BERRI EXPERIMENTAL ORCHARD STAFF.

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Assistant Manager	Mr. W. J. Baskett, R.D.A.
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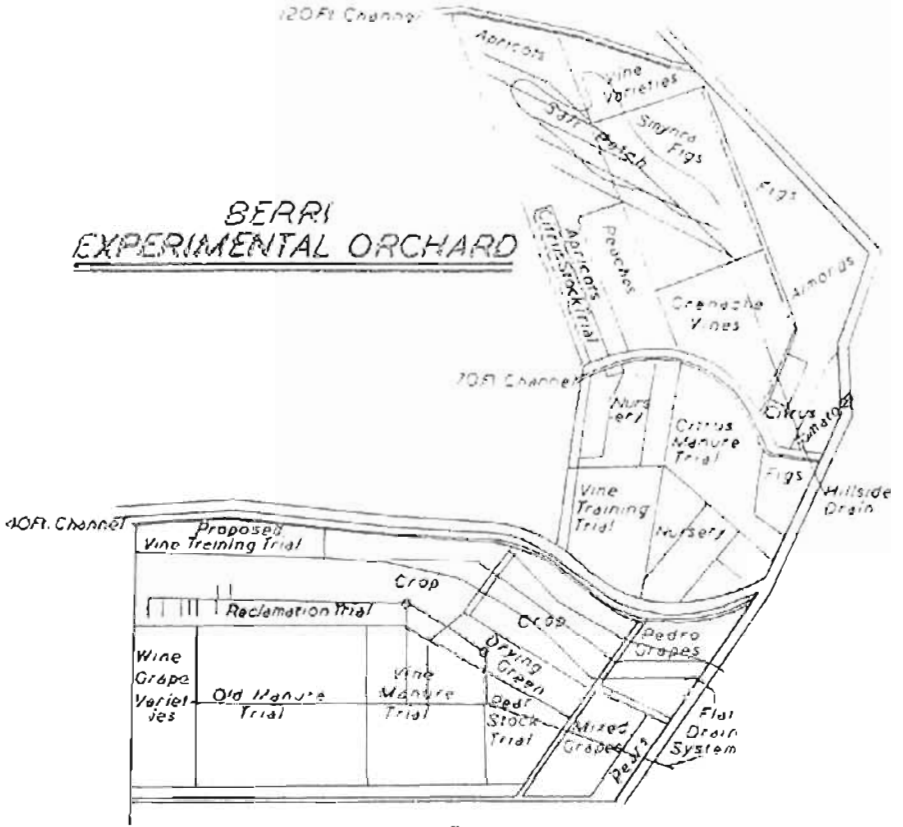

BERRI
EXPERIMENTAL ORCHARD
120 Ft. Channel
Apricots
Vine Varieties
Staff Patch
Smyrna Figs
Figs
Apricots
Peaches
Grenache Vines
Mourvedre
105 Ft. Channel
Nursery
Citrus Manure Trial
Citrus Variety
Figs
Hillside Drain
Vine Training Trial
Nursery
40 Ft. Channel
Proposed Vine Training Trial
Crop
Reclamation Trial
Crop
Drying Green
Pedro Grapes
Wine Grape Varieties
Old Manure Trial
Vine Manure Trial
Seedling Stock Trial
Mixed Grapes
Pedro
Flat Drain System

BERRI EXPERIMENTAL ORCHARD

The Berri Experimental Orchard was established with the opening of the Berri Irrigation Area in 1911, when 89 acres of irrigable land and 157 acres of dry farming country were reserved for experimental purposes.

The property was planted to citrus, stone fruits, vines and lucerne, together with a variety of miscellaneous tree fruits, the plantings being mainly concerned with variety and stock trials to decide types most suitable for River settlement plantings.

A portion of the Orchard was affected by salting and seepage troubles in the early 1920's. As original plantings of variety collections and stock trials fulfilled their functions they have been removed, and following reclamation of the salt-affected areas, the greater part of the Orchard plantings have been renewed over the last 12 years.

The present plantings are representative of all the major fruit tree and vine varieties grown in the district, and are devoted to trials on cultural problems. At the same time, opportunity has been taken to test possible new crops for use in the River areas.

Distribution of plantings on the Orchard has been determined largely by soil type, which is closely related to topography. The Experimental Orchard is situated on the frontal slope to the river and adjacent river flat, and extends over the three main pumping lifts of the Berri Irrigation Area, viz., 120ft., 70ft., and 40ft.

The area between the 120ft. and 40ft. lifts is steeply sloping land of sandy soil types, principally Murray sand, Berri sand, and Moorook sandy loam. Plantings on these soils are citrus, stone fruits, figs and vines.

The area below the 40ft. channel contains the transitional soil from the slope to the flat, Kulkyne sand, and the alluvial sands of clays of the river flat, characterised by Renmark and Bookmark sandy loams and clay loams. Plantings on these soils are pome fruits, vines and asparagus.

