2022年第26期总349期

蔬菜育种专题

本期导读

学术文献

1. Ascorbic Acid预处理对干旱胁迫下西兰花幼苗生长和光合作用的影响

2. 高通量测序鉴定观赏羽衣甘蓝中花青素相关的microRNA

3. 豆科生物覆盖间作及其生长管理对甘蓝产量和生物固氮的影响

4. BcMYB44对不结球白菜花色苷合成及耐旱性的调控

5. 甘蓝型油菜抗病基因的分子标记研究

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2022年6月27日

学术文献

1. Ascorbic Acid Preconditioning Effect on Broccoli Seedling Growth and Photosynthesis under Drought Stress(Ascorbic Acid预处理对干旱胁迫下西兰花幼苗生长和光合作用的影响)

简介：Drought is an abiotic stress that decreases crop photosynthesis, growth, and yield. Ascorbic acid has been used as a seed preconditioning agent to help mitigate drought in some species, but not yet in broccoli (Brassica oleracea var. italica). The objective was to investigate the effect of ascorbic acid on growth, photosynthesis, and related parameters in watered and drought-stressed broccoli seedlings. A 2 × 4 factorial experiment was designed where stress (watered or drought) was the first factor and ascorbic acid preconditioning (untreated, 0 ppm, 1 ppm, or 10 ppm) was the second factor. Positioning within the greenhouse was included as a blocking factor and the experiment was replicated three times. All seedlings were watered for 8 weeks and then half had water withheld for 7 days to impose drought while the other half continued to be watered. Ascorbic acid preconditioning increased shoot dry mass, root dry mass, water use efficiency, and photosynthesis in all seedlings while also increasing chlorophyll, relative water content, and leaf area in droughted seedlings. Ascorbic acid preconditioning also decreased membrane injury in droughted seedlings to the point that membrane injury was not significantly different than the watered control. There was strong evidence to support ascorbic acid as a successful seed preconditioning agent in watered and droughted broccoli.

来源：Plants

发布日期:2022-05-17

全文链接:

http://agri.ckcest.cn/file1/M00/03/35/CsgkOYcIKU-AU8cvACYozDbAoQg576.pdf

2. Identification of anthocyanin-related microRNAs in ornamental kale (Brassica oleracea L. var. acephala) by high throughput sequencing(高通量测序鉴定观赏羽衣甘蓝中花青素相关的microRNA)

简介：Anthocyanins have been found to be responsible for the pigmentation of red, purple and blue colors in plants. MicroRNA (miRNA) plays an important role in the regulation of anthocyanin biosynthesis in plants. However, few miRNAs and their corresponding functions related to anthocyanin biosynthesis in ornamental kale (Brassica oleracea var. acephala) have been reported. In this study, small RNA (sRNA) and degradome libraries from inner and outer leaves (IL and OL) of ornamental kale line “Pigeon Red” were constructed, respectively. Totally, 139 known and 14 novel miRNAs were identified by sRNA sequencing, and 304 target genes cleaved by 92 bo-miRNAs were identified by degradome sequencing. Of these, 5 miRNAs and their corresponding targets were potentially involved in the anthocyanin biosynthesis. And 35 miRNAs were differently expressed between IL and OL. Integrated analysis of sRNA-Seq, degradome sequencing and RNA-Seq revealed that

bo-miR828 and its targets potentially play a key role in the regulation of anthocyanin biosynthesis in ornamental kale leaves. Finally, an inverse correlation between the expression of bo-miR828 and its targets was revealed by both qRT-PCR and high-throughput sequencing. These results represented a comprehensive expression profiling of miRNAs related to anthocyanin accumulation in B.oleracea var. acephala and provided important clues for understanding the regulatory network of anthocyanin biosynthesis mediated by miRNA in Brassica crops.

