



Ministry of
Foreign Affairs
Republic of Latvia



Cultivation Technology of Sweet Potato (*Ipomoea batatas* L.) in Uzbekistan

Prof. Ravza Mavlyanova , RIVMC&P, Uzbekistan

Introduction

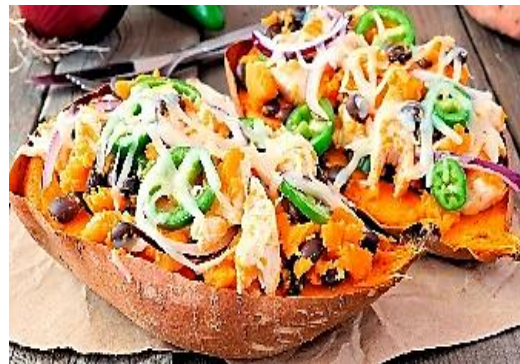
- Batata (*Ipomoea batatas*) is a valuable crop for nutrition and processing. Batata is also called "sweet potato".
- The sweet potato's homeland is Central America, from where it spread to other countries.
- It is widely cultivated in countries with tropical and subtropical climates - Africa, Australia, India, China, Japan, South America and other countries.



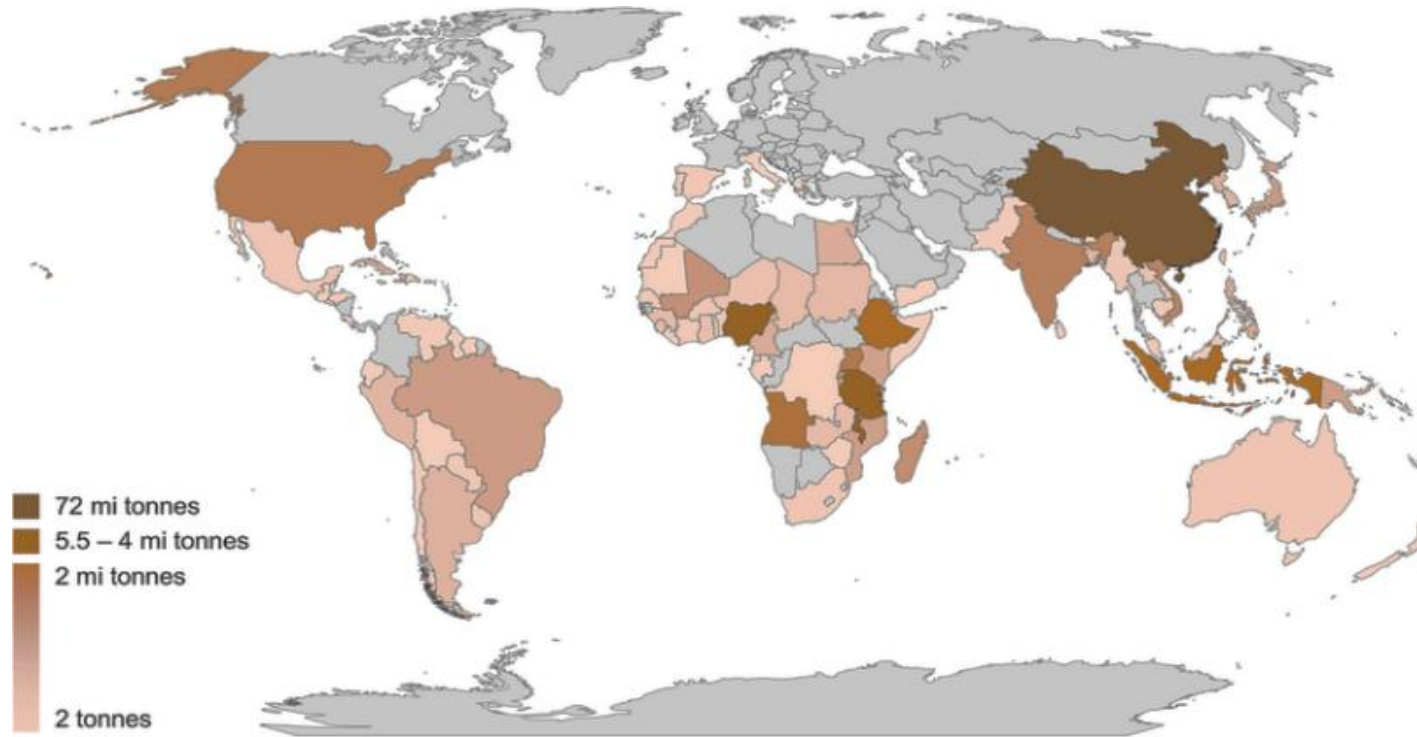
Use of batata - sweet potato

- Batata is also called "sweet potato ", and it is used for food as boiled, fried and baked potatoes. It is used in distilling, starch and molasses production. Alcohol, starch, and molasses are obtained from it, and pasta, jam, mashed potatoes, and pie filling are prepared.
- When sweet potato flour is added to wheat flour, bread of very high quality is obtained.
- Sweet potatoes also have fodder value and special fodder varieties have been created. It is used for livestock feed in fresh, steamed and ensiled form.
- Dry sweet potato tops are not inferior in nutritional value to clover and its silage is better than corn silage.