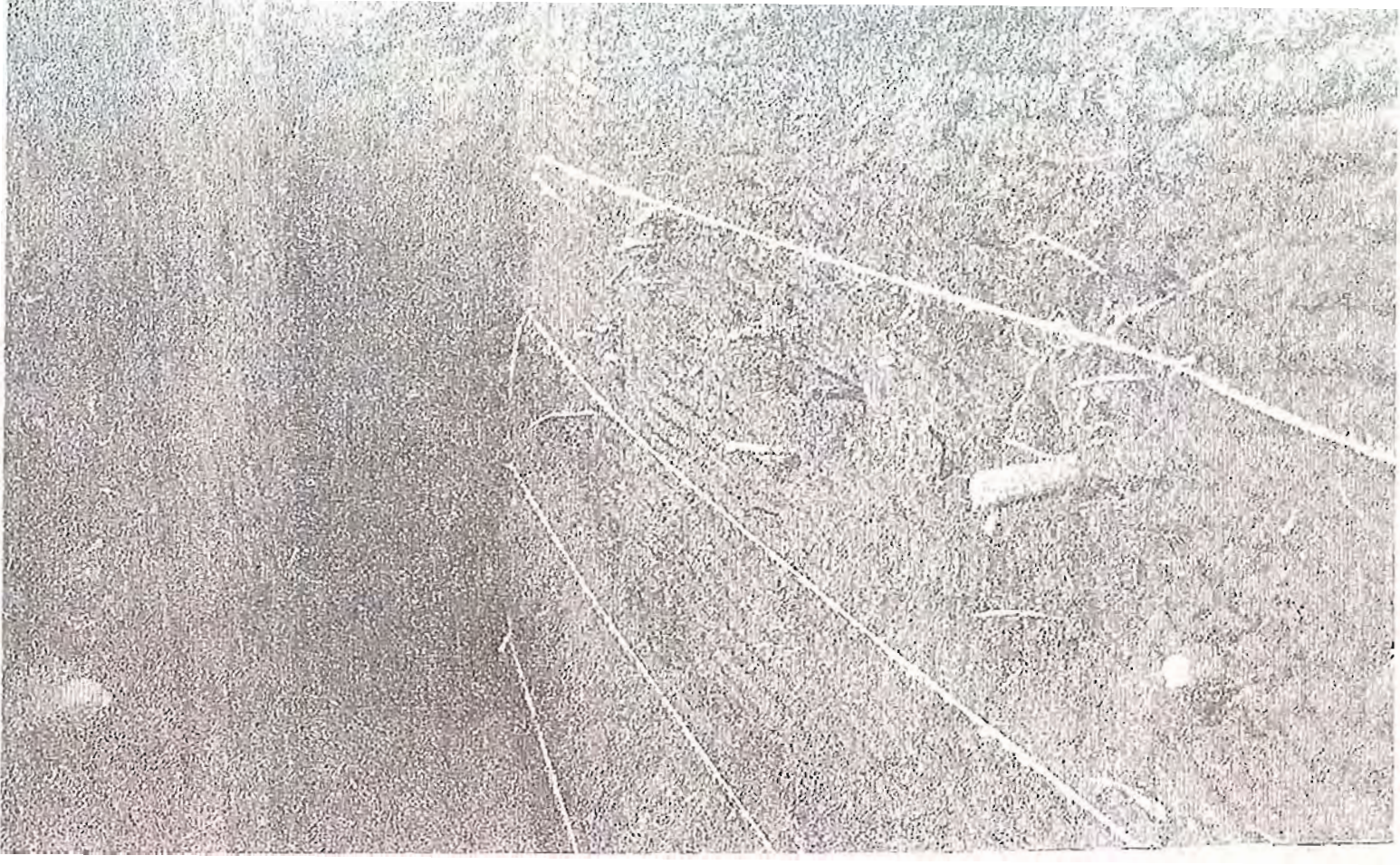
Sprinkler watering with portable sprinklers is used on the section of the Orchard between the 70ft. and 60ft. channels, where plantings are citrus, stone fruits, and figs. The remainder of the plantings are under furrow irrigation, with furrow runs of 2 chains to 4 chains on the sandy slopes, and up to 9 chains on the heavy flat soils.

Two tile drain systems, on the hillside and flat portions of the Orchard, have been developed following the salting and seepage troubles which developed early in the life of original plantings.

The hillside scheme covers an area of grey Mallee soil which has proved unresponsive to drainage. The salt-affected area has been confined but not reclaimed.

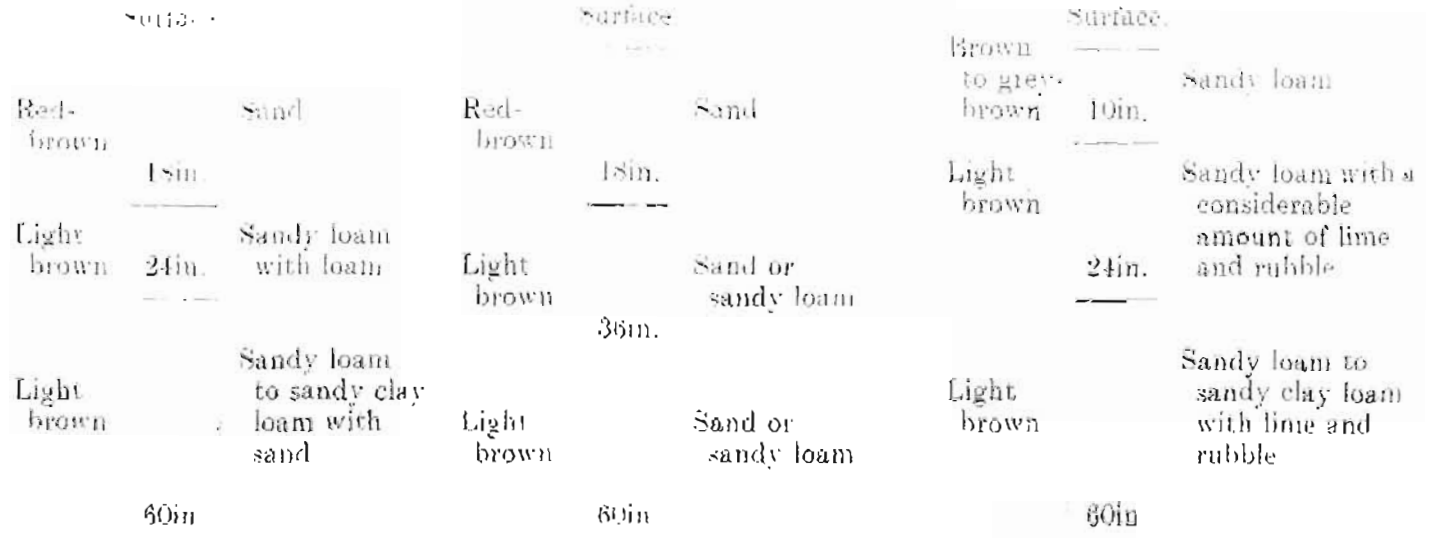
On the flat the problems have been seepage from the higher slopes and perched water tables on heavy clay subsoils. A deep interception drain at the foot of the slope and a series of closely-spaced shallow drains on the heavy soils have effectively reclaimed this area.

