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Staggering of heading in *Panicum maximum* Jacq. Origin and regulation

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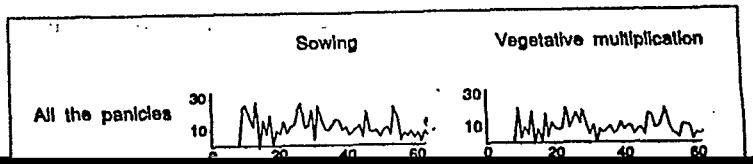
fertile tillers are not synchronous. This trait contrasts with the situation in temperate grasses (BOONMAN, 1971). This lack of synchronization may be explained by differences between induction dates and heterogeneity within the periods needed for

A second experiment, involving chronological observation of heading, was carried out at the research centre of Adiopodoumé (Côte-d'Ivoire). Two plants of the C1 variety were studied. The first was obtained from sowing in Petri dishes on March 15. The seedling was planted in a flower pot under

RESULTS

Floral development from initiation to heading

Table I shows the progression of the tiller population. The first changes appeared on July 27. The first headed panicles appeared [illegible]



be explained by a first order Markov's process (days with overheading were followed by underheading and vice versa).

DISCUSSION

Staggering of heading and duration of initiation

In grasses, the interval between initiation and heading varies from 30 to 50 days according to the species and the environmental conditions. Thus, in *Phleum pratense*, heading occurs 40 to 50 days after initiation (BEAN, 1970). In Nigeria, CURTIS (1968) noticed in *Sorghum* an interval of 40 days, under natural conditions. IKEDA (1970) showed that 33 days are necessary, under optimal conditions of short days, to obtain heading of rice. In the C1 variety of *P. maximum*, the observed interval is one month.

This interval corresponds to the time necessary for induction of all fertile tillers and also for the first heading wave. Thus, staggering of initiation constitutes

branching will stop due to lack of vigour; whence the observed lowering of the peak of the third wave. In this way, variety C1 controls its temporal pattern of heading. This explains why the late sowings with lower heading intensity exhibit greater and partially compensatory branching (NOIROT, 1991). In our experiments, the same effects differentiate plants produced by sowing or tuft splitting: branching intensity was greater for the plant with fewer fertile tillers.

Control of heading is not of one type. First order Markov's control allows daily adjustment: days with overheading are followed by days with underheading. The main characteristic of such control is to be related to the heading intensity of the genotype (NOIROT, unpublished). This emphasizes the role of caulescence in the adjustment of the heading dates (CURTIS, 1968) and the role of competition for water between tillers in the internode elongation stage. This competition changes the heading pattern by modifying the speed of caulescence and the bud inhibition. The heading process, with successive waves and its control types, appears to be an adaptation related to the water reserves of the soil, which fluctuate markedly in the tropical environment.