

# LOW RATES OF SULFUR AGAINST POWDERY MILDEW ON SUGAR BEETS IN THE IMPERIAL VALLEY, CALIFORNIA

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Powdery mildew on sugar beet. The white leaves are severely infected. Some leaves or whole plants may be literally covered with fungal growth and appear as if they had been dusted with a white powder.

Experiments during the last two years have established that 35 to 40 pounds of sulfur 98 percent dust per acre, applied once or twice, controlled the disease by 90 to 95 percent. Tests were conducted to determine the minimum amount of sulfur required to achieve a satisfactory control of powdery mildew on local sugar beets.

Plots consisting of two beds, 10 feet long, were hand dusted with 5, 10 or 15 pounds sulfur 98 percent per acre. A wide-mouth jar with a perforated lid was used for dusting. After application, the leaves were gently shaken by hand so that the deposited sulfur would be further spread on the foliage. Plots were also sprayed with Thiolux 80 percent (micronized wettable sulfur), 2½ pounds formulation in 20 gallons of water per acre or Benlate 50 percent WP, ½ pound formulation plus one quart FMC spectrum 415 spray oil in 20 gallons of water per acre. The plots were treated on April 18, 1975, and the results were recorded 28 days later.

The plots were randomized and the treatments replicated four times. The disease was moderate but uniformly distributed in the plant population. Large plants formed a thick canopy which completely covered the furrow. The average maximum and minimum ambient temperature during the experiment was 80.4 F and 53 F, respectively. The average relative humidity was 49.9 percent.

### Results and discussion

Sulfur dust at the rate of 15 pounds per acre controlled the disease by approximately 94 percent (see table). This control is comparable to the 90-95 percent control which has been obtained here by a 40-pound sulfur application. None of the treatments was phytotoxic to sugar beet.

Late applications of sulfur dust are often applied on local sugar beets for simultaneous control of both powdery mildew and mites. It is not known if 15 pounds of sulfur dust per acre control mites on sugar beets.

A single application of 15 pounds of sulfur 98 percent dust per acre gave 94 percent control of powdery mildew on sugar beets. One sulfur application will protect the crop for at least 4 weeks. If 15 pounds sulfur could be applied in commercial operations an estimated 1,625,000 pounds of sulfur could be saved each year.

BENLATE AND LOW RATES OF SULFUR AGAINST POWDERY MILDEW ON SUGAR BEETS  
(Data taken on May, 1975)

TREATMENT	DISEASE INCIDENCE	DISEASE INDEX
Sulfur 98% Dust (15 lbs/A)	0.62 a <sup>1/</sup>	0 = No Disease (complete control)
Sulfur 98% Dust (10 lbs/A)	1.5 ab	1 = 10% Disease
Sulfur 98% Dust (5 lbs/A)	2.9 b	2 = 20% Disease
Thiolux 80% WP (2.5 lbs/20 gallons water/Acre)	2.4 b	3 = 30% Disease
Benlate 50% WP (½ lb + one quart FMC spectrum 415 spray oil/20 gallons water/Acre)	7.75 c	4 = 40% Disease
		5 = 50% Disease
		6 = 60% Disease
		7 = 70% Disease
Non-treated (ck)	9.5 d	8 = 80% Disease
		9 = 90% Disease
		10 = 100% Disease

<sup>1/</sup> Significant at 1% level, 1.63 LSD

Thiolux 80 percent at 2.5 pounds per acre and Benlate 50 percent W in combination with oil carrier did not provide a satisfactory control of powdery mildew. It should be noted that the disease was well established in the plots at the time of treatment. Even 10 pounds of sulfur 98 percent dust per acre applied at first signs of disease will probably suffice to control the problem.

There are about 65,000 acres of sugar beets grown in the Valley. On the average, they are treated once with 40 pounds of sulfur 98 percent dust. If the same acreage were dusted once with 15 pounds instead of 40 pounds sulfur, about 1,625,000 pounds of sulfur could be saved annually.

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