Soil Profile of Murray Sand.



SOILS ABOVE 40ft. CHANNEL.

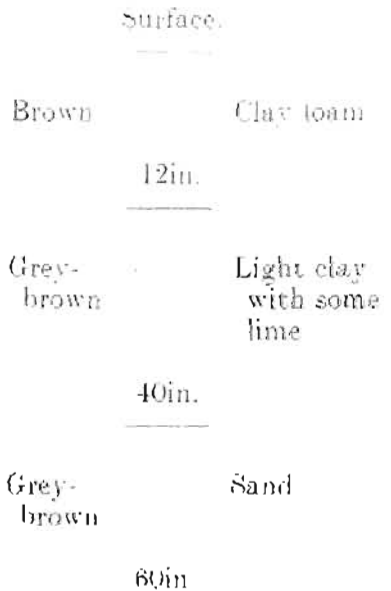
BERRI ORCHARD



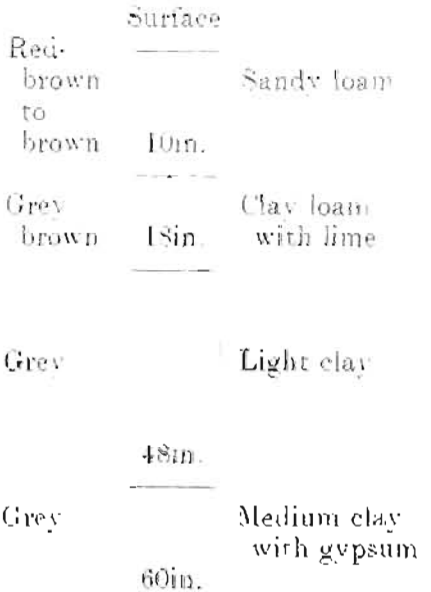
BERRI SAND | MURRAY SAND | MOOROOK SANDY LOAM

Kulkyne sand (below 40ft. channel) is similar to Murray sand, characterized by presence of grey loam light clay at 3ft. to 5ft.

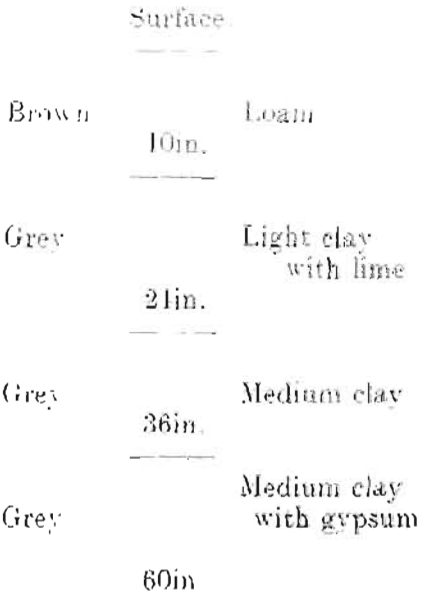
BERRI ORCHARD



BOOKMARK CLAY LOAM



RENMARK SANDY LOAM



RENMARK LOAM

TRIALS IN PROGRESS ON BERRI EXPERIMENTAL ORCHARD

Rootstock Trials.

Scion Var.	Rootstocks	Year Planted.	Results
Late Valencia orange . .	Citronelle sweet orange	1940	Citronelle yielded more heavily for the first 6 years. Sweet orange slightly out-yielded R.L. last season.
Washington navel orange Marsh seedless grapefruit	Citronelle sweet orange	1953	
Granny Smith apple Delicious apple	Northern Spy Granny Smith seedling	1951	To date seedling stock appears more vigorous.
W.B.C. pear	French seedling pear Calleryana pear D6 strain	1950	To date Calleryana stock appears more vigorous and even.

PRUNING TRIALS

Variety	Pruning Treatment	Year Begun	Results
Smyrna Fig	Pruned and unpruned	1940 concluded	Pruning improved quality but reduced yields by 40 per cent on dried weight basis.
Freestone peaches	Normal, light and unpruned, with thinning	1951	Greatly increased crop has followed lighter pruning without very much loss of size.
Clingstone peaches	Normal and light pruning, with thinning	1951	Light pruned crops were significantly heavier than from normal pruning.
Apricots and peaches	Open centre tree form. Modified central leader tree form	1953	—
Apples	Open centre tree form. Modified central leader tree form	1952	—

VINE TRAINING TRIALS

Variety	Training Method		Year Begun
Sultanas	1. Normal 2 Light pruning 3 T-head trellis	4. Sloping T-head trellis 5 Overhead trellis	1953
Currants	1. Single layer espalier 2 2-layer espalier 3. T-head espalier	4. Sloping T-head espalier 5 Overhead trellis	1953
Malaga	1. Spur pruned 2. Rod pruned 3 Casenave Cordon	4. Bordelais espalier 5 Bordelais espalier on laterals	1953
Muscat Gordo	1. Heavy spur pruned 2. Normal spur pruned	3. Light spur pruned 4. Hedge pruned	1953

Variety	Manurial Treatments.	Year Begun	Results
Washington navel orange	Sulphate ammonia 0-10cwt. per acre. Blood and bone *v.* sulphate ammonia	1920	Crop increases with up to 10cwt sulphate ammonia per acre Rate of increase declining above 4cwt. per acre. No advantage of blood and bone over ammonia.
Sultana vines	Sulphate ammonia 0-3cwt. per acre. Four types cover crop	1940	No significant increase in crop from either fertilizer or cover crop type
Currant vines	Sulphate ammonia 0-3cwt. per acre. Two types cover crop.	1940	As for sultanas
Smyrna fig	Sulphate ammonia 4 lb. per tree in spring.	1940	Manuring had no effect on cropping.
Asparagus	N, P, K, in two combinations as basal dressing, followed by N, P, K, in eight combinations as annual dressing. Varieties—Mary Washington *v.* 500.	1951	500 outyielding Mary Washington. Response to N, no response to P or K to date

VINEYARD CULTIVATION TRIALS.

