GROWTH HABIT OF SOME WINTER WHEAT VARIETIES
AND ITS RELATION TO WINTERHARDINESS AND EARLINESS

K. S. QUISENBERRY AND B. B. BAYLES

WHEAT varieties have been grouped into three general classes, namely, winter, intermediate, and spring, based on their habit of growth. Actually, as has been pointed out by Percival; Clark, Martin, and Ball; and Bayles and Martin,3 and others, there is a continuous series of varieties or strains from those having very early spring growth habit to those with an extreme degree of winter habit. Thus, within the varieties commonly classed as winter, there are different degrees of winterness. Numerous papers have reported the growth habit of wheat varieties at individual stations for one or more years, but the authors have not seen publications giving data on the growth habit of the same varieties grown under widely different environmental conditions. In order to study this problem, several varieties were seeded in the spring at eight experiment stations and their relative degree of winterness determined. The relation between growth habit, winterhardiness, and time of heading from fall seeding will also be discussed.

Nineteen varieties of wheat classified as having winter habit, one with intermediate habit, and one with spring habit of growth were seeded on three dates in the spring of 1934, 1935, and 1936 at each experiment station. Seven other varieties having winter habit of growth were grown for 1 or 2 years. The name, latitude, and longitude of each station are given in Table 1. The average critical seeding date after which Harvest Queen, Karmont, Minhardt, Denton, Red Rock, and Odessa did not produce heads the same year from at least 5 to 10% of the culms is also given, together with the deviations from this date for each station as compared with Denton, Tex., and also the calculated deviations based on Hopkins' bioclimatic law.4 These six varieties were chosen because, from the data obtained, it was possible to establish the critical date more accurately. The critical date for seeding the above-mentioned varieties at Denton, Tex., was January 29, whereas at Pullman, Wash., it was March 25, or 55 days later. The critical dates for the other stations were between these two.

According to Hopkins' law, biological phenomena controlled by seasonal changes such as heading dates of wheat should take place in the spring 4 days later for each degree of latitude, 4 days earlier for each 5° of longitude from east to west, and 1 day later for each in-