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MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATIONS OF THE REPUBLIC OF UZBEKISTAN

GULISTON DAVLAT UNIVERSITETI

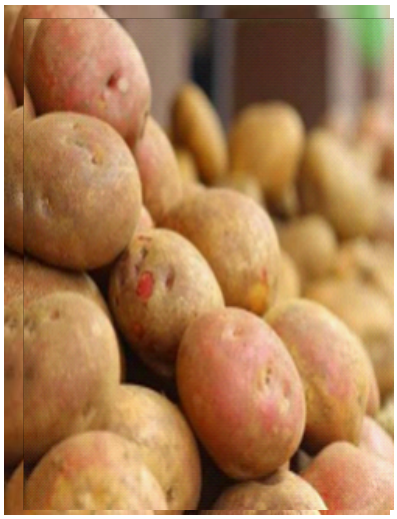
GULISTAN STATE UNIVERSITY

AGROTUPROQSHUNOSLIK VA MELIORATSIYA KAFEDRASI

DEPARTMENT OF AGROSOIL SCIENCE AND RECLAMATION

MA'RUZA MATNI / LECTURE TEXT

POTATO SEED PRODUCTION
KARTOSHKA URUG‘CHILIGI





Guliston – 2026

Abdujalilova O. Potato seed production (Kartoshka urug'chiligi). Ma’ruza matni. – Guliston: GulDU, 2026.

Ushbu ma’ruza matni “Kartoshka urug‘chiligi” mavzusiga bag‘ishlangan bo‘lib, unda kartoshkaning biologik xususiyatlari, navlari, urug‘lik kartoshka yetishtirish texnologiyasi, urug‘lik tuganaklarni tanlash va saqlash, ekish materialini tayyorlash, kartoshka urug‘chiligi tizimi, kasallik va zararkunandalardan himoya qilish usullari haqidagi ma’lumotlar ingliz va o‘zbek tillarida bayon etilgan. Matn mavzuga oid rasm va sxemalar, xulosa va nazorat savollari bilan boyitilgan. Shuningdek, mavzuga oid asosiy atamalar izohi – glossariy keltirilgan. Ma’ruza matni 3-bosqich Mevachilik-sabzavotchilik va uzumchilik yo’nalishi talabalari uchun mo‘ljallangan.

Taqrizchilar:

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Ma’ruza matni Tabiiy fanlar fakulteti Ilmiy kengashining 2-sonli qaroriga asosan (24.09.2026) nashrga tavsiya qilindi.

O‘UK kengashining "____" _____ 2026-yildagi ____-sonli bayoniga asosan Guliston davlat universiteti elektron platformasiga joylashtirishga ruxsat etildi.

POTATO SEED PRODUCTION
KARTOSHKA URUG‘CHILIGI

Objective: To provide students with theoretical and practical knowledge of potato seed production, including the biological characteristics and varieties of potatoes, seed potato cultivation technologies, selection and preparation of seed tubers, storage methods, and protection against diseases and pests. The lecture also aims to develop students' skills in producing high-quality, healthy seed potatoes and applying modern agricultural technologies to improve productivity and quality.

Plan:

1. Importance and objectives of potato seed production.
2. Biological characteristics and varieties of potatoes.
3. Potato seed production systems and seed categories.
4. Technologies for growing seed potatoes.
5. Selection, preparation, and planting of seed tubers.
6. Harvesting and storage of seed potatoes.
7. Protection of potatoes against diseases and pests.

Maqsad: Talabalarga kartoshka urug'chiligi bo'yicha nazariy va amaliy bilimlar berish, jumladan, kartoshkaning biologik xususiyatlari va navlari, urug'lik kartoshka yetishtirish texnologiyalari, urug'lik tuganaklarni tanlash va tayyorlash, saqlash usullari hamda kasallik va zararkunandalardan himoya qilish choralari bilan tanishtirish. Shuningdek, talabalarda yuqori sifatli va sog'lom urug'lik kartoshka yetishtirish, hosildorlik va mahsulot sifatini oshirishda zamonaviy agrotexnologiyalarni qo'llash bo'yicha bilim va ko'nikmalarni shakllantirish.