Soil Type	Cultural Treatment.	Year Begun.	Results.
Renmark sandy loam	1 No cultivation, weed control by oil spray. 2 Sown winter cover crop, clean summer cultivation. 3 Volunteer cover crop, clean summer cultivation.	1951	No effect on vine cropping to date.
Berri sand ..	1. No cultivation, weed control by oil spray. 2 Sown winter cover crop, clean summer cultivation.	1952	No effect on vine cropping to date.

DRAINING TRIALS.

Soil Type	Depths and Spacings	Year Begun.	Results.
Renmark sandy loam	2ft. 6in. and 4ft. 6in. depths 22ft. and 44ft. spacings	1951	Shallow drains are as effective as deeper ones. 22ft. spacing shows only small advantage over 44ft. on this soil type.

TREE AND VINE VARIETIES UNDER TEST FOR RIVER CONDITIONS.

Crop.	Varieties			Year Planted.
Apples	Granny Smith	Delicious		1951
Asparagus	Mary Washington	500		1951
Clingstone peaches	Wights Cling Youngs Cling	Gaume Stanford Cling	Transvaal	1952
Vine grapes	Palomino Madiera Blanquette Pedro off-type Uliade Frontignan Black	Carignan Tokay Semillon Verdeilho White Sauvignon Rhine Riesling	Malbec Sherry Pedro Ximines Cabernet Sauvignon Frontignan White	1950-52

TRIALS IN PROGRESS ON GROWERS' PROPERTIES

Subject of Trial	Locality	Aim of Trial
Zinc treatment of sultanas	Barmera	Testing methods of applying zinc to sultana vines, spraying and swabbing.
Hedge pruning of vines	Barmera	Testing of pruning method adapted to mechanized pruning of grape vines.
Black Spot of sultanas	Berri	Testing strengths and times of application of TMTD and ZIRAM for black spot control.
Dying vines	Renmark, Berri and Barmera	Annual survey to gain information on the rate of death of vines and to try to establish the cause
Phylloxera	Adelaide	Distribution of systemic insecticides in leaves and roots with the view to finding a chemical treatment against Phylloxera.

Subject of Trial	Locality	Aim of Trial
Hormone setting of currants	Berri, Barmera and Renmark	Testing the use of sprays of PCPA and other growth substances to replace cincturing of currants.
Frost control wind machine	Berri	Testing effectiveness of frost control wind machine installed by Berri-Barmera Frost Committee.
Manuring of stone fruits	Loxton	Testing rate and time of application of sulphate of ammonia to young stone fruit trees
Shot-hole, zinc deficiency of peaches	Berri, Loxton	Testing Bordeaux-zinc spray schedule for control of shot-hole and zinc deficiency of peaches.

CITRUS STORAGE TRIALS

Variety	Treatment	Result
Washington navels from Berri, Waikerie and Mypolonga	*a.* Tolerance to storage at 31°-32°F	Navels will withstand 9 days at 31°-32°F
	b. Phenodor treated cartons to New Zealand	Cartons unsuitable
	c. Combined and separate effects of borax boric acid, waxing, 245-T and Diphenyl wraps.	No treatment better than plain wrapped control.
	d. Bordeaux sprays (3:3:100) and pre-harvest 245-T	No result.

Mealy Bug in Grape Vines

Outbreak of mealy bug in grape vines in River Murray settlements nearly invariably follows the application of an insecticidal spray for another purpose. Often lead arsenate "bunch protection" sprays are responsible and nearly always the use of DDT or parathion is followed by serious build-up of mealy bug.

It is very difficult indeed to bring an outbreak of mealy bug under control by further insecticidal spraying. E605, DDT and HETP give immediately a satisfactorily kill of the pest, but build-up is very rapid, and by harvest the infestation is worse than before. Increased population of mealy bug has in nearly every case followed the use of these sprays.

Left entirely alone the naturally occurring parasites and predator insects such as lacewings and ladybird will rapidly bring mealy bug under control.

The process is hastened by growing legume cover crops and allowing some regrowth to encourage the insect population.

In a trial on about 60 acres of vines at Berri, mealy bug resisted spraying for three seasons. It was brought under control by parasite and predator insects in the first year that spraying with insecticides was stopped, and has not re-appeared since except in one portion where a bunch protection spray was applied. On the remainder, no insecticidal sprays of any kind were permitted and some grass cover was maintained in spring and summer.

Predators and parasites of mealy bug are native to the Murray lands and work freely on the vines and the fruit on the racks. They are much more sensitive to sprays than the mealy bug itself and seem to be easily killed by any kind of insecticide.

No insecticide at all should be used on vines unless material damage is being done. Particularly does this apply to Light Brown Apple Moth sprays.

These are usually the origin of mealy bug outbreak.

Particularly DDT and E605 (parathion) should never be used on vines without expert advice.

Mealy bug on citrus is in some districts a more difficult problem; but in many instances the same procedure has rapidly cleared the pest.

"Black Spot" of Grape Vines

"Black spot" or "Anthracnose" has become so despread in the irrigated areas mainly due to inefficient control measures.

More effective treatments are now available. Thorough winter treatment will reduce the amount of spring and summer treatment needed.

Treat at budswell with TMTD or ZIRAM*. If the infection is severe use 3 lb. per 100 gall. If mild, use 1½ lb. per 100 gall. of water. Thorough spraying is essential.

Thereafter watch carefully for leaf spotting. If it develops spray with TMTD or ZIRAM at 1½ lb. per 100 gall. or with Bordeaux mixture (15:8:100).

