Directions for the Preparation and Use of Insecticides and Fungicides

The following formulae for the preparation and use of insecticides and fungicides are in accordance with the best practice. This calendar has been prepared exclusively for the fruit and truck growers of the Rogue River Valley; and, with this fact in view, only such matter is included as is thought necessary for the intelligent use of insecticides and fungicides in the control of such insect pests and fungous diseases as are of economic importance in the valley. For this reason, the treatment of such diseases as the Brown Rot of stone fruits, the various leaf spot diseases, the Bitter Rot of apples, etc., is omitted. Pear and apple scab, so serious in many sections, is of no economic importance in the Rogue River Valley. Only in some of the higher mountain valleys, where air drainage is insufficient, is scab found at all, and even there commercial varieties are rarely attacked.

Bordeaux Mixture

This	is the	nta	ndare	i fall	Bhrah	tor	appies	and	stone truits.
Blueston	0 (00)	pper	sulp	hate)			100 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1	C 0 0 W 1 P	5 pounds
Lime (u	nalake	(be	***	49.50	9 1 5 1 1	14.00	1011174	414141	5 pounds
Water .	****				4 8 7 9 7	4.4.4	1000	K 1 ()	.50 gallons
						WAY.	The Control of Con-		The last of the la

Dissolve the bluestone by suspending it in a sack in water, be dissoived at the rate of one pound per gallon of water, of scale. Infestation of the fruit may be checked by its use. The lime may also be slaked, but not too far in advance of Lime (unslaked) the time necessary to use it. By having a sufficient number Sulphur (flour or flowers) of barrels for stock solutions, one man can easily keep three or four power spray outfits supplied with the Bordeaux mixture. An elevated platform upon which the mixing may be done will save a great deal of time. As little band labor as possible should be the rule, and all that should be necessary break the lumps. The mixture should be stirred and more in a well appointed mixing plant should be simply opening water added as needed to form a thick paste at first and ther and closing valves or gates. A scale to weigh the materials gradually a thin paste. The heat of the slaking lime wil used should be a necessary part of the equipment.

Resin-Bordeaux Mixture

This is the standard and other cane fruits.	нргау	for	blackberries,	raspberries,
Regin	WWW.	0.00	rigina rigina i	. 1 pound
Sal soda crystals	11.13.6	1.5 4/4		16 gallon

Boil together until a clear brown color appears; then add the above to each 50 gallons of Bordeaux mixture made according to the 5-5-50 formula, given above. The reason for using the resin mixture is to cause the Bordeaux to spread and adhere better. The Resin-Bordeaux should be applied with a good spray pump and a nozzle giving a very fine mist spray. Keep the mixture well agitated, and before using remember that it should be carefully strained so as to keep out all material which would tend to clog the nozzle.

Lime-Sulphur

This is the standard spray used during the spring for all fruit trees, vines, shrubs, etc., before the buds open. Limesulphur in concentrated form may be purchased, but there are many who prefer to boil their own solution. The proportions of time, sulphur and water, according to the most recent investigations, are:

Lime (unslaked)	47.1	SHEET AND	END VANCES	rin errek	pound
Sulphur (flour or	flowers)	anna.	· CATHERINA	2.2	pounds
Water	ACRES 10.00	(F 100 + 100	ARTER COLOR	to the same of	gallon

In order to make 50 gallons of lime-sulphur at one time, all that is necessary to do is to multiply the above formula Lime (unslaked)

Sulphur (flour or flowers)

Line (unslaked)

Sulphur (flour or flowers)

