

THE EFFECTS OF SIMULATED DROUGHT CONDITIONS ON
/ THE GROWTH AND DEVELOPMENT OF
VARIOUS CORN VARIETIES
(Zea mays L.)

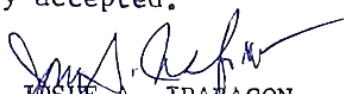
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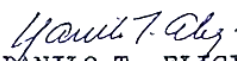
SUBMITTED TO THE INSTITUTE OF GRADUATE STUDIES
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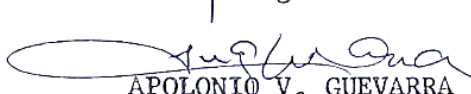
The thesis attached hereto, entitled "THE EFFECTS OF SIMULATED DROUGHT CONDITIONS ON THE GROWTH AND DEVELOPMENT OF VARIOUS CORN VARIETIES (Zea mays L.)", prepared and submitted by MS. PHAWINEE CHOTIKUNTA in partial fulfillment of the requirements for the degree of Master of Science in Crop Science (Agronomy) is hereby accepted.



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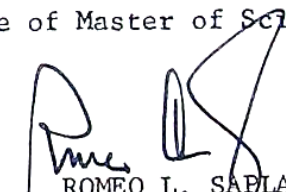

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BIOGRAPHICAL SKETCH

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ABSTRACT

PHAWINEE CHOTIKUNTA, Central Luzon State University, Muñoz, Nueva Ecija, October 1984. The Effects of Simulated Drought Conditions on the Growth and Development of Various Corn Varieties (*Zea mays* L.).

Major Professor : Prof. Julito B. Aleta

The experiment was conducted at the experimental area of the Department of Crop Science, CLSU, from January 5, 1984 to May 30, 1984 to evaluate the physiological and other agronomic characteristics of four corn varieties grown under various osmotic pressures and soil moisture conditions.

Factorial in completely randomized design with three replications was used. Four corn varieties, namely IPB 218, IPB Var. 1, DMR Comp. 2 and UPCA Var. 1, five osmotic pressure levels, 0 bar (control), -5 bars, -10 bars, -15 bars and -20 bars and irrigation treatments, non-stress and stress conditions were used.

The results show that under stress conditions corn varieties IPB 218 and UPCA Var. 1 produced higher leaf free-proline content at all levels of osmotic pressure, while DMR Comp. 2 produced the highest leaf total sugar content among the varieties. Plants

subjected to stress had higher degree of free-proline accumulation as well as total sugar content which increased with increasing levels of osmotic pressure. Based on the result, IPB 218 and UPCA Var. 1 are more resistant to early water stress condition while DMR Comp. 2 and IPB Var. 1 exhibited greater degree of resistance to limiting water conditions at later stages of growth.

All varieties differed significantly in terms of ear leaf area, ear diameter, ear height, days to silking, plant height and 100-kernel weight but no significant variations on ear length, number of kernels per ear and grain yield per plant were noted.

Non-stressed plants had significantly greater ear leaf area, wider and longer ear, higher ear height and plant height values, better production of kernels per ear, higher 100-kernel weight and grain yield per plant than stressed plants.

The imposition of water stress during the germination stage provided a conditioning, i.e., hardening effect, as evident in the increased ability to resist moisture stress imposed at the later stages of growth of the corn plant.

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