If "black spot" is present at flowering time a berry cover is advisable. Bordeaux mixture (6.4:100) is most suitable because it sticks longest.

At pruning time burn canes showing cankers.

* Most experience has been gained with TMTD, but the early indications of this season's trials are that ZIRAM is superior to TMTD.

Vine Mite (*Tenuipalpus Sp.*)

After the January heat wave in 1939, Dorndilo vines showed severe defoliation and in many places these vines were completely defoliated. Currants and Gordos were also affected. The damage was due to vine mite (*Tenuipalpus sp.*)

Vine mite is a small sucking insect, which can be seen by the aid of a magnifying glass. The insect overwinters in the bud scales and moves about freely on the vines when shade temperatures exceed 100°F. The mite prefers hairy leaf vines, and is seldom found on any other vines. Besides causing defoliation the mite can reduce fruit production by at least 20 per cent and Baume by 1 degree. When the mite is very active the fruit fails to mature properly, and the berries look dull and lifeless, and "hen and chickens" becomes very prevalent in the bunches. Bunch stems and pedicels become blackened, and canes show a dark stain 2in. up from the base.

Experiments were carried out for mite control at Murray View and Waikerie in the spring of 1939, when the vine buds were swelling. The work was repeated in 1940. Lime sulphur, tar distillate, red oil and white oil were all tried as controlling agents. Lime sulphur was found to be very effective for control and because of its wide range of uses, lime sulphur became the Departmental recommendation.

Spray with lime sulphur 1 in 12 at the beginning of budswell.

Setting Currants by Spraying With P.C.P.A.

Spraying of currants with a growth substance has given excellent results and is *recommended for trial* to replace the normal practice of cincturing.

The best growth substance to use is PCPA—parachlorophenoxyacetic acid—at a concentration of 20 parts in 1,000,000.

Correct timing is essential for good results. The best time is *when the majority of bunches have lost practically all their flower caps.* Earlier treatment is dangerous as it gives a poor set, and many buck currants. Later treatment, when the berries are expanding, gives quite fair results.

Most types of spray outfits are suitable as a thorough cover spray is not needed.

On small vines, use 50 gall. per acre; on large vines use 80 gall. to 100 gall. per acre. Don't add fungicides or insecticides.

Normally, PCPA-sprayed vines produce fruit very similar in size, weight and quality to cinctured vines, but show typically distorted leaves on later growth. Sometimes larger berries are produced with a consequent slight maturity delay and increased rain damage risk.

Growers are recommended *to spray a portion* of their currants this season with PCPA when most caps are off.

Experience with PCPA is limited. There may be disadvantages not shown yet in small-scale trial, so *use on a limited area only is recommended.*

Zinc Treatment of Fruit Trees and Vines

All soils in the Upper Murray appear to be deficient in zinc.

"Little leaf" or "zinc mottle" has long been recognized in citrus.

The effect on deciduous trees and vines is equally widespread, being noted as "little leaf" in apricots, delayed burst with "black bud" in peaches and nectarines; "little leaf" and "die back" in pears, and "little leaf" with some intervenal chlorosis in vines.

Corrective treatment is simple and easy to apply, and can be summarized as follows:—

Citrus—

First treatment—

Zinc sulphate (commercial)	10 lb.
Limil	5 lb.
Water	100 gall.

Maintenance spray—

Zinc sulphate (commercial)	5 lb.
Limil	2½ lb.
Water	100 gall.

Do not use zinc oxide. Apply spray prior to any growth cycle, preferably in spring.

Stone Fruits—

Spray during winter, i.e., trees *must* be dormant.

Apricots—Zinc sulphate (commercial)	30 lb. per 100 gall. water
Peaches and nectarines—Zinc sulphate (commercial)	40 lb. per 100 gall. water
Pears—Zinc sulphate (commercial)	50 lb. per 100 gall. water

In severe cases spray annually until symptoms disappear, thence biennially.

Zinc Deficiency in Peaches.

Vines—

Swab immediately after pruning	
Most spur varieties—Zinc sulphate (agricultural)	2 lb. per 1 gall. water
Currant—Zinc sulphate (agricultural)	1½ lb. per 1 gall. water
Sultanas—	
Swab cuts with zinc sulphate (agricultural)	2 lb. per 1 gall. water
Spray vine with zinc sulphate (commercial)	2 lb. per 1 gall. water

Treatment within an hour of pruning is essential.

Coryneum Fungus in Stone Fruits

APRICOT "SHOT-HOLE" AND "PEACH BLIGHT."

Well-known in apricots as "scab" or "shot-hole" but not fully recognized in peaches, nectarines and almonds, Coryneum has caused much loss of crop in the past few years.

Coryneum infects leaves and fruits during the growing season and infects buds and twigs during the winter.

Greatest loss to the grower is the potential loss of crop due to the killing of buds and twigs by the over-wintering fungus. This is recognized as "black bud" in apricots, "peach blight" in peaches and nectarines and "spur killing" in almonds.

New leaves and fruits are infected at bud-burst in the spring by spread from infected buds and twig lesions.

Leaf "shot-holing" in all varieties, fruit scabbing in apricots, gum spotting in peaches and almonds are typical of the spring attacks.

Control programme is:—Bordeaux 6:4:40 plus 1qt. white oil per 100 gall. at leaf fall, if possible before the first rains. Repeat at the "pink" stage in the spring.

To clean up a severe outbreak, several years of these dual sprays will be required.

The autumn spray being the most important.

Rind Crinkle in Citrus

Crinkle has been very common in the 1953 navel orange crop, and Valencias and particularly Mediterranean Sweet have been badly affected on some properties.

Crinkle is a physiological disorder. The irregular grooves patterning the rind overly gaps and fissures in the white albedo tissue between the oil cell layer and the flesh segments.

It has been shown experimentally that closely sheltering citrus trees in a season when there is little or no crinkle, greatly increases the incidence of the disorder.