Delicious dishes with sweet potatoes



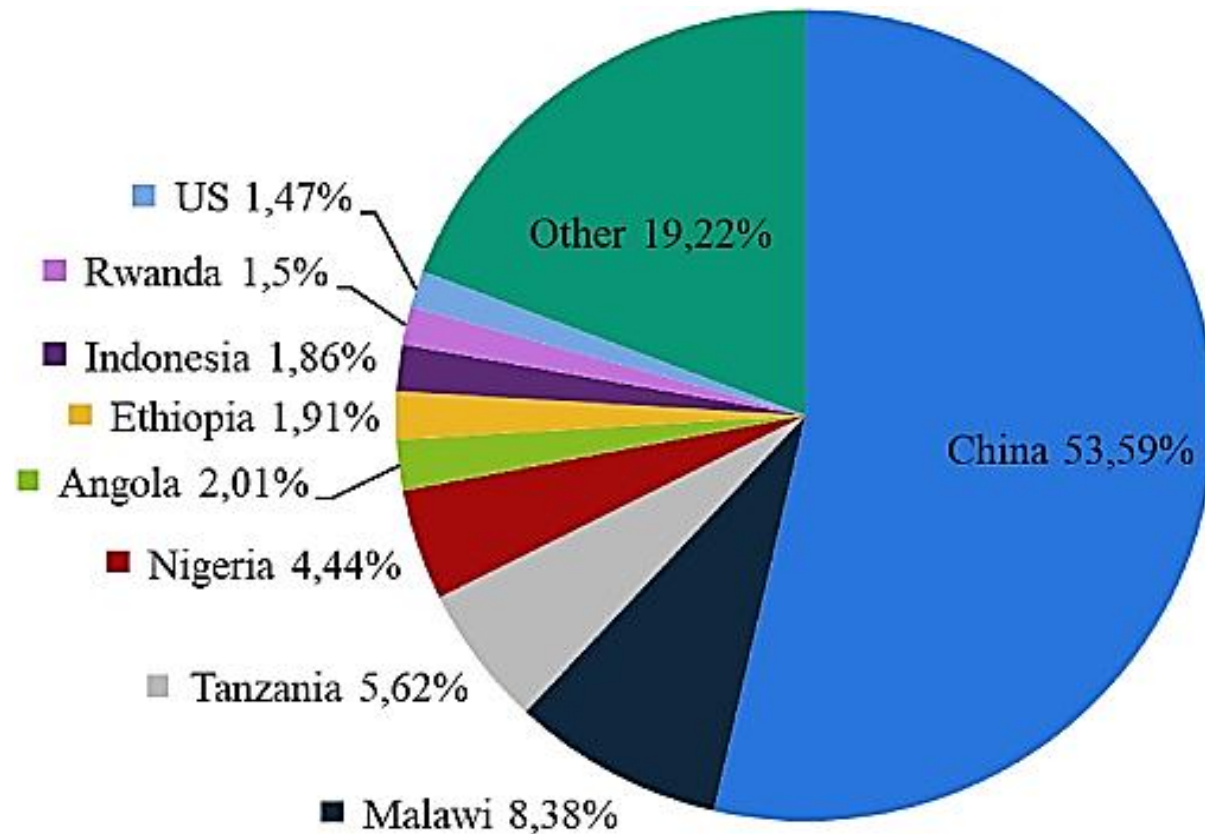
The spread of sweet potato in the world



- A map of sweet potato distribution shows its dominance in Asia, particularly China, which is the largest producer. In Africa, the main producers are Tanzania, Nigeria, and Rwanda, as well as Uganda and Burundi. In North America, the United States, particularly North Carolina, is also a major producer.

Sweet potato production by region

- **Asia:** The main production region, China accounts for over 80% of global sweet potato production.
- **Africa:** Tanzania, Nigeria, Angola, Rwanda, Uganda, and Burundi are major producers and consumers.
- **North America:** The United States, where North Carolina leads in production.



