



your Lake County HORTICULTURAL NOTES

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GRAPE POWDERY MILDEW

Powdery mildew (*Uncinula necator*) is much less severe in Lake County than other north and central coastal districts or the San Joaquin Valley. In fact, many growers claim excellent control with 3 - 5 sulfur applications starting at 4 - 6" shoot growth. Ergosterol inhibitors, e.g. Bayleton, Rally, Rubigan, are used sparingly if at all. Exceptions to this generalization may be years of unusually mild temperatures through the growing season or when canopy management or irrigation practices buffer the fungus from ambient heat which normally inhibits survival.

Climate is the basic limiting factor. While other districts battle PM in the spring, we are frost protecting young shoots and even clusters. Although spores will germinate under a wide temperature range, optimal germination occurs at 77°F, and optimal fungal growth from 70 - 86°F. Spores and colonies are killed above 90°F. Lake County means swing relatively quickly from sub-optimal in the spring to above-optimal in the summer. The duration of ideal weather conditions vis-a-vis susceptible growth stages is narrow versus more prone districts.

Late summer temperatures may also play an added role. Dr. Doug Gubler, UC Extension Plant Pathologist, has confirmed that thick-walled fruiting bodies called cleistothecia are a major source of primary infections at budbreak. These spore-filled bodies overwinter in bark until spring rains or heavy dews trigger ascospore release onto buds and new shoots. In trials, the number of cleistothecia on vines during dormancy correlated positively with the percent of infected vines in the spring. Where it was hot in late summer, i.e. above 90°F for 3 days or more, the spores never matured to germinate in the spring. Since Lake County, due to this interior location, is more akin to warmer areas than the mildew-prone coast, we may begin each season with lower primary inoculum levels. To ultimately determine this, cleistothecia must be collected from vines and prunings to determine ascospore maturity.

How has this new information modified treatment recommendations? Trials in mildew-prone districts have shown reduced infection by applying wettable sulfur VERY EARLY at budbreak to 2" shoot

growth kill primary inoculum, and continuing with sulfur (any form) at 7 - 10 day intervals to veraison. Growers with PM problems should heed this recommendation. The key is BUDBREAK TO 2" GROWTH WETTABLE SULFUR and vigilant follow-up.

As acreage and vineyard density of susceptible varieties increase (e.g. Cabernet sauvignon, Chardonnay), inoculum load will likely correspondingly increase over time. Local pear growers are well aware that a high density of a single crop in a relatively confined growing area raises the probability that the neighbors' problems become their problems. In the future, proper canopy management (i.e. thinner, more exposed) and irrigation practices, along with timely treatments, will be crucial to prevent disease build-up.

Details of PM biology and management are in Grape Pest Management, UCANR Publ. #4105 (\$25.00). Current control recommendations for all grape pests are in Pest Management Guidelines - Grapes, UCPMG Publ. #18 (\$1.35). Both are available from our office.

SPRING ZINC DEFICIENCY TREATMENTS

See June, July and November 1988 newsletters for further information on diagnosis and fall treatments.

<u>CROP</u>	<u>MATERIAL/RATE</u>	<u>WHEN</u>
*GRAPES	4 lbs. 36% Zn sulfate + 3 lbs. spray lime/ 100 gal. water, 100 - 150 gpa.	2 - 3 weeks before bloom
PEARS	4 - 5 lbs. 50% basic Zn sulfate/100 gal. 300 - 400 gpa. <u>OR</u> 2 lbs. Zn EDTA/100 gal. <u>OR</u> 4 - 5 lbs. Zn oxide/100 gal.	2 - 4 weeks after bloom on young leaves
WALNUTS	1 lbs. 36% Zn sulfate/ 100 gal. <u>OR</u> 2 lbs. Zn EDTA/100 gal.	just after bloom at about 6 - 10" shoot growth when leaves just turn green.
*spur-pruned vines respond to daubing <u>fresh</u> pruning rounds with 1 lb. 36% Zn sulfate/ 1 gal. water; 2 - 4 gpa.		Repeat 1 - 2 times at 2 - 3 week intervals if severe.

