

## 单季稻养分利用的TechnoGIN模型分析——以浦江县单季稻为例

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## Analysis of single rice nutrition utilization by TechnoGIN——A case study of single-rice in Pujiang County

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**摘要** 以单季稻为研究对象,建立单季稻土地利用单元,从区域范围利用TechnoGIN模型对浦江县单季稻土地利用类型N的变化进行测算和分析,结论如下:1)根据模型计算,若采用精细养分管理技术(TEF),可比目前减少23%~50%的N投入、25%~48%N淋溶和41%~59%N大气挥发损失,同时N的表观回收率由0.2提高到0.3;若采用改善养分管理技术(TBF),与现实技术(TAC)相比N的投入可减少40%~60%,N的淋溶可减少32%~60%,大气挥发损失量可减少54%~73%,同时N的表观回收率可达到0.42;而这些数据与经典试验,特别是与精细养分管理金华试验区多年的田间试验和农户试验十分一致;2)模型也可计算实现不同技术水平,单季稻所应投入的各种养分种类和数量,TAC技术水平下产生的结果与调查结果完全一致。因此可以说TechnoGIN是区域评判N肥利用效率的一个良好工具,其测算结果和采用的新技术,对指导单季稻作物的种植具有十分重要的指导意义。

**关键词:** TechnoGIN 单季稻 N的表观回收率 养分利用 TechnoGIN 单季稻 N的表观回收率 养分利用

**Abstract:** In this paper, using single rice as the research object, technoGIN model was employed to analyze and predict the change of nitrogen under single rice cultivation of Pujiang County at regional scale through setting up land use units. The results showed as follow: 1) Based on the calculated results using the TEF (Technology-E-Future) of TechnoGIN model, the nitrogen (N) input, N leaching loss and volatilized loss could be reduced by 23%—50%, 25%—48%, and 41%—59% comparing to TAC (Technology-A-Current), respectively. Meanwhile, the apparent N recovery efficiency could be increased from 0.2 to 0.3. Suppose TBF (Technology-B-Future) was used contrasted with TAC, the input of N can be reduced by 40%—60%, the leaching of N can be reduced by 32%—60%, the vaporization of N can be reduced by 54%—73% and the apparent N-recovery efficiency can be increased to 0.42 by using TBF. This is also consistent with the report that N-recovery efficiency of rice can achieve by 0.5—0.6. So it can be concluded that TechnoGIN is a good calculating tool for analyzing the plant nutrient utilization in regional range, though some of its functions still worth discussing. 2) Two conclusions of the loss of nitrogen through leaching and vaporization were drawn as follows: First, with the increase of yield, the loss of nitrogen through leaching and vaporization during production of single rice decreased at the same input of N in the same land unit. Second, the more input of N, the more loss of N through leaching and vaporization on the same land unit under the same yield. This agreed with pertinent report. Results calculated by TechnoGIN model based on more than thirty years trials can offer some theoretical foundation for routine thinking, though the loss of nitrogen through leaching and vaporization still remain to be verified. 3) By using TechnoGIN, the fertilizer nutrient on the single harvest rice is matched and calculated. The TAC level calculated by TechnoGIN is consisted with various of fertilizer used at present. From the result of calculation of other engineering levels, organic fertilizer arranged in pairs with inorganic fertilizer is one of the main ideas of TechnoGIN. It is showed that the balance of nutrient utilization not only can increase yield of crop, but also can reduce the pollution caused by agricultural production, which agreed with the normal analysis. And the nutrient factor generated by TechnoGIN has definite directive significance to the future agriculture production.

**Keywords:**

## 引用本文:

方斌<sup>1</sup>;王光火<sup>2</sup>;吴次芳<sup>2</sup>.单季稻养分利用的TechnoGIN模型分析——以浦江县单季稻为例[J] 植物营养与肥科学报, 2007, V13(2): 184-

FANG Bin<sup>1</sup>;WANG Guang-huo<sup>2</sup>;WU Ci-fang<sup>2</sup>.Analysis of single rice nutrition utilization by TechnoGIN——A case study of single-rice in Pujiang County[J] Acta Metallurgica Sinica, 2007, V13(2): 184-

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