Nutritional value

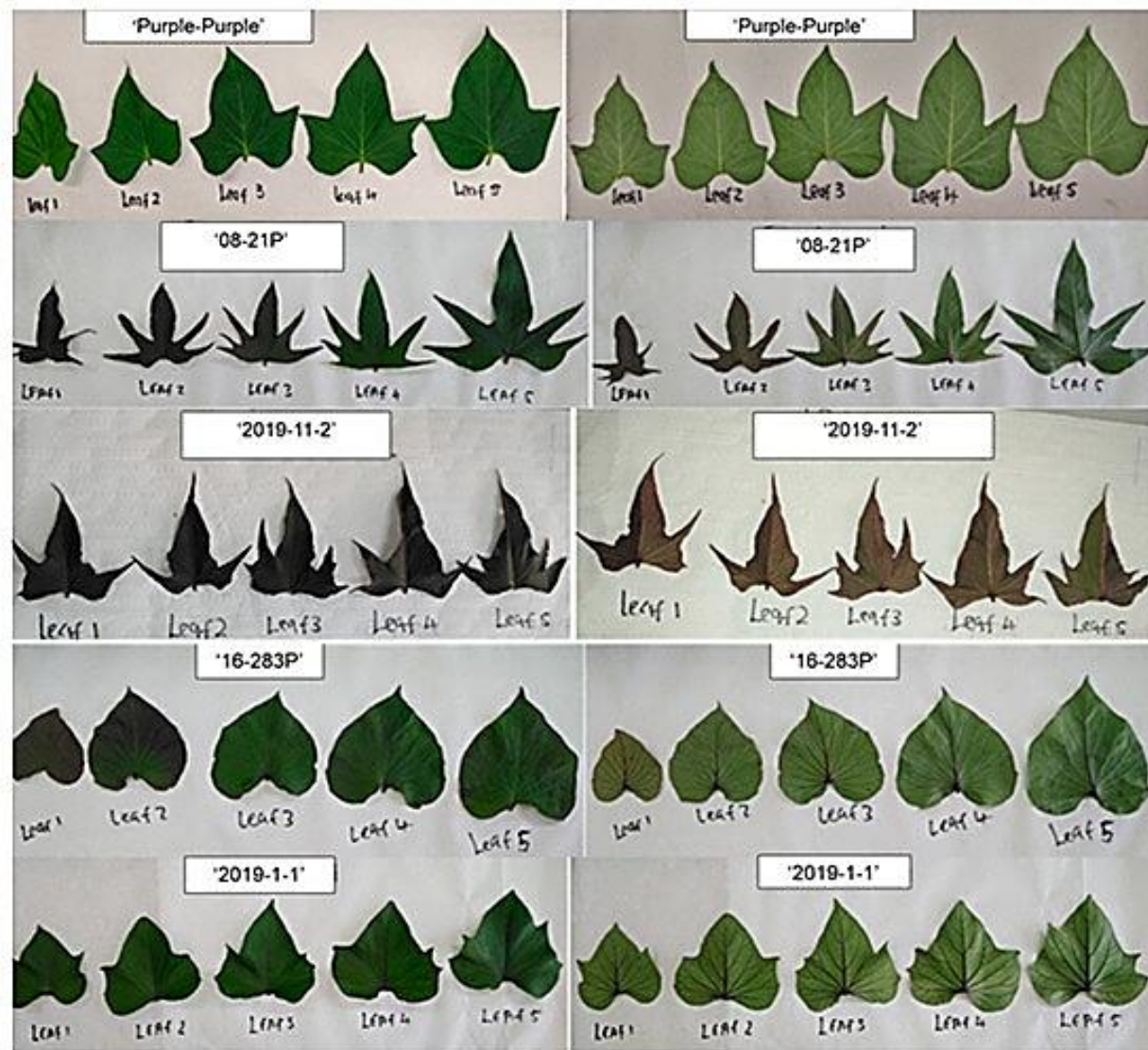
- Sweet potato tubers contain proteins with the most digestible albumins (1.5-2.0%), as well as mineral elements (potassium, sodium, magnesium, calcium, phosphorus, silicon, sulfur, iron), carotene and vitamins (A, B, D).
- Nitrogen-free extractives are mainly represented by starch, the content of which varies from 11.5 to 24.6% depending on the variety, and sugars (monosaccharides and sucrose) - 1.44-6.12%.
- Depending on the variety, the dry matter content is 23.7-28.2%, ascorbic acid is 4.0-7.2 mg/100 g.
- • The composition of tubers may vary depending on the specific variety and growing conditions (climate, agricultural technology used).

