

Control of Walnut Blight

antibiotic and copper formulations tested in modified spray program in experimental plots in San Joaquin County

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The standard schedule for the control of walnut blight in California—one prebloom and one or two postbloom treatments with copper—depends on very accurate timing. If errors are made, control of the disease may not be achieved. Because of climatic conditions, sprays are sometimes applied when blooming is at an end. This is too late because the causal organism has had a chance to infect susceptible parts of the plant.

To try out a slightly modified schedule, two experimental plots were established in San Joaquin County in orchards where walnut blight presented a serious economic problem. Of antibiotics, streptomycin was used as a wettable formulation—50 ppm, parts per million—and also as a pyrophyllite dust containing 500 and 1,000 ppm crude streptomycin. Copper A was used as a spray at the rate of three pounds per 100 gallons of water plus Triton B-1956 spreader and as a 10% dust in talc. The treatments were made at the prebloom stage when there were about 5%–10% open blossoms, middle of bloom, with about 40% bloom, and postbloom, about three weeks after the last spray. Spraying was done with an ordinary spray gun at 600 pounds pressure, and dusting was performed by ground equipment delivering about 50 pounds of the pyrophyllite-streptomycin dust per acre. Counts of healthy and diseased nuts were made on June 11 and 12, and the disease expressed as the percentage of diseased nuts in a given plot.

The results obtained show that both Copper A and streptomycin bring about considerable reduction in blight when applied at the proper time. Copper A at the rate of three pounds per 100 gallons and streptomycin at 50 ppm performed satisfactorily when applied to Payne walnuts in wettable form at the middle and postbloom periods, giving 95% and 85% control, respectively. In Eureka walnuts, Copper A when sprayed in the middle of bloom gave 92% control of blight, as compared to 73% control in the streptomycin—50 ppm—plot sprayed at the same time. This may suggest a longer antibacterial action of Copper A sprays when on a plant in comparison with the water soluble streptomycin formulation. It may explain, also, the better performance of Copper A spray when applied in the postbloom stage.

The smaller table demonstrates the efficacy of streptomycin in controlling walnut blight. It shows that 89% control was obtained when Payne walnuts were sprayed with streptomycin spray containing 50 ppm; 76% and 68% control with streptomycin-pyrophyllite dust; and 53% with 10% Copper A dust. Windy weather somewhat interfered with the proper application and the deposition of the dust did not seem to be good.

In no case was there any injurious effect observed on any of the trees sprayed or dusted in the middle of the bloom when the chemicals were applied to the open blossoms.

The experiment indicates that very poor control of walnut blight is attained when only one—either prebloom or postbloom—spray is applied. However, when one application is made at the middle of bloom—40% open blossoms—stage or one at that stage and an additional treatment in the postbloom stage, satisfactory control of the blight can be attained.

From these trials—and tests in other counties for the last two years—it appears that no injury to pollination follows the application of copper compounds to open blossoms of walnuts. This observation, coupled with the obvious

reduction in blight in trees treated in almost full bloom, makes the schedule very attractive. However, this new schedule has not been evaluated under different climatic and variety conditions and is still in the experimental stage.

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Experimental Control of Walnut Blight with Copper and Streptomycin (dust and wettable) at Linden, Summer 1955. Treatments Were Made at Early Prebloom, Middle of Bloom, and Postbloom Periods.

Plot	Treatment	No. of trees	Disease %	Disease in relation to check	Control %
1	No treatment. Check	150	24.6	100.	0.
2	10% Copper A dust	42	11.6	47.	53.
3	Streptomycin dust, 500 ppm.	42	5.9	24.	76.
4	Streptomycin dust, 1,000 ppm.	42	7.6	32.	68.
5	Streptomycin wettable, 50 ppm.	56	2.7	11.	89.

Experimental Control of Walnut Blight with Streptomycin and Copper Sprays Applied at Different Stages of Bloom in an Orchard at Ripon, Summer, 1955.

Variety of walnut	No. trees	Treatment	Rate	Stage of bloom	Disease %	Disease per cent in relation to check	Control of the disease %
Payne	9	Copper A	3#/100 gal.	Prebloom	9.50	84.8	15.20
Payne	9	Copper A	3#/100 gal.	Postbloom	4.90	43.7	56.30
Payne	5	Streptomycin	50 ppm.	Postbloom	8.70	77.6	22.40
Payne	18	Streptomycin	50 ppm.	Middle of bloom and Postbloom	1.60	14.2	85.80
Payne	18	Copper A and Streptomycin	3#/100 gal. 50 ppm.	Middle of bloom and Postbloom	0.56	5.00	95.00
Payne	18	Copper A	3#/100 gal.	Prebloom, Middle of bloom and Postbloom	0.93	8.3	91.70
Payne	4	No treatment			11.20	100	0
Eureka	3	Streptomycin	50 ppm.	Middle of bloom	4.30	26.7	73.30
Eureka	6	Copper A	3#/100 gal.	Middle of bloom	1.30	7.87	92.13
Eureka	9	No treatment			16.5	100	0