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1. Growth response of dwarf mutants of maize to the gibberellins produced by the fungus Fusarium moniliforme (Gibberella fujikuroi).

The dwarf mutants, anther-ear-1, dwarf-(5232), dwarf-1, dwarf-2, and dwarf-(8201) responded by normal growth to microgram amounts of gibberellic acid (gibberellin A₃), C₁₉H₂₂O₆; gibberellin A₁, C₁₉H₂₄O₆; and gibberellin A₂, C₁₉H₂₆O₆. Mutants treated with a total of 200 micrograms gibberellic acid per plant reached a tassel height approaching that of normals. Leaf color, size and form of leaf and stem were comparable to those of normals from the same culture. Tassels and ears of treated dwarfs varied considerably. Some remained similar to those of non-treated dwarfs, others were intermediate between those of non-treated dwarfs and normals, and a few approached the size and form of normals.

The dwarf mutants, dwarf-(4963), dwarf-(8043), nana-1, nana-2, midget, and dominant-dwarf showed no response or only a slight response to the three known gibberellins. Dwarf-(4963) and nana-1 mutants showed a slight response in the early seedling stage and no response or inhibition in later stages of growth. Mature plants of the mutant, dwarf-(4963) were smaller than non-treated dwarfs, having leaves that were twisted and pale-green in color. Treated nana-1 mutants reached a height at maturity no greater than the height of non-treated mutants. Dominant-dwarf mutants gave no growth response at any stage of development. Dwarf-(8043), nana-2, and midget mutants have been tested only in the seedling stage. They show no response or only a slight response to the gibberellins.

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2. Growth response of dwarf mutants of maize to "gibberellin-like" substances from flowering plants.

"Gibberellin-like" substances obtained from the seed or fruit of species representing seven different families of flowering plants have been found to give a response with the dwarf mutants indistinguishable from the gibberellin response. These substances are active for the five mutants that respond to gibberellins and inactive or slightly active for the five mutants that do not respond or respond only slightly to gibberellins. Paper partition chromatography suggests that: (1) A family of "gibberellin-like" substances may exist in higher plants, (2) None of these substances are identical to the three known gibberellins. The active substances do not give an indole test, nor a leucoanthocyanin test. They do not fluoresce in concentrated sulfuric acid as does gibberellic acid.

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