EFFECT OF FUNGICIDE SPRAYS ON PEAR SKIN RUSSET

The success Dr. Steve Lindow, Extension Specialist Jim Beutel and Mendocino County Farm Advisor Bruce Bearden had using fungicides to reduce russet-inducing bacteria experimentally prompted widespread use of Dithane M-45 last spring. Jim Beutel repeated several trials, including one in a russet-prone orchard in Upper Lake. He sprayed 5 times correlating with rain: April 8, 13, 20, 27 and May 10. There was significantly less russet at the 6 lb./acre rate of Dithane M-45. Other rates and materials showed no significant differences. In other areas, the lesser rate of 3 lbs./acre performed adequately. As with any other pesticide, growers should employ the least amount of material necessary to reduce russet. For a more detailed summary, see 1988 Report on Research Projects for California Bartlett Pears (contact me for a copy).

Lake County Russett Results in 1988

Treatments	Russetted Surface		
	Slight 0-2%	Medium 2-5%	Heavy 5%
Control	10%	30%	50%
Dithane 45 3 lbs/Ac	14%	33%	53%
Dithane 45 6 lbs/Ac	35%	28%	37%
Bayleton 2 oz/Ac	15%	26%	59%
Ziram 76 6 lbs/Ac	19%	21%	60%

1988 PEAR RESEARCH REPORTS

Growers (i.e. YOU) sponsored \$62,000.00 worth of research in 1988. Researchers reported results at meetings in Sacramento and Ukiah this winter. For those unable to attend, contact me for a copy of 1988 Report on Research Projects for California Bartlett Pears. Research focused on pest management: miticide resistance, new miticides, fireblight/frost injury/russet reduction using fungicides and antagonistic bacteria, codling moth control by mating disruption, "soft" pesticide programs (e. g. without Guthion), pear psylla control, and testing for codling moth resistance to Guthion. Several reports include data from Lake County, an additional motivation to find out WHAT YOU PAID FOR!

THE DROUGHT

You are all aware that total rainfall has been below normal so far this season. My only two immediate recommendations at this point are: 1) begin the season with as much stored water in the root system as possible, and 2) CONTROL WEEDS AND COVER CROPS!!! These are starting to grow rapidly right now and are consuming precious water, especially in young orchards and vineyards. For your information, here is the rainfall pattern for the past 55 years, courtesy of Ross Benson.

RAINFALL 1934 - 1989

BENSON RANCH

1934-35	27.34	1961-62	19.89
1935-36	26.20	1962-63	31.28
1936-37	19.97	1963-64	16.51
1937-38	38.46	1964-65	30.41
1938-39	13.18 (Kelsey Creek reached lake 12/10)	1965-66	20.01
1939-40	27.82	1966-67	29.46
1940-41	42.26 (Kelsey Creek reached lake 12/17)	1967-68	24.46
1941-42	32.70 (Kelsey Creek reached lake 12/2, ceased flow 7/4)	1968-69	33.27
1942-43	26.52 (Kelsey Creek reached lake 11/17, then again on 12/7, ceased flow 6/2)	1969-70	31.46
1943-44	18.82 (Kelsey Creek reached lake 1/2, ceased flow 6/12)	1970-71	25.94
1944-45	21.84 (Kelsey Creek reached lake 12/20, ceased flow 6/12)	1971-72	16.03
1945-46	18.83	1972-73	32.77
1946-47	17.94	1973-74	35.74
1947-48	22.13	1974-75	26.79
1948-49	16.12	1975-76	9.84
1949-50	17.14	1976-77	11.89
1950-51	29.70	1977-78	34.73
1951-52	30.96	1978-79	21.98
1952-53	27.11	1979-80	31.55
		1980-81	19.66
		1981-82	39.24
		**1982-83	44.96
			(Kelsey Creek ceased flow 7/21/83 reached lake 8/31/83)
1953-54	23.45	1983-84	33.73
1954-55	17.16	1984-85	19.05
1955-56	37.39	1985-86	36.05
1956-57	20.23	1986-87	15.59
1957-58	39.94	1987-88	22.44
1958-59	21.57	1988-89	13.07 (Thru 3/13)
1959-60	31.59		
1960-61	21.43		

** RECORD YEAR

Statistics courtesy of ROSS BENSON and Dept of Water Resources
Water Year: October - September

Sincerely,



Rachel Elkins
Farm Advisor