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FACTORS CONTROLLING GRAIN FILLING IN RICE UNDER SALINE CONDITIONS

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ABSTRACT

An experiment was designed with two rice lines grown at 0, 50 and 75 mol m^{-3} salinity for exploring the factors controlling sterility/grain filling status,and to sort out the causes of damage at panicle development stage in rice. Salinity decreased pollen viability and increased the sterility in rice which was more in BG 402-4 than that NIAB 6. Both pollen viability and subsequent grain filling was affected adversly by the high concentration of sodium and particularly chloride in the husk of spikelets.

INTRODUCTION

Among the various yield components of rice, spikelet number and their filling percentage are very important(Yoshida,1981) and in some cases, filled spikelets percentage may be more limiting to yield than other components (Yoshida and Parao 1976). Various factors such as weather, fertilizer application, incidence of diseases and insects and soil salinity affect filled spikelets or sterility percentage. Sterility percentage often [illegible] of unfilled spikelets early seedling stages,become sensitive at later stages of growth,particularly at reproductive stage (Aslam *et al.*, 1988), The experiment was conducted to explore the causes of yield depressin of rice at maturity stage.

MATERIALS AND METHODS

Fifteen days old seedlings of two rice lines (NIAB 6 and BG 402-4) were transferred in a 1 cm plugged holes in thermopal sheets floating over 100 liters of Yoshida nutrient solution (Yoshida *et al.*, 1976) in iron tubs lined with plastic sheet. Three separate tubs were used for different salinity levels { 0, 50 and 75 mol m^{-3} NaCl salinity}. Salinity was developed within three days starting from the fourth day of transplanting the plants. The leaf next to the flag leaf was sampled at panicle initiation stage and analyzed for Na^+, K^+, Cl^- and Ca^{2+} concentrations. Pollen grain fertility was determined by staining the pollen grain with 1% acetocarmine solution (Pittenger and Frolik, 1950). The number of filled and unfilled spikelets were recorded and their husk was removed and analyzed [illegible] K^+ and Na^+ concentrations. The