Put about 10 gailons of water in the kettle or boiler and Water Put about 10 gallons of water in the kettle, and, after slaking Partly fill a 100 gallon tank and add the start the fire. Place the lime in the kettle, and, after slaking of lime-sulphur solution for the spring spray, and to this add start the fire. adding water enough to maintain a thin paste. Sift the sut- 15 quarts more of commercial lime-sulphur solution. Then phur so that there will be no limps. After the slaking and add 15 pounds of dissolved iron sulphate and fill up to 100 mixing are completed, add water to about 50 gallons on the gallons, stirring the mixture thoroughly, then spray with good measuring stick or to a mark on the side of the boiler, and agitation. If the time-sulphur tests less than 32 degrees, add the use of this formula boil, stirring until the sulphury seum disappears. Then add a little more; if over 32 degrees, a little less, water to about the height of 60 gallons and boil down to Considering the fact that for each degree desired to keep it for a short while, it may be boiled down ont, it will be easy to calculate the exact amount of any control of gallons. During the boiling process the mixture should centrated lime-sulphur solution which must be added, if the be well stirred. As a rule, 6e minutes of vigorous boiling test is known, will cause the sulphur to unite completely with the lime. A slow fire will necessarily take longer. Do not overboll; when the sulphur has combined with the lime and the mixture is to be applied at once does not help or benefit the spray. Properly made lime sulphur is an amber-colored liquid, and there should be very little sediment. After settling and cooling, the mixture should be tested with a hydrometer. The following table, which may be used for the commercial as well as the home-boiled limesulphur, indicates the proper dilution for the various concen-

Table for Diluting Concentrated Lime Sulphur Solutions

Reading	on Hydrome	ter Amount of	dilution.
Degrees	Specific	Number gals, water to	one gal. lime-
Beaume	Gravity	sulphur solution. For de	ermant spraying.
4.0	1.357	1 gal. lime-sulphur.	11.0 gals, water
35	1.345	1 gal. lime-sulphur	10.5 gals, water
38	1.333		10.1 gals, water
37	1.322	1 gal. lime-sulphur	9.7 gals, water
36	1.310	1 gal, lime-sulphur	9.3 gals, water
35	1.299	1 gal. lime-sulphur	9.0 gals. water
34	1.288	1 gal, lime-sulphur	8.6 gals, water
33	1.277	1 gal, lime-sulphur	8.2 'gala, water
32	1.267	1 gal. lime-sulphur	7.9 gals, water
31	1.256	1 gal. lime-sulphur	7.5 gals, water
39	1.246	1 gal, line-sulphur	7.2 gals, water
29	1.236	1 gal, lime-sulphur	6.9 gals, water
28	1.226	I gal. lime-sulphur	6.5 gals, water
27	1.216	1 gal, lime-sulphur	6.2 gals, water
2.6	1.206	1 gal. lime-sulphur	5.9 gals water
2.5	1.197	1 gal, lime-sulphur	5.6 gals, water
24	1.188	1 gal. lime-sulphur	5.3 gals water
23	1.178	1 gal. lime-sulphur	4.9 gals, water
22	1.169	1 gal, time-sulphur	4.6 gain, water
2.1	1.160	1 gal. lime-aulphur	4:3 gals, water
20	1.152	1 gal. lime-sulphur	4.1 gals, water
Thia		natructed for a dilution	of 4.5 degrees

Benume or its equivalent 1.030 specific Gravity.

Tables	Comparing	Beaume's H	ydrometer and	Specific Gr	avities
Degrees	Specific	Degrees		Degrees	Specific
Beaume	Gravity		Gravity	Heaume	
0	1.000	14	1.101	27	1.214
1	1.007	15	1 . 1 . 1 . 1 . 1	28	1.220
2	1.013		1.118	29	1.234
	1.020	17	1.126	30	1.244
	1.027	18	1.134	31	-1.251
	1.034		1.143	32	1.263
	1.041		1.152	33	1.277
	1.048		1.160	34	1.285
	1.056	22	1.169	35	1.295
	1.063		1.178	36	1.310
	1.070		1.188	37	1.321
	1.078	25	1.197	38	1.33
	1.086		1.206	39	

Rules for Determining Number of Dilutions and Density of bugs, etc.

