

THE INFLUENCE OF TOPOGRAPHY ON RICELAND PRODUCTIVITY, AND ITS  
EFFECTS ON NITROGEN AND PHOSPHORUS FERTILIZATION IN THE  
KEGALLE DISTRICT

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Field experiments were conducted during Maha 1980/81 and Yala 1981 seasons in a selected rice tract in the Kegalle district to study the productivity and response to N and P fertilization as affected by different topographic positions. Three different land elements (Godakumbura, Madakumbura and Medhakumbura) were selected for this study. These land elements are separate areas of rice fields within a rice tract but their topographic positions and hydrological conditions differ. Two levels of nitrogen (40 or 80 kg N/ha) and 4 levels of phosphorus (0, 30, 60 and 90 kg P<sub>2</sub>O<sub>5</sub>/ha) were tested using the rice variety Bg 94-1 (3 1/2 months) in a 2 x 4 factorial experiment in each of these land elements. A control

plot with no N and P applications was included.

Considerable variability exist between different land elements with regard to their nutritional status in the upper soil layers. An increase in N and OM contents and a decrease in available P (Olsen's P) was observed with the downslope. Of the 3 land elements Medhakumbura has more stable environment for grain production than the other two land elements. The productivity of the other two land elements varied with the season, and was controlled mainly by the hydrological conditions of the particular land element. During the Maha season Godakumbura produced significantly higher yields compared to Madakumbura. The opposite of this was observed during the Yala season. The response to nitrogen and phosphorus varied with the land element as well as with the season. A good response to nitrogen was observed in Godakumbura during both seasons but in the case of Medhakumbura the response was observed only during the Yala season. A response to P fertilizer was observed at all land elements, but P fertilization is more important in Madakumbura than in the other two land elements. However, very high levels of P did not increase yields even at Madakumbura where P availability is low. This could be attributed to the continuous inundation, and waterlogging conditions in the Madakumbura resulting in several other stress factors.