Morphological traits of sweet potatoes

- Sweet potato is a herbaceous vine with long (1-5 m) creeping stems that root at the nodes. The bush grows 15-18 cm tall.
- The lateral roots of the sweet potato thicken considerably, forming tubers with white, yellow, orange, pink, cream, red, or purple edible flesh. A single tuber weighs from 200 grams to three or more kilograms.
- The leaves are cordate or palmately lobed, on long petioles.
- The flowers are located in the leaf axils; the corolla is large, funnel-shaped, pink, pale lilac, or white. Many varieties do not flower. Pollination is cross-pollination, primarily by bees. Flowering is rare in temperate zones.
- The fruit is a four-seeded capsule. The seeds are black or brown, 3.5–4.5 mm in diameter.



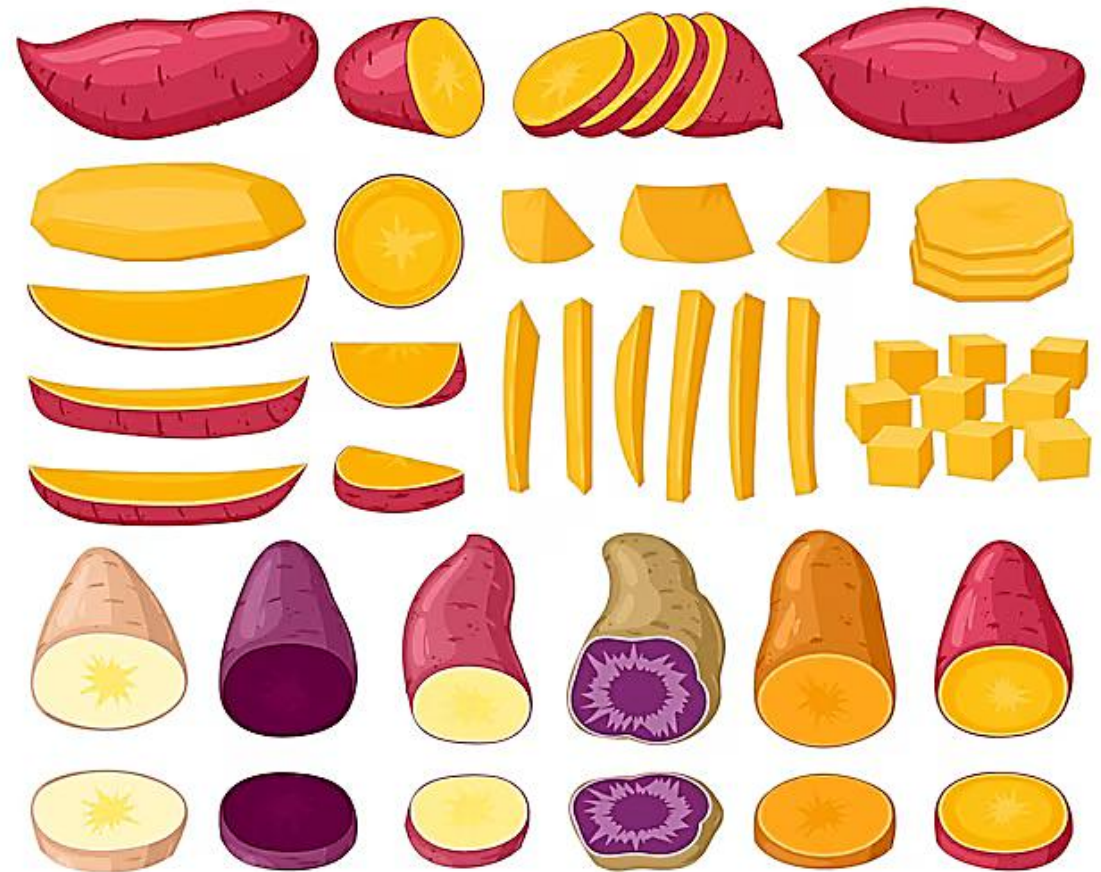
The shape of the leaf



Morphological traits of tubers

- The tuber is formed from a modified part of the stolon stem. For the convenience of naming the storage organ of sweet potatoes, the name "tuber" is used.
- Depending on the variety, the color of the tuber can also be white, yellow, pink, purple, brown, dark purple, uniform or heterogeneous even on the same tuber.
- The color of the flesh is not related to the color of the skin, but can also be diverse: white, cream, yellow, pink, purple and with various shades, unevenly distributed even within the pulp.
- The taste of tubers in different varieties of sweet potatoes differs and depends on the ratio of starch and sugar.

Diversity of sweet potato leaves and tubers



https://www.google.com/search?client=firefox-b-d&q=%D0%B1%D0%B0%D1%82%D0%B0%D1%82+%D0%B2%D0%B8%D0%BA%D0%B8%D0%BF%D0%B5%D0%B4%D0%B8%D1%8F&udm=2&source=univ&fir=rMUs_u9_Fbh7_M%252Cr2DFR9Dh-TxC-

