

HEXAPLOID COTTON

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Hexaploid cotton plants (n=78) were created by hybridizing the Australian wild cotton G. sturtianum (n=26) with American cultivated cottons G. hirsutum, variety A-44 (n=52) and doubling the chromosome number of the sterile hybrid with colchicine.

The hexaploid plants are now in the third generation of selection. Fertility is improving and sufficient quantity of seed has been harvested this past year to make a sizeable planting in 1968.

The fiber properties of the hexaploid cotton harvested in 1967 are now being determined in the fiber laboratory. Microspinning samples will be sent to the USDA Cotton Spinning Laboratory in Knoxville, Tenn. for evaluation of spinning qualities.

Preliminary observations on cold tolerance and insect resistance are very encouraging. Cold tolerance of the hexaploid plants is good. The plants also seem to have some degree of tolerance to the cotton leaf perforator (Buccatrix thurberiella Busck).

Gross morphological examination of the root system of the hexaploids shows a root system different from the normal tap root of the cotton plant. The roots appear more closely resembling a fibrous root system. Extrapolating from these observations, there is evidence that there may be some cotton root-rot (Phymatotrichum omnivorum) tolerance based upon such a root system. Plans are now being formulated to grow the hexaploid plants in cotton root-rot infested soils.

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EVOLUTIONARY ASPECTS OF GOSSYPIUM

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Our main objective is to determine genetic differences and gene action of the cultivated tetraploids on a biochemical level. We have initially approached this problem by attempting to determine the possible ancestral diploids of these cottons by means of electrophoretic patterns of seed proteins. This in turn should lead us to some concept of the evolutionary development of gene action with respect to protein and enzyme formation.

By a comparison of banding patterns and intensities, we found that by superimposing various combinations of diploid A and D genomes, the combination of herbaceum and raimondii bands matched the cultivated species somewhat with respect to pattern but differed quite markedly with intensity of banding. When compared to a more primitive and uncultivated tetraploid, however, this