

# Energy storage substances in soybeans

Soybeans contain approximately 40 % protein, 20 % oil, 25 % carbohydrate and 5 % crude fiber and are rich in multiple bioavailable nutrients such as isoflavones, minerals, lecithin and phytosterols [13]. Among these elements, SPs are high-grade plant proteins with multiple potential bio-functional effects and are in growing demand in the global food industry [14].

This indicated that the presence of moderate soil salinity, together with drought, enabled soybean seedlings to accumulate more Na<sup>+</sup> and other ions, and most of the ions are compartmentalized into vacuoles and used as osmotic adjustment substances, which can enhance the water absorption and retention, and reduce the photoassimilate and energy ...

A primary role of transcription factors in seed development is the primary control of protein and oil and possibly other classes of storage substance accumulation (for review, see Kroj et al., 2003; Gutierrez et al., 2007; Santos-Mendoza et al., 2008) and the developmental processes that support the accumulation of storage substances.

Soybean is an important oilseed crop that is used as a feed for livestock and has several industrial uses. Lipid biosynthesis and accumulation primarily occur during seed development in plants. This process is regulated by several transcription factors and interconnected biochemical pathways. This study investigated the role of glycine max LEAFY ...

6 &#0183; The composition of soybean protein is shown in Fig. 1 A. Detailed information and sequences of soybean 7S and 11S storage proteins, obtained from NCBI, are summarized in ...

As mentioned above, unlike most legumes, soybeans have a high protein quality, making soybeans and their food products excellent plant-based protein sources [18]. The soybeans contain ~35-40% protein, ~20% lipids, ~9% dietary fiber, and ~8.5% moisture based on the dry weight of mature raw seeds [19]. Different cultivation environments ...

The proteolysis supplies amino acids and energy needed by the seedling. Proteomic observations of storage protein degradation during germination have been made for several other plants including Arabidopsis [17] and rice [18]. The pattern of degradation of storage proteins in the soybean has been analyzed by one-dimensional gels [19], [20], [21] ...

Although, there are several heat losses in the soybean processing system (solvent extraction of oil) due to cooling of water from the condenser, condensation of hexane and steam mixture in the condenser, and heat transfer in the heat exchanger, this study is limited to the heat losses from the soybean, oil, and soy meal flows in the solvent extraction plant, ...

The seeds, leaves, branches, roots, and pods of soybean contain essential bioactive compounds, including

flavonoids, isoflavonoids, and other specialized metabolites, ...

Soybean meal is one of the most important and preferred protein feed sources for poultry due to the capability of providing up to 40% protein and 20% oil, as well as its high nutritional value for ...

In addition to providing nutrients, food can help prevent and treat certain diseases. In particular, research on soy products has increased dramatically following their emergence as functional foods capable of improving blood circulation and intestinal regulation. In addition to their nutritional value, soybeans contain specific phytochemical substances that ...

Isoflavones, a class of substances with high biological activity, are abundant in soybeans. This study investigated isoflavone biosynthesis in soybean cell suspension cultures under UV-B radiation. UV-B radiation enhanced the transcription level and activity of key enzymes involved in isoflavone synthesis in cell suspension cultures. As a result, the isoflavone contents ...

A low R/FR ratio can enhance the utilization of light energy in soybean leaves at low light intensities, mostly by reducing Y(NO) and increasing YII. Download: ... Chlorophyll is an important substance for plants to absorb light energy, and it participates in the formation of light-harvesting pigment complexes (LHC II) and complexes in light ...

Grain and legume seeds cannot obtain energy from the outside world during germination, so they must degrade their own storage substances to provide energy for growth. There are a large number of bound enzymes stored in quiescent dry seeds, and these dormant enzymes could be activated under suitable conditions, resulting in enzymatic hydrolysis.

These characteristics of the AC have been additionally enhanced by incorporating other substances like CP, metal oxides, and other CBMs. An effective energy storage substance by employing Gr, MnO<sub>2</sub>, AC nanofiber (ACN) for this description. The integrated composite substances have been examined toward supercapacitor utilization.

