

Energy storage substances in potato tubers

Are potato tubers a good source of starch?

Springer Science Reviews 2: 15-33. Potato tubers are rich sources of various nutrients and unique sources of starch. Many genes play major roles in different pathways, including carbohydrate metabolism during the potato tuber's life cycle.

Is potato a tuber?

Potato (*S. tuberosum* spp. *andigena*) has been widely used as a model system to investigate the SD-dependent tuberization mechanism (Ewing and Struik, 1992). A potato tuber is formed from the belowground modified stem, known as stolon (Jackson, 1999), and serves as a rich source of starch, storage proteins, vitamins, and dietary antioxidants.

Are potato tubers a good source of nutritional value?

Potato tubers are at greatest nutritional value at harvest, while they are endodormant and high in starch content, and require storage under certain environmental conditions to maintain quality.

How is starch synthesis regulated in a potato tuber?

Starch biosynthesis is developmentally regulated in the potato tuber, with rates being highest during tuber initiation and maturation (Ferne & Willmitzer, 2001). Sucrose imported from source tissues like leaves provides the main substrate for starch synthesis.

Why are potato tubers used as seed tubers?

In addition to food and feed, potato tubers are also the starting material for the next generation when used as so-called seed tubers. Therefore, processes associated with tuber formation, storage, sprouting, and development have been intensively studied over the recent decades [3 - 7].

How does dormancy regulate potato tubers?

Overall, dormancy regulation of potato tubers is a complex process driven by genetic as well as environmental factors. Elucidation of the molecular and physiological mechanisms that influence different dormancy stages of tubers has wider potato breeding and industry-relevant implications.

The metabolic processes of potato tubers continue after harvest and therefore interact with their storage environment. Consequently, the quality of tubers and their shelf life can be reduced by the surrounding environment in storage. Markets continue to demand competitively priced and an uninterrupted supply of tubers with an increasing expectation of high quality, ...

The contribution of starchy roots and tubers to the energy supply in different populations varies with the region and the country. ... Sporamin is a soluble protein and serves as the main storage protein of sweet potato

Energy storage substances in potato tubers

tubers. It accounts for 60-80% of tubers total proteins . The sporamin of sweet potatoes was initially known as ipomoein and ...

Depending on storage conditions potato tubers will - to a lesser or greater extent - respire and transpire and thus lose fresh weight. Maintenance and metabolic processes require energy, and potato tubers use part of their dry matter (mainly starch) for necessary energy supply resulting in ...

Potato (*Solanum tuberosum* L.) is an annual herb belonging to the Solanaceae family and is the world's third largest food crop after wheat and maize. More than 300 million tons of potatoes are produced worldwide each year, and more than 5000 varieties are known (Gumbo et al., 2021). Potato tubers will sprout after 2 ~ 3 months after harvest when their dormant ...

Potatoes are typically seeded as tubers, and their slow sprouting significantly impacts production. Therefore, the effects of polyacrylamide (20 g[#]L-1, 30 g[#]L-1, and 40 g[#]L-1) as a seed potato dressing on sprouting, seedling growth, and biomass were investigated. The phytohormone content, respiratory intensity, and starch metabolism enzyme activity were ...

Introduction. Potato tubers (*Solanum tuberosum*) have been cultivated for more than 6000 years. Currently, potato is the fourth most important crop produced worldwide with an annual production of ca. 382 MT. Europe and Asia are the biggest producers with a share of 40.7% each, followed by America and Africa (12.6 and 4.5%, respectively) (FAOSTAT, ...

The tuber sprouting process in potato involves three physiological stages: (i) dormancy, (ii) sprout initiation, and (iii) sprout growth (Fig. 1). During the sprouting, the tuber buds and the tuber tissues exhibit peculiar growth characteristics as well as specific metabolic and cellular gene expression changes (Ronning et al. 2015) the dormant potatoes, the tuber ...

The tuber is, in the field of botany, part of a root or an underground stem that has specialized for the storage of reserve substances and that, for this, undergoes a marked thickening. Therefore, there are two types of tubers, root and stem, but in both cases it is a thick part in which nutrients and substances for the plant are stored, always partially or fully ...

Respiration was elevated in the constitutively expressing lines indicating a compensation for the dramatic increase in ATP hydrolysis. The increase in respiration did not affect the internal oxygen tensions in the tubers. However, the tubers developed a ginger-like phenotype having an elevated surface-volume ratio and a reduced mass per tuber.

