



2017年第25期总87期

## 蔬菜育种专题

### 本期导读

#### ▶ 前沿资讯

1. 新发现的基因有助于适时地在重要的禾本科作物开花。

#### ▶ 学术文献

1. 影响叶面肥的亚硒酸钠和硅酸盐单独或联合不同改良剂对积累的砷、镉和白菜抗氧化系统
2. 堆肥和蚯蚓粪鼓的应用提高土壤健康, 生长, 和番茄和甘蓝产量参数
3. 分子农艺的鉴定及遗传研究揭示了花椰菜杂交育种成品小仓细胞质不育系应用基础 (甘蓝, 番茄L.)
4. 长期储存减少了在不同温度下储存的大白菜种子对水启动的积极作用。

中国农业科学院农业信息研究所

联系人: 季雪婧

联系电话: 010-82106769

邮箱: [agri@ckcest.cn](mailto:agri@ckcest.cn)

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## ▶ 前沿资讯

### 1. Newly identified gene helps time spring flowering in vital grass crops (新发现的基因有助于适时地在重要的禾本科作物开花。)

简介: A gene that keeps grasses from entering their flowering cycle until the season is right has been found by researchers, a discovery that may help plant breeders and engineers get more from food and energy crops.

来源: Science Daily

发布日期: 2017-06-05

全文链接:

<https://www.sciencedaily.com/releases/2017/06/170605151953.htm>

## ▶ 学术文献

### 1. Effects of foliar dressing of selenite and silicate alone or combined with different soil ameliorants on the accumulation of As and Cd and antioxidant system in *Brassica campestris* (影响叶面肥的亚硒酸钠和硅酸盐单独或联合不同改良剂对积累的砷、镉和白菜抗氧化系统)

简介: This study was conducted to investigate the possibility of using a combined technology to synchronously reduce As and Cd accumulation in the edible parts of *Brassica campestris*. The results showed that a foliar application of selenite (Se) and silicon (Si) combined with soil ameliorants (including Ca-Mg-P fertilizer, sodium silicate and red mud) showed limited effects on the growth of *B. campestris*. The As concentration in the leaves of *B. campestris* in all treatments was below the Chinese safety standard. When sodium silicate and Ca-Mg-P fertilizer were added to the soil, the additional foliar application of Se and Si could in some cases help further reduce the concentrations of As and Cd in the leaves of *B. campestris*. However, when red mud was applied to the soil, the foliar application of Se and Si enhanced the Cd concentration in the leaves of *B. campestris*. In most cases, high levels of soil ameliorants plus foliar application of Se and Si significantly enhanced the As concentrations in both the soil solution and the roots of *B. campestris* but reduced the soil solution Cd concentration and the leaf As concentration. Most of the treatments reduced the thiobarbituric acid reactive substances (TBARS) concentration in the leaves of *B. campestris*, and the foliar application of Se and Si helped the soil ameliorants alleviate the oxidative stress resulting from As and Cd exposure. In this study, several treatments significantly increased the activities of superoxide dismutase (SOD) and ascorbate peroxidase (APX). However, the enzymes peroxidase (POD) and catalase (CAT) were not induced by most treatments. In summary, the combined treatment of 1 g kg<sup>-1</sup> Ca-Mg-P fertilizer plus foliar spraying 2 mmol L<sup>-1</sup> sodium selenite was most effective in reducing the Cd concentration and a rather strong ability to reduce the As concentration and trigger the activities of SOD and APX in the leaves of *B. campestris*.

来源: Ecotoxicology and Environmental Safety

发布日期：2017-04-13

全文链接：

<http://agri.ckcest.cn/ass/NK002-20170619004.pdf>

## **2. Application of drum compost and vermicompost to improve soil health, growth, and yield parameters for tomato and cabbage plants (堆肥和蚯蚓粪鼓的应用提高土壤健康，生长，和番茄和甘蓝产量参数)**

