Dominion of South Africa

ANNUAL REPORT OF THE DIVISION OF CHEMICAL SERVICES FOR THE YEAR 1938

THE Division of Chemical Services is a branch of the Department of Agriculture and Forestry, but also supplies chemical services to other State Departments that require them, notably to the Departments of Public Health, Justice, Customs and Excise, Lands, Defence and Interior. It is under the direction of Dr. J. P. van Zyl.

ARSENIC ON FRUIT.—One of the regulations under the Fruit Export Act (No. 17 of 1914) is that "no fruit showing visible spray stains or fruit which may contain more than 1/100th grain per pound of arsenious oxide shall be allowed to be exported." Of the total samples examined at Capetown and Port Elizabeth during the season January to April, 1938, 204 contained arsenic in excess of 1/100 grain per lb. However, only 5 samples gave results exceeding the 1/50 grain per lb. permissible under the regulations of the Food, Drugs and Disinfectants Act of South Africa. Some growers have difficulties in complying with the regulations, but certain larger growers who have introduced scientific washing machines experience no difficulty. This may in some measure account for the fact that the percentage of samples exceeding the 1/100 grain limit was only 4·6 at Capetown as against 7·2 at Port Elizabeth.

PUBLIC HEALTH.—Of the 4476 samples examined under the Food, Drugs and Disinfectants Act, 509 were adulterated or below standard. Of this total, 3129 were milks, of which 292 were adulterated or below standard. These figures are much the same as for the previous year and reflect a somewhat high percentage of adulteration.

Ice-Cream.—According to the regulations ice-creams must contain at least 10 per cent. of milk-fat. Of the 215 samples examined, 56 (26 per cent.) were adulterated. Although most of the large and reputable firms supply ice-creams containing more than the required percentage of milk-fat, there must be a number of dealers producing ice-creams of inferior value.

FLUORINE IN CITRUS FRUITS.—Experiments to ascertain the extent to which fluorine is absorbed by citrus fruits are being continued, and the fluorine-content of oranges sent to the London market from various parts of the world is being determined. The results so far obtained indicate that traces of fluorine are frequently present.

TRIORTHOCRESYL PHOSPHATE IN SOYA-BEAN OIL.—In the early part of the year a so-called "mystery disease" occurred in Durban and an investigation was carried out in the Johannesburg laboratory. The Government Pathologist at Durban formed the opinion that the problem was probably a chemical one and invoked the assistance of the division to investigate the possibility of a consignment of soya-bean oil having been the cause of the alleged disease. After an investigation lasting some months it was established that the oil contained triorthocresyl phosphate, a substance which some years ago had produced an epidemic of a similar nature in U.S.A. (*cf.* ANALYST, 1938, **63**, 813).

ABSORPTION OF FLUORINE BY CROPS.—The uptake of fluorine by various crops and grasses is being studied by pot culture. The different materials used comprise not only those rich in fluorine, but also commercial phosphatic fertilisers such as rock phosphate, which sometimes contains as much as 3 per cent. of fluorine, and superphosphate. Judging by appearance alone, the plants receiving a high dressing of sodium fluosilicate show very marked symptoms of poisoning. Analyses to show the amounts of fluorine taken up by the plants themselves are in progress.

"SOOTY BLOTCH" ON CITRUS AND ORANGE.—Until recently a mixture of chloride of lime and boric acid has been used to remove "sooty blotch" from

oranges, but it has been found to lose its bleaching properties rapidly. For citrus better results were obtained by the use of a mixture of sodium carbonate, chloride of lime and boric acid. The fruit is readily bleached and keeps well subsequently, but it is essential to coat metallic parts of the containers with a suitable paint or enamel. For the removal of "sooty mould" from oranges a mixture of sodium metasilicate and borax was found to be the most suitable.

EFFECT OF MOISTURE ON THE INTAKE OF PHOSPHORUS AND NITROGEN.—In the cultural experiments in pots the findings of the previous year were confirmed. Under dry-land conditions phosphate response alone is noted, whilst under irrigation or heavy rainfall response to nitrogen as well as phosphate is shown. The depressing effect of large quantities of potash on the grain yield were again noted.