syrup or molasses. The lures should

![Graphs showing moth activity](image-url)
be examined twice a week and the number of moths caught recorded. Wash out lure pots and renew the lure material at weekly or fortnightly intervals as required. Cover spray applications either of arsenate of lead for poisoning the grubs, or white oil for killing the eggs, should be commenced from four to six days after a “peak” number of moths has been caught in the lures. A little experience of moth catches will soon be gained by the grower, who will then be able to interpret the results and determine spray applications. Observations of egg-laying on the fruit should also be made to confirm lure records. In Victoria the critical periods, when maximum flights of moths have occurred have been during November, February and March. The actual period in these months varies with the season. Spray applications should be “timed” so that maximum results will be obtained.

**SCHEDULES.**

Arsenate of lead and summer white oil emulsion (the latter is an egg-killing spray) are the only insecticides which can be recommended for the control of codling moth.

Arsenate of lead sprays, 5 lbs. paste in 80 gals. water may be used throughout the season. Washing of fruit is essential to reduce the residue below the tolerance.

Sprays of arsenate of lead, 5 in 80, until late December, followed by summer white oil 1-1/3rd or 1 gal. in 80 until harvest. Washing not essential.

The first one or two cover sprays may be a combination of lead arsenate, 5 in 80, and white oil, 1 in 80, followed by white oil, 1 in 80, for the balance of the season.

**NOTE.—**Do not apply white oil sprays to Cleopatra apples, unless past experience has shown it to be safe.

**Spreaders:**

For arsenate of lead sprays the addition of 1/2 lb. lime-casein spreader will reduce blotchiness, but will add very little, if anything, to the efficiency of the spray. For combination sprays, 4 to 6 oz. of casein (not lime-casein) spreader per 80 gallon vat is recommended. If this is not included a tenacious residue will result. The latter addition will also reduce the risk of possible injury resulting from combination sprays.

The addition of small quantities of red or white oil to arsenate of lead sprays will usually result in a tenacious residue and this practice, therefore, should be confined to the earliest sprays or to canning pear varieties.

**NOTE.—**Where seasonal conditions warrant the continued application of lime-sulphur sprays after petal-fall, care should be taken not to apply white oil within three weeks of a lime-sulphur spray, otherwise serious injury may result. In such circumstances, arsenate of lead should be used as cover sprays until the risk of injury has passed.
Supplementary Measures for Control.

While spraying will reduce the damage caused by Codling Moth, growers are urged to adopt other supplementary measures, such as orchard hygiene and banding the tree trunks, for better control.

CODLING MOTH TREE BANDAGES (See also Page 24).

Bandages cannot operate efficiently unless all alternative cover for grubs, such as loose and rough bark on the butts, debris in forks and on the ground around the tree, and cracks and crevices are eliminated as far as possible. Therefore, scraping the butts and a general clean-up in the winter will serve the dual purpose of preparing the tree for the bands to be applied in November and detecting and destroying many over-wintering grubs.

When placed in position care must be taken, especially with chemical bands, to see that the bandage is in contact with the bark at all points.

If bag bandages are used they must be examined every 10 to 14 days. Bag bandages are to be preferred to chemical bands for pears, particularly in warm districts, and are valuable wherever birds are troublesome in damaging chemical bands.

In cool districts, bands should be in position no later than the last week in November and should be removed and destroyed in June or July of the following year. In warm districts bands should be in position a fortnight earlier.

Picking boxes and second-hand cases are frequently hiding places for Codling Moth larvae and pupae. These may be effectively sterilised by dipping in a boiling solution of washing soda, 1 lb. in 20 gallons.

THE CONTROL OF BLACK SPOT OF APPLES.

In general the remarks which appear under the heading of Black Spot of Pears will apply equally well to this disease although the fungus responsible is not identical. Spray programs differ in each State — See Spraying Chart.

The various stages of growth at which sprays are applied are as follow:—

1. Green Tip—This is recognized when the bud scales have separated from the majority of the blossom buds and the tips of the green folded leaves are just visible. (See illustration.)
Apple blossom buds showing "green tip" stage. The bud scales have separated from the majority of the fruit buds and the tips of the green folded leaves are just visible.

Showing — "early pink" stage of apple blossom. (5-10% blossom)

2. **Finger**—The young green leaves have separated from the blossom buds which are beginning to separate in the cluster.

3. **5-10 per cent. Blossom**—i.e., when 5-10 per cent. of the flowers have opened. (See illustration.)

4. **Petal-fall**—i.e., when the majority of the petals have fallen.

**SCHEDULE 1.**

For varieties liable to russet, such as Jonathan, London Pippin, Yates, Rokewood, Gravenstein, etc., the following Schedule is recommended:

At the "Green Tip" stage apply Bordeaux mixture 6:4:40.

At the "5-10 per cent. Blossom" stage apply Lime-sulphur (20 per cent. polysulphide content) 2 1/4:80.
At the "Petal-fall" stage apply Lime-sulphur (20 per cent. polysulphide content) 1:80.

At a stage 14 days after the petal-fall application, apply Lime-sulphur (20 per cent. polysulphide content) 1:80. See Note 3 re combination of Lime-sulphur with Arsenate of Lead.

NOTE.—For the Jonathan variety Bordeaux mixture should be applied at a slightly earlier stage than the "Green Tip" described above.

SCHEDULE No. 2 (The Bordeaux Schedule).

This programme is suitable only for varieties which do not russet readily and should not be used for Jonathans, London Pippins, Yates, Rokewood and Gravensteins.

At the "Green Tip" stage apply Bordeaux mixture 6:4:40.

At the "Finger" (no later) stage apply Bordeaux mixture 3:3:50.

CONTROL OF SUMMER SPOT.

If the above Schedules have been carefully adhered to, little trouble should be experienced with Summer Black Spot. If late spot does appear, 6 ozs. each of bluestone and freshly slaked lime should be included in each 80 gallons of lead arsenate or white oil spray. Growers who prefer to use lime sulphur should use same at a strength of 1:80.

NOTES.—
1. If freshly slaked lime (hydrated lime) is used for making Bordeaux mixture, the 6:4:40 formula becomes 6:6:40, the 3:3:50 becomes 3:4:50 and the 1:1:50 becomes 1:1½:50.
2. Spray injury may result if summer oil sprays are applied within three weeks of an application of a lime-sulphur spray.
3. If it is necessary to combine lime-sulphur and lead-arsenate, add the latter to the diluted lime-sulphur and spreader immediately before spraying. For this combination spray, lime casein spreader ¼ lb. in 80 gallons is recommended to reduce the risk of spray injury.
4. Efficient spraying, at all stages, is essential for the control of Black Spot. Care should be taken not to "miss" the tips of leaders.
5. For details of the preparation of Bordeaux mixture see page 18.

THE CONTROL OF BLACK SPOT OF PEARS.

In the control of this disease, as in many others, prevention is aimed at. Once infection occurs, cure is impossible, but the disease may be prevented from spreading further by thorough and frequent applications of suitable fungicides.
To control this disease weak solutions of copper compounds in the form of Bordeaux mixture are used. These are applied at frequent intervals to the plants so that a small amount of copper will be left on all new growth as it occurs. Rain and dew dissolve minute amounts of this copper and so poison the spores which germinate in this moisture. Every effort should be made to prevent primary infection in the Spring because control at this time is a front line defence. Summer infection will not be so severe, or may not occur, if Spring treatment is thorough.

Ploughing and orchard cultivation should be completed before "bud-burst" in Spring or otherwise delayed until risk of infection has passed with the arrival of more settled weather conditions.

The various stages of growth at which sprays are applied are as follow:

1. **Delayed Green Tip**—When the maximum number of blossom buds have brown scales (bracts) separating and tips of green folded leaves are just visible. (See illustration.)

2. **Finger** — When green leaves are separated from blossom buds which are beginning to separate in the cluster, **but before white petals appear.** (Note. — Odd blossoms only may be showing white petals. If a 6:4:40 Bordeaux mixture spray is applied later than this stage russet may occur. See illustration.)

3. **Late Calyx** — About three weeks after the fruit has formed.
Spray Schedules for some Varieties:—

**Williams, Beurre Bosc:**
At **"Delayed Green Tip"** stage apply Bordeaux mixture 6:4:40.
At **"Finger"** stage apply Bordeaux mixture 6:4:40.
At **"Late Calyx"** stage apply Bordeaux mixture 3:3:50, combined with the first arsenate of lead spray.

**Josephine, Winter Cole and d'Anjou:**
Only one Bordeaux mixture spray (6:4:40) should be applied, and this will be at an **early "Green Tip"** stage. This stage is slightly earlier than that described as **"Delayed Green Tip"** above. Any further Bordeaux mixture sprays will russet these varieties.

**Winter Nelis and Madame Cole:**
At **"Delayed Green Tip"** stage apply Bordeaux mixture 6:4:40.
At **"Finger"** stage apply Bordeaux mixture 6:4:40, but this application must be completed before any petals show pink.
At **"Late Calyx"** stage apply Bordeaux mixture 3:3:50. This spray must not be applied within three weeks after petal fall. This spray may be combined with the first arsenate of lead spray.
To reduce russet on Winter Nelis some growers reduce the **"Finger"** stage spray above to 3:3:50.

**Packham's:**
At **"Delayed Green Tip"** stage apply Bordeaux mixture 6:4:40.
At **"Finger"** stage apply Bordeaux mixture 6:4:40.
At **"Late Calyx"** stage apply Bordeaux mixture 1:1:50, combined with the first arsenate of lead spray.