The soybean [*Glycine max* (L.) Merr.] is a legume crop native to East Asia, now grown worldwide because of its high protein and oil contents. World production reached 263.7 million metric tons in 2010/2011, which is more than double than that in 1992/1993 (Fig. 1). The increase in soybean production can be attributed to increased crop yield and demand to ...

The energy and exergy study of the industrial processing of soybean into soy oil also revealed that the highest energy consumption was associated with the subsystems which involved the use of ...

To understand how the biosynthesis of soybean storage substances in seeds is regulated, we cloned soybean TFs that are homologs to these functionally characterized counterparts from *Arabidopsis* (Figure 1A). Homology search with *Arabidopsis* LEC2 protein against soybean genome identified two genes that share the

highest homology with AtLEC2, GmLEC2a

As a significant protein source for humans and animals, soybean (*Glycine max*) has experienced a fast growth with the rapid development of population and economy. Despite broad interest in energy consumption and CO<sub>2</sub> emissions generated by soybean production, there are few impact-oriented water footprint assessments of soybean production. This study ...

To investigate the cause of yield increase, the rapid effect of enriched nitrogen at R1 growth stage on soybean dry matter accumulation, different kinds of sugar contention ...

The DPPH radical scavenging activity and ORAC value of soybeans (yellow soybean, blue soybean, and black soybean) were increased by roasting at above 190 °C. Concerning raw beans, black soybeans with the darkest seed coat color had the strongest antioxidant activity, indicating the effect of the coat pigment. However, the degree of increased antioxidant activity ...

**Background** Soybean (*Glycine max*), a vital grain and oilseed crop, serves as a primary source of plant protein and oil. Soil salinization poses a significant threat to soybean planting, highlighting the urgency to improve soybean resilience and adaptability to saline stress. Melatonin, recently identified as a key plant growth regulator, plays crucial roles in plant ...

The high energy requirement for drying grain can be significantly reduced in solar energy storage tanks combined with a heat pump. The use of a complex solar energy system and ground energy can significantly increase the efficiency of drying systems (Wang et al., 2019). The literature presents many publications comparing the innovative drying ...

The dry matter content of cotyledons from germinating soybean seeds stored under different conditions increased with the increase in storage period up to 180 days and increase in dry matter content in cotyledons of germinating soybean seeds stored in jute bags at 15 °C or RT was more as compared to those stored in polythene bags beyond 120 DOS.

It should be taken into account that the nutritional value of processed soybeans, although more uniform than most raw materials, varies depending on factors such as the type of seed, origin of the bean, the environmental and agronomic conditions of the sowing area during growth, harvest time, storage & thermal processing conditions of broad ...

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Soybean-maize intercropping system can improve the utilization rate of farmland and the sustainability of crop production systems. However, there is a significant gap in understanding the interaction mechanisms between soil carbon (C), nitrogen (N), and phosphorus (P) cycling functional genes, rhizosphere microorganisms, and

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nutrient availability. To reveal ...

Soybean is high in fiber, protein, and phytoestrogens, low in saturated fats, free cholesterol, and lactose, and a good source of omega-3 fatty acids and antioxidants. Moreover, the stable ...

**Abstract.** The ontogeny of seed structure and the accumulation of seed storage substances is the result of a determinant genetic program. Using RNA interference, the synthesis of soybean (*Glycine max*) glycinin and conglycinin storage proteins has been suppressed. The storage protein knockdown (SP-) seeds are overtly identical to the wild type, maturing to ...

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**Main conclusion** The keys to alkali-stress resistance of barren-tolerant wild soybean lay in enhanced reutilization of reserves in cotyledons as well as improved antioxidant protection and organic acid accumulation in young roots. **Abstract** Soil alkalization of farmlands is increasingly serious, adversely restricting crop growth and endangering food security. Here, ...

Soybean seeds contain roughly 37% protein, 30% carbohydrates (9% of which are fiber), 19% oil (84% unsaturated), 9% moisture, and 5% ash. Soybean is the only legume containing nine essential amino acids for human health. Thus, soybean protein is classified as a complete protein with high-quality.

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