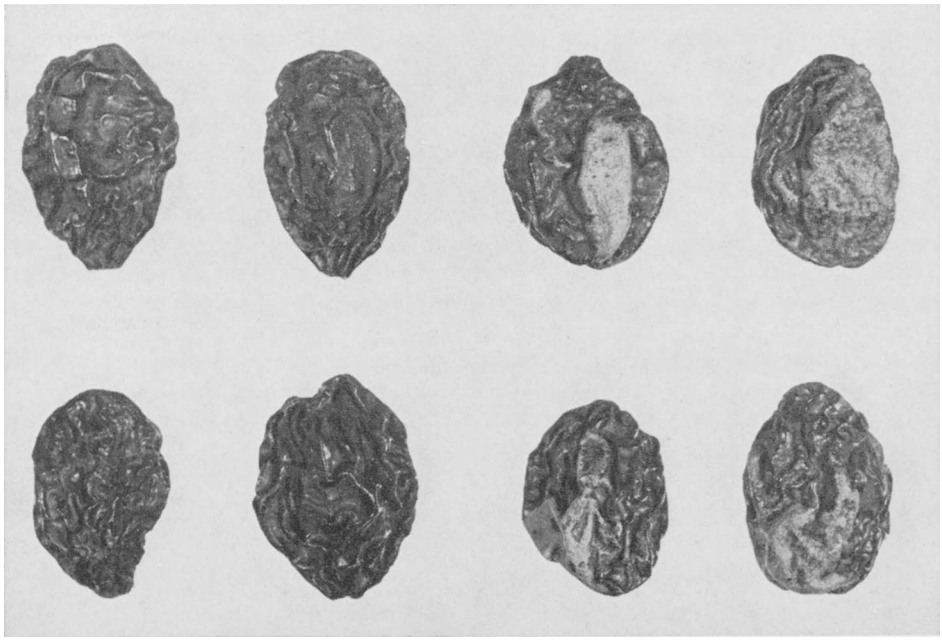
CONTROLLING PRUNE RUSSET SCAB



Four healthy "standard prune" types, to left, compared with four russet scab prunes eligible for a "substandard prune" grade, to right.

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Prune russet scab, sometimes called lacy scab, was reduced to an insignificant level in the 1967 season by one application of a fungicidal spray during the full bloom period. Both Captan and Phygon (dichlone) proved successful and may be used by prune-growers. Difolatan (folcid), another chemical used in these tests, is not registered for use on prunes and should not be applied to prune trees.

RUSSET SCAB has been a cause of major financial loss to prune growers and processors alike in four of the past 20 years. In four other years the disease caused significant irregular losses; but growers report that in almost every season some prune orchards are affected.

The problem was most significant in 1967, when it was estimated that russet scab and other associated defects resulted in grower losses of more than $3,000,000 because of the extra costs of sorting and because fruit of lower quality brought reduced prices.

The exact cause of russet scab has not yet been determined in spite of the persistent efforts of research workers. Frequently the russeting or lace-like network occurs on the stylar end of prune fruits. For this reason some researchers refer to it as "jacket scab" and believe it is caused by the adherence of the jacket to the fruit after petal fall. In some "scab years" this has occurred, but in other "scab years," the jackets or husks have been shed soon after bloom.

Unlike the russeting in some other fruit crops, such as apples and pears, the russeting in California prunes is not associated with the application of chemicals to the flowers or young fruits. Russet scab in French prune frequently occurs severely in orchards receiving no sprays at all in the growing season.

Late rains

Years with late rains during the jacket stage fall have frequently been "scab" years. The 1965 season followed this pattern. In other years, such as the 1952 season, rains that fell during the bloom period have been followed by russeted fruit at harvest. Russet is most likely to develop when rains are above normal both during the bloom and again after the bloom, as in the 1967 season.

The time of prune bloom varies from season to season, and from county to county within any one season. However, records kept during the past 20 years indicate that the main prune bloom will occur between the second week of March and the first week of April. It is possible to get a fair idea of the magnitude of the russet scab problem in any one year by examining the rainfall pattern to determine the extent to which precipitation exceeded expectations.

Thus, during March and April of 1966, rainfall was below normal and russet scab was not a problem, while in 1963, 1965 and 1967, rainfall was above normal and russet scab was a statewide problem. The years 1963 and 1967 had more above-normal rains than did 1965, and also had more russet scab.

In 1967, a severe russet year, a number of trials were conducted in Butte, Yuba, and Sutter counties within the Sacramento Valley, and within Sonoma and Napa counties of north coastal California. In these trials, fungicides were applied either at full bloom or at other times during the spring to determine their effectiveness in reducing russet scab. The fungicides used were Captan 50W (Orthocide) at 8 lbs per acre, and Phygon XL 50W (dichlone) at 2.25 to 2.50 lbs per acre. These were applied with ground rig orchard sprayers, as both high-volume and as semi-concentrate sprays.