**CONTROL OF SUMMER SPOT.**
If the early Bordeaux mixture sprays have been efficiently applied, little trouble should be experienced with Summer Spot. If Summer Black Spot does appear a Bordeaux mixture 1:1:50 can be applied, either alone or combined with an arsenate of lead spray, to Williams, Bosc and Packhams. For Josephine, if necessary, 6 oz. bluestone and
6 oz. freshly slaked lime can be added to 80 gallons of arsenate of lead spray, for the control of Summer Spot.

NOTES.—
1. If slaked lime (hydrated lime) is used for making Bordeaux mixture, the 6:4:40 formula becomes 6:6:40, and the 3:3:50 becomes 3:4:50. The 1:1:50 becomes 1:1\frac{1}{2}:50
2. For details of the preparation of Bordeaux mixture see page 18.
3. Thorough spraying at all stages is essential for the control of Black Spot. Care should be taken not to "miss" the tips of leaders.
4. For varieties not mentioned in this circular consult your District Horticultural Officer.

"VALLO" CONCENTRATED LIQUID LIME SULPHUR.

"Vallo" Concentrated Liquid Lime Sulphur is for the control of Black Spot of apples, pears and walnuts, Curl Leaf of peaches, nectarines, etc., and Shot Hole Fungus of apricots; Black, Green and Peach Aphids, Apple Mussel Scale, Mealy Bug, Red Spider, San Jose Scale, Brown Rot, etc., Mosses and Lichen, Potato and Bean diseases.

"Vallo" Concentrated Liquid Lime Sulphur is made from specially selected pure materials and is concentrated by a special process so as to bring it to the maximum strength without altering its properties.

RECOMMENDATIONS FOR USE.

For the Control of Fungus.—Winter (dormant) spraying of all trees—Mix 1 gallon of "Vallo" Concentrated Liquid Lime Sulphur with 10 to 15 gallons of water, see "Spraying Chart" for details.

Black Spot of Apples.—For details of spraying see special article on page 9.

General Spraying.—For correct dilutions for control or eradication of various pests or fungus see "Spraying Chart." Potato and Bean Diseases (as a preventive).—Strength, 1 in 100 up to 1 in 200.

For the Control of Red Mite in Fowl Houses.—Strength, 1 in 8 gallons of water.

COMBINED SPRAY ARSENATE OF LEAD AND LIME SULPHUR WASH.

From our own practical experience we do NOT recommend the above combination.

(a) Because the functions of the two Sprays are entirely different, and the best results are achieved if the two Sprays are applied separately and at the proper times.

We recommend the addition of the lead arsenate to the diluted lime sulphur and spreader in the vat immediately before spraying.—See page 15.
(b) When these two Sprays are mixed together a chemical change commences, and the longer the mixture is allowed to stand the more pronounced the change becomes. This chemical change greatly increases the possibility of damage to fruit and foliage.

We have, however, received numerous enquiries on the subject, and wish this booklet to be as informative as possible, and we give the following directions to make up 80 gallons of combined Spray.

1. Pour into spray tank 75 gallons of water and to this quantity add 1 lb. of "Vallo" Spray Spreader.
2. Add $1\frac{3}{4}$ gallons of "Vallo" Concentrated Liquid Lime Sulphur.
3. Mix the required amount of "Vallo" Arsenate of Lead with $3\frac{1}{4}$ gallons of water in a separate container.
4. With the agitator running pour the Arsenate of Lead mixture into the $76\frac{1}{4}$ gallons of Spray already in the tank, thus making up 80 gallons altogether.

5. When the combined Spray is made according to the above directions, Spray operations should commence immediately.

Under no circumstances should the combined Spray be allowed to stand for any length of time before spraying.

POINTS TO REMEMBER WHEN USING SULPHUR COMPOUNDS.

The following main points in connection with sulphur compounds and lime sulphur are summarised for the guidance of those who use this useful pest destroyer in any shape or form:

1. Do not confuse liquid lime-sulphur with the self-boiled or dry-mix powders.
2. Do not regard dry lime-sulphur as similar to the self-boiled or dry-mix powders.
3. Do not purchase lime-sulphur in any form or of any description without a guaranteed analysis stating (a) in the case of liquid lime-sulphur, the percentage of soluble sulphur and the polysulphide content; (b) the percentage of free polysulphide sulphur in dry lime-sulphur powder; and (c) the percentages of sulphur and lime in the case of self-boiled and dry-mix powders.
4. Do not buy farm-made liquid lime-sulphur without the usual guarantee required by the Fungicides Act, and then only after a careful comparison of prices.
5. It may be assumed that the lower the content of thiosulphate sulphur in liquid lime-sulphur the safer the spray.
6. When mixing or diluting lime-sulphur prior to spraying, do not over-agitate. The greater the agitation, the greater the decomposition and reduction in effective strength.

7. Spray as you mix or dilute, which means discarding any residue left over at the end of the day.

8. Take care to cleanse the spray outfit thoroughly prior to placing it away for the next spraying day.

9. When liquid lime-sulphur is used with lead arsenate as a dual purpose spray, there is double decomposition, which is considerably retarded by the addition of high-grade slaked lime. This also applies to a well-prepared self-boiled lime-sulphur, but not so much to the dry-mix powder.

10. When the full tank, drum, or tin of liquid lime-sulphur is not emptied at one spraying, always replace the volume of liquid withdrawn with an equal volume of rain water, and keep the container airtight. Mark the receptacle with the new lime-sulphur strength. This action is recommended once only, as dilution should not go on continually.

11. If rain water is not available for spraying make sure the water to be used is suitable for the purpose.

12. An interval of 3 or 4 weeks should elapse between the application of lime-sulphur and white oil sprays.

"VALLO" COLLOIDAL SULPHUR.

The development in recent years of Colloidal preparations for the control of fungous diseases and insect pests has been most successful. Experts have expressed their belief in the efficiency of this type of spray, particularly in Australia and New Zealand.

The great value of a Colloidal preparation is that the ingredients, being in such an extremely fine state of division, remain in suspension almost indefinitely.

Sulphur, as contained in the Colloidal preparation, is chemically the same as Flowers of Sulphur, but its fungicidal and insecticidal power is enormously multiplied, because of the extreme fineness of the Colloidal particles.

When it is considered that the average particle of sulphur Colloidally prepared is approximately 1/500,000th the size of an average particle in Flowers of Sulphur, it can be seen that the total surface, of a given weight of sulphur in its Colloidal form, is immeasurably greater than that of the same weight of Flowers of Sulphur.

The greater the total surface of sulphur particles, the greater the chemical activity.

Colloidal Sulphur, being so much finer than Flowers of Sulphur, can penetrate where the latter cannot. It is much more evenly distributed, and it adheres longer to the leaves.

Sulphur in the Colloidal form is at present receiving special prominence, and in Australia and New Zealand the
use of Colloidal Sulphur has undoubtedly proved an effective control for—

Brown Rot of Stone Fruits (omit on Apricots).
Oidium of the Vine.
Black Spot and Powdery Mildew of apples and pears

The following dilutions have proved efficacious:

1. **Brown Rot of Stone Fruits**—(except Apricots)
   Before buds swell, spray with "Vallo" Concentrated Liquid Lime-Sulphur, 1 gallon to 14 gallons of water.
   Immediately after petal-fall, "Vallo" Concentrated Liquid Lime-Sulphur, 1 to 160, plus "Vallo" Colloidal Sulphur, 2 lbs. to 100 gallons.
   When fruit is nearing maturity, "Vallo" Colloidal Sulphur, 2 lbs. to 100 gallons.

2. **Oidium of the Vine**—
   "Vallo" Colloidal Sulphur, 2 lbs. to 100 gallons. Spray preparatory to blooming and later at the same strength, as humid conditions may require.

3. **Black Spot and Powdery Mildew of Apples and Pears**—
   "Vallo" Colloidal Sulphur may be used with "Vallo" Concentrated Liquid Lime-Sulphur, Arsenate of Lead and/or Nicotine Sulphate, and can, therefore, be used in conjunction with the Codling Moth Spray programme.
   At the "**Green Tip Stage**" spray with Bordeaux, 6:4:40 (Use "Vallo" Neige Crystals and "Vallo" Prepared Spraying Lime).
   At the "**Pink Stage**", use "Vallo" Concentrated Liquid Lime-Sulphur, 1 to 80, plus "Vallo" Colloidal Sulphur, 2 lbs. to 100 gallons.

   **Calyx Spray**—"Vallo" Concentrated Liquid Lime-Sulphur, 1 in 160, plus "Vallo" Colloidal Sulphur, 2 lbs. to 100 gallons, plus Arsenate of Lead (usual proportions), plus Hydrated Lime, 3 to 5 lbs. to 100 gallons.

   **Cover Sprays**—Spray with a similar combination as Calyx sprays, with the exception that the Lime-Sulphur and Hydrated Lime can be omitted where Black Spot is not prevalent.

   **Method of Mixing**—Mix to a thin cream by adding three times its weight of water, then add to bulk of water or other dilute spraying material.
   When mixing combined spray, it is essential "Vallo" Colloidal Sulphur be added last, as follows:
   1. Make full dilution of "Vallo" Lime-Sulphur.
   2. Add Arsenate of Lead and Hydrated Lime combined.
   3. Add the cream of "Vallo" Colloidal Sulphur last, and thoroughly mix the combined spray.

**"VALLO" COPPER SULPHATE.**
**Commercial Crystals.**

This high quality Bluestone is in every way equal to the best English imported Copper Sulphate and has been supplied throughout Australia for a number of years and has given complete satisfaction.
"Neige" or "Snow" Crystals.

"Vallo" Copper Sulphate "Neige" Crystals is made precisely to the same analysis as "Vallo" Copper Sulphate Commercial Crystals, and is even more suitable for the making of Bordeaux or Burgundy Mixture on the Orchard, as these Crystals dissolve very easily in cold water. We will gladly supply a sample on request and would like you to make this test for yourself.

