Chapter 13

Processing and Utilization of Oilseed Sunflower
D. GORDON DORRELL

The sunflower (Helianthus annuus L.) has become an important oilseed crop in North America, with an estimated 1 million ha grown in Canada and the USA in 1977. Commercial crushing began on a continuous basis in Manitoba, Canada, in 1944. The industry has subsequently progressed until today several plants in Canada and the USA are crushing a combined total of more than 70,000 metric tons of seed annually. This development of sunflower can be attributed to the introduction of cultivars from the USSR which contain more than 40% oil, the availability of surplus crushing capacity in flaxseed and cottonseed crushing mills, and the general need for crop diversification in the Red River Valley and parts of the Cotton Belt. Until recently, most of the crop has been exported as seed. With greater public awareness of the excellent quality of sunflower products and better identification on product labels, however, the domestic utilization of sunflower should increase significantly.

SEED

The sunflower seed is more correctly described as an achene, a specific type of indehiscent fruit. It is pointed at the base, rounded at the top, approximately 10 to 15 mm long, and in cross section appears to be four-sided. The outer portion of the pericarp or hull consists of elongated and pigmented cells, below which are several layers of sclerenchyma cells with pitted walls and bundles of fibers with heavily pitted walls. Immediately beneath these layers is the testa, or seedcoat, which is a white, papery layer of compressed epidermal cells and spongy parenchyma. In sunflower, the endosperm is only one or two cells thick as it is almost totally consumed dur-