In trials in 1938-39, trees were closely screened with hessian, to resolve the origin of various rind blemishes. These trees produced fruit very badly crinkled.

Crinkle occurs widely in the field in seasons of little wind and high humidity. These are conditions which repeat the closely sheltered experimental conditions on a district scale. It is notably rare in seasons of high wind and hot summer conditions the years in which " wind rub blemish " is common.

With this evidence, crinkle is rated as of climatic origin and a symptom of the reaction of the tree to the lush growing conditions which ruled last summer.

Silver Leaf

The foliage on one or more branches of an infected tree turns a silvery-leaden colour and the tree dies back for [illegible].

Late in the season the symptoms of this disease in peaches and nectarines may be confused with the silvering caused by mite.

Silver leaf spores enter through wounds.

Spores are produced in millions from fructifications on diseased wood allowed to decay in the orchard.

Silver leaf can only enter wounds. Paint all large pruning cuts.

Burn all wood from infected trees. This is required by law.

Silver Leaf in Apricots.

Clover as a Cover Crop

Clover as a cover crop has these advantages

(1) Once established and allowed to re-seed each year, it requires no re-planting.

(2) It saves the cost of sowing crops each year and the seed in the first year is much cheaper.

(3) It returns nitrogen to the soil over a long period.

(4) Most important of all, it can return to the soil the greatest bulk of organic matter per acre of any cover crop grown in the same period.

(5) It will withstand dry conditions better than beans, peas or cereals and they are not retarded by winter conditions as are other crops.

(6) Clover can be made to flourish under conditions where cereal and other legume crops have failed.

(7) Tractors and tractor-drawn implements now enable the handling of clover cover crops which formerly could not be handled by horse-drawn implements.

A hard seed-bed is essential to start clover. Do not cultivate after mid-January.

The clover can be started by means of burr collected from an established crop or seeding 5 lb-6 lb. per acre of Burr or Barrel Medic or Melilotus.

These seeds are available through your packing sheds this season.

Broadcast the seed on hard ground in March with one bag of superphosphate or 3 and 1 and lightly harrow in.

Do not cultivate before seeding.

Allow at least part of the row to seed down each year. Either delay French ploughing the vine rows or leave a centre strip to set seed.

After the first year get the superphosphate on early each year—February or March. Broadcast rather than drill, and do not cultivate after January.

Summer weeds—innocent weed and fat hen—are easily controlled by November and December cultivations.

A natural Barrel Medic cover crop.

Pest and Disease Control Recommendations

GRAPE VINES

Pest or Disease.	Symptoms	Timing of Treatment	Treatment
Zinc deficiency	Little leaf with some interveinal chlorosis. Short-noded shoots.	Within an hour of pruning	Swab cuts with agricultural zinc sulphate 2 lb. per 1 gall. water. For currants use 1½ lb. per 1 gall. Sultanas can be swabbed or cover sprayed.
Oidium	Powdery light-grey mildew on leaf surface. Black cane markings	(1) When shoots are 9in. to 12in. long (2) At blooming time. (3) When berries are half-grown. (4) Just before grapes ripen.	Regular yearly treatment is worthwhile. Blow sulphur dust through vines. Lime sulphur (1 in 70) is effective in cool weather. Colloidal sulphur will mix with Bordeaux mixture.
Black spot . .	Pinhead " spots on leaves which darken, enlarge and centres drop out. Leaves become jagged and distorted cankers on canes.	Essential treatment :— (1) At budswell. Late treatment if disease re-appears. (2) At 3in.-growth stage. (3) Pre-blosson. (4) After cap-fall.	(1) TMTD or ZIRAM. Where severe, use 3 lb. per 100 gall., otherwise use 1½ lb. per 100 gall. (2) (3) (4) Use TMTD or ZIRAM 1½ lb. per 100 gall. or Bordeaux (15:8:100, 6:4:100). (See note on page 25).

Oidium on Sultanas.

Pest or Disease.	Symptoms.	Timing of Treatment.	Treatment.
Downy mildew	Oil spotting of leaf with glistening white "salt-like" spores on lower surface. Bright tapestry markings on old leaves. Early leaf drop.	Spray when disease appears and at 3-weekly intervals while weather is humid.	Bordeaux mixture (15:8:100) at 6in.-growth stage: (6:4:100) at blooming and later. A weak strength should be used on sultanas which are copper-sensitive.
Erinose	Raised blisters on top of leaf. Hairy felt on underside of blisters.	(1) Shortly before bud-burst. (2) During summer.	(1) Lime sulphur 1 in 12. (2) Spread checked by sulphur dusting.
Vine mite ...	Early leaf scorching and leaf drop on woolly-backed varieties.	Shortly before bud-burst.	Lime sulphur 1 in 12.

GRAPE VINES—*continued*

Pest or Disease	Symptoms.	Timing of Treatment	Treatment.
Vine moth	Large active grub, coloured greenish yellow and black.	On appearance of the grubs	* Lead arsenate 3 lb.-4 lb. per 100 gall
Apple moth	Berries and leaves stuck together by white web containing active green grub.	Shortly after setting.	* Lead arsenate 2 lb. per 100 gall. Cryolite, 3 lb. per 100 gall.
Snails	Leaves irregularly chewed—shining.	(1) At budswell. (2) During summer.	(1) Bordeaux mixture (6:4:40). (2) Bart Metaldehyde 3 lb. 6 lb. in bran 100 lb.

* NOTE—Insecticides should not be used if mealy bug is, or has been, evident

Pest or Disease	Symptoms	Timing of Treatment	Treatment
Zinc deficiency	Little leaf. Leaves yellowed interveinally and reduced in size.	Commencement of spring growth cycle.	Zinc sulphate (commercial grade) 10 lb., Limil 5 lb., water 100 gall. Zinc oxide is not recommended.
Red scale	Reddish-brown circular, flat conical scale $\frac{1}{16}$ in. diameter.	November to February.	White oil 1 in 40 plus cyanide fumigation. Notifiable pest. Treatment not left to grower.
Brown scales	Presence of sooty mould.	November to February.	White oil 1 in 40.
Cottony cushion scale	Large white-fluted egg sacs up to $\frac{1}{4}$in. diameter, light-brown parent scale $\frac{1}{8}$in. diameter at one edge.	Allow parasites to control. Treat only if necessary when young scabs appear.	Cyanide fumigation or white oil 1 in 40 to 1 in 60.

