

研究报告

FACE水稻干物质积累与分配模型

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收稿日期 2005-9-26 修回日期 2006-7-20 网络版发布日期 接受日期

摘要 借助中国唯一的FACE技术平台, 通过设置不同的N肥处理, 研究了FACE条件下水稻干物质积累及分配动态的模拟模型. 模型以生理发育时间为驱动因子, 以CO₂浓度函数为主要影响因子, 同时引入N素影响因子调节干物质的积累与各器官分配指数. 模拟结果表明, 随着大气CO₂浓度的增加, 水稻地上部总干重显著增加, 叶干重分配指数下降, 穗干重分配指数基本不变, 茎干重分配指数前期增加, 后期持平. 通过不同年份试验数据对模型的验证, 预测根均方差 (RMSE) 较小, 且相关系数均达到了极显著水平. 表明模型拟合程度高, 具有较好的适应性和预测性.

关键词 [水稻](#) [FACE](#) [干物质积累](#) [分配指数](#) [模拟模型](#)

分类号

Dry matter accumulation and allocation models of rice in FACE

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Abstract

A fertilization experiment with 150 kg N·hm⁻², 250 kg N·hm⁻² and 350 kg N·hm⁻² was conducted on the free-air CO₂ enrichment (FACE) platform at Wuxi of Jiangsu Province in 2001~2003, aimed to build a simulation model of dry matter accumulation and allocation of rice in FACE. Physiological development time and CO₂ concentration were selected as the driving factor and the main affecting factor, respectively, and nitrogen application rate was introduced as the factor adjusting the dry matter accumulation and allocation in green leaf, stem and panicle. The results showed that with the increase of atmospheric CO₂ concentration, the drymatter accumulation in above-ground part of rice increased remarkably, but the allocation index dropped in green leaf, changed little in panicle, while increased in stem at early stage and equaled to the CK at last. The model was tested with different experimental data, and the results indicated that the model had high fitting degree and preferable applicability and predictability.

Key words [Rice](#) [Free-air CO₂ enrichment](#) [Dry matter accumulation](#) [Allocation index](#) [Simulation model](#)

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