Further tests of a similar nature are being undertaken this season (1937).

Delayed Marketing of Cox's Orange Pippins.—This experiment, being five lots each of thirty cases of Cox's Orange Pippin apples, was undertaken at the request of the growers and with a view to determining, if possible and if the scheme were practicable, the best conditions as a guide to the Fruit-export Control Board.

The conclusion arrived at was that there should be no delay between picking and shipment of the fruit from New Zealand and that storage, if any, to prolong the marketing period should be undertaken at the store which supplied the final market.

The Influence of Position on the Tree with regard to the Incidence of Bitter-pit in Cox's Orange Pippins.—Apples for this trial were supplied from the Research Orchard, Nelson, and were picked from the sunny and the shady positions on the trees and shipped to England, as was the case in a similar but inconclusive experiment during the 1935 season. Details regarding the former trial (1936) are given in Covent Garden Paper, New Zealand Apples, No. 4, and the conclusion is that the fruit exposed to direct sunlight develops more bitter-pit in storage than fruit picked at a similar stage of maturity but from shaded positions on the tree. It was suggested, however, that further experiments with this variety of apple should be undertaken, and consequently a further small consignment has been sent forward this season (1937) for storage.

Apples transported to England under Ordinary Air-cooled Conditions and subsequently placed in Refrigerated Gas-storage.—Four cases, each of five varieties of apples—viz., Delicious, Dougherty, Statesman, Granny Smith, and Jonathan—were shipped to the Department of Scientific and Industrial Research, London, to obtain information with regard to the effect of storage in a controlled atmosphere of carbon dioxide after transport in air from New Zealand in comparison with a "full time in air" storage.

At present no report has been received concerning this experiment.

Transport of Cox's Orange Pippins under Refrigerated Gas-storage Conditions.—Two relatively small cool chambers on the m.v. "Empire Star" were reserved for this trial and carried three specially constructed gas-tight cabinets each with control cocks and equipped with an electric thermometer. Two of the cabinets were sealed up immediately after the apples were stowed therein, while the third cabinet was used for normal control purposes and was left open; thirty-six cases were placed in each cabinet, and a further thirty-six cases were carried in the ordinary way on the floor of one of the two cool chambers.

The fruit arrived in good condition, was very favourably reported upon after a very thorough examination, and portion of the shipment was placed into a refrigerated gas-store for a further period.

Overseas Investigations on Cox's grown in New Zealand.—An experiment was carried out with Cox's Orange Pippins to determine the effect of precooling before shipment, and of cold storage in England prior to marketing, also the influence of different types of wrappers was investigated. Details regarding this fruit are given in Covent Garden Papers, New Zealand Apples, No. 6, and the conclusions given therein are briefly as under:—

(*a*) Precooled and examined upon discharge in England: A fair amount of bitter-pit on arrival, but other forms of wastage only slight; fruit remained in good condition during the four weeks' storage except for slight increase in bitter-pit.

(*b*) Precooled and stored for five weeks following arrival and then examined: Showed increased wastage of all types, and storage for such period is inadvisable.

(*c*) Precooling for three days prior to shipment led to greater development of bitter-pit, but further tests with fruit of different maturities and of different types are needed, as fruit not subject to bitter-pit may be benefited by precooling.

(*d*) The Cox's in oiled wraps developed more bitter-pit than the fruit in plain wraps, but as very few of the samples were comparable in size and grade this result may not be significant, and further experiment with wraps is recommended.

In this connection see "Research and Experimental Work in 1937 Season," items (*b*) and (*c*) below.

Research and Experimental Work in 1937 Season.—Two special consignments only of fruit have been forwarded overseas during the 1937 season and, in the ordinary commercial transport, one demonstration shipment of apples per m.v. "Sydney Star" on the no-dunnage system of stowage.

The former comprised small experimental lots to determine—

(*a*) The influence of position on the tree and incidence of bitter-pit in Cox's Orange Pippins.

(*b*) The effect of precooling on the incidence of bitter-pit in Cox's Orange Pippins.

(*c*) The effect of different types of wrappers on wastage in Cox's Orange Pippins,—

the three lots being an extension of earlier trials for similar purposes.

Special work in ordinary cool storage and some research in refrigerated gas storage is also being done locally, including—

(1) The influence of copper-sulphate wrappers in controlling the spread of grey-mould (*Botrytis* rots) in Winter Cole pears; and extension of the experiments of 1934, 1935, and 1936 seasons.

(2) The control of superficial scald on Granny Smith apples, involving the maturity at time of picking, delayed storage and oiled versus plain wrappers.

(3) The effect of oiled wrappers on the keeping-quality and general appearance of apples for export—eleven varieties of apples are being tried.

(4) The experimental gas storage of apples of the Washington and the Ballarat varieties at various CO_2 gas concentrations and temperatures; also the determination of the rate of respiration of individual apples.