We suggest that you use an ordinary white teacup for the test; nearly fill a cup with water, empty sample into it, and after stirring a few times you will note how easily the particles dissolve.

Reasons why you should use "Neige" Crystals—

1. Prevents waste.
2. Saves time and labour.
3. Means more vats per day.
4. With ordinary Commercial Crystals it is necessary to dissolve them overnight, but "Vallo" "Neige" Crystals dissolve so easily you may put out your Spray at a moment's notice, and are therefore not dependent on weather conditions.
5. Analysis guaranteed—99 per cent. Copper Sulphate.

Recommendations for Making Bordeaux on the Orchard, using "Vallo" Copper Sulphate Commercial Crystals or "Vallo" Copper Sulphate "Neige" Crystals (preferably "Neige" Crystals) with "Vallo" Specially Prepared Lime. (Reference to "Vallo" Specially Prepared Lime will be found on page 19).

To make a 6:4:40/50 Mixture use 6 lbs. of "Neige" Crystals with a sufficient quantity of Specially Prepared Lime, with 40 or 50 gallons of water as required. Half fill the spray tank, and to this quantity of water, with the agitator working, add the "Neige" Crystals. In a separate vessel mix the required quantity of Lime into a thin paste, further dilute with water, and add this solution to the Copper Sulphate. By adding further water to the spray vat, and with the agitator working, bring up to the required gallonage.

To make a 4:4:40/50 Mixture follow out the above directions, using 4 lbs. of "Neige" Crystals with a sufficient quantity of Specially Prepared Lime to 40 or 50 gallons of water as required.

Although the usual formulae is 6:4:40 (4 lbs. quick lime), if "Vallo" Specially Prepared Lime is used in place of the quick lime, it will be found that only 2 to 3 lbs. is sufficient to neutralise 6 lbs. of Copper Sulphate. "Vallo" Specially Prepared Lime contains a spreader, and has this advantage over ordinary lime.

We recommend that the grower test the Bordeaux before applying.
For suitable method of testing refer to the use of Litmus Papers, page 20.

For detail instructions for the prevention of Black Spot of Pears see special article on page 11.

"VALLO" SPECIALLY PREPARED LIME.

Reference to this high quality product has been made under the heading “Recommendations for Making Bordeaux with ‘Vallo’ Copper Sulphate,” page 18.

With ordinary Lime there is a certain proportion known as “core,” which is of no value to the Spray Mixture.

“Vallo” Specially Prepared Lime is treated by a special process and brought to a very fine state of division, making it particularly suitable for spraying purposes. This has been done only after the “core” or waste material has been removed. Hence the reason that it is only necessary to use a smaller quantity of Specially Prepared Lime than Ordinary Lime; it means also that the resultant mixture contains no grit, is less dense and is much easier on the spray pump.

“Vallo” Specially Prepared Lime contains a spreader.

BORDEAUX MIXTURES.

In addition to “Vallo” Copper Sulphate and “Vallo” Prepared Lime we supply Bordeaux prepared for immediate use.

"VALLO" HOME-MADE BORDEAUX.

“Vallo” Home-Made Bordeaux is put up in two strengths to conform to two formulae:—

1. 6:4:40/50. For Autumn and Delayed dormant spraying.

"VALLO" HOME-MADE BORDEAUX IS SOLD IN CASE LOTS ONLY.

One case of “VALLO” HOME-MADE BORDEAUX, 6:4:40/50 (sufficient to make 320/400 gals. of spray) contains

- 8 x 6 lb. bags “Vallo” Copper Sulphate “Neige” Crystals,
- Also 8 bags “Vallo” Specially Prepared Lime.

2. 4:4:40/50. For Pinking stage or when blossoms just begin to open.

One case of “VALLO” HOME-MADE BORDEAUX, 4:4:40/50 (sufficient to make 480/600 gals. spray) contains

- 12 x 4 lb. bags “Vallo” Copper Sulphate “Neige” Crystals,
- Also 12 bags “Vallo” Specially Prepared Lime.
For directions for combining these ingredients, follow out instructions on page 18.

**"VALLO" BURGUNDY MIXTURE.**

This preparation is an excellent Fungicide and is a Preventive for Downy Mildew of the Vine, Curly Leaf and Brown Rot of the Peach, Shot Hole of the Apricot, and a control for Black Spot of the Vine, Apple and Pear; also particularly suited for the control of Blue Mould on Oranges.

"Vallo" Burgundy Mixture must not be used with Arsenate of Lead.

**RECOMMENDED DILUTIONS.**

**Vines. Winter Strength**—Add 2 lbs. to 5 gals. water.

**Summer Strength**—Add 1 lb. to 5 gals. water.

**Deciduous Trees.**

**Winter Strength**—Add 3 to 4 lbs. to 10 gals. water.

**Summer Strength**—Add 2 lbs. to 15 gals. water.

**Citrus Trees.**

Add 2 lbs. of Mixture to 15 gallons of water.

Add Mixture gradually by sprinkling into the full quantity of water, stirring all the time; continue stirring until water becomes cloudy. It is then ready for use.

**N.B.**—The Mixture must be added to the water, not the water to the Mixture.

Trouble will be caused if insufficient water is used.

**DRY BORDEAUX.**

In this product the ingredients are present in exact quantities to neutralise each other, and there is no possibility of free Copper Sulphate or excess of Lime existing in the final preparation as frequently occurs in mixtures made on the Orchard from Lime and Copper Sulphate, which have not been specially selected.

**LITMUS PAPERS.**

It is advisable to test Bordeaux Mixtures before applying, as it is not desirable to apply the mixture if it tests acid.

Copper Sulphate in solution gives an acid reaction, that is to say, if a piece of blue litmus paper is dipped in a solution of Copper Sulphate it will turn red, therefore, before applying your Bordeaux spray mixture, test it with a piece of blue litmus paper. If it turns red, sufficient Lime has not been used and more Lime must be added until the mixture turns the piece of red litmus paper a blue colour.

**"VALLO" IMPROVED SPRAY SPREADER.**

This spreader is now manufactured from a new formula and by a special process recently determined to perfect a
compound to perform all the duties of the ideal spray spreader.

“Vallo” Improved Spray Spreader is a perfect product.

By giving a more uniform spread to the spray and increasing its adhesiveness a greater protection from grubs, etc., is assured.

Increasing the wetting and covering power of the solution permits the spray to spread in an even, thin film over all surfaces. “Vallo” Improved Spray Spreader makes it possible to reduce the quantity of spray required for a given acreage.

RECOMMENDATIONS FOR USE.

Add 1 lb. of Spreader to 1 pint of water, stir to form a thin paste. Add more water, stir well, then pour into tank. One (1) lb. of “Vallo” Improved Spray Spreader is sufficient for 80 gallons of spray.

When two or more spray materials are combined always add the Spreader first, then the Arsenate of Lead, Nicotine Sulphate or Bordeaux.

The following reproduction from actual photographs give a clear indication of the advantages to be gained by using “Vallo” Improved Spray Spreader.

APPLES Sprayed with Arsenate of Lead.
Without Spreader. With Spreader.

“VALLO” PREPARED WHITE OIL.
Contains 89 per cent. of Mineral Oil.

“Vallo” Prepared White Oil is made from a specially selected Petroleum Oil and is recommended for the control of various pests which attack deciduous and citrus trees.

“Vallo” Prepared White Oil contains no added water.

DECIDUOUS TREES.
For the control of Codling Moth, Aphids, Mites, Red Spider, Thrips, and various Scale Pests.
CITRUS TREES.

For the control of Aphids and all kinds of Scale, including Cottony Cushion Scale, Oleander, Olive, Black and Red Scale.

ORNAMENTAL TREES, SHRUBS, Etc.

In the Flower Garden “Vallo” Prepared White Oil is an invaluable insecticide, and is most suitable for the control of pests affecting Ornamental Trees in parks, etc.

DIRECTIONS FOR MIXING.

To 1 gallon of Prepared White Oil add one-third of a gallon of water in small proportions very gradually, and stir vigorously until a thick white emulsion is formed. Pour this emulsion into the required amount of water in the spray tank.

RECOMMENDED DILUTIONS.

(The following recommendations apply also to “Vallo” White Oil Emulsion.)

Deciduous Trees.

For Aphids (except during blossoming and fruit setting)—1 gallon of emulsion added to 40 gallons of water.

For Red Spider—½ gallon of emulsion and 1 pint Nicotine to 80 gallons of water.

For Codling Moth—When used alone (last two sprays before picking)—1 gallon of emulsion in 80 gallons water.

When used in combination with “Vallo” Arsenate of Lead adopt the following method of combining the sprays. Pour in vat 79 gallons of water and with the agitator running add the usual quantity of Arsenate of Lead required to make up 80 gallons of spray. Then add 1 gallon of emulsion, which will make up 80 gallons of spray altogether. The Arsenate of Lead must be added to the water in the spray vat before the emulsion.

Citrus Trees.—1 gallon of emulsion added to 49 gallons of water.

Ornamental Trees, Shrubs, Etc.—1 gallon of emulsion added to 79 gallons of water.

The emulsion may be used in combination with Arsenate of Lead, Bordeaux or Nicotine Sulphate, but should NOT, under any circumstances, be used with Lime Sulphur. After spraying with Lime Sulphur do not apply White Oil for a period of 3 to 4 weeks at least.

When combining the emulsion with Bordeaux or Nicotine Sulphate use the usual quantities of the two latter sprays and add the emulsion in the proportion of 1 gallon of emulsion to 79 gallons of water.
"VALLO" WHITE OIL EMULSION.

For those growers who prefer Petroleum White Oil ready for use, we supply it in the emulsified form and under the trade name "Vallo" White Oil Emulsion.

RECOMMENDED DILUTIONS.

