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A Simple Method for the Germination of Pollen Maize and Potato (Abstract)

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TENSIOMETERS FOR FOLLOWING SOIL MOISTURE CONDITIONS IN THE FIELD (ABSTRACT)

ROY A. BAIR

Fifty instruments were installed at various soil depths and distances from field grown maize plants in order to follow daily moisture changes without disturbing the growing plants. Tensiometer readings were used to study the rate of root penetration, comparative moisture use at different depths, rate of rainfall infiltration in the soil, and to calculate the depth of the water table. The zone of active water absorption progressed downward as much as two inches a day. Within the root zone the rate of moisture absorption was highest near the stalk. Soil moisture classed as equally available by mechanical methods is, in fact, less accessible when situated farther from the base of the plant, even though roots completely ramify the area. Roots seemed to ignore reserves at 24 inches after rainfall had supplied moisture at 12 inches. Two rains of more than one and one-half inches failed to penetrate to the 24 inch soil point. When the soil was sufficiently moist to operate tensiometers, the weekly dry weight increase of 480 maize plants followed closely Lehenbauer's physiological temperature indices.

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A SIMPLE METHOD FOR THE GERMINATION OF POLLEN OF MAIZE AND POTATO (ABSTRACT)

R. A. BAIR AND W. E. LOOMIS

In connection with studies of the effect of ecological factors on pollination and yield of maize, a reliable method for rapidly evaluating the viability of pollen has been developed. With both maize and potato pollen as high as 90 percent germination has been secured within 30 minutes after inoculation on a nutrient solution containing only agar, cane sugar and water. The growth of the tubes begins within ten minutes, is sufficiently rapid to be plainly visible under the microscope, and may continue until a tube length fifty times the diameter of the pollen grains is reached. Protoplasmic streaming is strikingly rapid. Preliminary

tests indicate that the method may be useful for germinating the pollen of many species, providing an easily performed, stimulating experiment for elementary students.

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THE USE OF TETRACHLORETHANE IN THE ERADICATION OF THE EUROPEAN BINDWEED (ABSTRACT)

A. L. BAKKE

Tetrachlorethane, made by the addition of chlorine to acetylene, has proved to be effective in killing the European bindweed. By making holes 18 inches deep and having the holes 18 inches apart and placing two ounces of tetrachlorethane in each hole, a complete eradication of the European bindweed may be made with one application.

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THE EARLIEST KNOWN EPIPHYTOTIC OF RUST IN IOWA (ABSTRACT)

MARIE A. CORKLE AND I. E. MELHUS

A rust epiphytotic in 1858 apparently has been overlooked in the study of disease prevalence in Iowa. Early Iowa agricultural records and newspapers contain numerous reports of the calamitous wheat and oat failures caused by rust in 1858; yet this rust year has not been reported in any scientific publication from Iowa. Wheat yielded an average of 4.2 bushels per acre, oats 5.4 bushels, while the yields for 1855 were 14.09 and 32.09 bushels per acre, respectively. County agricultural societies reported either total wheat crop failures or very poor yields, with the exception of Van Buren and Woodbury Counties, which reported "medium" and "fair" yields, respectively. In general, oats were reported as a total failure or seriously injured. Throughout the state grain fields were left uncut, not being worth the expense of harvesting. Losses were attributed to rust and wet