Cottony Cushion Scale.

Pest or Disease	Symptoms	Timing of Treatment	Treatment.
Apple moth	Active green grub in white web	After blossoming	Lead arsenate 2 lb. per 100 gall. or Cryolite 3 lb. per 100 gall
Brown rot	Browning of tips of leaves. Leaf curling and dropping. Light brown soft rot on fruit.	Autumn.	Bordeaux mixture (3:3:50).
Collar rot	Bark at ground level rots, dies and splits	When it appears.	Remove earth from the collar of the tree and all dead and diseased bark. Paint with Bordeaux paste. Wet conditions aggravate the disease.
Pre-harvest drop	—	End of May.	2,4-D or 2,4,5-T at 20 p.p.m. This spray or its drift will kill grape vines.

Pest or Disease.	Symptoms	Timing of Treatment	Treatment
Coryneum Fungus—			
"Black bud" phase	Buds blackened generally with some gumming.	Autumn (approximately ⅔ leaf fall) before autumn rains.	Bordeaux mixture (6:4:40) plus 1qt. white oil per 100 gall.
"Shot-hole" phase	Leaves shot-holed.	Spring "pink bud" stage.	Bordeaux mixture (6:4:40) plus 1qt. white oil per 100 gall.
Brown rot.	Leaves and blossoms on isolated laterals on young spurs die and turn brown after wet weather. Fruit rots with masses of brown spores—remains as "mummy."	Spring "pink bud" stage. Petal fall and commencement of fruit ripening.	Bordeaux mixture (6:4:40). TMTD 0·2 per cent.
Zinc deficiency.	"Little leaf."	Winter dormant period.	25 lb.-30 lb. zinc sulphate per 100 gall.

Pest or Disease.	Symptoms	Timing of Treatment	Treatment
Coryneum Fungus—			
"Peach blight" phase	Dead twigs and dead buds with some gumming around dead buds.	Autumn (till leaf fall).	Bordeaux mixture (6:4:40) plus 1qt. white oil per 100 gall.
"Shot-hole" phase	Leaves shot holed	Spring "pink bud" stage	Bordeaux mixture (6:4:40) plus 1qt. white oil per 100 gall.
Prune rust	Underside leaves covered with small brown pustules usually with a pale spot above.	Spring "pink bud" stage. Fruit half-grown.	Bordeaux mixture (6:4:40) plus 1qt. white oil per 100 gall. Lime sulphur 1 in 120 or colloidal sulphur 2½ lb. per 100 gall.
Brown rot . .	As for apricot.	Spring "pink bud." Petal fall and commencement of ripening.	Bordeaux mixture (6:4:40). TMTD 0·2 per cent or wettable sulphur 4 lb. per 100 gall.

Pest or Disease	Symptoms	Timing of Treatment	Treatment
Leaf curl	Leaves curled and distorted—coloured yellow and red	Spring "pink bud."	Bordeaux mixture 6:4:40
Zinc deficiency	Delayed burst with black bud.	Winter dormant period	Zinc sulphate 40 lb. per 100 gall.
Green aphid	Presence of aphids in curled leaves.	Winter—June or July ONLY	Tar distillate 1 in 35
	Leaves not coloured.	Spring.	DDT (emulsion type) 0·1 per cent. or nicotine sulphate 1¼ pints per 100 gall. plus 1qt. white oil.

Pest or Disease	Symptoms	Timing of Treatment	Treatment
Coryneum fungus (Shot-hole)	Gum spots on young nuts.	Late May	Bordeaux mixture (6:4:40).
	Leaves shot-holed	Bud burst.	Bordeaux mixture (6:4:40.) If disease has been serious, the two sprays are necessary for effective control

PEARS.

Pest or Disease.	Symptoms.	Timing of Treatment.	Treatment
Zinc deficiency.	Little leaf and die-back.	Winter dormant period. Summer.	Zinc sulphate 40 lb. per 100 gall. 3 lb. zinc oxide per 100 gall. with Codling Moth sprays.

Eggs of Byrobia Mite.

Pest or Disease	Symptoms	Timing of Treatment	Treatment
Codling Moth	Pink grub ¾in. long feeding in fruit	Petal fall—before calyx closes	Lead arsenate 4 lb. per 100 gall.
		First cover—10 to 14 days later.	Lead arsenate 4 lb. per 100 gall.
		Second cover—Three weeks later	Lead arsenate 4 lb. per 100 gall. plus 1qt. white oil per 100 gall.
		Third cover—Three weeks later.	Lead arsenate 4 lb. per 100 gall. plus 1qt. white oil per 100 gall.
		Fourth cover—Three weeks later.	Lead arsenate 4 lb. per 100 gall. plus 1qt. white oil per 100 gall.
Red spider mite (*Bryobia*)	Leaves bleached and yellowish. Mites feeding on undersurface.	Winter	Red oil 1 in 20.
		Summer.	White oil 1 in 60, with any cover spray or two sprays of HETP 1 pint in 200 gall at 10-day interval.
Pre-harvest drop	—	Early January	ANA plant growth substance 10 p.p.m. as first fruit drop occurs.

