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Response of Orchardgrass Grown under Different Rates of Fertilization to Additional Fertilization and Cutting

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Abstract:

The changes in growth of orchardgrass, *Dactylis glomerata* L., cv. Natsumidori as affected by previous fertilization were investigated in field and pot trials. In the field trial, the seeds were sown on October 31, 1991 and three fertilization plots were set up on January 5, 1992 by broadcasting a chemical fertilizer (N : P₂O₅ : K₂O = 15% : 15% : 15%) at the rate of 66.6, 33.3 or 0 g/m². Additional fertilization was done for all plots using the same fertilizer at an equal rate of 33.3 g/m² on April 15 and then a half of plants of each plot were cut to a height of 3 cm. Changes in growth were observed from January 5 to April 14 (the first period) and from April 15 to May 25 (the second period). In addition, similar treatment and observation were made in the pot trial in 1993. As the direct effects of the fertilization at the beginning of the first period, tiller production, the leaf extension rate, leaf area index (LAI) and the dry matter yield of the aerial part decreased along with the fertilization rate. However, for both non-cut and cut plants, dry matter production rates during the second period was higher in the plot given less fertilizer during the first period. This strongly suggests that a compensatory growth occurred in the second period due to the fertilizer deficiency in the first period. Such compensatory growth may have resulted from the stimulation of daughter tiller production and leaf growth of each tiller, which in turn brought about a higher LAI and net assimilation rate in the plot given less fertilizer in the first period.

Keywords:

Compensatory growth, Dry matter yield of aerial part, Fertilization, Leaf area index, Orchardgrass, Tiller number

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