

研究论文

两系杂交稻腋芽在母体与离体条件下的再生特性

易镇邪, 屠乃美, 王璞, 陈平平

湖南农业大学农学院, 湖南长沙 410128

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摘要 以两系杂交稻培矮64S/E32、培两优500为材料, 采用留高桩和节插两种试验方法, 对两组合各节位腋芽的再生特性进行了研究。结果表明, (1) 头季稻齐穗期中部腋芽较长, 齐穗到齐穗后20 d各节腋芽伸长速度均慢, 齐穗后20 d到成熟期伸长速度均加快, 但上位芽更快。(2) 中高节位腋芽对母体营养物质的依赖性较低节位腋芽大, 且其营养供应优先于低节位腋芽。(3) 母体条件下腋芽再生力强弱, 由遗传因素、母茎营养条件及生态条件等共同决定; 只有将高桩再生稻试验与节插试验相结合, 方可客观评价各节位腋芽决定于遗传因素的再生力强弱。(4) 头季稻节间全氮含量与相应节位再生率的关系, 齐穗期到齐穗后10 d呈显著正相关, 齐穗后20 d和成熟期呈负相关或相关性较小; 齐穗期节间可溶性糖+淀粉总量高不能提高再生率; 齐穗后10 d至成熟期, 一般节间淀粉含量与再生率呈负相关, 可溶性糖含量及可溶性糖+淀粉总量与再生率呈正相关。表明头季稻灌浆前期各节间的全氮含量是决定相应节位腋芽再生率高低的的主导因素, 而灌浆中后期可溶性糖含量高、淀粉含量低以及两者总量高时再生率高, 起主导作用的是可溶性糖含量。

关键词 [两系杂交稻](#) [腋芽](#) [母体](#) [离体\(节插\)](#) [再生率](#)

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Ratooning Properties of Axillary Buds of Two-line Hybrid Rice in vivo and in vitro

YI Zhen-Xie, TU Nai-Mei, WANG Pu, CHEN Ping-Ping

College of Agronomy, Hunan Agricultural University, Changsha 410128, Hunan

Abstract Two-line hybrid combinations—Peiai 64S/E32 and Peiliangyou 500 were used to investigate the ratooning properties of axillary buds from different nodes in vivo and in vitro. The high-stubble and node-cuttage experiments were conducted. The main results are as follows: (1) The length of the middle nodes' axillary buds was longer than that of other nodes' in fully heading stage (FHS) in main crop. The growth speed of all nodes' axillary buds was slow from FHS to 20 d after FHS, and it accelerated from 20 d after FHS to maturing stage, but the growth speed of higher nodes' axillary buds was faster than that of lower nodes' (Fig.1 and Fig.2). (2) The plant heights of ratooning rice of the 2nd and 3rd node from the top of Peiai 64S/E32 and of the 2nd, 3rd and 4th node from the top of Peiliangyou 500 in vitro were shorter than those of the in vivo, and the higher the node position was, the bigger the height difference was (Table 3). Compared to those in vivo, the panicle length and spikelets per panicle of all nodes' ratooning rice in vitro were bigger, and the lower the node position was, the bigger the difference was. It suggested that the dependence of middle and higher nodes' axillary buds to nutrition of the stubble was bigger than that of lower nodes', and the limitation of nutrition application to lower nodes' axillary buds was bigger than that to higher ones in vivo. (3) The difference between ratooning rate of axillary buds from different nodes was bigger in vivo than that in vitro (Table 4). In general, ratooning capability of different nodes' axillary buds in vivo is reflected by ratooning rate and contribution percentage to yield, and it is decided commonly by heredity, nutrition in mother stem and ecological conditions. So, the objective result of the ratooning capability of different nodes' axillary buds decided by heredity can be obtained only by the combination of high-stubble experiment and node-cuttage experiment. (4) The correlation between total N content of internodes and ratooning rate of corresponding axillary buds was positive at the 0.05 level from FHS to 10 d after FHS, but it was negative or very weak from 20 d after FHS to maturing stage. The higher soluble sugar and starch in gross in fully heading stage couldn't increase ratooning rate. In general, from 10 d after FHS to maturing stage, negative correlation existed between starch content and ratooning rate, and positive correlation existed between soluble sugar content, soluble sugar and starch in gross and ratooning rate (Table 2). The results suggested that total N content of internodes is the main factor to decide ratooning rate of corresponding-node axillary buds in early productive stage in main crop. In general, when soluble sugar content was higher, starch content was lower and soluble sugar and starch in gross were higher, the ratooning rate was higher in middle and late productive stage in main crop, and the main factor was soluble sugar content.

Key words [Two-line hybrid rice](#) [Axillary buds](#) [in vivo](#) [in vitro \(Node-cuttage\)](#) [Ratooning rate](#)

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通讯作者 屠乃美 tnm@hunau.net