Pest	Symptoms	Timing of Treatment	Treatment
Mealy bug	Fruit and stems covered with white mealy colonies of insects, red when squashed, producing honey dew and sooty mould.	—	Avoid use of any insecticide. Where possible, encourage build-up of useful insects by ground growth
Rutherglen bug	Small grey-brown bug, occasionally causing severe damage in spring and summer when weed growth dies off.	During an attack.	DDT (emulsion type) 0·1 per cent
Curculio beetle	Leaves chewed to saw-toothed edge. Brown weevil-like insect sheltering in soil. Leaves eaten at night.	Spring or summer attack.	DDT (emulsion type) 0·1 per cent

Cautions

1. Do *not* use lime sulphur or sulphur dust in hot weather.

2. Do *not* use white oil in hot weather or on trees in moisture stress. Always spray after an irrigation.

3. Do *not* use more than one white oil spray at 1 in 40 on citrus in any season.

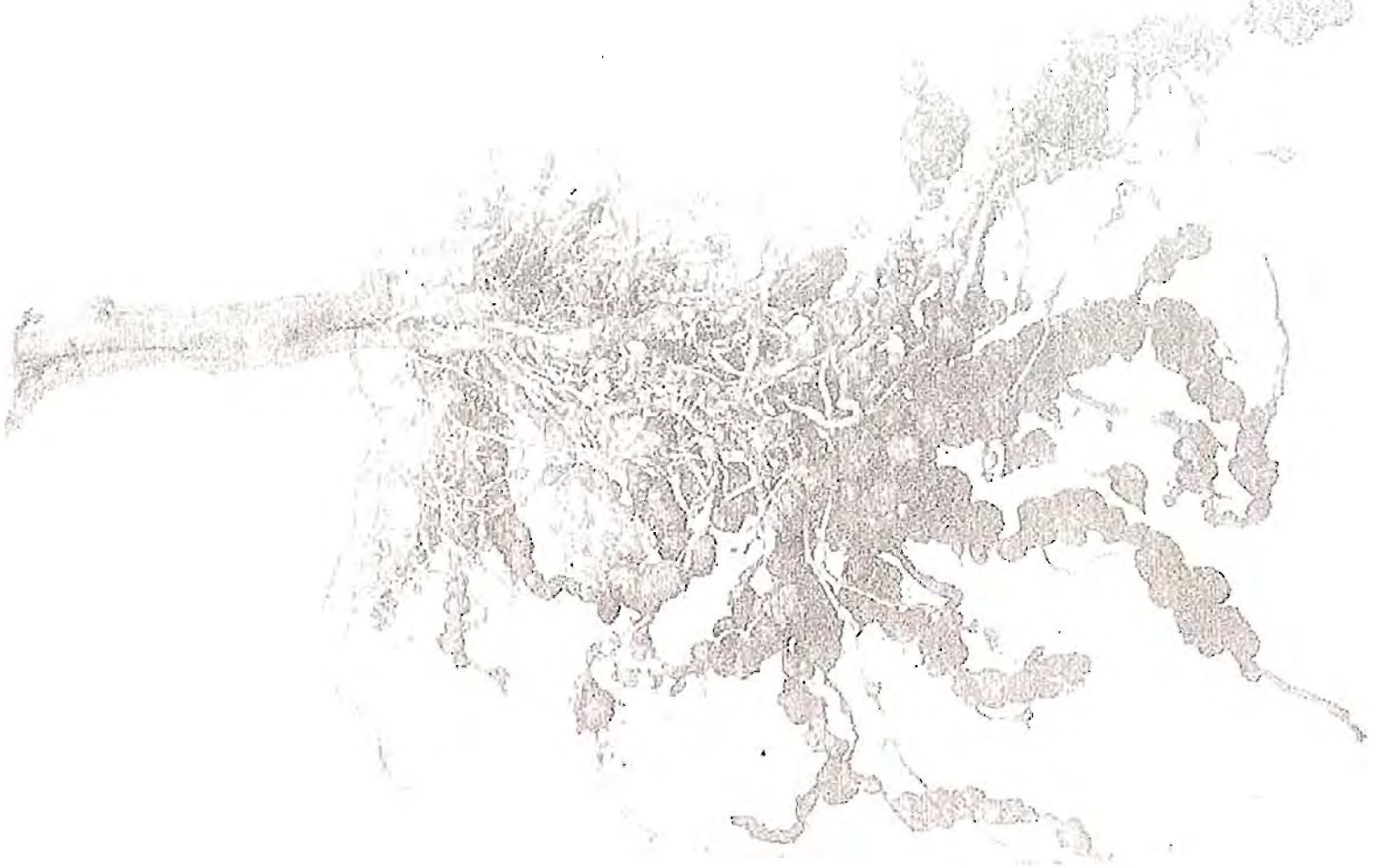
4. When mixing lime sulphur with lead arsenate add 1 lb. Lmuf for each 1 lb. of lead arsenate, as soon after mixing as possible.

5. DDT schedule for Codling Moth is *not* recommended except where serious losses are consistently being accepted.

6. Do *not* use Apple Moth sprays unless material damage is being done.

7. Seek departmental advice before using DDT, E605, or similar high-powered insecticides.

8. Use agricultural grade zinc for swabbing, commercial grade for spraying.



Tomatoes

Pest or Disease	Symptoms	Treatment
Eelworm	Knots on roots, plants stunted, yield and quality of fruit reduced.	Rotate crops with resistant crops, viz.—cereals and mustard. Use clean seedlings. *For small areas:*—Soil fumigation with DD or chloropicrin.
Cutworms and wireworms	Seedlings cut through at ground level. Damaged at night. Green to slatey-grey, brown or black caterpillar, 1½in. in surface soil.	One of the following bran mash baits broadcast through the crop:— 1. Bran, 30 lb.; Paris green, 8oz., molasses, 4 lb.; water as required. 2. Bran, 24 lb.; Paris green, 1 lb.; salt, 8oz.; water 3 gall. 3. Bran, 24 lb.; 20 per cent benzene hexachloride, ½ lb.; water, 2½ gall.
Bronze surface mite	Bronzing and silvering of leaves and stems from ground upwards, stunting and premature dying of plants.	Dust regularly with sulphur mixed with equal proportions of hydrated lime. Sprays:—Lime sulphur 1 to 100, or colloidal sulphur 1 lb. to 40 gall.