DURING the past three and one-half decades much controversy has arisen about the relative usefulness of induced variability in applied crop breeding programs. A number of research findings have stoked this controversy. The following are examples: (a) Mutations for qualitatively inherited attributes have appeared to be predominantly deleterious (16) whereas mutations expressed in quantitatively inherited attributes have tended to be somewhat equally distributed between "deleterious and beneficial" (23, 31). (b) Until recently, it appeared that mutations occurred at random in the germplasm, but more definitive work shows that this is probably not true (18, 26). (c) Different mutagens appear to have varying efficiencies for producing mutations (19, 20). The present study was designed: (a) to compare the relative efficiencies of several mutagens, namely, thermal neutrons, P\textsuperscript{32}, and ethyl-methanesulphonate, for inducing genetic variability in the quantitative characters, heading date, plant height, and weight per 100 seeds in hexaploid oats (Avena sativa); and (b) to determine whether these mutagens were somewhat specific for causing mutations which affected one quantitative character more than another.

REVIEW OF LITERATURE

X-rays and neutrons have been the most widely used ionizing radiations for increasing mutations rates (5, 10, 24, 28). Ehrenberg et al. (7) and Thompson et al. (38) found that P\textsuperscript{32} caused a high mutation rate in barley and

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2 Associate Plant Breeder, Univ. of Puerto Rico, Isabela, Puerto Rico (formerly graduate student at Iowa State University) and Professor of Farm Crops, Iowa State University.