

长江流域油菜氮磷钾肥料利用率现状研究

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Status of Nutrient Use Efficiencies of Rapeseed in the Yangtze River Basin

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摘要

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摘要 总结近年来在长江流域冬油菜主产区进行的74个田间试验结果, 分析目前条件下油菜氮磷钾肥的偏生产力、农学效率、肥料表观利用率、生理效率及肥料对油菜产量的贡献率。结果表明, 油菜农学效率分别为 $6.2 \text{ kg kg}^{-1} \text{ N}$ 、 $6.3 \text{ kg kg}^{-1} \text{ P}_2\text{O}_5$ 和 $2.6 \text{ kg kg}^{-1} \text{ K}_2\text{O}$; 表观利用率为N 34.0%、 P_2O_5 17.4%和 K_2O 36.9%, 生理利用率为 $18.5 \text{ kg kg}^{-1} \text{ N}$ 、 $35.5 \text{ kg kg}^{-1} \text{ P}_2\text{O}_5$ 和 $9.1 \text{ kg kg}^{-1} \text{ K}_2\text{O}$, 氮磷钾肥对油菜籽产量的贡献率分别为41.9%、21.4%和11.5%。研究结果显示, 试验条件下长江流域油菜的肥料利用率较低, 生产上需同时解决油菜高产及肥料利用效率提高的问题。

关键词: 油菜 肥料利用率 氮 磷 钾

Abstract: Nutrient use efficiency is an important index not only for fertilizer recommendation on the field scale but also for forecasting fertilizer demand on the regional and national scales, however, exact nutrient use efficiencies of rapeseed in the Yangtze River Basin have not been well known yet. In this paper, data from 74 field experiments were collected and used for analysis and evaluation of partial factor productivity (PFP), agronomic efficiency (AE), apparent recovery efficiency (RE), physiological efficiency (PE), and fertilizer contribution index of rapeseed. The results indicated that AE averaged $6.2 \text{ kg kg}^{-1} \text{ N}$, $6.3 \text{ kg kg}^{-1} \text{ P}_2\text{O}_5$, and $2.6 \text{ kg kg}^{-1} \text{ K}_2\text{O}$, respectively. RE averaged N 34.0%, P_2O_5 17.4%, and K_2O 36.9%, respectively. The averages of PE were $18.5 \text{ kg kg}^{-1} \text{ N}$, $35.5 \text{ kg kg}^{-1} \text{ P}_2\text{O}_5$, and $9.1 \text{ kg kg}^{-1} \text{ K}_2\text{O}$. The contribution of N, P and K fertilizer to rapeseed yield was 41.9%, 21.4%, and 11.5%, respectively. It was concluded that nutrient use efficiencies of rapeseed in the Yangtze River Basin were low. Thus, rapeseed yield and nutrient use efficiencies should be improved simultaneously to ensure sustainability for rapeseed production.

Keywords: Rapeseed Nutrient use efficiency Nitrogen Phosphorus Potassium

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