2019年第4期总44期

小麦遗传育种专题

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3. 大豆和小麦育种中高产田间表型的多传感器系统

相关专利

1. 品质优良的黑小麦的育种方法及其栽培方法

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前沿资讯

1. Identification of wheat stress-responding genes and TaPR-1-1 function by screening a cDNA yeast library prepared following abiotic stress(通过筛选非生物胁迫后制备的cDNA酵母表达库鉴定小麦应激反应基因和TaPR-1-1功能)

简介：非生物胁迫对作物的生长和产量影响十分显著，发现和利用抗逆境功能基因是作物改良的必要条件。本研究从抗旱耐热小麦品种Hanxuan10构建的cDNA酵母表达库中筛选出对非生物胁迫（如冷冻、盐和渗透胁迫）有反应的基因。筛选出存活的克隆后，我们分离出7249、4313和4469个原始序列，分别对应于4695、2641和2771个基因，文氏图显示出377个基因重叠。GO分析表明，这些基因主要参与代谢和应激信号通路；KEGG通路富集分析表明，分离出的基因主要属于能量代谢途径。选择致病相关（PR）蛋白家族中重叠基因TaPR-1-1进行详细鉴定。虽然以前的研究曾表明，在病原体攻击过程中，PR基因起作用，但我们的研究结果表明，TaPR-1-1的表达也受到冷冻、盐度和渗透胁迫的诱导。酵母和拟南芥的过度表达表明TaPR-1-1能耐受这些胁迫。我们的结论是，在非生物胁迫后筛选cDNA酵母表达库是识别耐应激基因的有效方法。

来源：Nature

发布日期:2019-01-15

全文链接:

http://agri.ckcest.cn/file1/M00/06/5C/CsgkOFxFPXKATMa4AFE2-EVgL8Q318.pdf

学术文献

1. Reactivity of gluten proteins from spelt and bread wheat accessions towards A1 and G12 antibodies in the framework of celiac disease(斯卑尔脱小麦和面包小麦中麸胺蛋白对A1和G12抗体在乳糜泻中的反应性)

简介：In the framework of celiac disease, this research aims at evaluating the reactivity of 195 wheat accessions and 240 spelt accessions to A1 and G12 monoclonal antibodies. A great variability in reactivity was found among the accessions of both subspecies. On average, spelt showed very slightly higher reactivity than wheat but accessions with low reactivity were encountered in both subspecies. In both wheat and spelt, there was no significant difference in the level of reactivity between varieties and landraces. Similarly, there was no significant difference in reactivity between old, mid and new varieties of wheat. In contrast, new spelt varieties showed lower levels of reactivity than old and mid ones. No relationship could be established between level of reactivity, protein content and the Zeleny index. This research did not establish a link between the breeding strategies for baking quality improvement and A1-G12 antibodies reactivity.

来源：Food Chemistry

发布日期:2018-12-01

全文链接:

http://agri.ckcest.cn/file1/M00/06/5C/CsgkOFxFaumAXrOAABfk1ySAkCk973.pdf

2. Comparison of the dietary fibre composition of old and modern durum wheat (Triticum turgidum spp. durum) genotypes(新旧硬粒小麦(Triticum turgidum spp. durum)基因型膳食纤维组成的比较)

简介：有人认为，强化育种会导致现代小麦中有益健康的成分含量下降。因此，我们比较了传统和现代的意大利硬粒小麦精粉和全麦面粉中主要膳食纤维成分阿糖基木聚糖和β-葡聚糖的含量和组成。未观察到阿糖基木聚糖总含量的差异，但现代品种的全麦面粉中可溶性阿糖基木聚糖的比例较高，在粗粒小麦粉中β-葡聚糖的比例较高。因此，本研究未有证据显示强化育种对硬粒小麦中膳食纤维组分含量有负面影响。然而，两年来越来越多的原料实验比较表明，早期的阿糖基木聚糖和β-葡聚糖的含量和组成比现代基因型小麦表现的更稳定。现代高粘度品种与高β-葡聚糖含量的相关鉴定表明，它们是人类健康的良好纤维来源。

来源：Food Chemistry

发布日期:2018-04-01

全文链接:

http://agri.ckcest.cn/file1/M00/06/5C/CsgkOFxFaMaAdiBHAAjPih_Q8Kw115.pdf

3. A multi-sensor system for high throughput field phenotyping in soybean and wheat breeding(大豆和小麦育种中高产田间表型的多传感器系统)

简介：Collecting plant phenotypic data with sufficient resolution (in both space and time) and accuracy represents a long standing challenge in plant science research, and has been a major limiting factor for the effective use of genomic data for crop improvement. This is particularly true in plant breeding where collecting large-scale field-based plant phenotypes can be very labor intensive and costly. In this paper we reported a multi-sensor system for high throughput phenotyping in plant breeding. The system comprised five sensor modules (ultrasonic distance sensors, thermal infrared radiometers, NDVI sensors, portable spectrometers, and RGB web cameras) to measure crop canopy traits from field plots. A GPS was used to geo-reference the sensor measurements. Two environmental sensors (a solar radiation sensor and air temperature/relative humidity sensor) were also integrated into the system to collect simultaneous environmental data. A LabVIEW program was developed to control and synchronize measurements from all sensor modules and stored sensor readings in the host computer. Canopy reflectance spectra (by portable spectrometers) were post processed to extract NDVI and red-edge NDVI spectral indices; and RGB images were post processed to extract canopy green pixel fraction (as a proxy for biomass). The sensor system was tested in a soybean and wheat field trial. The results showed strong correlations among the sensor-based plant traits at both early and late growing season. Significant correlations were also found between the sensor-based traits and final grain yield at the early season (Pearson's correlation coefficient r ranged from 0.41 to 0.55) and late season (r from 0.55 to 0.70), suggesting the potential use of the sensor system to assist in phenotypic selection for

plant breeding. The sensor system performed satisfactorily and robustly in the field tests. It was concluded that the sensor system could be a powerful tool for plant breeders to collect field-based, high throughput plant phenotyping data.

来源：Computers and Electronics in Agriculture

发布日期:2016-10-01

全文链接:

http://agri.ckcest.cn/file1/M00/06/5C/CsgkOFxFbM-AMBO-AECKI-9D86o293.pdf

相关专利

1．品质优良的黑小麦的育种方法及其栽培方法

简介：本发明涉及一种品质优良的黑小麦的育种方法及其栽培方法，属于黑小麦育种技术领域。本发明包括以下步骤：(1)以黑05-0391为母本，以淄麦12为父本，进行有性杂交5穗，当年秋播；(2)第二年混合收获F1代种子，秋播为F2；(3)第三年收获黑色籽粒单穗，秋播；(4)第四年选择良好的穗行，室内考种，当年秋播为穗行群；(5)第四年收获期，选择整齐一致、抗寒性、丰产性好、紫粒性状稳定一致的穗行群，5-10行混合收获，秋播为品系鉴定；(6)第五年经过田间观察、测产及室内考种，品系良好的符合育种目标，中选出圃。本发明培育出的黑小麦兼具优质和高产的优点，同时适应性强、抗病性强。

来源：国家知识产权局专利检索及分析

发布日期:2018-07-20

全文链接:

http://agri.ckcest.cn/file1/M00/06/5C/CsgkOFxFbamADkz-AAT-aqBTnu4680.PDF