MALTING quality is an important present-day consideration in barley production. This is emphasized by the considerably higher price that the maltster is willing to pay for “malting” barley in contrast to “feed” barley. Malting barley is distinguished by both physical and chemical characteristics of its kernels. This fact is brought out by Anderson, Meredith, and Sallans (1) who state that some of the important physical kernel characters are medium size and a high degree of uniformity, while three of the more useful chemical attributes are low protein, medium to high diastatic power, and high extract.

One of the problems confronting the barley breeder is the development of lines which are high both in malting quality and yielding capacity, inasmuch as a considerable number of present varieties are either feed barleys or low-yielding malting barleys.

Little is known about the degree of association which certain of the agronomic characters and yield have with chemical criteria of malting quality. Such information would be of considerable value in a breeding program.

Floret sterility was studied by Woodward (7) on a number of selections out of the six-rowed variety, Velvon. He observed that the strains showing sterility in excess of 25% (general fertility below 75%) were despite their larger kernel size. He concluded was hereditary. In a study of the six-rowed F4 segregates of a two-row-six-row cross-Liang3 found none of the following characters to be significantly associated with average kernel weight, weight uniformity, or bushel weight.

Anderson, Sallans, and Meredith (2) found three of the criteria of malting quality, protein, diastatic power, and extract, to be rather closely inter-related on the basis of intravarietal correlations. Protein was positively correlated with diastatic power while extract was negatively correlated with both protein and diastatic power. Intervarietal correlations were obtained between characters. Meredith, Sallans, and Rowland found a high positive correlation between barley diastatic power and malt diastatic power. Meredith (3) found high positive correlations between barley extract and malt extract.

Meredith and Anderson (4) noted a positive inter-vaietal correlation between 1000-kernel weight (average kernel weight) and extract and obtained negative correlations between average kernel weight and nitrogen and between average kernel weight and malt diastatic power.

Neatby and McCalla (6) found that one of the desirable malting quality characters, low protein, tended to be associated with high yield.

Den Hartog4 compared F3 plants that were selected for several characters with unselected material of the same origin. He concluded that visual selection was of considerable value as a means of obtaining plants of greatest desirability with respect to average kernel weight, weight uniformity, and general fertility of the florets. As a continuation of this subject the present study deals with (a) significance of differences between 10 crosses having Mars as a common parent and between lines within these crosses with respect to 6 characters, (b) correlations between

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3 Liang, T. J. A study of the characters of six-rowed F1 segregates from crosses between two-rowed and six-rowed barleys. M.S. Thesis. Univ. of Minn. 1946.

4 Den Hartog, G. T. Kernel characters of barley as studied in both selected and unselected heads within F2 rows of twenty-two crosses having Mars as a common parent. M.S. thesis. Univ. of Minn. 1950.