**简介：** Utilization of different types of solid wastes through composting is important for environmental sustainability and restoring soil quality. Although drum composting is an efficient technology, the possibility of heavy metal contamination restricts its large-scale use. In this research, a field experiment was conducted to evaluate the impact of water hyacinth drum compost (DC) and traditional vermicompost (VC) on soil quality and crop growth in an agro-ecosystem cultivated intensively with tomato and cabbage as test crops. A substantial improvement in soil health was observed with respect to nutrient availability, physical stability, and microbial diversity due to the application of drum compost and traditional vermicompost. Moreover, soil organic carbon was enriched through increased humic and fulvic acid carbon. Interestingly, heavy metal contamination was less significant in vermicompost-treated soils than in those receiving the other treatments. The use of VC and DC in combination with recommended chemical fertilization effectively stimulated crop growth, yield, product quality, and storage longevity for both tomato and cabbage.

**来源：** Journal of Environmental Management

**发布日期：** 2017-05-23

**全文链接：**

<http://agri.ckcest.cn/ass/NK002-20170619003.pdf>

## **3. Molecular-agronomic characterization and genetic study reveals usefulness of refined Ogura cytoplasm based CMS lines in hybrid breeding of cauliflower (*Brassica oleracea* var. *botrytis* L.) (分子农艺的鉴定及遗传研究揭示了花椰菜杂交育种成品小仓细胞质不育系应用基础 (甘蓝, 番茄L.))**

**简介：** Cytoplasmic male sterility (CMS) is the most widely used system for hybrid seed production in vegetable brassicas. Information of morphological and molecular divergence in combination with combining ability is instrumental in selecting suitable parent in hybrid development. Twenty five CMS lines developed after more than 9 generations of backcrossing were analysed for different agronomic and floral traits. Besides, they were also evaluated for combining ability to reveal their breeding potential. Two CMS lines, Ogu402-6A and Ogu76-4A were distantly placed from rest of the CMS genotypes based on morphological characterization. Molecular analysis through SSR primers also revealed the genetic distance of the CMS lines Ogu402-6A from rest of the CMS pool. Three genotypes (Ogu402-6A, Ogu76-4A and Ogu119-2A) with early maturity were identified for their use in

development of short duration hybrids. Similarly, 3 CMS lines Ogu118-2A, OguHL-3A and Ogu126-1A were identified with yield potential of more than 60 t/ha. Based on 13 polymorphic SSR markers 25 CMS lines were grouped into 4 major clusters. Molecular diversity in combination with agronomic characterization will be very useful in diverse parental lines. Introgression of Ogura cytoplasm into cauliflower nuclear background caused variety of flower deformities. However, these deformities were genotype specific. General combining ability (GCA) of the CMS lines revealed their potential for use in hybrid breeding. Few genotypes were identified based on combining ability for their use in development of short duration and high yielding F<sub>1</sub> hybrids.

来源: Scientia Horticulturae

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全文链接:

<http://agri.ckcest.cn/ass/NK002-20170619001.pdf>

#### **4. Prolonged storage reduced the positive effect of hydropriming in Chinese cabbage seeds stored at different temperatures (长期储存减少了在不同温度下储存的大白菜种子对水启动的积极作用。)**

简介: Primed seeds generally deteriorate and lose beneficial effects of priming during subsequent dry storage. Therefore, it is necessary to determine how long the positive effects of priming could maintain in primed seeds stored at ambient temperature. In present study, naturally aged Chinese cabbage seeds were hydroprimed at 20 °C in the dark for 10 h. The primed seed were stored at 4, 20 or 30 °C, respectively, and samples were tested at regular intervals (1, 3, 6 and 9 months). Results indicated that the germination attributes (germination percentage, germination rate and seedling vigor index) of primed Chinese cabbage seeds stored at 30 °C for 9 months significantly decreased compared with un-stored primed seeds, even worse than non-primed seeds. However, such negative effects were not observed in primed seeds stored at 4 °C and 20 °C for 9 months and 30 °C for 6 months. The diminished beneficial effects of hydropriming can be attributed to decreased activities of peroxidase (POD) and catalase (CAT), soluble sugar and soluble protein content, with increased malondialdehyde (MDA) in primed Chinese cabbage seeds.

来源: South African Journal of Botany

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全文链接:

<http://agri.ckcest.cn/ass/NK002-20170619002.pdf>