Refer to the recommended dilutions for "Vallo" Prepared White Oil, commencing page 22.

PALE SPRAYING OIL.
82 per cent. Pale Mineral Oil.

"Vallo" Pale Spraying Oil for Deciduous Fruit Trees—Spray during the Dormant and late Dormant periods. "Vallo" Pale Spraying Oil gives added protection when used with Fungicidal Sprays—apply not later than the "Green Tip" stage of bud development. It should NOT be used with such an insecticide as Lead Arsenate.

RECOMMENDED DILUTIONS.

Apples and Pears—1 gallon "Vallo" Pale Spraying Oil to 15-20 gallons of water (dormant period only).

Peaches and Nectarines—1 gallon "Vallo" Pale Spraying Oil to 20-25 gallons of water (dormant period only).

Fungicidal Sprays—Add 1 gallon "Vallo" Pale Spraying Oil to 100 gallons of Fungicidal Spray Mixture.

Directions for Mixing.

Make sure all utensils are clean. Measure required amount of "Vallo" Pale Spraying Oil into suitable vessel, while stirring add slowly an equal bulk of water; continue stirring until a thin smooth mixture results. This forms the PRIMARY EMULSION. Pour this PRIMARY EMULSION into correct quantity of water in spray vat to give required strength, and mix thoroughly. When adding "Vallo" Pale Spraying Oil to Fungicidal Sprays, slowly pour two gallons of PRIMARY EMULSION into 100 gallons of already prepared Fungicidal Spray, to which has previously been added ½ lb. of Casein Spreader. Mix thoroughly and spray at once.

"VALLO" RED SPRAYING OIL.

"Vallo" Red Spraying Oil contains 89 per cent. of specially selected Heavy Mineral Oil.

"Vallo" Prepared Red Spraying Oil mixes readily with cold water and leaves no trace of free oil.

This highly efficient insecticide is recommended for Woolly Aphis, Mussel Scale, San Jose Scale, Red Mites, Brown Olive Scale, Red Scale, Cottony Cushion Scale, White Wax, etc., and Peach Aphis (Winter Spray).

DIRECTIONS FOR MIXING.

1. All vessels used in oil spraying should be thoroughly washed out, as the presence of Lime or other foreign substances will cause a separation of the emulsion.
2. If water is hard use "Vallo" Special Spraying Soft Soap.

3. Mixing.—Add equal parts of oil and water, mix together until the liquid turns a milky white colour, and then add the mixture to the stated quantity of water.

RECOMMENDED DILUTIONS.

Deciduous Fruit Trees.—Winter spraying (when buds are dormant)—1 gallon of Oil to 15 to 20 gallons of water.

Spring Spraying (when buds are bursting)—1 gallon of Oil to 39 gallons of water.

Citrus Fruit Trees.—Spray during late Summer and Autumn—1 gallon of Oil to 39 gallons of water.

Ornamental Trees and Plants.—
Deciduous—1 gallon of Oil to 24 gallons of Water.
Evergreen—1 gallon of Oil to 39 gallons of water.

"VALLO" CODLING MOTH TREE BANDS.

Certain Death to all Grubs, etc., that Attack Fruit Trees.

Realising the need for an improved method of trapping and destroying larvae of Codling Moth and the like, by the most certain and inexpensive means, we have, after most careful and certain tests, embodied in a finished "Vallo" product all the essentials of

THE PERFECT TREEBAND.

"Vallo" Codling Moth Tree Banding material is treated in such a manner that it will remain effective for the period of approximately 8 months, November to June, while on the trees.

Tree Bandages would have been favoured to a greater extent in past years had it not been for the heavy cost of applying and inspecting them. By using "Vallo" Codling Moth Tree Banding material great economy is effected by obviating all the labour entailed in removing bag bandages and fixing new ones as is necessary when the old method of bandaging is employed.

With "Vallo" Tree Bands there is no necessity to remove or even inspect them. They should be applied about the end of November and should NOT be removed earlier than the end of June in the following year.

Before applying the Bands it is advisable to scrape all loose bark from the trunks of the trees.

The application of these Bands is quite a simple matter. It is only necessary to cut the Band to a length to suit the circumference of the tree and allow for an overlap of one inch, insert the staple through the corrugated side in a parallel position, then wrap around the tree with the corrugations lying next to it, press the overlap section on the projecting points of the staple, bend the ends inwards, this will hold the Band securely in position.
It will be seen that the Band when in position provides two series of small passages, around and parallel to the trunk of the tree, which form an excellent trap for the larvae or grubs; the Band of course is placed on the trunk with the corrugated side to the trunk.

"Vallo" Codling Moth Tree Bands not only trap innumerable grubs, weevils, etc., but the poison with which the Bands are impregnated kills them outright.

It is estimated that of all Codling Moths more than 60 per cent. are females, and that a female moth lays as many as 50 eggs. On the assumption that only 50 per cent. of the eggs are fertile, a kill of 100 grubs in a tree band is definitely responsible for the prevention of 2,000 moths in the first year.

Your trees are not adequately protected until fitted with "VALLO" CODLING MOTH TREE BANDS.

PACKAGE.—Rolls 200 ft. in length. (With "Vallo" Codling Moth Tree Bands we supply 1 gross of staples per roll).

Reproduction of an 8-inch Section of Tree Band.

This photograph shows the two sections of the Band stripped apart and reveals the second set of corrugations with grubs trapped and killed.

The above blocks are reproductions from actual photographs of a Band which has been removed from a tree grown in the Harcourt district (Vic.).
### Spraying Chart for Victoria

1. **DO NOT** Spray Peach trees with Arsenate of Lead.
2. **,,,,** Add soap to Arsenate of Lead sprays.
3. **,,,,** Spray Apricot trees with sprays containing Copper or Sulphur when in fruit or foliage.
4. **,,,,** Fumigate citrus with cyanide preparation for at least 6 months after Bordeaux mixture applications.
5. **,,,,** Spray Cherry trees with Arsenate of Lead between Early October and harvest.
6. **,,,,** Spray Cleopatra Apples with White Oil in Summer.

**Note.**—In all directions for the use of Arsenate of Lead the quantities specified are for Paste; if it is desired to use Arsenate of Lead Powder only use half the quantities specified.

<table>
<thead>
<tr>
<th>Insect Pest</th>
<th>What to Use</th>
<th>When to Treat</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aphids</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cherry Aphid</td>
<td>Tar distillate, 3 in 100</td>
<td>1st week July to end of July (as late as possible but before bud movement). When trees are in leaf.</td>
<td>Sprayer should wear goggles and protect exposed skin with lanoline when spraying with Tar Distillate.</td>
</tr>
<tr>
<td></td>
<td>Nicotine Sulphate, 1 pint in 80 galls., plus 3 lbs. soft soap.</td>
<td></td>
<td>Tendency for leaves to curl therefore contact of spray with insects is difficult. Early treatment is advised.</td>
</tr>
<tr>
<td></td>
<td>As for Cherry Aphid.</td>
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<td></td>
</tr>
<tr>
<td>Green Peach Aphid</td>
<td>Nicotine Sulphate, 1 pint in 80 galls., plus 3 lbs. soft soap.</td>
<td>As soon as insects are noticed on young foliage.</td>
<td>Keep headlands clean of weeds. If San Jose Scale is present, Oil and Tar Distillate may be combined providing emulsion does not &quot;break&quot;.</td>
</tr>
<tr>
<td>Black Peach Aphid</td>
<td></td>
<td></td>
<td>Apply tanglefoot bands 2 in. to 3 in. wide around tree trunks in early July. Place ring of tobacco stems around base of tree trunk to prevent aphids ascending from the roots. Nicotine Sulphate spray can also be placed in channel at base of tree.</td>
</tr>
<tr>
<td>Pest</td>
<td>Treatment</td>
<td>Application Periods</td>
<td></td>
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<td>-------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Black Citrus Aphid</td>
<td>Nicotine Sulphate, 1 pint in 80 galls., plus 3 lbs. soft soap. 1/2 to 3/4 gall. White Oil Emulsion may be substituted for soft soap; or White Oil 1-40.</td>
<td>Spring and Autumn, as required.</td>
<td></td>
</tr>
<tr>
<td>Wolly Aphid</td>
<td>Red Oil 1 in 15, or Red Oil 1 gall. plus Nicotine Sulphate 1 pint, Soft Soap 1 lb., Water 80 galls. White Oil 1 in 80; or Nicotine Sulphate 1 pint in 80 gall.</td>
<td>Spring and Autumn as required. (Except in October and November during blossoming and fruit setting.) After pruning while trees are still dormant. After pruning while trees are still dormant. In Summer. When majority have hatched but before young hoppers develop wings (November and December). Repeat spray in January for second brood, if necessary. In Winter. When beetles are noticed feeding on leaves. White Oil can be increased in the Autumn application to 2 in 80 as a control for Red, Brown and Black Scales. There is no need to include Nicotine Sulphate in this 2 in 80 White Oil spray. This pest is usually controlled by the parasite—Aphelinus mali—but in the cooler districts Winter spraying is often necessary. A coarse jet and a high pressure are helpful in destroying the woolly protection. Winter oil sprays do not adversely affect the parasite. Either of these sprays may be added to the usual Lead Arsenate sprays for Codling Moth control. NOTE,—Soap must be omitted. Spray under-side of leaves. This spray can be combined with the Lead Arsenate sprays if required, but soon must be omitted. Lime Sulphur 1 in 80 combined with the Lead Arsenate 5 in 80 may also be used. This scale also attacks many other fruit trees. Tanglefoot bands can be placed around tree trunks or the use of zinc traps and bands are very helpful particularly from August to December. Regular collection of beetles is recommended. Manure affected trees heavily with a complete fertiliser.</td>
<td></td>
</tr>
<tr>
<td>Apple Leaf Hopper (Jassids)</td>
<td>Nicotine Sulphate 1 pint in 80 galls., plus either 1 gall. White Oil or 2 lbs. of Soft Soap.</td>
<td>After pruning while trees are still dormant. In Winter.</td>
<td></td>
</tr>
<tr>
<td>Apple Mussel Scale</td>
<td>Red Oil 1 in 15; or Lime Sulphur 1 in 10.</td>
<td>In Winter. This scale also attacks many other fruit trees.</td>
<td></td>
</tr>
<tr>
<td>Apple Root Borer</td>
<td>Arsenate of Lead 8 lbs. in 80 galls.</td>
<td>In Winter. This scale also attacks many other fruit trees.</td>
<td></td>
</tr>
</tbody>
</table>
# SPRAYING CHART (Continued)

