2022年第39期总172期

杂交水稻专题

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中国农业科学院农业信息研究所
联系人：于超;罗建军;李亮;顾亮亮
联系电话： 0731-84690287
邮箱：agri@ckcest.cn
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前沿资讯

1．优质香软米云粳37号绿色轻简技术集成示范样板 实收测产成绩斐然

简介：云南省农业科学院粮食作物研究所等单位承担的云南省重大专项项目“优质粳稻新品种选育及绿色轻简技术集成” 针对我省九大高原湖泊绿色发展的需要，年初采用水旱轮作、稻豆轮作、稻烟轮作耕作模式，选用优质香软米云粳37号，按照全程机械化、病虫害绿色防控（生物防治、理化诱控、新型高效绿色农药）方案，在玉溪澄江市龙街街道办事处下海洋村举办1300亩绿色轻简高效生产技术集成示范。示范区云粳37号，株型熟色好、整齐一致，丰产性优良，稻谷采用订单收购方式由企业进行优质优价，高出普通稻谷0.8-1.2元/千克的加工收购。

来源：云南省农业科学院

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2．优质耐热两系不育系“滕383S”通过现场鉴定

简介：2022年9月19日，江西省农作物品种审定委员会办公室组织专家对我院超级稻中心曹志斌副研究员主持选育的水稻两用核不育系“滕383S”进行田间育性鉴定。专家组听取了关于不育系“滕383S”选育过程汇报，审阅了相关资料，考察了不育系田间群体种植现场。不育系“滕383S”田间群体整齐一致，农艺性状稳定，株型适中，剑叶短挺，穗粒协调，稃尖、柱头均为无色，无芒。未发现可育株和异型株，不育株率100%。随机取样100株进行花药混合镜检，不育度均达100%。该不育系配合力强，且所配组合高温环境条件下结实率与外观品质性状均表现突出，可以在生产上广泛配组应用。其中新组合滕两优慧占和滕两优亮翠目前分别参加水稻国家联合体生产试验和江西省区试。近年来，超级稻中心加强不育系选育，配组成系列优质杂交稻新组合推向市场，在杂交稻育种方面取得了突破性进展。

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学术文献

1．Growth Regulators Improve Outcrossing Rate of Diverse Rice Cytoplasmic Male Sterile Lines through Affecting Floral Traits(生长调节剂通过影响花部性状提高不同水稻细胞质雄性不育系的异交率)

简介：Cytoplasmic male sterility (CMS) provides an irreplaceable strategy for commercial exploitation of heterosis and producing high-yielding hybrid rice. The exogenous application

of plant growth regulators could improve outcrossing rates of the CMS lines by affecting floral traits and accordingly increase hybrid rice seed production. The present study aimed at exploring the impact of growth regulators such as gibberellic acid (GA(3)), indole-3-acetic acid (IAA), and naphthalene acetic acid (NAA) on promoting floral traits and outcrossing rates in diverse rice CMS lines and improving hybrid rice seed production. The impact of foliar applications of growth regulators comprising GA(3) at 300 g/ha or GA(3) at 150 g/ha + IAA at 50 g/ha + NAA at 200 g/ha versus untreated control was investigated on floral, growth, and yield traits of five diverse CMS lines. The exogenously sprayed growth regulators, in particular, the combination of GA(3), IAA, and NAA (T3) boosted all studied floral, growth, and yield traits in all tested CMS lines. Moreover, the evaluated CMS lines exhibited significant differences in all measured floral traits. L2, L3, and L1 displayed the uppermost spikelet opening angle, duration of spikelet opening, total stigma length, style length, stigma brush, and stigma width. In addition, these CMS lines exhibited the highest plant growth and yield traits, particularly under T3. Consequently, exogenous application of GA(3), IAA, and NAA could be exploited to improve the floral, growth, and yield traits of promising CMS lines such as L2, L3, and L1, hence increasing outcrossing rates and hybrid rice seed production.

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2. Finding Stable QTL for Plant Height in Super Hybrid Rice(超级杂交水稻株高稳定QTL的发现)

简介：Plant height (PH) is one of the most important agronomic traits determining plant architecture in rice. To investigate the genetic basis of plant height in the high-yielding hybrid rice variety Nei2You No.6, recombinant inbred sister lines (RISLs) were used to map quantitative trait loci (QTL) over four years. A total of 19 minor/medium-effect QTLs were mapped on eleven chromosomes except chromosome 10, totally explaining 44.61-51.15% phenotypic variance in four environments. Among these, qPH-1a, qPH-1b, qPH-2b, qPH-3b, qPH-6, and qPH-7b were repeatedly detected over four years. Among these, the qPH-6 was mapped to an interval of 22.11-29.41 Mb on chromosome 6L, which showed the highest phenotypic variation explained (PVE) of 10.22-14.05% and additive effect of 3.45-4.63. Subsequently, evaluation of near isogenic lines (NILs) showed that the qPH-6 allele from the restorer line (R8006) could positively regulate plant height, resulting in an 18.50% increase in grain yield. These results offered a basis for further mapping of qPH-6 and molecular breeding in improving plant architecture in rice.

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3．Salt tolerance in rice: Physiological responses and molecular mechanisms（水稻耐盐性：生理反应和分子机制）

简介：Crop yield loss due to soil salinization is an increasing threat to agriculture worldwide. Salt stress drastically affects the growth, development, and grain productivity of rice (Oryza sativa L.), and the improvement of rice tolerance to salt stress is a desirable approach for meeting increasing food demand. The main contributors to salt toxicity at a global scale are Na' and Cl ions, which affect up to 50% of irrigated soils. Plant responses to salt stress occur at the organismic, cellular, and molecular levels and are pleiotropic, involving (1) maintenance of ionic homeostasis, (2) osmotic adjustment, (3) ROS scavenging, and (4) nutritional balance. In this review, we discuss recent research progress on these four aspects of plant physiological response, with particular attention to hormonal and gene expression regulation and salt tolerance signaling pathways in rice. The information summarized here will be useful for accelerating the breeding of salt-tolerant rice. (C) 2021 Crop Science Society of China and Institute of Crop Science, CAAS. Production and hosting by Elsevier B.V. on behalf of KeAi Communications Co., Ltd.

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