

in the fast multiplying seed mycelia. The difference we have noticed between the 'seed mycelia' and the full-grown one in the fermentors probably explains why the former produces no penicillin at all while the latter does<sup>11</sup>. The presence of free glucose and ribose and also the large percentage of sugars in the 'free sugar pool' of the aqueous extracts is of interest. Whether the sugars exist as such or are produced during the processes of extraction is being studied. The free ribose detected need not be a degradation product of nucleic acids, but could be the excess produced over what is diverted for the synthesis of the nucleotides and also used up for conversion into glucose.

Full details will be published elsewhere.

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### Control of Superficial Scald in Stored Apples

ALTHOUGH superficial scald of apples is effectively controlled by wrapping in paper impregnated with mineral oil the labour involved in doing so renders the method expensive, and the search for alternative methods of control continues. Fidler<sup>1</sup> has shown that the view that superficial scald is attributable to an injury to the tissues caused by volatile products of the metabolism of the fruit fails to explain many of the observed phenomena. He has suggested that an interaction between a heavy volatile substance Y which cannot be removed from proximity to the fruit by ventilation and a non-volatile substance X produces a compound or compounds toxic to the skin. Recent observations made during the course of experiments on the control of low-temperature injury would seem to support Fidler's view.

Apples of the variety Bramley's Seedling were picked from twelve large trees at three different dates. Comparable samples were made up within each harvest and were stored on trays in air at 0° C. Four trays from each harvest were placed at 15.5° C. for 5 days commencing with the date of picking and afterwards at intervals until the thirtieth week. Up to the twelfth week the warming was applied at fortnightly intervals. No tray of fruit was subjected to warming more than once.

Fig. 1 shows the percentage of fruits affected in the second harvest after 34 weeks from the date of storing. The relationship shown is characteristic also of that obtained with the two other harvests, although the amount of scald in the last pick was small, as is usual with fruit of more advanced maturity. There

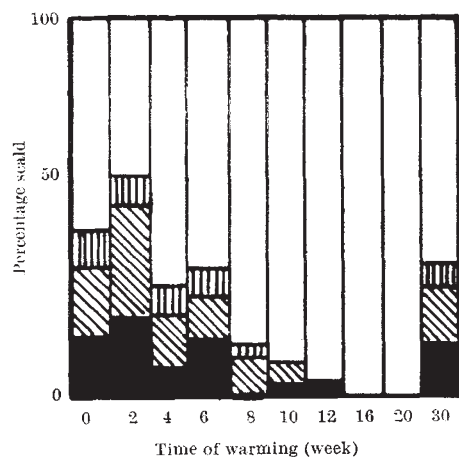


Fig. 1. Effect on the occurrence of superficial scald of keeping Bramley's Seedling apples for 5 days at 15.5° C. at successive stages during storage at 0° C. Vertical hatching, slight scald; oblique hatching, moderate scald; black, severe scald

was a progressive reduction in the percentage of apples with superficial scald and a diminution of severity with warming at successive intervals of time from the second to the twelfth week and a complete absence of scald when the apples were warmed at the sixteenth and twentieth weeks. Scald was very marked on the fruit treated at the thirtieth week. It has hitherto been considered that the damage to the fruit, although it does not become manifest until later, is incurred before the sixth-eighth week after putting into store<sup>2</sup>. These results suggest that this is not necessarily so.

Kidd and West<sup>3</sup> observed that very brief intermittent warming of Newton Wonder apples during storage at 3° C. reduced the amount of scald. Treatment, however, commenced early in the storage life and was continued throughout the period.

A possible explanation of the result described above is that the combination of substances X and Y is cumulative and reversible at higher temperatures, so that when warming is carried out prior either to the build-up of a sufficient concentration of the toxic substance or before the substance has had time to react lethally upon the cells, no scald injury results. If, however, the time-interval exceeds a certain limit, scald will appear in an amount increasing with extension beyond this limit. Although in Fig. 1 no observations are recorded for warming at intervals between the twentieth and thirtieth week, it can safely be assumed that, had they been made, an upward gradation in the amount of scald would have appeared in this interval.

From the practical point of view change of temperature would seem to be a possible method for control of superficial scald provided the fruit could be stored at 0° C. without low-temperature injury or provided the same effect could be secured at a temperature of storage above the critical level for low-temperature injury.

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