<table>
<thead>
<tr>
<th>INSECT PEST</th>
<th>WHAT TO USE</th>
<th>WHEN TO TREAT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Scale</td>
<td>Same treatment as for Soft Brown Scale.</td>
<td></td>
<td>Clean sawdust away from holes in trunk and branches, squirt in kerosene or carbon bisulphide and plug holes with clay. Wire probes are also useful to destroy larvae in tunnels. Will also attack many other trees.</td>
</tr>
<tr>
<td>Cherry Borer Moth</td>
<td>No effective spray treatment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cherry Green Beetle</td>
<td>Arsenate of Lead 1 lb. in 25 galls.</td>
<td>When beetles are noticed on foliage.</td>
<td>Hand picking of winged adult insects is frequently adopted. Bugs drop to the ground or fly away when disturbed.</td>
</tr>
<tr>
<td>Codling Moth</td>
<td>See special article on page 6.</td>
<td>In Summer.</td>
<td>Direct dust to undersides of leaves.</td>
</tr>
<tr>
<td>Cottony Cushion Scale</td>
<td>White Oil 1 in 40 with ½ pint Nicotine Sulphate.</td>
<td>When bugs are noticed in nymphal stage on tip growth.</td>
<td>Burn all prunings. Also attacks apple, plum, peach, quince, fig, currants, raspberry and loganberry.</td>
</tr>
<tr>
<td>Cross or Holy Bug of Citrus</td>
<td>Nicotine Sulphate, 1 pint in 80 galls., plus White Oil 1 gal.</td>
<td>Just before bud movement.</td>
<td>Looper may cause injury to cherries which offers favourable opportunity for Brown Rot to develop.</td>
</tr>
<tr>
<td>Erinrose</td>
<td>Lime Sulphur 1 in 12. Dust with fine sulphur.</td>
<td>When warty spots are noticed on leaves.</td>
<td></td>
</tr>
<tr>
<td>Greater Vine Scale</td>
<td>Red Oil 1 in 15.</td>
<td>In Winter, after pruning.</td>
<td></td>
</tr>
<tr>
<td>Looper Caterpillar</td>
<td>Arsenate of Lead 1 lb. in 25 galls.</td>
<td>When caterpillars are noticed on foliage. (Early October for Cherries.)</td>
<td></td>
</tr>
<tr>
<td>Pest</td>
<td>Treatment</td>
<td>Remarks</td>
<td></td>
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<td>----------------------</td>
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<td>--------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Mealy Bug</td>
<td>Lime Sulphur 1 in 10. or Nicotine Sulphate 1 pint in 80 galls., plus ½ gall. White Oil.</td>
<td>Dormant period. Remove loose bark before applying spray. When infection is noticed around calyces of fruit.</td>
<td></td>
</tr>
<tr>
<td>Oriental Peach Moth</td>
<td>No satisfactory spray.</td>
<td>No satisfactory spray treatment is known. Investigations are proceeding with biological methods.</td>
<td></td>
</tr>
<tr>
<td>Pear and Cherry Slug</td>
<td>Lead Arsenate 1 lb. in 50 galls.</td>
<td>When slugs are noticed on leaves of pears, plums, cherries or quinces.</td>
<td></td>
</tr>
<tr>
<td>Pear Leaf Blister Mite</td>
<td>Lime Sulphur 1 in 12.</td>
<td>In Winter, before bud movement.</td>
<td></td>
</tr>
<tr>
<td>Red Scale</td>
<td>White Oil 1 in 40.</td>
<td>Mid-December and Mid-March or Mid-January and Mid-February</td>
<td></td>
</tr>
<tr>
<td>Red Spider and Bryobia Mite</td>
<td>Lime Sulphur 1 in 40; or Red Oil 1 in 15. or 5 lbs. Sulphur, ½ lb. casein spreader, 1½ gall. Lime Sulphur, 100 galls. water; or Nicotine Sulphate (40 per cent.) 1 pint in 80 galls., plus ½ gall. White Oil.</td>
<td>After pruning, June or early July. In Summer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Applications of this spray to cherry trees should be delayed until after harvest. Codling Moth sprays control this pest on mature pear trees, but young pear trees should be sprayed as directed here.</td>
<td></td>
</tr>
</tbody>
</table>

On vines, Winter swabbing with acid-iron sulphate solution for Black Spot assists in controlling this insect.

Direct the spray upwards so that contact is made and calyces are well wetted.

Burn all affected prunings. Delay spray as late as possible before bud burst.

Spray under-side of leaves. This spray may be combined with the usual Arsenate of Lead sprays for Codling Moth control. Arsenate of Lead 5 lbs. in 80 galls., plus 1 gall. of White Oil is also recommended.
<table>
<thead>
<tr>
<th>INSECT PEST</th>
<th>WHAT TO USE</th>
<th>WHEN TO TREAT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutherglen Bug.</td>
<td>Dust of equal parts Pyrethrum Powder and 3 per cent. Nicotine Dust; or Dust containing 7 per cent. Creosote and 3 per cent. Nicotine.</td>
<td>When immature and wingless bugs are first noticed. Repeat treatment if necessary.</td>
<td>Winged forms in myriads in Summer cannot be effectively controlled. Smudge fires are sometimes used. Clean cultivation assists in control.</td>
</tr>
<tr>
<td>San Jose Scale</td>
<td>Lime Sulphur 5 galls., Winter White Oil 2 galls., Water 80 galls.; or Lime Sulphur 1 in 10; or Red Oil 1 in 15.</td>
<td>When tree is dormant.</td>
<td>This spray assists in the control of Red Spider. Heavy infestations may require two applications. White Oil, 1 in 60, in Arsenate of Lead sprays for Codling Moth will assist in control during Summer.</td>
</tr>
<tr>
<td>Soft Brown Scale</td>
<td>White Oil 1 in 40.</td>
<td>January to April, as required.</td>
<td>Best results are obtained if applications are made at completion of egg hatching. Spray under-side of leaves particularly.</td>
</tr>
<tr>
<td>Thrips</td>
<td>5 per cent. Nicotine Dust.</td>
<td>When insects are first noticed in blossoms. Repeat at two-day intervals.</td>
<td>Frequently, damage is done to vital parts of the flower before petals open. No satisfactory method of control is known when insects occur in plague numbers.</td>
</tr>
<tr>
<td>Tomato Moth</td>
<td>50 per cent. Arsenate of Lead Dust.</td>
<td>At fortnightly intervals from just before flowering time until 3 weeks before picking.</td>
<td>The frequency of the dusting will depend largely on the severity of the infestation. Destroy infected fruit.</td>
</tr>
<tr>
<td>Vine Moth</td>
<td>Arsenate of Lead 1 lb. in 25 galls.</td>
<td>When larvae appear on foliage.</td>
<td></td>
</tr>
<tr>
<td>FUNGOUS DISEASE</td>
<td>WHAT TO USE</td>
<td>WHEN TO TREAT</td>
<td>REMARKS</td>
</tr>
<tr>
<td>----------------------</td>
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</tr>
<tr>
<td>Apricot Freckle</td>
<td>Bordeaux mixture 6:4:40.</td>
<td>1. In May, 2. “Pink-bud” stage as for Shot Hole</td>
<td>No really safe and effective cover spray is known for this disease.</td>
</tr>
<tr>
<td></td>
<td>Bordeaux mixture 1:1:50.</td>
<td>Just as ‘caps’ fall from fruit—about first week in October.</td>
<td>This spray may cause a red blush on apricots which are very sensitive to copper sprays.</td>
</tr>
<tr>
<td></td>
<td>See special articles on pages 9 and 11.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Spot of Apple</td>
<td>Bordeaux mixture 10:5:50.</td>
<td>When first sign of Spot appears, repeat as required.</td>
<td>Burn prunings. Swab vines just before buds commence to swell with Sulphate of Iron, 20 lbs., and Sulphuric Acid, 8 lbs., in 10 gallons of hot water. This swab is very corrosive.</td>
</tr>
<tr>
<td>and Pear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Spot of Vine</td>
<td>Bordeaux Mixture 6:4:40.</td>
<td>“Pink bud” stage.</td>
<td>Rigid orchard sanitation is essential. Collect mummies, prune and burn affected twigs. Do not use cover sprays containing copper or sulphur. Thorough cultivation particularly around tree is also essential.</td>
</tr>
<tr>
<td>(Anthracnose)</td>
<td>Bordeaux Mixture 6:4:40; or</td>
<td>When white petals commence to show (Popcorn stage).</td>
<td>Remarks on orchard sanitation—“Brown Rot of Peaches”—also apply for this disease.</td>
</tr>
<tr>
<td></td>
<td>Lime Sulphur 2 1/2 in 80, Lime Sulphur 1 in 80,</td>
<td></td>
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<tr>
<td></td>
<td>Lime Sulphur 1 in 80, Ammonium Polysulphide 1</td>
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<tr>
<td></td>
<td>in 80, plus 3 lbs. Soft Soap.</td>
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<td></td>
</tr>
<tr>
<td>Brown Rot of Apricots</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Brown Rot of Cherries</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fungal Disease</td>
<td>What to Use</td>
<td>When to Treat</td>
<td>Remarks</td>
</tr>
<tr>
<td>-------------------------</td>
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</tr>
<tr>
<td>Brown Rot of Citrus</td>
<td>Bordeaux mixture 3:3:50; or Zinc Sulphate 12 lbs., Copper Sulphate 1 lb., Slaked Lime 6 lbs., Water 100 galls.</td>
<td>When first infection is noticed. \ When first infection is noticed.</td>
<td>Spray ground around and under the tree as well as foliage. Prune up low hanging branches. <strong>NOTE.</strong>—Fumigation warning under Septoria Spot.</td>
</tr>
<tr>
<td>Brown Rot of Peaches</td>
<td>Bordeaux mixture 6:4:40. \ Dry-mix Lime Sulphur 25 in 100. \ Wettable Sulphur 4 lbs. in 100 galls.</td>
<td>At &quot;Pink-bud&quot; stage. \ In October, end November, January and late February for canning peaches. \ November and/or December for dessert peaches.</td>
<td>This zinc-copper spray can be followed by fumigation. Complete ploughing before applying first Bordeaux mixture spray. Thorough, clean cultivation. Prune affected twigs, collect and burn mummies. Late February applications may be necessary on mid-season and late canning varieties (Golden Queen and Pullars). Avoid spraying within one month of harvesting unless essential. Do not apply within 14 days of picking. The &quot;pink-bud&quot; Bordeaux spray should also be applied to dessert peaches. Choose fine weather, with quick drying conditions, otherwise spray injury may occur.</td>
</tr>
<tr>
<td>Brown Spot of Passionfruit</td>
<td>Bordeaux mixture 4:4:50.</td>
<td>As required, particularly in Spring and early Summer.</td>
<td>Aphids sometimes cause leaves to curl. This condition can be distinguished from that caused by the fungus which causes leaves to swell and become brilliantly coloured. Carefully examine for aphids. A dormant spray of Tar Distillate, as for Green Peach Aphid, appears to control this disease also.</td>
</tr>
<tr>
<td>Curly Leaf of Peach</td>
<td>Bordeaux mixture 6:4:40.</td>
<td>At &quot;Pink-bud&quot; stage in Spring.</td>
<td>Warm, humid conditions favour the development of this fungus.</td>
</tr>
<tr>
<td>Downy Mildew</td>
<td>Bordeaux mixture 10:5:50.</td>
<td>1. Late September or early October. \ 2. Late October. \ 3. In January—if required.</td>
<td></td>
</tr>
<tr>
<td>Disease</td>
<td>Treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oidium of Vine</td>
<td>Dust with fine sulphur.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powdery Mildew</td>
<td>Lime Sulphur 1 in 12. Lime Sulphur 2 1/2 in 80, plus 10 lbs. of atomic sulphur.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Septoria Spot of Citrus</td>
<td>Bordeaux mixture 3:3:50, plus 1/2 gall. White Oil.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shot Hole and Scab of Apricot</td>
<td>Bordeaux mixture 6:4:40, plus Lime casein spreader 1/2 lb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sooty Mould</td>
<td>Bordeaux mixture 3:3:50, plus White Oil 1 gall.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Shortly after sprouting, if required.
2. At blossoming and when fungus is observed in December and January.