Spray. If the density of the commercial solution or the home-made wash has been first determined by the use of a hydrometer, sprays of any desired density may be calculated by using the above table. Hydrometers do not detect impurities in lime-sulphur solutions; these can be determined only by chemical analysis. The rule for obtaining the number of dilutions is as follows: Divide the decimal of the concentrate by the decimal of the spray desired, the quotient will be the number of dilutions. Example: The concentrated lime-sulphur solution tests 34 degrees Beaume which by the table is 1.288 Specific Gravity. It is desired to use the lime-sulphur solution to spray upon trees at 3 degrees Beaume which is 1.020 Specific Gravity. The decimal of the concentrate is .288 which divided by .020 equals 14.4 which is the number of dilutions required, and which, of course, is obtained by adding 13.4 volumes of water to one volume of the concentrated lime-sulphur solution. This rule is based upon the general fact that the density of a solution heavier than water varies inversely with the number of dilutions. Another example: Supposing the decimal of the concentrate is known and this concentrate is diluted by a certain number of volunies of water, what is the decimal of the spray? Let us take the figures in the example above. The decimal of the such as green aphis, woolly aphis and other aphides.

concentrate is .288 and 13.4 volumes of water are added to it. 13.4 plus I equals the number of dilutions. .288 divided by 14.4 equals .020 which is the decimal of the spray and corresponds to 3 degrees Beaume.

Self-Boiled Lime-Sulphur

This is the standard summer spray for peaches and other and dilute to 25 gallons. Slake the lime to an even paste and stone fruits to prevent the fruit spot disease. Its use, howadd water to make 25 gailons. Mix these dilute solutions by ever, is never necessary if proper fall spraying with Bordeaux pouring together slowly into the spray tank or barrel. Strain has been done. This spray is much safer than dilute lime-through a 20-mesh strainer made of brass wire while pouring sulphur solutions, as it will not injure foliage. It may be into the spray tank. In large operations it is best to prepare used to prevent apple and pear scab where this disease appears. stock solutions of both bluestone and lime. The bluestone may It also has a beneficial effect in a limited way in the control

cook the mixture and from 5 to 15 minutes will be necessary according to the quickness of the lime. Be sure not to let it overcook as this would tend to form compounds which would burn. As soon as the sulphur and lime have reached the paste state, fill up the barrel to 50 gallons with cold water. Do not use any hot water in making this mixture. For large operations, proportionate amounts of lime and sulphur should be used, and it will be found that it is easier to make large quantities than small amounts.

The Iron Sulphide Spray

	This is the standard spray for apple and rose mildew for this district. The following formula is for summer use, or
1	after the buds have opened.
	Iron sulphate (copperas) 1 pound
1	Lime-sulphur (32 degree Beaume test) quart
ı	Water
1	Dissolve the iron sulphate in about 5 gallons of water and
ı	add the quart of lime-sulphur, stirring well. Let the black
	precipitate settle for a few hours and pour off the liquid.
	keeping the precipitate. Then add 5 gallons of water, stir
	thoroughly, and let settle again. Pour off the liquid as be-
	fore. This process is called washing, and is necessary in order
į	to get rid of the excess lime-sulphur which would burn tender
J	foliage. Repeat the washing until the water is no longer
1	yellow. The black "muck" should be diluted to 10 gallous
ı	and sprayed with good agitation. If plant lice are present,
ı	tobacco extract or kerosene emulsion may be mixed with it.
1	Arsenate of lead for the codling moth may also be applied in
1	the same mixture without any injurious effect. For making
ı	up large quantities, proportionate amounts of the materials
ł	
1	should be used. It is often necessary to apply the iron sulphide before the
1	It is often necessary to apply the fron surpling before the
	buds open, and in this case, washing is not necessary. The

best way to apply it in the case of apple mildew is with the is valuable for destroying cut worms in young onlons.

Considering the fact that for each degree Beaume there about 55 gallons if the spray is to be used at once. If it is is about three-fourths of one percent combined sulphur pres-

Distillate-Oil Emulsion

	This is the standard spray for thrips.	
	Water	gallons
Ē,	Lye (98 percent)2	pounds
	Fish oil	
	Put water in boiler and add lye. When dissolved a	and the
9	water boiling, pour in fish oil, and boil for two hours.	When
ė:	soap has boiled sufficiently it should have a ropy effect	t when
	stirred. This formula gives about 40 pounds of mod	erately
ı	firm soap,	4.5
	The distillate-oil stock emulsion should be made	as fol-
	lows:	
	Hot water	
e.	Fish-oil or whale-oil soap (above formula) 30	pounds
6	Distillate-oil (raw) 30 to 34 degrees Beaume 20	gallons
	The state of the s	to the second

