

## SPRAYING

Continued from page 5

very large trees where a larger volume of air is required.

The principle of displacing the air in the tree area by the air delivered from

### Dilution of Spray Chemicals Used in Bulk and Low Volume Sprays

Spray compound	Amount per 100 gallons	
	Bulk spray	Low volume spray
Oil emulsion.....	5 gals.	8.0 gals.
Emulsive oil.....	4 gals.	6.5 gals.
Lime sulfur solution.....	3 gals.	4.0 gals.
Wettable sulfur.....	4 pounds	6.0 pounds
Neutral copper.....	1 pound	2.0 pounds
DDT-wettable.....	2 pounds	3.0 pounds

the equipment shows the necessity for a large volume of air. Without sufficient air volume the rate of travel of the equipment is too low to be practical.

### Directional Control

The spray pattern of the liquid discharge from this type of equipment is important. In order to obtain adequate deposits in the tops of the trees it is necessary not only to have directional control of the air stream but also of the spray discharge. The shape of the spray pattern may be changed from a semicircular form to that not unlike the forewings of a butterfly by diverting more of the air stream in the direction of the tops of the trees. This is done by means of deflectors placed in the cowling of the fan housing.

Directional control of the spray discharge is obtained by the proper arrangement of the spray nozzles. More nozzles are placed in the air stream directed at the tops of the trees and less nozzles in the air stream going to the lower limbs.

### Number of Trees Sprayed at Various Rates of Travel in Low Volume Spraying

Miles per hour	Feet per minute	Number of tree spaces passed with trees spaced				
		18 ft.	20 ft.	22 ft.	24 ft.	26 ft.
1.0	88	5.5	4.4	4.0	3.7	3.4
1.5	132	7.3	6.6	6.0	5.5	5.0
2.0	176	9.8	8.8	8.0	7.3	6.8
2.5	220	12.2	11.0	10.0	9.1	8.5

Field experience has shown that a better distribution of the spray liquid in the air stream and a more desirable range of droplet sizes are obtained either with nozzles giving a fan-shaped pattern or a cone-shaped pattern than is obtained with spray jets. There is also the added advantage that these two types of nozzles are less apt to clog and are more readily cleaned than the jet type.

The droplet size must not be too fine or the deposits will be less. Coarse droplets tend to increase run-off.

Preliminary studies indicate that a droplet size range of from 30 to 100 microns in diameter gave very satisfactory deposits.

### Advantages

In low volume spraying the problem of transporting large volumes of water is greatly reduced as the gallonage applied per tree is much less and the saving in cost of materials per acre—by preventing run-off of the spray liquid—is from 50 to 90% of bulk spraying. Added to this is the additional saving in time and equipment needed in refilling.

With the development of more air-carrier types of equipment and the use of the low-volume method of application the spraying of deciduous fruit trees promises to be much more efficient and economical than is the present practice of bulk spray applications.

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## POULTRY

Continued from page 13

A positive reaction to the HI test is reliable evidence that the bird tested has been infected with PE. A bird will continue to react positively for a long time after recovery.

If a flock has had two attacks of respiratory disease and specimens were not submitted for laboratory examination until the second attack, a positive reaction to the HI test at that time would not reveal whether the first or second attack was due to PE. Conversely, if PE was diagnosed when the first outbreak occurred, the HI test would be of no value in identifying the disease responsible for the second attack.

This feature of the HI test is probably responsible for some of the mistaken beliefs that PE has occurred twice in the same birds.

The PE vaccine which has been available for the past few years is prepared from infected embryos with formalin added to kill the virus. This vaccine is incapable of producing the disease and can be safely used on any farm.



## NEW PUBLICATIONS

A copy of the publications listed here may be obtained without charge from the local office of the Farm Advisor or by addressing a request to Publications Office, College of Agriculture, University of California, Berkeley 4, California.

### New Grape Varieties

**RUBY CABERNET AND EMERALD RIESLING**, by H. P. Olmo. *Bul. 704, May, 1948. (12 pages.)*

**PERLETTE AND DELIGHT**, by H. P. Olmo. *Bul. 705, May, 1948. (6 pages.)*

**SCARLET**, by H. P. Olmo. *Bul. 706, May, 1948. (6 pages.)*

### Tomato Pests

**CONTROLLING COMMON PESTS ON TOMATO IN NORTHERN CALIFORNIA**, by A. E. Michelbacher, W. W. Middlekauff, and N. B. Ahesson. *Cir. 384, April, 1948. (15 pages.)*

### Breeding Turkeys

**SELECTING TURKEYS FOR BREEDING IMPROVEMENT**, by W. E. Newlon and V. S. Asmundson. *Ext. Cir. 143, April, 1948. (15 pages.)*

Extensive field trials of such vaccine in which only a part of the flocks were vaccinated have shown that it does not give complete immunity against natural infection. Nearly all of these flocks became infected in six months or less subsequent to vaccination.

The loss from both mortality and decreased egg production among the vaccinated birds was enough less than among the nonvaccinated, that the flock owners considered vaccination worthwhile.

Much experimental effort has been directed toward developing live-virus vaccine which will produce complete and lasting immunity. The progress that has been made indicates that this objective will be accomplished in the reasonably near future.

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### DONATIONS FOR AGRICULTURAL RESEARCH

Gifts to the University of California for research by the College of Agriculture, accepted in April, 1948

#### BERKELEY

Carbide and Carbon Chemicals Corp.....	\$2,400.00
Studies on ethylene oxide and other epoxides.	
Division of Food Technology	
Corn Industries Research Foundation.....	\$7,000.00
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