Control of Powdery Mildew (Erysiphe betae) of Sugar Beets

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Only since 1974 has powdery mildew been considered of potential economic importance to sugar beets in California and Arizona. Mildew is not a new disease for sugar beets, however, for Europe has studied the problem for decades. Many tests conducted under various European conditions have built a solid foundation from which to work. The available literature will support a wide variety of theories relating geographical distribution patterns, economic importance, symptoms, physiological affects, ecological factors, epidemiology, complexes involving other organisms, and control measures. How relative these data may be depends entirely on comparing similar conditions. Data is often confusing and contradictory because conditions relating to the disease complex varies as does the conclusions drawn from these data.

Powdery mildew has reached epiphytotic proportions consistantly for years in the Soviet Union and other European countries. Under optimum conditions, severe infections may be responsible for significant reduction in root yields. In the western United States, powdery mildew is currently a problem of varying proportions, depending upon locality, time of year and plant conditions.

In central Arizona, powdery mildew does not appear in any substantial quantity until the first of March. This varies annually for each locality according to the weather conditions.

It is not unusual to have enphytotic conditions in one field adjacent to several fields having no powdery mildew symptoms. Severity of this disease varies greatly from plant to plant, field to field and area to area. Natural remission or regression is not uncommon. Disease pressures and symptoms may very from week to week, irregardless of chemical treatments.

Because of the low cost of sulfur materials and the lack of experience with powdery mildew, control measures have been based on prevention and control at first sign of disease. Realistically, this has been an adequate and logical approach.

Arizona sugar beets planted in September or October but having early powdery mildew symptoms in March are six months old and well established. When considering the local potential economic importance, three obvious questions arise. (A) What is the economic threshold for powdery mildew? (B) When should control begin? (C) What chemical is the most practical for control?

MILDEW TEST - WILLCOX, 1976

Bay Meb 6447 and Thiolux were evaluated for control of powdery mildew. Four treatments replicated five times each on double row 40 inch beds, 20 feet long were sprayed three times. A pressurized hand sprayer with two 8003 nozzles sprayed 2 rows at a time under 30 psi pressure.

Two visual index ratings were taken. After September 30, there were no consistancies in disease symptoms within replications.

Thiolux, a micronized wettable sulfur, applied at a rate of five pounds per acre, was the commercial treatment used in the area.

Bay Meb 6447 is a candidate fungicide which shows potential for Cercospora control and powdery mildew. For the Willcox area, it would be advantageous to have one compound for both diseases since they occur at approximately the same time. Bay Meb 6447 is a systemic fungicide. Its ability to control mildew after infestation is questionable. In one treatment, the initial spray was delayed until powdery mildew was well established, indexed rate of 2 in a scale of 1 to 5 (5 = complete mycelium coverage of all plants). Although the yields (tons sugar per acre) were not significantly different for any treatment, there were obvious visual difference in mildew control (Table I). There was a natural regression occurring sometime after September 14, as evidenced by the untreated check dropping from a rating of 2.2 to 1.6.

More evaluations relating to time and disease pressures with Bay Meb 6447 will be conducted in 1977.

TABLE I

MILDEW TEST - WILLCOX, 1976

| | Spray Dates | Index Rating | | Harvest Data | | |
		9/15	9/30	TS/A	% S	TB/A
Bay Meb 6447 (early)	8/11) 8/27) 9/10)	0.1	0.0	4.56	15.21	30.16
Bay Meb 6447 (late)	8/27) 9/10	2.1	0.8	4.49	14.77	30.36
Thiolux	8/11) 8/27) 9/10)	0.8	0.8	4.29	14.54	29.51
Check	–	2.2	1.6	4.19	14.28	29.35
LSD @ P = .05				NS	NS	NS