The StSP6A gene and the coding protein are pivotal players in the induction and formation of potato tubers. Potato tuberization has photoperiodic dependence, with short days promoting StSP6A expression and thus tuber formation . Tuberization is controlled by StSP6A, which induces tuber formation under high sucrose

availability [28,36].

Are you looking for what are tubers and examples beyond potatoes or potatoes? ... part of a root or underground stem that has specialized for the storage of reserve substances and that, for this ... They are high in starch, which makes them rich in carbohydrates, making them an excellent source of energy. Types of tubers. As we have mentioned ...

Different tuber varieties have different storage requirements. Some tubers, like potatoes, can be stored for several months if kept at around 45-50°F (7-10°C) with high humidity. Others, such as sweet potatoes, prefer slightly warmer temperatures around 55-60°F (13-16°C) and lower humidity levels.

The results of the tyrosinase inhibitory activity of sweet potato tips and tubers are shown in Figure 5. The positive control, vitamin C, showed an inhibitory rate of 89.76% at a concentration of 1 mg/ml, and the tyrosinase inhibitory activity of sweet potato tips and tubers was in the range of 32.82%-63.93% at 10 mg/ml.

A potato tuber is formed from the belowground modified stem, known as stolon (Jackson, 1999), and serves as a rich source of starch, storage proteins, vitamins, and dietary antioxidants. Tuberization (stolon-to-tuber transition) involves the integration of multiple environmental cues, molecular signals, and phytohormones (Sarkar, 2010).

WHEN POTATO TUBERS are harvested, respiration becomes a crucial metabolic process that keeps potatoes alive throughout storage. Respiration involves the breakdown of complex substances like starches, sugars, and organic acids in tuber cells. As a result, simpler molecules are produced, along with energy and other compounds.

thiamine, niacin and riboflavin. Sweet potato tubers combine the properties of cereals, fruits and vegetables owing to its content of starch, pectin and vitamins, respectively. Due to very high dietary energy production of about 195 MJ/ha/day, sweet potato is considered as "Energy Storehouse of Nature". Despite a carbohydrate

In addition, starch content decreased slightly, while hexose levels remained unaltered, compared with the wild-type controls. Similar to low sucrose-containing invertase tubers, respiration and starch breakdown were found to be accelerated during storage in ...

storage period compared with soaking tubers soaked in those substances before storage. Soaking tubers in succinic acid, salicylic acid, eucalyptus oil and peppermint oil gave the lowest values of reducing sugars, non-reducing and total sugars content in potato tubers at the end of storage period . The lowest values of reducing, non-reducing and ...

The breakdown of starch to glucose nourishes the plant during periods of reduced photosynthetic activity. We

Energy storage substances in potato tubers

often think of potatoes as a "starchy" food, yet other plants contain a much greater percentage of starch (potatoes 15%, wheat 55%, corn 65%, and rice 75%). Commercial starch is a white powder.

Potato (*Solanum tuberosum*) is categorized among the top three essential food crops after wheat and rice in the world (Agrimonti and Marmioli 2008; Muthoni et al. 2014a) is widely grown in more than 100 countries, mostly due to its succulent, tuber storage organ with multipurpose uses, specifically as a staple crop and raw material for industrial food and starch ...

Though raw potatoes are a good source of vitamin C, potato chips have more dietary vitamin C due to the rapid dehydration of potato tubers at the time of frying. Potato chips contain up to 18.6-21.6 mg/100 g of vitamin C. Frying results in a 30-50% loss in vitamin C due to heat sensitivity (Tian et al. 2016).

The tuber of potato (*Solanum tuberosum*) is commonly used as a model for underground storage organs. In this study, changes in the proteome were followed from tuberization, through tuber development and storage into the sprouting phase. Data interrogation using principal component analysis was able t ...

Potato is susceptible to light exposure and wounding during harvesting and transportation. However, the metabolite profile changes in these potato tubers are unclear. The potato cultivars in this study included Hezuo88 (HZ88), Shida6 (SD6), and Jianchuanhong (JCH); the effects of light exposure (L), wounding (W), and the cooking process on potato metabolites ...

Potatoes are the basis of many diets around the world due to the content of nutrients, such as carbohydrates, protein, dietary fibre, vitamins and minerals [1,2,3] addition to the nutrients in potato tubers, there are also natural undesirable substances: nitrates (V) and glycoalkaloids [4,5,6].Nitrates (V) are not directly toxic to humans, but under the influence of ...

Web: <https://www.wholesalesolar.co.za>