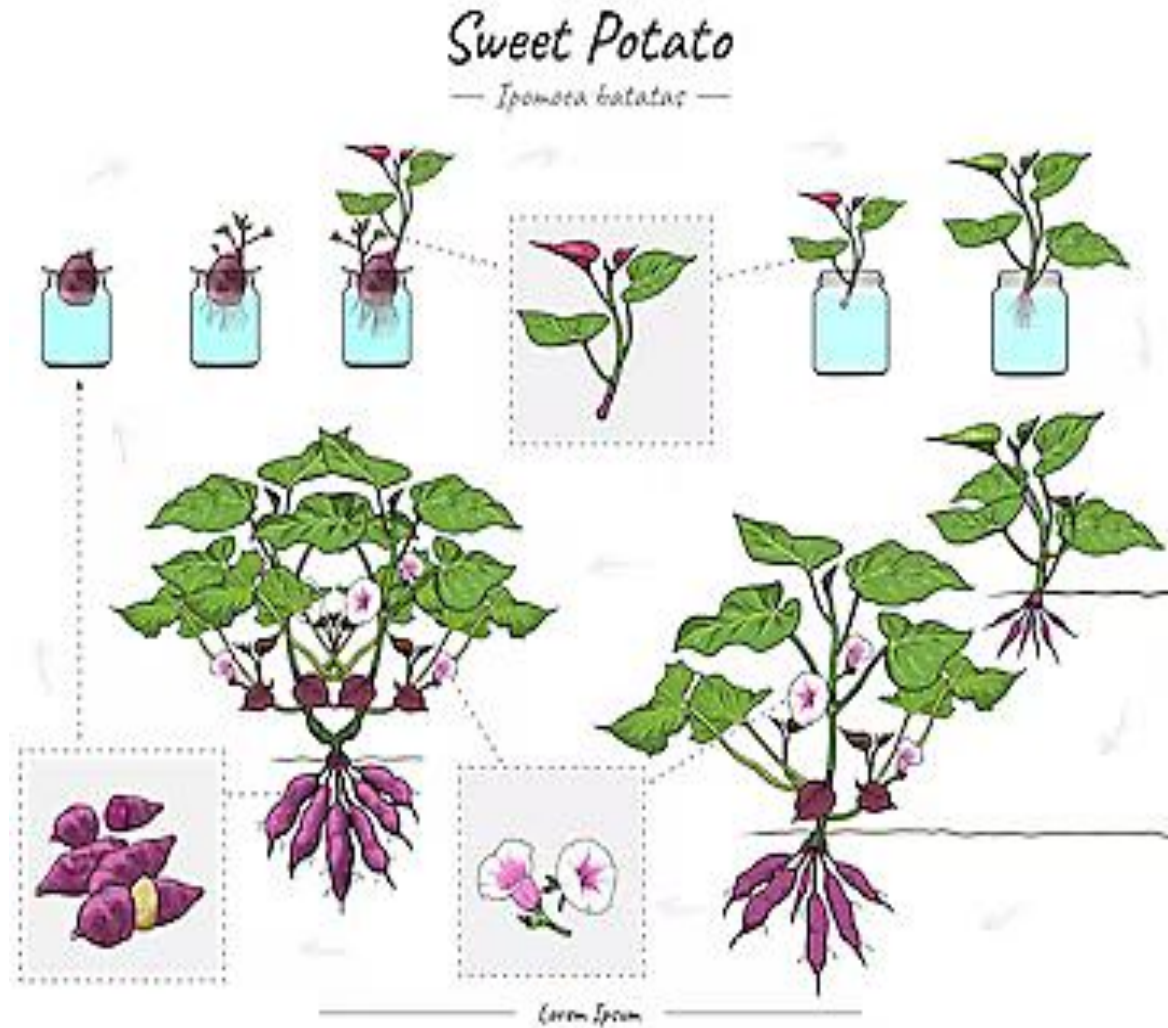


Biological features of sweet potatoes

- **Temperature.** Sweet potatoes belong to heat-loving crops and the optimal temperature for tuber germination and plant development is $+30...+35\text{ C}^0$, but not lower than 20C^0 . At a high temperature of $+37...+40\text{ C}^0$ and above with sufficient soil moisture, plant growth is much more intensive. Plants are very sensitive to temperature drops and do not tolerate frost. When harvesting seedlings in a greenhouse at a temperature of $+25...+30\text{ C}^0$, sprouts on tubers appear in 12-15 days the onset of warmth during the day is not less than $+20\text{ C}^0$, at night, it is not lower than $+12\text{ C}^0$.
- **Humidity.** The plant is moisture loving plant, but tolerates dry air during artificial irrigation. In the conditions of Uzbekistan, the cultivation of sweet potatoes is possible only on irrigated lands. In the first half of the growing season, rain and air humidity are necessary for sweet potato plants, but their excess in the second half adversely affects the quality of tubers.
- **Soil.** Sweet potatoes prefer light sandy loam and sandy soils with a clayey subsoil, which does not allow the roots to go too deep for harvesting. It also does well on gray earth and pebble soils. For the quality of tubers and their keeping quality to be good, the soils must be well-drained.

Sweet potato growing stages

- Growing of seedlings
- Planting seedlings in the field
- Agrotechnology
- Harvesting of a yield
- Storage of tubers



<https://www.google.com/search?q=sweet+potatoes+batata+seedling+production&client=firefox-b-d&udm=2&oq=sweet+potatoes+batata+seedling+production#vhid=YQqVdf0M3SLVUM&vssid=mosaic>

Seedling production (traditional method)

- Treatment is carried out 8 days before planting tubers. It is advisable to disinfect the tubers by immersing them for 5-10 minutes in a solution of sulema (30 g per 40 litres of water).
- After winter storage, intact whole sweet potato tubers weighing 150-500 g in mid-February are laid in rows on a surface prepared and moistened in advance, slightly pressing them into sand or soil to a thickness of 3-4 cm. A distance of 1 cm is left between the tubers, and they are covered with a thick cloth or paper for a week.

