YELLOWING IN RICE PLANTS CAUSED BY PATHOGENS AND NUTRIENT DEFICIENCIES

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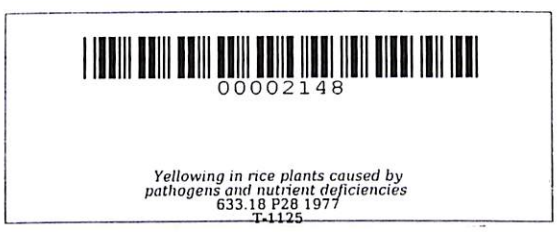

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ABSTRACT

PAUNLAGUI, ESTER G., University of the Philippines at Los Baños, March 1977, Yellowing in Rice Plants Caused by Pathogens and Nutrient Deficiencies, Major Professor: Dr. Eduvigis B. Pantastico.

Three cultivars namely, IR-8, C4-53G and BPI-76 were grown in R.S.-17 culture solution under four levels of N, P, K, Ca and Mg to determine growth, soluble nutrients, chlorophyll content and percentage leaf infection of diseased plants.

It was observed that the root growth of phosphorous-deficient plants was highest followed by K, control, N, Mg and calcium deficient plants.

The chlorophyll content of plants was highest in control followed by P-deficient, K, Ca, Mg and N-deficient plants.

The highest NO_3-content was obtained in K-deficient while the highest K-content was obtained in Mg and Ca-deficient plants. It was also noted that the highest P and Ca-content was obtained in Ca-deficient plants and P-deficient plants respectively.

Tungro diseased plants had high chlorophyll content than the blast-diseased.

The percentage leaf infection was high in tungro-diseased plants.

The three varieties exhibited different responses depending on the levels of nutrients. The higher the concentration of N P and K, the higher the percentage leaf infection. It was also noted that the higher the Mg and Ca-content of the solution, the lower the percentage leaf infection.

The 3 varieties showed resistance to blast and susceptibility to tungro virus under greenhouse condition.

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INTRODUCTION

Yellowing is a general term which denotes lack of chlorophyll, and/or dominance of carotene otherwise it is known as chlorosis from the original term, chlorophyll hydrolysis. Early yellowing plants are often called diseased plants.

Disease in plants can be defined as any disturbance brought about by a living entity for an environmental factor which interferes with physiological processes with concomittant change in appearance and may or may not decrease in yield. A normal plant is a plant which can carry out its physiological functions according to its genetic potential at a given environment.

The more important causes of yellowing are the pathogens and nutritional disorder. The factors which can cause yellowing are either deficiency of N, K, Fe, Mg or Mn (Levitt, 1969) or pathogens like fungus and virus (Agrios, 1969).

However, reduction or destruction of chlorophyll adjacent or in the vein tissue due to virus or fungus is often referred to as vein clearing while that due to nutritional deficiency is termed as interveinal chlorosis which actually developed in the intervascular tissue.

Moreover, disease brought about by pathogens are termed as infectious diseases which can spread from a diseased to a healthy plant. Disease brought about by extreme environmental factors is