

Research and developmental work on vegetable and apple dehydration has been proceeding along the following lines:—

- (1) Suitability of different varieties for dehydration, from the following aspects:
Culture, processing, yield of dry matter, vitamin content, and appearance of finished product;
- (2) Storage tests on experimental and commercial products;
- (3) Methods of peeling (particularly lye and flame peeling), blanching, and compression.

Dr. B. W. Doak, Acting Director of the Plant Chemistry Laboratory, visited Australia during March, 1944, for discussions with officers of the Australian Council of Scientific and Industrial Research and others engaged in vegetable-dehydration work, and for visits to commercial plants.

FRUIT COLD STORAGE RESEARCH

In view of the fact that investigations on the refrigerated transport of fruit overseas are no longer called for, it was decided that there was no further necessity to retain a special Cold Storage Advisory Committee, and that control could be assumed directly by the Fruit Research Advisory Committee on which key personnel of the Cold Storage Committee was fully represented.

REFRIGERATED GAS STORAGE OF APPLES

Jonathan.—Fruit for semi-commercial-scale trials by the Dominion Laboratory was drawn from Hawke's Bay and Nelson, but owing to failure of transport the Nelson fruit on arrival had to be rejected on account of over-maturity. The Hawke's Bay fruit was put into store on the 12th March, and examinations were made at monthly intervals, commencing from the second month. The total storage period was 154 days. The atmosphere in the store was maintained at 8 per cent. carbon dioxide and 13 per cent. oxygen. Brown-heart again appeared in the fruit this season, but on a reduced scale. It was apparent at the end of two months, and had undoubtedly occurred earlier, but it did not increase appreciably in extent at any later date. Size of fruit very much affected susceptibility, for with a range of size counts from 100 to 198 it was found at the final examination that there was 22 per cent. brown-heart in the largest fruit, but only 5 per cent. in the smallest. Breakdown and fungus were just beginning to appear at the final examination, though not in amounts of commercial significance. There was no *Jonathan*-spot. The recurrence of brown-heart strengthens the idea that the range of picking dates for this variety for gas storage is very limited. A slight lowering of the percentage of carbon dioxide from 8 to, say, 7 might help to provide a greater margin of safety.

Sturmer.—In view of the troubles encountered when this variety was gas stored under semi-commercial conditions, further studies have been made of its behaviour under various modifications of the storage atmosphere composition and under various temperatures. At each of the temperatures 35° F., 38° F., and 41° F., atmospheres containing the following percentages of carbon dioxide and oxygen were employed, for comparison with storage in air:—

Carbon Dioxide.				Oxygen.	Carbon Dioxide.				Oxygen.
5	..	..	..	16	5	..	..	..	10
7.5	..	..	..	13.5	5	..	..	..	7.5
10	..	..	..	11	5	..	..	..	2.5

The fruit remained in store for a maximum period of 248 days.

In general, the fruit held at 35° F. suffered severely from internal breakdown, while that at 41° F. developed more or less severe superficial scald. A small amount of brown-heart of very mild intensity appeared at all temperatures in certain of the atmospheres, particularly the 10 per cent. carbon dioxide 11 per cent. oxygen, and the 5 per cent. carbon dioxide 2.5 per cent. oxygen. A trace was also found under 7.5 per cent. carbon dioxide 13.5 per cent. oxygen, and under 5 per cent. carbon dioxide 7.5 per cent. oxygen. No brown-heart appeared in atmospheres containing 5 per cent. carbon dioxide with either 16 per cent. or 10 per cent. oxygen. These results suggest that the *Sturmer* will, in general, tolerate only a small amount of carbon dioxide, and that there must be a fairly liberal amount of oxygen present. As far as they have gone, the tests suggest the most promising conditions as being a temperature in the neighbourhood of 38° F. with moderate carbon dioxide and slightly subnormal oxygen, as represented by 5 per cent. carbon dioxide and 10 per cent. oxygen in the series chosen. In respect of colour, hardness, and general quality, the fruit stored under these conditions was vastly superior to the air-stored controls.

SUPERFICIAL SCALD ON GRANNY SMITH

Wrapping Test.—The work carried out last year was repeated. By wrapping various lots of fruit in oiled paper for a three-week period at progressive stages in the storage life of the fruit it was confirmed that the greatest protection—and, therefore, the period of maximum susceptibility to scald—occurred from the ninth to the twelfth weeks after commencement of storage. Fruit that spent most of its storage life in oiled wraps but was left unwrapped for a three-week period at progressive stages in its storage life again remained free from scald throughout the twenty-four weeks duration of the experiment. In view of these results, it is now proposed to determine how long it is possible to leave the variety without oiled wraps on either side of its period of maximum susceptibility before scald appears. Core-flush was the only other storage disorder appearing during the commercial life of the fruit, and was unaffected by the wrapping treatments. A detailed report of the work is being prepared.