DEVELOPMENT of barley varieties, *Hordeum vulgare* L., with satisfactory malting quality is important. As an aid to the barley breeder, tests have been developed for predicting malting quality of lines in early generations. These "prediction tests" are relatively easy to perform and require only 50 grams of seed. The tests include chemical analyses of protein, potential diastatic power, and extract yield; they are frequently supplemented by evaluation of kernel plumpness. These characteristics are very important in malting varieties. Extract percentage provides a prediction of malt yield and potential diastatic power, an estimate of enzymatic potential.

Prediction tests have been used for several years and yet only limited information is available concerning effectiveness of selection for these characters in early generations. Meredith (6) and Bendelow and Meredith (1) have shown that prediction tests on small quantities of barley will rank varieties essentially the same as malting tests. Evidence suggesting that selection in the F₃ generation would be effective for protein and diastatic power and ineffective for extract was obtained by Hsi and Lambert (5). However, their quality predictions were done on composite samples of seed from eight replicates, and thus, provide only indirect evidence on effectiveness of selection on nonreplicated lines in early generations. Sisler and Banasik (7) found that selection in the F₃ of a barley cross for kernel weight, nitrogen, diastatic power, and extract increased the proportion of lines with acceptable quality. No data were presented on effectiveness of selection for the characters individually. Day, Down, and Frey (2) obtained broad sense heritability percentages for diastatic power in the F₃ generation of 30.6, 32.5, and 34.2 for 3 crosses.

Protein, diastatic power, and extract are generally believed to be associated in inheritance. However, data which show the degree of these associations in segregating populations are rather limited. Den Hartog and Lambert (3) reported correlations among the 3 characters obtained from analysis of 150 F₅ progenies consisting of 15 lines from each of 10 crosses. The correlation of protein with diastatic power was .64, and protein with extract, -.52. A negative association between extract and diastatic power was shown to result largely from the associations of both characters with protein. We have not found any reports of correlations in early generation populations between kernel plumpness and protein, diastatic power, or extract yield; they are frequently supplemented by evaluation of kernel plumpness. These characteristics are very important in malting varieties. Extract percentage provides a prediction of malt yield and potential diastatic power, an estimate of enzymatic potential.

Prediction tests have been used for several years and yet only limited information is available concerning effectiveness of selection for these characters in early generations. Meredith (6) and Bendelow and Meredith (1) have shown that prediction tests on small quantities of barley will rank varieties essentially the same as malting tests. Evidence suggesting that selection in the F₃ generation would be effective for protein and diastatic power and ineffective for extract was obtained by Hsi and Lambert (5). However, their quality predictions were done on composite samples of seed from eight replicates, and thus, provide only indirect evidence on effectiveness of selection on nonreplicated lines in early generations. Sisler and Banasik (7) found that selection in the F₃ of a barley cross for kernel weight, nitrogen, diastatic power, and extract increased the proportion of lines with acceptable quality. No data were presented on effectiveness of selection for the characters individually. Day, Down, and Frey (2) obtained broad sense heritability percentages for diastatic power in the F₃ generation of 30.6, 32.5, and 34.2 for 3 crosses.

Protein, diastatic power, and extract are generally believed to be associated in inheritance. However, data which show the degree of these associations in segregating populations are rather limited. Den Hartog and Lambert (3) reported correlations among the 3 characters obtained from analysis of 150 F₅ progenies consisting of 15 lines from each of 10 crosses. The correlation of protein with diastatic power was .64, and protein with extract, -.52. A negative association between extract and diastatic power was shown to result largely from the associations of both characters with protein. We have not found any reports of correlations in early generation populations between kernel plumpness and protein, diastatic power, or extract yield; they are frequently supplemented by evaluation of kernel plumpness. These characteristics are very important in malting varieties. Extract percentage provides a prediction of malt yield and potential diastatic power, an estimate of enzymatic potential.

Prediction tests have been used for several years and yet only limited information is available concerning effectiveness of selection for these characters in early generations. Meredith (6) and Bendelow and Meredith (1) have shown that prediction tests on small quantities of barley will rank varieties essentially the same as malting tests. Evidence suggesting that selection in the F₃ generation would be effective for protein and diastatic power and ineffective for extract was obtained by Hsi and Lambert (5). However, their quality predictions were done on composite samples of seed from eight replicates, and thus, provide only indirect evidence on effectiveness of selection on nonreplicated lines in early generations. Sisler and Banasik (7) found that selection in the F₃ of a barley cross for kernel weight, nitrogen, diastatic power, and extract increased the proportion of lines with acceptable quality. No data were presented on effectiveness of selection for the characters individually. Day, Down, and Frey (2) obtained broad sense heritability percentages for diastatic power in the F₃ generation of 30.6, 32.5, and 34.2 for 3 crosses.

Protein, diastatic power, and extract are generally believed to be associated in inheritance. However, data which show the degree of these associations in segregating populations are rather limited. Den Hartog and Lambert (3) reported correlations among the 3 characters obtained from analysis of 150 F₅ progenies consisting of 15 lines from each of 10 crosses. The correlation of protein with diastatic power was .64, and protein with extract, -.52. A negative association between extract and diastatic power was shown to result largely from the associations of both characters with protein. We have not found any reports of correlations in early generation populations between kernel plumpness and protein, diastatic power, or extract yield; they are frequently supplemented by evaluation of kernel plumpness. These characteristics are very important in malting varieties. Extract percentage provides a prediction of malt yield and potential diastatic power, an estimate of enzymatic potential.