A SPORE TRAP TO STUDY SPORULATION IN TREE CANKER DISEASES [1]

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Fungi causing tree canker diseases usually produce wettable spores which may be trapped on a sticky surface, such as a vaselined microscope slide, in the path of rainfall splashed off the sporulating canker. Hopkins (1) has designed a vertical spore trap of this type for use on vertically-oriented cankers. This paper describes a slide spore trap for use on horizontally-oriented branch cankers. Branch cankers caused by Boydia insculpta (Oud.) Grove (2) on 35-year-old English holly trees in a commercial orchard were selected to test, over a period of one year, the efficiency of the apparatus in trapping spores.

The spore trap consists of a shallow tray made of heavy gauge galvanized sheet metal, or aluminum, large enough to accommodate two standard (3x1 inch) microscope slides side by side (Fig. 1). The slide platform was suspended with a slight downward tilt from, and approximately two inches below a branch canker of 1/2 to 3/4 inches diameter and slightly over six feet above ground level (Fig. 2). The length of the single support wire at the tapered end of the platform was used to adjust the angle of the platform. Prewarmed slides were completely coated with a thin, smooth layer of melted vaseline, using a clean spatula. A 30-rnl. capacity test tube with flared rim was suspended under the tapered end of the platform (Fig, 2) to gain some idea of the relative amounts of rain reaching individual canker sites between spore counts. If required in more intensive studies, the number of spores that may be carried from the slide tray into the tube may be determined by centrifugation or concentration of the contained water as in the vertical slide method of Hapkins. The characteristic hyaline Boydia spores were made readily visible under the' low power of a compound microscope by flooding the exposed slides with acid fuchsin stain, The number of spores trapped over the entire surface of the slides was recorded, using an underlying slide on which a grid of squares had been etched, The values obtained for the pair of slides under each canker were averaged at each count (Fig. 3).

Temperatures given at each spore count represent maximum and minimum values recorded in the interval between the current and previous observation. Rainfall data represent the total precipitation in this interval which was usually of 7 days' duration throughout the fall and winter period. Meteorological data opposite the first spore count on September 30, 1960, is also based on the previous 7-day interval. In addition, it should be noted that total rainfall for this month was only 0. 6 inches with none between September 5 and September 22.

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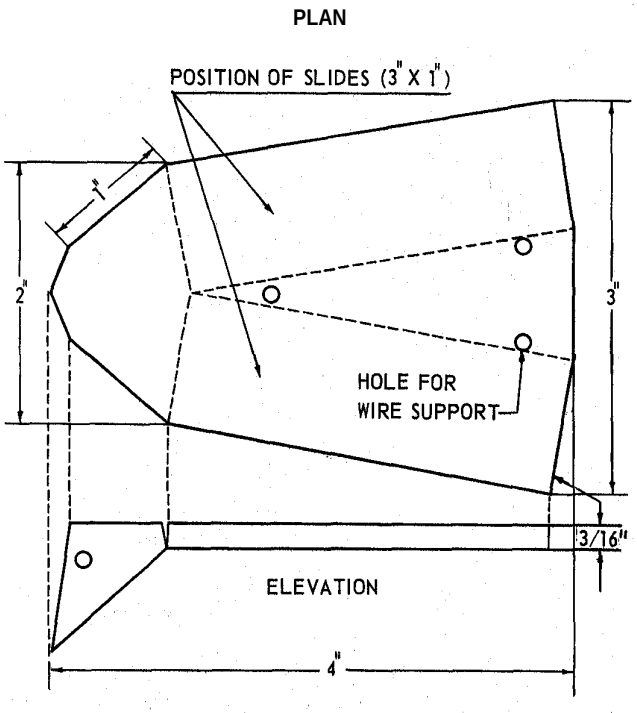

FIGURE 1. SPECIFICATIONS OF THE SLIDE TRAP SHOWN IN FIGURE 2.

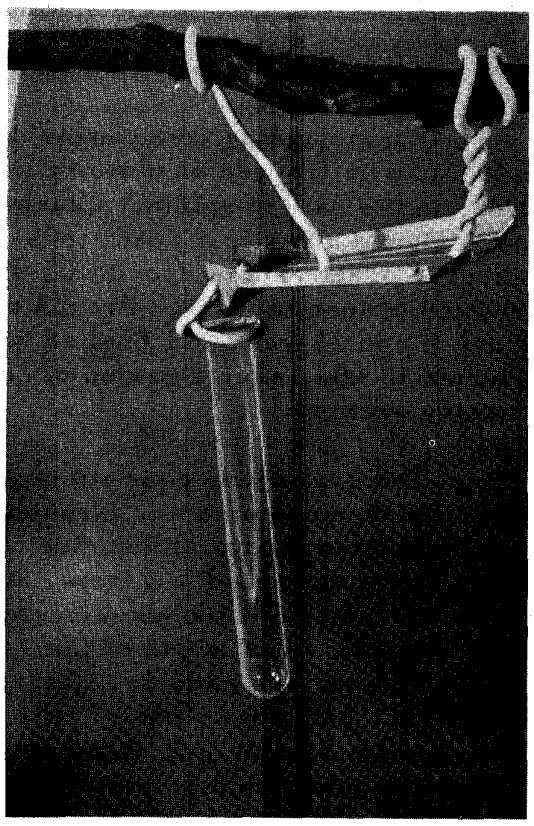

FIGURE 2. SLIDE TRAP WITH TWO MICROSCOPE SLIDES IN POSITION UNDER A *BOYDIA* CANKER ON HOLLY.

