

chiefly concerned in the consumers' concept of staleness, and from their viewpoint this class of substances could be regarded as anti-staling agents. An opposite view would be that they function essentially as softening agents rather than as inhibitors of staling, since bread fresh from the oven is less firm when it contains them.

Usually, slightly less shortening is used when anti-staling compounds are present, since they possess some of the properties of shortening. They increase water absorption of the dough slightly and reduce the hydrophilic or water absorptive power of the starch. No harmful effect on human health has been found from incorporating anti-staling compounds in dough. At present, there is no clear-cut, definite concept of what staling really is from the technical standpoint.

The influence of the compounds discussed in this article on bread quality and consumer preferences are of especial interest to wheat producing states such as North Dakota. This is particularly true at the present time when flour consumption is declining and a large wheat surplus is feared.

BROMEGRASS AND CRESTED WHEATGRASS SEED PRODUCTION DOWN IN 1949

Production of both bromegrass and crested wheatgrass seed in North Dakota in 1949 was sharply lower than in any previous year. Bromegrass seed production in 1949 is estimated at 100,000 pounds of clean seed, compared to 150,000 pounds in 1948 and a five-year average of 592,000 pounds. Crested wheatgrass seed in 1949 is estimated at 80,000 pounds compared to 150,000 pounds in 1948 and the five-year average of 1,024,000.

For the U. S., 1949 production of bromegrass seed in the four commercially important states (North Dakota, South Dakota, Nebraska and Kansas) is estimated at 5,450,000 pounds, up 29 per cent over the 4,220,000 pounds of 1948 but scarcely more than half the five-year average of 10,450,000. Crested wheatgrass seed in the Dakotas, Nebraska, Montana, Washington and Wyoming is estimated at 2,550,000 pounds for 1949, slightly more than the 2,480,000 pounds in 1948, but only 36 per cent of the five-year average. (Figures compiled by C. J. Heltemes, USDA bureau of agricultural economics statistician in Fargo and his assistant, Leonard W. Orvold.)

NORTH DAKOTA HONEY PRODUCTION DOWN

The state's honey production in 1949 was 1,040,000 pounds, scarcely half the 1,995,000 pounds in 1948, reports the USDA bureau of agricultural economics in Fargo, C. J. Heltemes and L. W. Orvold, statisticians. In the nation, however, 1949 honey production was nearly 227 million pounds, 10 per cent more than the previous year. Leading honey state is our neighbor across the Red River. Minnesota in 1949 produced nearly 25 million pounds, while California was second busiest honey state with 22½ million pounds.

The water fern, *Marsilea*, was found last summer in Barnes county, farthest east that it has been found in North Dakota. This plant, with floating, rounded leaves of four leaflets, made the shallow water quite green at a low corner of a field near Rogers. It frequently appears in roadside ditches and was found south of Marmarth, but was very much dried up.

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