来源： Scientia Horticulturae

发布日期: 2022-05-01

全文链接:

http://agri.ckcest.cn/file1/M00/03/35/CsgkOYcIIK6AYINrAC683uYz2KA577.pdf

3. The Effects of Leguminous Living Mulch Intercropping and Its Growth Management on Organic Cabbage Yield and Biological Nitrogen Fixation(豆科生物覆盖间作及其生长管理对甘蓝产量和生物固氮的影响)

简介： In organic horticulture, living mulches (LM) are used for weed suppression and erosion prevention. In addition, leguminous LM can contribute to higher nitrogen (N) import into vegetable cultivation systems via biological N_2 fixation (BNF). In order to investigate the effect of LM systems, a two- as well as three-year field experiment was conducted between 2019 and 2021 at two loca-tions in Southwest Germany. White cabbage was intercropped with two different clover varieties (Trifolium repens cv. 'Rivendel', with regular growth and T.repens cv. 'Pipolina', a micro clover) and perennial ryegrass (Lolium perenne cv. 'Premium'). Bare soil (with spontaneous vegetation) without intercropping was the control treatment. The second factor was the growth management of the LM: incorporation by rototilling before planting the cabbage, intercropping with the cabbage and no LM growth management, and intercropping with mulching of the LM during the cabbage growing. The results show that rototilling LM before planting the cabbage did not lead to higher weight of cabbage residues or differences in total head yield among the treatments for growth management. Intercropping without further LM growth management did not result in a reduced total head yield of cabbage compared to mulching. The micro clover 'Pipolina' showed no reduced competition with cabbage compared to the regular-growing white clover 'Rivendel'. Therefore, we conclude that leguminous LM systems, regardless of growth management, can achieve high yields with sufficient irrigation and additional fertilization while increasing the inputs of N via BNF into the entire cropping system.

来源： Agronomy

发布日期: 2022-04-23

全文链接:

http://agri.ckcest.cn/file1/M00/10/07/CsgkOGKxdFmAW5WeACNAFlLjpIc351.pdf

4. Regulation of BcMYB44 on Anthocyanin Synthesis and Drought Tolerance in Non-Heading Chinese Cabbage (Brassica campestris

ssp. chinensis Makino)(BcMYB44对不结球白菜花色苷合成及耐旱性的调控)

简介：The purpose of this study was to explore the regulation of BcMYB44 on anthocyanin synthesis and drought tolerance of non-heading Chinese cabbage. The BcMYB44 gene was cloned from the purple inbred line 'NJZX1-3' and its green mutant 'NJZX1-0'. Sequence analysis confirmed that BcMYB44 belongs to the R2R3-MYB family and has the highest homology with BnMYB44. Subcellular localization revealed that BcMYB44 is a nuclear protein. Yeast two-hybrid (Y2H) and Bimolecular Fluorescent Complimentary (BiFC) experiments showed that BcMYB44 interacts with BcPAP1 and BcEGL3. Pigment detection of BcPAP1 and BcMYB44 protein activity in N. benthamiana indicates that BcMYB44 plays a negative regulatory role by inhibiting the expression of key structural genes (F3H, DFR, etc.) in anthocyanin synthesis. Virus-induced gene silencing (VIGS) further confirmed this inhibition. Analysis of drought tolerance of non-heading Chinese cabbage based on VIGS showed that pTY-S plants are more resistant to drought than pTY-BcMYB44 plants. The results indicate that BcMYB44 has a positive regulatory role in drought stress, which most likely is achieved by inhibiting anthocyanin accumulation, regulating stomatal movement, and improving osmotic regulation and homeostasis of reactive oxygen species (ROS).

来源：Horticulturae

发布日期:2022-04-20

全文链接:

http://agri.ckcest.cn/file1/M00/03/35/CsgkOYcJMReAQ3bbAGLTKhdpMPg592.pdf

5. Molecular Markers for Identifying Resistance Genes in Brassica napus(甘蓝型油菜抗病基因的分子标记研究)

简介：Blackleg disease, caused by the fungal pathogen Leptosphaeria maculans, is the most devas-tating disease of canola (Brassica napus, oilseed rape) worldwide. Breeding for genetic resistance is the most widely used tool for controlling this disease and minimizing the impact on yield. To date, five resistance genes (Rlm2, LepR3, Rlm4, Rlm7, Rlm9) have been cloned from B. napus, representing alleles of two different gene loci, Rlm2-LepR3 and Rlm4-7-9. We report on the development and validation of Kompetitive Allele-Specific PCR (KASP) markers that can discriminate between the resistant and susceptible alleles of each resistance gene. These markers will provide valuable tools for both researchers and industry through the ability to characterize resistance genes without phenotyping.

来源：Agronomy

发布日期:2022-04-20

全文链接:

http://agri.ckcest.cn/file1/M00/10/07/CsgkOGKyfRyAS3odABYfWxso92k904.pdf