add soap while agitator is running at good speed. When allow to dry before planting. The tar acts as a repellant. soap is thoroughly dissolved, pour in the distillate-oil slowly, keeping the mixture well agitated. When oil and soap are well mixed, pump out through the spray nozzle at a pressure of not less than 175 pounds into a storage tank. This is the stock emulsion, and contains 55 percent oil. To make a 3 percent emulsion use 5 ½ gallons of this stock in each 100 gallon tank. To dilute, first put the stock emulsion in spray tank and then add water, keeping agitator running. To make about the trunks of trees, it will catch such insects as creep the spray more effective, tobacco black leaf or sulphate of up or down the trunks of trees. It will not dry readily, and nicotine may be added after the emulsion has been diluted. one application will last a long time. The amount of each to add will be in accordance with formulae given elsewhere.

Kerosene Emulsion

	ROPOSCHO	ж
	Hard soap (whale-oil soap) ½ pound	
	Water	
	Dissolve soap in water by boiling; add hot suds to the	e.
	kerosene. Do not do this near a fire. Agitate the mixtur-	*
	with a spray pump so as to emulsify the oil. After five min	70
į	utes the mixture becomes creamy. To use, dilute the above	ø.
	stock solution at the rate of one gallon to 10 gallons o	t
	water. This is a standard remedy for destroying green aphis	١.
	woolly aphis, mealy bugs and other plant lice. It may be	e
	used instead of the tobacco solutions if desired,	

Whale-Oil Soap and Quassia

	Whate on boup and Quasen	cover a square yard. Coloring matter may be put in, such
ij	Whale-oil soap 10 pounds	as Spanish brown, yellow ochre, etc.
ļ	Quassia 5 pounds	(2)
	Water	
Ó	lons of water and soak for 24 hours. Then boil, remove the	Lime (air slaked)
l	chips, add the soap and boil until dissolved. Add water to	Tallow
	given elsewhere. This formula has given good success in	Water Enough to make wash flow well
j	destroying soft bodied insects like plant lice, young squash	When old trees are cut back for top working, they may

Arsenate of Lead

j	Arsenate of lead 4 pounds
U	Water
9	It is better to purchase arsenate of lead than to attempt
	to make it. In mixing, preparatory to spraying, the amount
	of arsenate of lead for each spray tank full should be worked
	into a very thin paste having the appearance of milk of lime.
	It should never be thrown as a mass into the spray tank.
	This is the standard spray for codling moth and other eating
į.	insects. It is possible, however, that we shall use arsenite
ü	of zinc in the future.

Tobacco Sprays

										н	e	1												
Tobacco .	bla	ck	le	af	A	74	1		4	914		Į,	era)		074	40	j.			14.5	16	16	1	gation
Water .	11.5	1.15		4. 4	4.4						2	i		4		1		×			* *		65	gatton
Sulphate	of	n	leo	tin	ia	6	bli	ic	k	1	ea	î	4	0)				٠,	SIA.	(E) (S	30			1 pin
Water			8.4			43				8	63	V.		1875			W	1	11	2	to) 1	125	gallon

Hellebore

Hellebore Water This is		ΧŹ	'n,		·	d	4	×	i	K.	o	. ,	è	×	ě.	ķ	ŧ.		×		19	×	Œ	100	ě	. 2	guille	nn:
which are	0	di	n	01																								

Pyrethrum

-1																													
	Pyrethrum	2.6	- W100	-6	X 14	0.00	×.		d		į,			v					v.	0	ķ,	P.3			e.	J.	Lo	ans	56
9	Water	100	1		w.	F. 1			e y			ė. v	×	×	Ó	œ.			4.5			a 19	0.00		130	x	i gr	ille	m
ı	This is																												
j	Burning a	19	tt	le	1	yy'	re	tt	117	T	n	1	153	W	đi	14	1	n	(1)		L,t	ж	111		wJ	11	te	id	to
	destroy flie	764	81	pd	1	n	15	rg t	111	0	et			It	X	H S	y	ti	40	d	u	nt	Ot	1	OD		plan	15%	as
d	a dry powe	ie	ε.																										

