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蔬菜育种专题

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前沿资讯

1. Helping plants pump iron（帮助植物泵铁）

简介：Genetic variants have been identified that help plants grow in low-iron environments, which could improve crop yields, say researchers. Just like people, plants need iron to grow and stay healthy. But some plants are better at getting this essential nutrient from the soil than others. Now, a study led by a researcher at the Salk Institute has found that variants of a single gene can largely determine a plant's ability to thrive in environments where iron is scarce.

来源：Science Daily

发布日期：2017-05-24

全文链接：

https://www.sciencedaily.com/releases/2017/05/170524191606.htm

学术文献

1. Impact of irrigation on plant growth and development of white cabbage（灌溉对白菜生长发育的影响）

简介：It is widely known that an optimal irrigation water supply is a key to high horticultural productivity, efficient water use, and the reduction of off-site effects due to percolation of excess water. To promote better agronomic practices in irrigated horticulture, three different irrigation scheduling approaches based on soil water balance calculations, soil water potential measurements (sensor-based), and crop growth model simulations, were evaluated in a two-year field experiment. The experiments were conducted with white cabbage on a loamy sand soil near Dresden, Germany. The results show that sensor-based irrigation, at a soil water potential of -250 hPa measured at a soil depth of 30 cm, achieved high yields with moderate to low irrigation water inputs. Irrigation scheduling based on soil water balance calculations led to unproductive over-irrigation due to overestimated crop coefficients, which highlight the need for more accurate estimates of these coefficients. Simulation-based irrigation scheduling resulted in acceptable water productivities but can only be recommended to farmers to some extent because it requires a robust crop model calibration. Analysis of the plant development indicates that maintenance of field capacity until the end of head formation is favorable. Drought stress lead to reduced plant heights, leaf area indices and head yields. Furthermore, the results show that early drought stress effects can be compensated by an appropriate water supply in later growing stages.

来源：Agricultural Water Management

发布日期：2017-03-23

全文链接：

http://agri.ckcest.cn/ass/NK002-20170605003.pdf

2．Expressing a modified cowpea trypsin inhibitor gene to increase insect tolerance against *Pieris rapae* in Chinese cabbage（表达一种改良的豇豆蛋白酶抑制剂基因，以增加对中国卷心菜的昆虫的抗药性）

简介：To increase the tolerance of Chinese cabbage (*Brassica campestris* L. ssp. *pekinensis*) to *Pieris rapae*, we introduced a modified cowpea trypsin inhibitor (*CpTI*) gene, SCK, into various cultivars. SCK was derived from *CpTI*, an insect-resistance gene. The protein accumulating capacity of *CpTI* can be improved by adding a signal peptide sequence at the 5' end and an endoplasmic reticulum-detained signal sequence at the 3' end. Using an optimized *Agrobacterium tumefaciens*-mediated transformation system in Chinese cabbage, we obtained a maximum transformation efficiency of ~6.83%. Insect resistance tests and *CpTI* enzymatic assays showed that most of the transgenic plants had significant resistance to cabbage worm (*Pieris rapae*) larvae and that the plants with the highest levels of insect resistance had the greatest *CpTI*-related capacity, indicating a high correlation between SCK expression and insect resistance. An evaluation of segregation patterns in the independent transgenic line with the highest insect resistance, 'ZB-08-04', showed that kanamycin resistant versus sensitive plants segregated in a 3:1 Mendelian fashion. This study provides a potential germplasm resource for Chinese cabbage breeding in the future.

来源：Horticulture Environment and Biotechnology

发布日期：2017-04

全文链接：

http://agri.ckcest.cn/ass/NK002-20170605001.pdf

3．A critical review on effects, tolerance mechanisms and management of cadmium in vegetables（蔬菜镉效应、耐性机制及管理研究进展）

简介：Cadmium (Cd) accumulation in vegetables is an important environmental issue that threatens human health globally. Understanding the response of vegetables to Cd stress and applying management strategies may help to reduce the Cd uptake by vegetables. The aim of the present review is to summarize the knowledge concerning the uptake and toxic effects of Cd in vegetables and the different management strategies to combat Cd stress in vegetables. Leafy vegetables grown in Cd contaminated soils potentially accumulate higher concentrations of Cd, posing a threat to food commodities. The Cd toxicity decreases seed germination, growth, biomass and quality of vegetables. This reduces the photosynthesis, stomatal conductance and alteration in mineral nutrition. Toxicity of Cd toxicity also interferes with vegetable biochemistry causing oxidative stress and resulting in decreased antioxidant enzyme activities. Several management options have been employed for the reduction of Cd uptake and toxicity in vegetables. The exogenous application of plant growth regulators, proper mineral nutrition, and the use of organic and inorganic amendments might be useful for reducing Cd toxicity in vegetables. The use of low Cd accumulating vegetable cultivars in conjunction with insolubilizing amendments and proper agricultural practices might be a useful technique for reducing Cd exposure in the food chain.

来源：Chemosphere

发布日期：2017-05-02
全文链接：
http://agri.ckcest.cn/ass/NK002-20170605004.pdf

4. Development and Validation of a Diagrammatic Scale to Assess the Severity of Black Rot of Crucifers in Kale(开发和验证一个图表，以评估在羽衣甘蓝十字花科蔬菜黑腐病的严重程度)

简介：The aim of this study was to develop a diagrammatic scale to evaluate black rot (*Xanthomonas campestris* pv. *compestris*) severity on kale (*Brassica oleraceae* var. *acephala*) leaves. The diagrammatic scale was developed and validated with eight levels of severity, ranging from 0.19 to 48.8%. More than 95% of the leaves collected from the field showed severity levels ranging from 0.1 to 21%, and 5% of the leaves showed severities higher than 22%. The validation of the scale was performed by 10 inexperienced evaluators, and the data were analysed with two methods: linear regression and Lin's statistics. Without the scale, most evaluators overestimated disease severity, whereas the use of the scale resulted in increased precision, accuracy, repeatability, and reproducibility of the estimates according to both validation methods. In conclusion, the proposed diagrammatic scale proved to be useful for assessments of black rot severity in kale leaves. The scale may be of interest to researches performing studies on epidemiology or breeding for resistance.
来源：Journal of Phytopathology
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http://agri.ckcest.cn/ass/NK002-20170605002.pdf