The possible value of somatic reduction as a tool in the hands of the plant breeder was pointed out by Huskins (5) in 1948. Franzke and Ross (3) attributed the occurrence of variants obtained in sorghum following colchicine treatment to this phenomenon of somatic reduction. The variant plants had the same chromosome number as their untreated full sibs and gave progenies which bred true. This study deals with measurements and observations of characteristics of agronomic importance made on progenies from treated and untreated full sibs of a true breeding variety of sorghum.

MATERIALS AND METHODS

Self fertilized seeds on one plant of the grain sorghum Experimental 3, which has in its ancestry Milo, Sudan grass and Black Amber, were germinated in the greenhouse in the winter of 1951-1952. This stock had been propagated by self-fertilization for the previous 10 generations. Eight seedlings were left untreated while coleoptiles of others were treated with 0.5% colchicine. From the eight untreated (numbered 1–8) and seven treated plants (numbered 9–15), selfed seed was harvested in the spring and germinated immediately in plant bands. The seedlings were transplanted into the field approximately 8 inches apart in 12-foot rows of 18 plants each, and arranged in a randomized block experiment of two replicates. To obviate border effects, measurements were made on only the centrally located 14 plants in each row. Parent plants were transplanted into the head of each row of the first replicate of their own generation. An account of the breeding of Experimental 3, and the method of treatment has been reported previously (3).

For simplification, reference will be made to the immediately succeeding generations produced by self fertilization of untreated parents as the U₁, U₂, U₃, etc. and from treated parents as the C₁, C₂, C₃, etc. The first generation progeny from untreated plant 1 above, will therefore be referred to as 1U₁, and that of treated plant 9 as 9C₁.

To obtain a measure of the degree to which untreated material and the variants breed true, each of four succeeding generations (U₂, U₃, U₄, and U₅) of Experimental 3 and C₂, C₃, C₄, and C₅ of variants of this variety were sown in this fashion in 1952.