A Biometric Evaluation of the Growth-Regulating and Herbicidal Properties of Some Organic Compounds

JESS L. FULTS AND MERLE G. PAYNE

THE literature covering the action of organic chemicals having growth-regulating properties is extensive. The recent paper of Thompson, Swanson, and Norman presents a comprehensive review of all the modern work from 1931 through the early months of 1946. In addition, the activities of 1,160 new compounds are described and classified using 2,4-dichlorophenoxyacetic acid as a standard.

Beginning in the summer of 1945, workers at the Colorado Agricultural Experiment Station began a search for new chemicals suitable for use as herbicides, plant growth-regulators, and inhibitors. Up until the present time, most of the emphasis has been placed on the search for herbicidal materials that are either more specific or more active than 2,4-dichlorophenoxyacetic acid. The objectives of this report are to present a biometric evaluation of the primary growth-regulating properties of a group of organic compounds as measured by a modification of Went's pea test and to evaluate the herbicidal action of many of the same compounds as shown by a standard test on castor beans under greenhouse conditions.

METHODS

THE SPLIT PEA STEM TECHNIQUE

Went's pea test modified to meet the conditions of this study was used to determine primary growth-regulating properties of all compounds studied. This test is based on the fact that chemical solutions with growth-regulating properties cause inward curvatures of the terminal sections of young split pea stems. The procedures used for growing, sectioning and testing the peas were those outlined by Went and Thimann, except that no corrections for variation in pH were made. Each compound was tested over a range of 13 concentrations that varied...