

The use and value of plant's starch

[Environment](#), [Plants](#)



Deep in the system of plants such as in its leaves, flowers, fruits, seeds, stems or roots is the plant's starch which is formed in the chloroplasts of plants that perform starch production rapidly. In amyloplasts which are commonly found in root crops, starch reserves are deposited over several days or weeks, and is being mobilized during seed germination, fruit maturation or sprouting of tubers. Starch is the most abundant carbohydrate in plants and is used as source of carbon and energy.

Starch has several uses in the society. Firstly, as it comes from the plants that living things consume; it serves as a source of carbohydrate in a balanced diet. While on the other hand, it acts as a renewable element in the industrial world, making it useful to the humans as well as in the commercial world. Relating its usefulness in the world of industry, its versatility ranges from being a thickening agent in processed foods, as it gelatinizes leading to formation of pastes when heated in water; up to the non-food category for it can be produced as paper or board in some companies, packaging materials in some other factories and biodegradable plastics as well.

Throughout the years, starch is progressively used in much industrial utilization even as a renewable energy source in the economy. Developing technologies and methods had increased the use of wastes especially in plants that make the starch biomass which is a consequential proxy element in various usages in several inventions; due to its usefulness, versatility, accessibility, and low-cost quality. Cereals contain 40-90% of starch, roots with 30-70%, and tubers or potatoes up to 65-85%, legumes from 25-50%, and some unripe fruits like bananas or mangoes approximately contain 70% of starch in dry weight. Starches are useful in container production and other

biodegradable materials that emerge along with today's developments because of its accessibility and economic-friendliness compared to other polymers. Starches evidently draw much attention from packaging industries for its low-cost natural source of polymer that is useful in the production of bioplastics. They are digestible by microorganisms, making its biodegradability excellent and environmental friendly. Also, starches produce hydrophilic bioplastics because of their hydroxyl end groups.

Starch in potatoes (*Solanum tuberosum*)

Potatoes, a well-known root crop, have originated from the tropical areas particularly in Andes of South America where it is the number one cultivated crop in the area. Moreover, potatoes have high adaptive nature, making it able to grow anywhere in the world in all climates. In fact, it ranks as the second place in the top crops grown in greatest number of countries in the world. A potato contains an approximate of 18% starch, 1% cellulose, and 81% water, and contains dissolved organic compounds like protein and carbohydrates such that harvesting of potatoes has a great impact because plays a role in maintaining a low level of damage to the tubers.

Starch in bananas (*Musa paradisiaca*)

On the other hand, the tropical and subtropical countries inhabit a plentiful species of *Musa paradisiaca* or simply bananas, belonging to the Musaceae family. Bananas, specifically the green unripe banana, contains starch as its major constituent as it undergoes plenty of phases when it ripens. These plants are considered to have a high industrial significance because of their

high starch content. Starch in banana peels, together with other compounds such as fat, proteins, and carbohydrates, increases with maturity and degrades or declines as soon as it reaches its over-ripening stage.

Banana starches have high resistance from heat and amylase attack. They are also low in amylase content, swelling properties, and solubility in water. With low retrogradation - a process in which starch dissolves in water; it has been proven however that banana starches are less superior than modified and unmodified corn starch, thus having a potentially lesser market value.