FIGS. 1 and 2. Intracellular strands of *Streptomyces scabies* in tissues of cultured Katahdin tubers (×300).

sterile at the time of tuber formation, while examination of histological preparations failed to reveal any colonization. It is realized, nonetheless, that some bacterial or fungal organism could exist which has eluded all the attempts at isolation but it is considered that the possibility of this is remote and that the cultured potato tubers were sterile. The successful culturing of aseptic tuber callus by Steward and Caplin (*5*) supports this contention.

A known pathogenic strain of *S. scabies,* isolate P 21,[2] was used in all experiments. Although several inoculation technics were used, a loop transfer of *S. scabies* in sterile distilled water applied to the aseptic unwounded surface of an aerial tuber proved to be the most satisfactory. In addition, it was found that a scab lesion could be induced most readily by applying the inoculum to a tuber surface in contact with the wall of the culture vial. Apparently, under such conditions, moisture persisted long enough for infection to occur.

Common scab lesions appeared on rapidly enlarging Katahdin tubers within 10 days of inoculation and only at the site of the inoculation. Tubers, each bearing a well-developed lesion, subsequently were transferred to Difco potato dextrose agar in Petri plates. After a period of incubation pure cultures of *S. scabies* agreeing in morphological characteristics with isolate P 21 were obtained. Reinoculations were made on suitable aseptic tubers using isolates recovered as outlined above and once again scab lesions appeared at the point of inoculation. Isolates yielded only *S. scabies* which was similar in appearance to the isolate P 21 as originally used. There was no evidence of bacterial or fungal contaminants. After two passages alternately through P.D.A. and host tissue the isolates of *S. scabies* still resembled control colonies and still were pathogenic.

Tubers with scab lesions were fixed in Navashin's Craf, sectioned at 10 μ, and stained with safranin-fast green. Microscopic examination of scab lesions revealed the presence of intracellular filaments of *S. scabies* (Figs. 1 and 2); this is in agreement with the illustrations of Hooker *et al.* (*6*). *S. scabies* was associated only with macroscopically apparent lesions. Filaments of isolate P 21 in agar stained as above agreed with those in infected host tissue. In addition P.D.A. blocks infested with *S. scabies* and applied to the sterile surface of a tuber showed contiguous filaments in the agar and in the tuber.

In recapitulation, shallow common scab lesions have been induced by inoculation of unwounded aseptic potato tubers with a pure culture of a known pathogenic strain of *S. scabies.* The causal organism after successive passages through the host, resulting in lesion formation, and subsequent recoveries in pure culture showed no apparent attenuation of pathogenicity. The subcultures were similar to control cultures of *S. scabies,* isolate P 21. As none of the methods attempted revealed the presence of any microorganism in the cultured host tissue it may be assumed that the scab lesions were incited by the *S. scabies.*

Of practical importance is the fact that by this technic a scab lesion can be obtained on a tuber within one month of the culturing of a node of an etiolated potato shoot. The possibilities that such rapidity of tuber production can be of benefit to the testing of scab resistant varieties are included in current investigations.

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[2] The Department of Bacteriology, Ontario Agricultural College, supplied the cultured *S. scabies,* isolate P 21 and also assisted in the assessment of the sterility of the potato tissue. This is gratefully acknowledged.

Effect of Benzothiazol-2-Oxyacetic Acid in Delaying Maturity of Grapes

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During the testing of various growth regulators on grapes at Davis, California, it was found in 1953 that benzothiazol-2-oxyacetic acid strikingly retarded the maturity of several varieties. As a delay in ripening and harvesting would be of commercial interest in some regions, results of these preliminary tests are reported. These results should also be of interest to plant physiologists in general and to chemists interested in the synthesis and uses of such compounds.

Red Malaga, Tokay, Ribier, Zinfandel, and Thompson Seedless in their fourth or fifth summer of growth

TABLE 1. Effect of benzothiazol-2-oxyacetic acid on development of Red Malaga and Thompson Seedless grapes.

Concentration (ppm)	Date of treatment	Av. wt./berry (g)	Total soluble solids (%)	Acid (%)	Color (%)
		Red Malaga			
0	—	3.89	21.3	0.46	98
50	June 29	3.45	17.5	.66	50
50	July 31	3.19	14.9	.90	30
		Thompson Seedless			
0	—	1.31	22.8	.56	—
20	June 10	1.70	18.2	.70	—
50	June 10	1.32	19.4	.69	—
100	June 10	1.28	17.2	.68	—
0	August 10	—	21.1	.59	—
20	August 10	—	19.2	.72	—
50	August 10	—	18.9	.70	—

were used. All are varieties of *Vitis vinifera*, and all are seeded except Thompson Seedless. The clusters of Thompson Seedless sprayed on June 10 were reduced to 6 per cane one day before time of treatment, but vines sprayed on Aug. 10 were not thinned (*1*). Tokay was berry-thinned and Ribier flower-cluster thinned so that there were about 12 clusters per vine. Red Malaga and Zinfandel were not thinned.

Benzothiazol-2-oxyacetic acid (obtained from the American Cyanamid Co.) was dissolved by adding sufficient ammonia to an aqueous suspension of the compound. Dreft, about 0.2% by weight, was used for a wetting agent. The sprays were applied with a 3-gal hand-sprayer. The clusters and much foliage were heavily sprayed. There were 2 vines per treatment, except for the spraying of Thompson Seedless on Aug. 10 when there were 5.

Each variety was first sprayed soon after the shatter of berries following flowering. When a second lot of vines was sprayed, berries of Red Malaga and Zinfandel were beginning to color, but berries of Tokay and Ribier were still green although they had attained almost maximum size. Thompson Seedless on Aug. 10 had about 12% total soluble solids.

There was little or no damage to foliage except from the spraying of Thompson Seedless on June 10. By Aug. 10 many of these leaves, especially on the apical one foot of shoots sprayed with compound at 20 ppm, were cupped and crumpled. The injury was progressively greater with applications of compound at 50 or 100 ppm.

Thompson Seedless grapes sprayed on Aug. 10 were harvested on Sept. 1, and all other grapes were harvested on Sept. 23 (Table 1). About 30 lb of fruit were harvested per treatment. The procedure for determining average weight per berry, percentage of total soluble solids, and percentage of acid has been described previously (*2*). The percentage of the total surface of fruit that was colored was estimated.

The data (Table 1) show that with Red Malaga and Thompson Seedless the compound delayed maturity, as evidenced by a decrease in the percentage of total soluble solids, an increase in the percentage of acid, or decrease in coloration. Results similar to those of Red Malaga were obtained with the other grapes studied. Although the growth regulator usually decreased the size of seeded grapes, it is probable that lower concentrations or later applications of compound would delay maturity without decreasing berry size. The compound at 20 ppm sprayed on June 10 increased the size of the berry of Thompson Seedless (*2*).

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Ephelis on *Sorghum halepense* in Mysore

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Severe infection of *Sorghum halepense* (Linn.) Pers. incited by a species of *Ephelis* was noticed in a field in Mysore, India. As many as 40% of the plants were infected in restricted areas, the diseased plants being conspicuous by their malformed, mummified inflorescence bearing grayish-white pseudomorph of the fungus. In healthy plants the inflorescence is a loose

FIG. 1. Healthy and diseased spikelets of *Sorghum halepense*.