Carbolated, Lime

This	may	be	used	for	root	maggots.	Work	the)	mixture
Lime (inslak acid	(er	ude)	21.23	****	maggots,		10 1 to	pounds 2 pints
water	10 10 E F	1 5 2	64 6 1		BEE A.	e water, a	4 A A C S S	A F 45 M	Kurmin

Carbolic Acid Emulsion

2	This, like the above formula, may be used to destroy eggs
1	and young maggots infesting onions, radishes and other gar-
	den crops.
	Carbolic acid (crude)
9	Soap (bard)1 pound
	Water 1 gallon
1	Dissolve soap in boiling water; add acld and stir or churn.
ď	as in making kerosene emulsion, until the substance becomes
	creamy. Too use, dilute one part of the emulsion by adding
r	30 parts of water.

Bran-Arsenic Mash

	White arsenic 1 pound
	Brown sugar (or molasses) 1 to 2 pounds
#	Bran 6 pounds
1	Thoroughly mix the above and add enough water to make
¢.	thoroughly wet. A spoonful should be placed near the crown
·	of each tree. The mash may be used to kill grasshoppers,
r	but it is usually best to cover the trees and use the Bordeaux
	mixture as a repellent

Bran-Paris Green Mash

Paris Green			ound
Bran	**********	40 p	ounds
Molasses or su	gar		ounds
		1/2 pt	
Make a mr	ash by adding	water; add molasses for g	ugar)
and salt; mix	thoroughly a	nd scatter in small piles a	mong
plants or in be	eds before pla	nting. This bait will prove	more
		at worms and cabbage worm	
		ws of plants to be protected	

Formalin -(Formaldahyde)

Formalin (40	percent solu	tion)		1 pint
Water	ACK RESIDENCE PROPERTY.	EXCEUTED/05/06/06		.30 gallons
	preventive of			
Potatoes and				
hours. Smut	of onions m	ay also be	prevented	by treating
the seed. Pro		arden seeds	will be dis	infected by

Corrosive Sublimate (Bichloride of Mercury)

	This is the standard disinfectant when working with PEAR BLIGHT. No other disinfectant should be used to wash the cut surfaces or to disinfect the pruning tools.
ı	Corresive sublimate 1 part Water
B	Corrosive sublimate may be purchased in tablet form at drug stores, and directions for making solutions will be found on the container. Never put corrosive sublimate into a
18	metallic container, always use a glass bottle. Be sure to label the bottle "POISON" in large, plain letters. It is the

Pine Tar

	For soil-infesting, a	seed-eating insects	such a	as the wi
	worm, tar may be used			
Š.	Pine tar	***********	1	teaspoonf
421	T Charles			15 0000

Dampen the seeds, such as corn, squash, canteloupes, etc., Have the water boiling when put into the spray tank and with a little warm water. Put in the tar and mix thoroughly;

Sticky Preparations

(Tanglefoot)

Tanglefoot may be purchased in cans or pails. It is manufactured by O. and W. Thum Co., Grand Rapids, Michi-By putting it on bands of paper or strawboard secured

Whitewashes (1)

	N.5	· #.	
	Government	Whitewash	
Lime (unslaked) .		******	.40 pounds
Salt			
Rice flour (or gro Spanish whiting .			
lue			. 1 pound
Vater		********	. 5 gallon
		ter and cover so	
he steam; strain			
salt, well dissolved not; the Spanish w			
reviously dissolve			
rallons of hot wa			

days. Apply hot with a brush. One pint of the mixture will

Whitewash for Trees Tallow 4 pounds

White Lead Paint

White lead, slightly thinned with linseed oil, should be used where large cuts are made, or in case where the wood s exposed by the removal of the bark and cambium as in the case of pear blight eradication. It should not be applied n the latter case until it is certain that the disease has been

Grafting Wax

eradicated.

(1)			2)		1	3)
Resin 4 Beeswax 2 Tallow 1	pounds	2	pounds pounds pounds	Linseed	2	pounds pounds pint

Grafting Wax for Walnuts

	(1)	(2)
nt	Beeswax1	pound Beeswax pour
DB	Resin	poundsResin 5 pour
S.	Linseed oll1	pint Linseed oil 1 pint
	Lamp black1	ounce Flour pint

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