"Pink-bud" stage.
October, November, January and February.

In Winter.
At "Green-tip" stage.

February or early March.

1. End of May, when leaves are falling and at 2. "Pink-bud" stage (August)

When required.

In September or early October for Spring application, or In March for Autumn application.

Apply dusts in the early morning, conditions are usually more favourable then.

Bury fallen leaves by deep ploughing. These sprays are similar to those used in the control of Brown Rot of Peaches. Affects most of stone fruits.

Remove affected twigs in Winter. Substitute Lime Sulphur for Bordeaux mixture in Black Spot control programme.

Remove dead wood from trees. Plough under fallen leaves. 3:3:50 Bordeaux mixture may be combined with usual White Oil 1 1/4 in 50 for Red Scale control. Do not fumigate with cyanide preparations after Bordeaux mixture applications for at least 6 months.

This spray can also be used for Shot Hole on Almonds and Plums. Apply at "pink" or "white" bud stage.

If Aphids, Brown and Black Scale are controlled this mould will disappear.

If White Oil is to be used in combination, it should be added to the Zinc-Sulphate—Lime, and/or Bordeaux mixture—Zinc-Sulphate—Lime in the vat. The spray must be alkaline before adding White Oil. While Blood Albumin is sometimes used as a spreader it is not essential.
## SPRAYING CHART (continued)

The Directions, as given in the “Spraying Chart” for Victoria will apply with certain modifications (see general directions, page 4) in all parts of Australia; but there are certain pests and diseases which are not prevalent in Victoria and therefore not mentioned in the chart. In the following spraying chart, the main pests and diseases are mentioned, and we are indebted to the New South Wales Department of Agriculture “Spraying Guide” for the details of treatment, etc.

<table>
<thead>
<tr>
<th>PEST OR DISEASE</th>
<th>WHAT TO USE</th>
<th>WHEN TO TREAT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit Fly</td>
<td>1. Traps baited with vanilla-ammonia lure, or 2. Foliage poison baits. Control measures are compulsory under the Plant Diseases Act.</td>
<td>In the case of both (1) and (2) commence five weeks prior to ripening or harvesting of fruit. Re-bait traps when necessary. Spray every seven days. Pick up and destroy fallen and infested fruit every three days (daily where practicable). Baiting and trapping to be continued for four weeks after harvesting of last fruit.</td>
<td>1. The lure consists of $\frac{1}{4}$ fluid oz. vanilla, $\frac{1}{4}$ fluid oz. ammonia (household), and 26 fluid oz. water (about 1 teaspoon, 1 tablespoon and three breakfast cups respectively). 2. Foliage poison bait is made with 2 oz. sodium fluosilicate, 2½-lb. sugar and 4 galls. water; or with 1 gallon fruit syrup, 3 galls. water, 4 lb. molasses or treacle, and 4 oz. Arsenate of Lead powder. Apply in patches at the rate of 6 oz. per tree, avoiding fruit.</td>
</tr>
<tr>
<td>Sooty Blotch</td>
<td>Bordeaux mixture 6:4:80.</td>
<td>When the disease is becoming evident.</td>
<td>This disease generally makes its appearance when the fruit is half grown. Cut off and burn withering tips to destroy larvae within. The trees may be bandaged as for Codling Moth and the sheltering grubs destroyed at intervals not exceeding fourteen days.</td>
</tr>
<tr>
<td>Peach Tip Moth</td>
<td>Destruction of infested tips; bandaging.</td>
<td>Early in Spring when tips of young shoots commence to wither.</td>
<td>Should only be applied when the fruit is in its immature stages.</td>
</tr>
<tr>
<td>Frosted Scale</td>
<td>Miscible Red Oil 1 in 20.</td>
<td>During Winter.</td>
<td></td>
</tr>
<tr>
<td>Leaf Eating Beetles</td>
<td>Arsenate of Lead Powder, 1½ lbs. to 50 galls. water.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### CITRUS PESTS & DISEASES

<table>
<thead>
<tr>
<th>Pest/Disease</th>
<th>Treatment</th>
<th>Control Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown Scale</td>
<td>See Red Scale.</td>
<td>Banding should be completed by 1st August, and maintained in an effective condition until December.</td>
</tr>
<tr>
<td>Dicky Rice</td>
<td>Band the tree trunks with a sticky tree-banding material.</td>
<td></td>
</tr>
<tr>
<td>Passion-vine Leaf Honper</td>
<td>Arsenate of Lead, 1½ lbs. powder to 50 galls. water.</td>
<td>During Spring and Summer.</td>
</tr>
<tr>
<td>Pink Wax Scale</td>
<td>Pyrethrum Dust and Nicotine Dust (2½ per cent.) mixed in equal parts.</td>
<td>Early Spring.</td>
</tr>
<tr>
<td>Purple Scale</td>
<td>See White Wax Scale.</td>
<td>December to February, when immature.</td>
</tr>
</tbody>
</table>

**Do not spray during very hot weather. In the early morning the bugs are very sluggish and may be readily dislodged on to a sheet by jarring the branches of the tree. Collect and destroy the bugs. Fumigation with small doses of hydrocyanic acid gas may be used to stupefy the bugs and cause them to fall to the ground. They must then be collected and destroyed.**

**This material may be applied with a flat piece of wood or a stiff bristled brush to form a band about two inches wide and about ½ inch thick, as high above the ground as possible. Weevils congregating below banding material should be destroyed. Freshen bands when required. Where the trunk is exposed to the sun the banding material should be placed on grease-proof paper, tied around the trunk. Destroy all weeds by which the beetles may gain access to the tree. Prune all lower branches to not less than six inches off the ground.**

