

植物生理科学

水稻两优培九生育后期籽粒灌浆生理研究

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摘要:

摘要: 目的: 探讨两优培九生育后期籽粒灌浆的生理基础, 揭示水稻品种间叶片和籽粒灌浆的生理学差异。方法: 以两优培九为实验材料, 以汕优63和其父本9311为参照品种, 测定了三品种生育后期籽粒灌浆期间叶片光合速率和籽粒中相关能量和物质代谢酶活性变化。结果: 三品种强势粒的各项生理活性指标变化趋势一致, 两优培九在灌浆前期, 叶片生理和强势粒灌浆具有一定的超亲活性优势; 灌浆的中后期, 剑叶叶片中的光合速率, 特别是弱势粒生理活性下降较快。与其他两品种相比, 叶片和籽粒中的ATP酶活性、谷氨酸脱氢酶(GDH)活性、蔗糖合成酶(SS)活性、可溶性糖及淀粉含量差异显著; 从变化曲线上看, 其弱势粒的灌浆启动较慢, 按先后次序依次为9311, 汕优63和两优培九。相对强势粒, 弱势粒灌浆能量和物质不足。结论: 两优培九叶片和籽粒中与能量和相关物质合成代谢的酶活性相对较低是其籽粒空瘪率相对较高的主要原因。加强生育后期剑叶叶片功能的调控, 提高其生理活性, 增强弱势粒能量代谢是解决高产杂交稻籽粒充实度低的有效途径。

关键词: 水稻 两优培九 籽粒灌浆 生理基础

Studied on physiology bases of grain filling for "Liang You Pei Jiu" at the late development stage

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Abstract:

Abstracts: Objective: To understand physiological bases of grain filling for Liang You Pei Jiu at the late development stage and study on physiology differences among varieties in the leaves and filling, the experiments was carried out . Methods: The photosynthesis rate and the enzyme activities in metabolisms of the energy and substances of the flag leaf and grain filling for Liang You Pei Jiu, Shan you 63 and 9311 at the late developmental stage were studied. Results: The results shown that changes tend of every physiological characteristics are at same for vigorous grain of three species, the Liang You Pei Jiu had advantages in the physiological activity at early filling stage and filling of vigorous grain. The physiological activity declined gradually during early and middle filling stage, the net photosynthetic rate of flag leaf declined fairly especial the physiological activity of week grain was more than other two species. Comparing with other two species, the changes of that ATPase activity GDH activity, sucrose synthetase activity, contents of soluble sugar and starch in leaf and grain were notable. The set up time of filling in week grain was slowly, in proper order, they are 9311, Shan you 63 and Liang You Pei Jiu from curve. Comparing with vigorous grain, the energy and substances in the week grain was on less. Conclusion: the energy and enzyme that substances synthetase activity are in lower in leaf and grain of the Liang You Pei Jiu, which are an important reason for high empty-unfilled grain. Therefore, it is an effective way for overcome difficulty that regulation in physiological function and activity of flag leaf and strengthen metabolism of energy of the week grain .

Keywords: Rice Liang You Pei Jiu Filling of grain Physiology bases

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