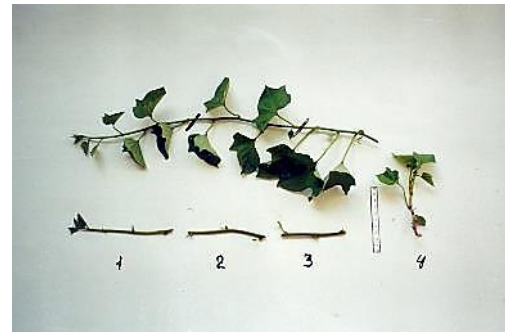


Seedling production (traditional method)

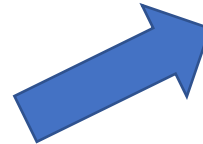
- To lay out 100 kg of medium-sized tubers, an area of 6 m² is required. From 100 kg of tubers laid for germination, you can get 35-40 thousand seedlings.
- The average number of sprouts alternately appearing on the tuber in March-April is 30-40 and up to 50 pieces, and on large tubers weighing 0.4 - 0.5 kg - up to 500 and more sprouts.
- The growth of new sprouts on the tuber occurs only when the previous ones are broken.
- Planting sprouts separated from the tuber (3-5 cm long) provides good survival, but with this method, the number of grown seedlings is reduced.

Seedling production (traditional method)

- When reaching a length of 15-20 cm, seedlings grown from previously planted cuttings are cut, and cuttings are carried out on the upper and middle parts of 4-5 nodes. The lower part of the seedlings remains to grow in the soil with 1-2 nodes above the soil surface.
- Thus, based on specific conditions, you can use various methods of preparing seedlings. Before planting in the field, seedlings should have 4-5 leaves.



Seedling production (in-vitro)



Agrotechnology

- In autumn, it is necessary to apply 20 t/ha of rotted manure, 200-300 kg/ha of superphosphate and 80 kg/ha of potassium fertilizers for plowing. Nitrogen fertilizers 200-300 kg/ha are applied in mixtures with phosphorus fertilizers (100-200 kg/ha) after the first hoe and during the formation of tubers.
- Soil preparation consists of plowing in autumn to a depth of 20-25 cm or in spring 2-3 weeks before planting seedlings in the field. Then discing, grinding, harrowing and cutting furrows are carried out.
- Planting time is the first decade of May. Seedlings are planted manually or with a planting machine. A row spacing of 180 cm and a distance of 40-50 cm between plants.
- During the growing season, 2-3 deep loosening is carried out, then the tubers grow larger and the yield is higher.
- During the growing season, 12-14 irrigations are carried out.

Sweet potato field



Harvesting

- Sweet potatoes should be harvested in clear weather so that the soil is dry. When harvested in humid cold weather, tubers are poorly preserved in winter.
- Before harvesting, you need to cut the tops with a sickle to a height of up to 20 cm to see the location of the tubers. Tubers are dug up by hand with ketmen, a horse plow or a potato digger.
- You need to treat the tubers very carefully, as if they were fruits, without damaging them. Do not clean them from the soil by hitting the ground or throwing them, otherwise they may rot and not be preserved.
- Tubers are sorted, damaged and cut tubers are removed and transported to storage.





- The mass ripening is observed in mid-October (160 days) when planted in open ground in early May. The yield of sweet potatoes when grown in the Tashkent region is 30 - 40 t/ha.



Storage of seed material

- Tubers should be well ripened, do not secrete milky juice, are not damaged and dried before storage.
- During industrial storage, sweet potatoes are stored in above-ground rooms with appropriate conditions of temperature and humidity on racks with a layer of 30-40 cm or in boxes.
- The optimal temperature for storing sweet potatoes is $+10 \dots +13 \text{ }^{\circ}\text{C}$ and humidity not higher than 75%. These conditions must be without sharp fluctuations, otherwise it will lead to a large lunging of tubers. Therefore, the room should be heated and well ventilated.
- Compliance with the storage conditions for tubers will allow the grown crop to be well preserved and ensure the reproduction of planting material next year.



Thank you for your attention!