**Caterpillars usually not numerous to warrant spraying. Hand picking usually sufficient.**

**Control should be carried out before any of the leafhoppers become winged.**

**If allowed to mature the wax becomes very hard and spraying has little effect.**
<table>
<thead>
<tr>
<th>PEST OR DISEASE</th>
<th>WHAT TO USE</th>
<th>WHEN TO TREAT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Scale</td>
<td>Fumigation with hydrocyanic acid gas.</td>
<td>January to April, or during July-August.</td>
<td>Trees should never be fumigated when out of condition or for some months after they have been sprayed with Bordeaux mixture as they are likely to be injured.</td>
</tr>
<tr>
<td></td>
<td>(See N.S.W. Departmental pamphlet “Fumigation for Control of Scale Insects of Citrus Trees”)</td>
<td></td>
<td>Control measures for Red Scale compulsory under the Plant Diseases Act.</td>
</tr>
<tr>
<td>Rust or Silver Mite</td>
<td>Spraying with Miscible Red Oil or White Oil Emulsion, 1 in 40.</td>
<td>Late December to March.</td>
<td>The damage to the fruit commences when it is only half to one inch in diameter, and control measures should be undertaken then, especially if the mite was in evidence during the previous season.</td>
</tr>
<tr>
<td>Spiny Citrus Bug</td>
<td>Lime Sulphur 1 in 50.</td>
<td>Early in December.</td>
<td>Do not spray too early as the young emerge irregularly and those hatching later will re-infest the trees. The soda sprays may be combined with the oil sprays when other scales are present.</td>
</tr>
<tr>
<td>White Wax Scale</td>
<td>See Bronzy Citrus Bug.</td>
<td>“Peak” stage about mid-February.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Washing soda 8 lbs. to 40 galls. water, or else 2½ lbs. soda ash to 40 galls. water.</td>
<td>For later stages.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Washing soda 15 lbs. to 40 galls. water, or else soda ash 5½ lbs. to 40 gall. water.</td>
<td>May to August.</td>
<td></td>
</tr>
<tr>
<td>White Louse</td>
<td>Fumigation with hydrocyanic acid gas. Lime Sulphur 1 in 10 to 1 in 15, depend-</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>ing upon quality of Lime Sulphur; 1 lb. of calcium caseinate spreader should be added to each 80 galls. of spray.</td>
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</tr>
</tbody>
</table>

Trees should never be fumigated when out of condition or for some months after they have been sprayed with Bordeaux mixture as they are likely to be injured.

Control measures for Red Scale compulsory under the Plant Diseases Act.

The damage to the fruit commences when it is only half to one inch in diameter, and control measures should be undertaken then, especially if the mite was in evidence during the previous season.

Do not spray too early as the young emerge irregularly and those hatching later will re-infest the trees. The soda sprays may be combined with the oil sprays when other scales are present.

The trunk and main limbs should be thoroughly sprayed from the inside of the tree cutwards, taking care to avoid spraying the fruit.
<table>
<thead>
<tr>
<th>Disease</th>
<th>Treatment</th>
<th>Control Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exanthema</td>
<td>Bordeaux 6:4:80-1/2 spray, or soil application of bluestone.</td>
<td>Preferably spray at blossoming, or apply the bluestone soil dressing in Autumn or Early Spring. At blossoming, after half, but before all the blossoms have shed their petals. In October and again (on lemons) in January or February. In early May.</td>
</tr>
<tr>
<td>Citrus Scab</td>
<td>Spray with Bordeaux Oil 6:4:80-1/2.</td>
<td>Drainage, the application of farm-yard manure, resoiling, etc., are useful control measures.</td>
</tr>
<tr>
<td>Sooty Blotch</td>
<td>Spray with Lime Sulphur 1:40 or Bordeaux Oil 4:3:80-1/2.</td>
<td></td>
</tr>
</tbody>
</table>

*The fourth figure is the volume of oil used as a spreader—1/2 gallon to 80 gallons of Bordeaux mixture.*
"VALLO" OVICIDAL WASH.
(TAR DISTILLATE)

The Perfect Winter Wash for Fruit Trees.

During recent years much consideration has been given to Tar Distillate as a Winter Wash for fruit trees, and as a result "Vallo" Ovicidal Wash is put forward as a means of control for Cherry Aphid and Green Peach Aphid and other destructive insects.

During the Autumn the eggs of Aphids and similar insects are laid on the shoots and branches of the tree and are usually well hidden from view. These eggs hatch out during early Spring and cause untold damage to leaves and young shoots and also distorted growth and loss of vigour to the trees.

The greatest contributing cause of unsuccessful control of these pests is the fact that spraying is frequently carried out when the mischief has already been done.

"Vallo" Ovicidal Wash should be used only during the dormant period of the tree, and if used in strict accordance with directions and properly applied, will give complete immunity from infestation by Aphids. It is also a control for San Jose Scale and Red Spider.

"Vallo" Ovicidal Wash will thoroughly cleanse the tree and rid it of Moss and Lichen, and, in doing so, removes the Winter home of many insect pests.

A considerable saving is effected by using "Vallo" Ovicidal Wash for the reason that it will obviate the necessity of Spring Spraying for Aphids, thereby saving a considerable amount of time and labour.

RECOMMENDED DILUTIONS.

Apples and Pears.—Use 4 gallons of Ovicidal Wash to make 100 gallons of spray. Spraying to be carried out up to the end of August, but it is not recommended at a later period.

Peaches, Nectarines, Cherries, Plums and other Stone Fruit.—3 gallons of "Vallo" Ovicidal Wash to make 100 gallons of Spray. Spraying should be carried out during June and July. Do not apply after buds begin to swell.

"VALLO" NICOTINE SULPHATE.

(Guaranteed to Contain 40 per cent. Nicotine)

This product is of the highest possible quality. This Spray is a vegetable product and is scientifically prepared.
by an improved process. For the purpose of destroying Aphids, Thrips and similar soft bodied sucking insects, it is a most efficient and economical insecticide.

Although it will definitely kill the pests, mentioned it does not injure fruit or foliage.

**USE SOAP TO AID PENETRATION AND WETTING.**

If Nicotine Sulphate is used alone (not in combination with any other Spray) it is necessary to use Soap to aid penetration and wetting and to make the Spray more active.

Use "Vallo" Special Spraying Soft Soap in the proportion of 3 lbs. to 100 gallons of Spray.

This addition of Soap should only be made when Nicotine Sulphate is used as a Spray on its own. The Soap should not be used when Nicotine Sulphate is used in combination with Lime Sulphur Wash, Arsenate of Lead or other Spraying compounds.
<table>
<thead>
<tr>
<th>PLANTS</th>
<th>INSECTS</th>
<th>DILUTION</th>
<th>TIME OF APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple and pear</td>
<td>Green and Black Aphis</td>
<td>3/4 pint 100</td>
<td>As soon as the buds show green tips. If scale is present, mix this spray with &quot;Vallo&quot; Lime Sulphur. Later sprayings should be made whenever the insects appear; if possible before the leaves begin to curl.</td>
</tr>
<tr>
<td></td>
<td>Woolly Aphis</td>
<td>1 pint 100</td>
<td>Spray in Spring and again in Autumn. If the roots are attacked by the aphis, expose the roots for several feet by removing the soil, then apply spray.</td>
</tr>
<tr>
<td></td>
<td>Harlequin Bugs</td>
<td>1 pint 100</td>
<td>Spray when the insects appear.</td>
</tr>
<tr>
<td></td>
<td>Thrips</td>
<td>3/4 pint 100</td>
<td>As soon as blossoms open, and repeat after they fall.</td>
</tr>
<tr>
<td>Peach, plum, prune, cherry</td>
<td>Black and Green Aphis</td>
<td>1 pint 100</td>
<td>As soon as blossoms open, and repeat when necessary. All sprayings should be done before the leaves curl.</td>
</tr>
<tr>
<td>Currant gooseberry</td>
<td>Aphids</td>
<td>3/4 pint 100</td>
<td>Spray when the insects appear.</td>
</tr>
<tr>
<td>Orange, lemon</td>
<td>Aphids</td>
<td>3/4 pint 100</td>
<td>As soon as the buds open, and repeat when necessary.</td>
</tr>
<tr>
<td></td>
<td>Thrips</td>
<td>1/2 pint 100</td>
<td>When the insects appear on new growth and foliage in Autumn or Spring. Repeat as required.</td>
</tr>
<tr>
<td>Hops</td>
<td>Aphids</td>
<td>1/2 pint 100</td>
<td>When blossoms are ready to burst. Repeat as required during Spring, and give another spraying in Autumn. This spray gives the best result when combined with 1 1/2 gallons of &quot;Vallo&quot; Lime Sulphur.</td>
</tr>
<tr>
<td>Vegetables, flowers, shrubs</td>
<td>Aphids</td>
<td>3/4 pint 100</td>
<td>Spray when insects appear, before vines make vigorous growth. Be as soon as insects appear, and repeat as required. Be sure to spray the under side of leaves.</td>
</tr>
</tbody>
</table>
“VALLO” SPECIAL SPRAYING SOFT SOAP.

This Soap is not ordinary Soft Soap, but is scientifically prepared for spraying purposes.

It has an oleine potash base and contains no filler; is clear, transparent, and readily saponifies in water.

Use with Nicotine Sulphate (when not in combination with any other Spray), Red Spraying Oil, Crude Oils, Emulsified Crude Oils, etc.

“VALLO” CALCIUM ARSENATE.

This preparation contains not less than 40 per cent. Arsenic Pentoxide As₂O₅ and is used extensively by orchardists and market and home gardeners.

“Vallo” Calcium Arsenate is particularly recommended for the destruction of garden slugs, snails, and many other classes of leaf-eating pests. It is mainly used in the form of a bait mixed with bran and placed in positions easily accessible to the grubs, snails, slugs, etc.

DIRECTIONS FOR USE.

Take 1 part of “Vallo” Calcium Arsenate and mix it with 17 parts of Bran or Pollard, make into a stiff mash with water and distribute in the form of small baits over infested places.

“VALLO” BENZOL EMULSION.

A safe Insecticide for use against the Rutherglen Bug, Aphids, Thrips, and all kinds of insect pests. Especially useful for cabbage aphis, tomato weevil, etc.

If these pests attack the plants when the fruit is almost ready for picking, it would not be safe to use any of the poison sprays.

DIRECTIONS FOR USE.

To 1 lb. of Benzol Emulsion add 5 gallons of water. Thoroughly mix before using.