The data in Fig. 3 indicate that from the beginning of October to the end of December none or very few spores were recorded when rainfall dropped below 0. 5 inches during the intervals between counts. Large numbers of spores were trapped under some of the cankers during these months when more than one inch of rain fell between counts. The highest spore counts obtained, even during intervals of adequate rainfall through November and December, never reached the levels observed on the final day of September through October. This decline in numbers of spores trapped in November and December is correlated with gradually lowering maximum and minimum temperatures. During January and February spore counts from all five test cankers dropped to either nil or trace levels despite rainfall and temperature values that, in general, were similar to those of November and December. As temperatures again rose from the latter half of March onward so did spore counts, but in general, they did not reach the levels of the previous autumn. Also, with one exception, the number of spores trapped during this period was either nil or very few when less than 0. 5 inches of rain fell between counts. Throughout the dry months of June, July and August no spores were observed on the slides. With the advent of rains in September, when sporulation might be expected to rise sharply, only trace amounts of spores were trapped up to the middle of November when

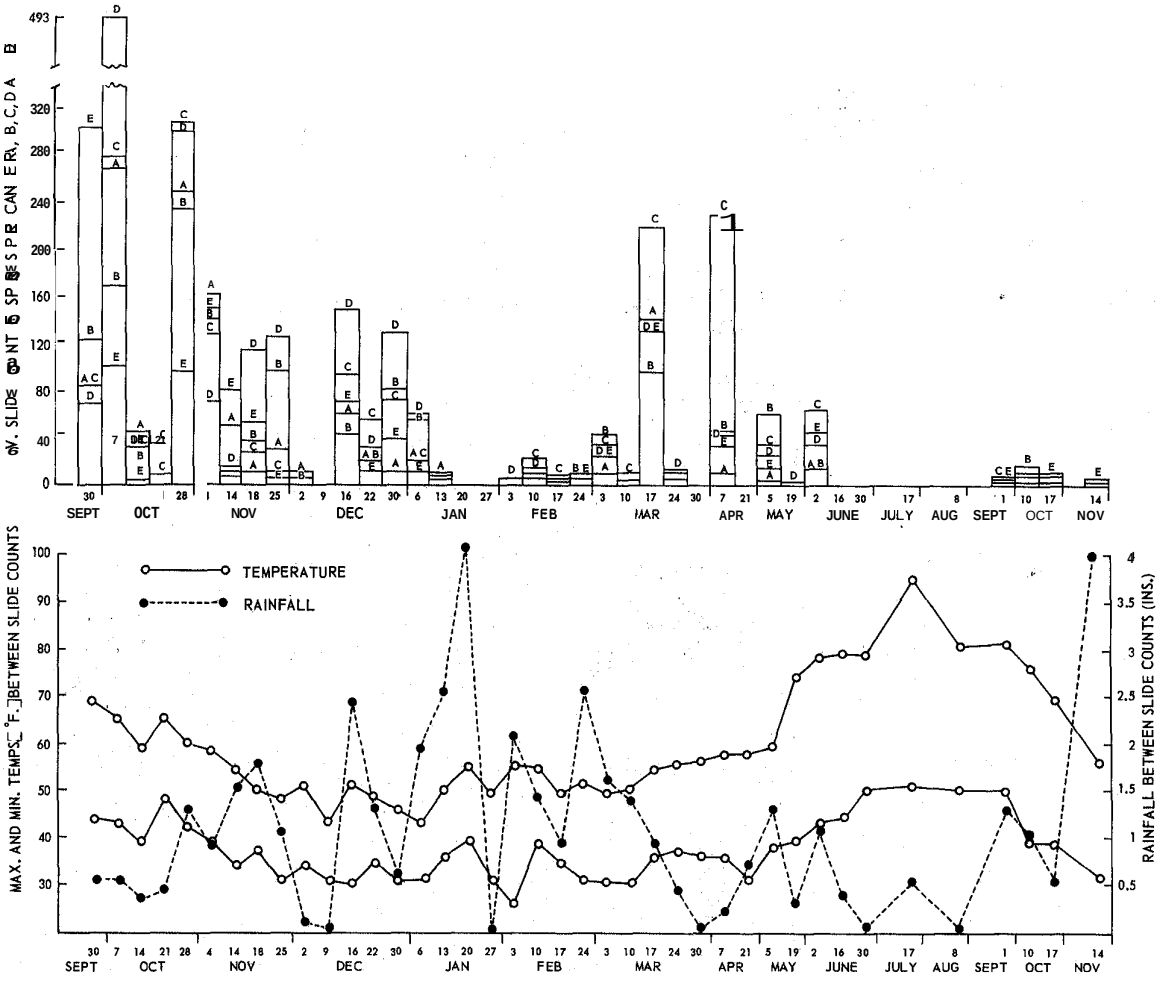

FIGURE 3. DATA ON SPORULATION OF *BOYDIA INSCULPTA* ON FIVE HOLLY CANKERS OBTAINED BY USE OF THE SLIDE TRAP DESCRIBED, AND METEOROLOGICAL DATA DURING THE TRAPPING PERIOD.

the test was terminated. Sporulation of the cankers under test then appears to have declined to a permanently **low** level following a very active state over the previous one-year period.

The data presented are considered to indicate that the spore trap apparatus described is sufficiently sensitive to changes in sporulation activity in response to meteorological conditions to be of value in studying canker-forming fungus pathogens.

Literature Cited

1. HOPKINS, J. C. 1959. A spore trap of the vaseline slide type, Can, J. Botany 37: 1277-1278.
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