Table 1 gives the details of trials located on seven prune properties. The trials showed first that whenever prunes

were not sprayed with either Captan 50W or Phygon XL 50W, a very high level of russet scab was visible on the dehydrated prunes. Secondly, whenever either Phygon XL 50W (dichlone) or Captan 50W was applied during the full bloom period, russet scab was substantially reduced, and in some cases almost eliminated. Thirdly, russet scab was satisfactorily reduced in both the Sacramento Valley and in north coastal counties of California. Fourthly, both high-volume rigs, with enough water spray mixture to completely wet the prune trees (that is, 350 to 400 gallons per acre), and semi-concentrate ground rigs were found to be effective in applying either fungicide to reduce russet scab.

Finally, the results in orchard 7 (table 1) suggest that there is no added benefit in a further reduction of russet scab by applying a fungicidal spray during the green bud stage if a fungicide is going to be applied anyway at the time of full bloom.

New fungicide

An experiment was conducted in Napa County in 1967 with a new experimental fungicide, Difolatan 80W, used as a wettable powder. The timing, frequency of application, and resulting level of russet scab are presented in table 2. Again, these results showed that applications of the fungicide Difolatan during the time of full bloom greatly reduce russet scab. Additional sprays at other times did not further reduce russet scab to a significant degree. Data in table 2 also suggest, however, that a single application of Difolatan at the late green bud stage was as effective in reducing russet scab as a single application in the full bloom stage of flower development. This is thought to be associated with the particularly long residual effect and redistribution characteristics of this new experimental fungicide. Difolatan is not registered for use on prunes and should not be used on the trees.

In conclusion, it seems likely that the real cause of russet scab is some phenomenon occurring in the blossom about the time is is fully opened. Although fungicides control the russet scab, it does not necessarily mean that a fungus caused the problem. There are several components in commercial fungicides other than the fungicidal chemical itself, and some of these may also affect prune russet scab.

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TABLE 1. PRUNE RUSSET SCAB CONTROL: A COMPARISON OF TWO FUNGICIDES AND SEVERAL APPLICATION METHODS, CALIFORNIA 1967

Orchard number	Prune-growing district	Fungicide used and amount per acre	Method of ground rig application	Amount of spray liquid applied	Stage spray applied*		Russet scab after dehydration
					Green bud	Full bloom	
				gallons per acre			%
1	Sacramento Valley	Captan 50W (as Orthocide 50W) 8 lbs per acre	High-volume	400	X	X	1
					O	O (control)	25
2	Sacramento Valley	Captan 50W (as Orthocide 50W) 8 lbs per acre	Semi-concentrate	90	X	X	1
					O	O (control)	11
3	Sacramento Valley	Captan 50W (as Orthocide 50W) 8 lbs per acre	Semi-concentrate	105	O	X	1
					O	O (control)	13
4	Sacramento Valley	Phygon XL 50W (dichlone) 2.50 lbs per acre	Semi-concentrate	95	O	X	1
					O	O (control)	6
5	North Coast	Captan 50W (as Orthocide 50W) 8 lbs per acre	Semi-concentrate	110	O	X	1
					O	O (control)	21
6	North Coast	Phygon XL 50W (dichlone) 2.25 lbs per acre	High-volume	350	O	X	9
					O	O (control)	26
7	North Coast	Phygon XL 50W (dichlone) 2.25 lbs per acre	High-volume	360	X	X	7
					O	X	6
					O	O (control)	33
		Captan 50W (as Orthocide 50W) 8 lbs per acre	High-volume	360	X	X	5
					O	X	4
					O	O (control)	31

* X = spray; O = no spray

TABLE 2. EFFECT OF DIFOLATAN ON PRUNE RUSSET SCAB FOLLOWING APPLICATION AT VARIOUS DATES, NAPA COUNTY, CALIFORNIA, 1967

Difolatan applied on*:			Russet scab after dehydration
18 March late green bud	27 March full bloom	7 April petal fall	
			%
X	X	X	4
X	X	0	7
X	0	X	4
X	0	0	6
0	X	X	8
0	X	0	9
0	0	X	31
0	0	0	27

* Difolatan 80W was applied at each application date at the rate 3.5 lb. 80W per acre in 350 gal. water-spray suspension per acre. X = spray; O = no spray.

MAPS OF PERCENTAGE OF NORMAL RAINFALL IN CALIFORNIA DURING MARCH (top rows) AND APRIL (bottom rows) FOR YEARS 1963, 1965, 1966, and 1967
(Shading indicates areas receiving 100%, or more, of normal rainfall)