ZINC SULPHATE.

Zinc Sulphate is used for the control and eradication of Foliocellosis or Mottle Leaf of Citrus, also in combination with Copper Sulphate for preventing Brown Rot of Citrus.

Mottle Leaf—The term “Mottled” is a good description of the appearance of leaves on citrus trees affected with Mottle Leaf or Foliocellosis; it has been noted in various citrus growing areas in Australia.

Experiments were carried out in 1935 in the various States with successful results and spraying with Zinc Sulphate is now an established practice under widely varying district conditions.

The first symptoms of this condition is that the leaves show irregular yellow chlorotic areas between the midrib and veins of the leaves; at first this is not very serious to the health of the tree, but as the conditions become worse the
leaves on the new growths do not develop and later possibly the young twigs die back and the tree generally becomes unproductive.

It is generally considered that this condition is caused by a Zinc deficiency in the soil though there may be partial contributory factors such as salt and poor drainage, associated with the mottling.

In certain districts mottled trees were found to be heavily infested with Citrus Nematodes, which are a form of parasitic organisms that cluster around the root systems of citrus trees and choke back the growth of the fine hair roots, thus preventing the tree from obtaining sufficient nourishment to develop its foliage. Zinc Sulphate definitely destroys Nematodes.

A Tree at Leeton, N.S.W., Badly Affected with Dieback as a Result of Mottle Leaf.

Methods of Using Zinc Sulphate.

The spray is prepared in a similar manner to a Bordeaux mixture spray; using the following formula:—

Zinc Sulphate, 10 lbs.; Hydrated Lime (Fresh), 5 lbs.; Water, 100 gallons.

About 6 to 8 oz. of blood albumen may be used as a spreader, but this is not absolutely necessary. This quantity is sufficient to spray 25 trees or approximately one-third of an acre (80 trees to 1 acre).

Time to Spray.

The time to spray is just before one of the growing periods, i.e., early Spring or late Autumn. It is not advisable to spray just prior to picking the fruit as the sulphate leaves a white residue on the skin which detracts from the appearance.
“VALLO” DUSTING SULPHUR.

“Vallo” Dusting Sulphur is particularly suitable for the dry dusting of vines, and was primarily intended for this purpose. It is also suitable for the dusting of other plants and is used extensively by market gardeners and others.

The Sulphur used is brought to the finest possible state of division, and included with the Sulphur is 10 per cent. inert matter, which prevents the Sulphur balling.

“VALLO” WETTABLE SULPHUR.

“Vallo” Wettable Sulphur is supplied in dry form, but is in such a condition that it is readily wetted with water.

It may be applied as a straight spray or in combination with Arsenate of Lead. When used alone it is intended chiefly for the control of powdery mildew, but when used in combination with Arsenate of Lead its purpose is to control late Black Spot of the apple and pear. This combination can be used later in the season than a combination of, say, Arsenate of Lead and Lime Sulphur or Arsenate of Lead and Bluestone.

DIRECTIONS FOR USE.

Add 10 to 12 lbs. of “Vallo” Wettable Sulphur to 80 gallons of water.

“VALLO” WOOD PRESERVATIVE.

This is a preparation of Arsenic in Oil particularly suited for the treatment of timber against White Ants, Borers and similar pests.

The most suitable means of application is by a sprayer, or the material may be applied liberally to affected timber by means of a large brush.

“VALLO” Wood Preservative is more economical to use than other similar products.

One gallon of “VALLO” Wood Preservative is sufficient to treat from 350 to 400 square feet of timber.

EXTERMINATION OF WEEDS.

The control and eradication of all classes of noxious vegetation is obviously of vital importance to landowners throughout Australia.

The Government Vermin and Noxious Weeds Department has exhaustively tested all classes of chemical weed exterminators. These tests have resulted in the conclusive proof of the efficacy of Arsenical preparations in this most important work.

The following information sets out in concise form the latest improved methods of poisoning, scale of dilutions, how to apply, and the best time to spray.
"Vallo" Arsenical preparations are uniform in quality, highly concentrated, and mix readily in cold water. They consist of the following:

"Vallo" Liquid Pentoxide Weedkiller (36 per cent. $\text{As}_2\text{O}_5$).

"Vallo" Granulated Pentoxide Weedkiller (83 per cent. $\text{As}_2\text{O}_5$).

Arzeen Liquid (48 per cent. $\text{As}_2\text{O}_3$).

Arzeen Powder (80 per cent. $\text{As}_2\text{O}_3$).

Spraying is more effective in fine warm weather as the plants are then dry and will more readily absorb spray solution than under showery or moist conditions.

Care should be taken to see that the spray is concentrated on the plant it is desired to treat; if this is done waste will be reduced to a minimum, grass will be protected, and there will be very little danger to stock.

It is advisable to remove live stock from the area being treated for four weeks or until after a very heavy downpour of rain.

Over a period of years it has definitely been proved that when Arsenical sprays are used as directed there is no lowering of the soil fertility.

All spraying apparatus should be fitted with trigger valve attachment which cuts off the spray as soon as thumb pressure is released.

The solution should be applied as a fine misty spray, taking care to thoroughly cover the top and underside of all foliage, also stems and trunks to the level of the ground.

There is no danger from fire or explosion in using "Vallo" Weedkillers as they are non-inflammable. The material, however, should not be handled with bare hands and it is advisable to wash in water immediately after spraying.

When preparing the Weedkiller for use, mix the required quantity with the stated amount of water, stir thoroughly making sure the solid Weedkilling material is dissolved.

A special booklet entitled "Extermination of Weeds" is available on request.
<table>
<thead>
<tr>
<th>PENTOXIDE</th>
<th>ARZEEN</th>
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<tbody>
<tr>
<td>Liquid</td>
<td>Cold to use Gals.</td>
</tr>
<tr>
<td>1. BOXTHORN (Lycium ferocissimum)</td>
<td>1</td>
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<tr>
<td>2. BATHURST BURR (Xanthium spinosum)</td>
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<tr>
<td>3. B'BERRY BRAMBLE (Rubus fruticosus)</td>
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<tr>
<td>4. BOWLING GREENS, GOLF COURSES, etc.</td>
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<tr>
<td>5. BRACKEN FERN (Pteridum aquilinum)</td>
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<tr>
<td>6. CAPE TULIP (Homeria collina)</td>
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<tr>
<td>7. CAPE WEED (Cryptostemma calendulaceum)</td>
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<tr>
<td>8. CHARLOCK OR WILD MUSTARD (Brassica sinapistrum)</td>
<td>1</td>
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<tr>
<td>9. FENNEL (Foeniculum vulgare)</td>
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</tr>
<tr>
<td>10. GORSE or FURZE (Ulex europeus)</td>
<td>1</td>
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<tr>
<td>11. HEMLOCK (Conium maculatum)</td>
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<tr>
<td>12. HOARY CRESS (Lepidium draba)</td>
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<tr>
<td>13. HO'REHOUND (Marrubium vulgare)</td>
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<tr>
<td>14. NOOGOORA BURR (Xanthium strumarium)</td>
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<td>15. ONION WEED (Asphodelus fistulosus)</td>
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<tr>
<td>16. PATTERSON'S CURSE or BLUE WEED (Echium platagineum)</td>
<td>1</td>
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<tr>
<td>17. PRICKLY PEAR (Opuntia)</td>
<td>1</td>
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<td>18. RAGWORT (Senecio jacobaea)</td>
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<td>19. SKELETON WEED (Chondrilla juncea)</td>
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<td>20. STINKWORT (Inula graveolens)</td>
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<tr>
<td>21. ST. JOHN'S WORT (Hypericum perforatum)</td>
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<tr>
<td>22. SWEET BRIAR (Rosa rubiginosa)</td>
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<tr>
<td>THISTLES—</td>
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<tr>
<td>23. ARTICHOKE (Cynara Cardunculus)</td>
<td>1</td>
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<tr>
<td>24. CALIFORNIAN or PERENNIAL CANADIAN</td>
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"VALLO" ARSENICAL WEEDICIDES.

TABLE OF DILUTIONS.

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<thead>
<tr>
<th>PENTOXIDE</th>
<th>ARZEEN</th>
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<tr>
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<tr>
<td>25. SAFFRON</td>
<td>1 29 1 5</td>
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<tr>
<td>(Kentrophyllum lanatum)</td>
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<tr>
<td>28. ST. BARNABY, commonly called COCKSPUR or YELLOW JACK</td>
<td>1 29 1 5</td>
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<tr>
<td>(Centaurea solstitialis)</td>
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<tr>
<td>31. THORN APPLE</td>
<td>1 14 2 5</td>
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<tr>
<td>(Datura stramonium)</td>
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<tr>
<td>34. WILD SAGE</td>
<td>1 9 3 5</td>
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<tr>
<td>(Salvia verbenaca)</td>
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</tbody>
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SPRAY COMPATABILITY GUIDE.

The ruled lines denote Sprays which will mix together. The dotted lines denote Sprays which should not be mixed.
Other Lines Manufactured:—

Weed, Scrub and Tree Killer.
Dusting Compounds.
Manurial Insecticide.
Sheep Dips, Powder and Liquid.
Cattle Dip, Liquid.
Branding Fluid.
Blowfly Oil.
Calcium Arsenite (Sheep Jetting).
"Anti-Bunt" (Copper Carbonate).
Arsenic.
Arsenic Compounds.
Soluble Arsenic.
Arsenite of Soda.
Arsenate of Soda.
Arsenic Pentoxide.
Arsenic Sulphide (Yellow).
Golden Sulphide of Antimony.
Hyposulphite of Soda.
Glauber's Salt.
Case Hardening Compound.
Insulation Wool.
Skin Preservative.
Quik-Pikel.