Reja:

1. Kartoshka urug‘chiligining ahamiyati va asosiy vazifalari.
2. Kartoshkaning biologik xususiyatlari va asosiy navlari.
3. Kartoshka urug‘chiligi tizimi va urug‘lik materialining toifalari.
4. Urug‘lik kartoshka yetishtirish texnologiyasi.
5. Urug‘lik tuganaklarni tanlash, tayyorlash va ekish.
6. Urug‘lik kartoshkani yig‘ib olish va saqlash texnologiyasi.
7. Kartoshka kasalliklari va zararkunandalariga qarshi kurash choralari.

1. Importance and Main Objectives of Potato Seed Production

Potato (Solanum tuberosum L.) is one of the most important food crops in world agriculture. It is rich in starch, carbohydrates, vitamins, and minerals essential for human nutrition. Potatoes are widely used as a food product and in the food-processing industry and animal husbandry. Seed production plays a crucial role in obtaining high and good-quality potato yields.

Potato seed production is a system of agricultural and organizational measures aimed at growing, propagating, selecting, and storing healthy, high-quality seed tubers while maintaining varietal characteristics and high yield potential. Since potatoes are propagated vegetatively, mainly through tubers, the quality of seed material directly affects the yield and quality of the subsequent crop.

One of the main objectives of potato seed production is to preserve the genetic and biological characteristics of a variety, maintain varietal purity, and prevent the spread of viral, bacterial, and fungal diseases. To achieve these objectives, it is necessary to select healthy mother plants, grade seed tubers, regularly inspect potato fields, and implement preventive measures against the spread of diseases.

In addition, potato seed production requires the selection of varieties adapted to local soil and climatic conditions, compliance with planting dates, proper irrigation and fertilization, effective weed control, and timely harvesting. During storage, maintaining appropriate temperature, humidity, and ventilation conditions helps preserve the viability and sprouting capacity of seed tubers.

1. Kartoshka urug‘chiligining ahamiyati va asosiy vazifalari

Kartoshka (Solanum tuberosum L.) dunyo qishloq xo‘jaligida muhim oziq-ovqat ekinlaridan biri hisoblanadi. U inson organizmi uchun zarur bo‘lgan kraxmal, uglevodlar, vitaminlar va mineral moddalarga boy. Kartoshka oziq-ovqat mahsuloti sifatida, shuningdek, qayta ishlash sanoatida va chorvachilikda keng qo‘llaniladi. Kartoshkadan yuqori va sifatli hosil olishda urug‘chilik muhim ahamiyatga ega.

Kartoshka urug‘chiligi – nav xususiyatlarini saqlagan holda sog'lom, sifatli va yuqori hosildorlik imkoniyatiga ega urug'lik tuganaklarni yetishtirish, ko‘paytirish, saralash hamda saqlashga qaratilgan agrotexnik va tashkiliy tadbirlar tizimidir. Kartoshka, asosan, tuganaklari orqali vegetativ yo‘l bilan ko‘paytirilgani sababli urug‘lik materialining sifati kelgusi hosil miqdori va mahsulot sifatiga bevosita ta’sir ko‘rsatadi.

Kartoshka urug‘chiligining asosiy vazifalaridan biri navning genetik va biologik xususiyatlarini saqlash, nav tozaligini ta’minlash hamda virusli, bakterial va zamburug‘li kasalliklar tarqalishining oldini olishdan iborat. Buning uchun sog‘lom ona o‘simliklarni tanlash, urug‘lik tuganaklarni saralash, ekinlarni

muntazam nazorat qilish va kasalliklarga qarshi profilaktik tadbirlarni amalga oshirish zarur.

Bundan tashqari, kartoshka urug‘chiligida tuproq-iqlim sharoitiga mos navlarni tanlash, ekish muddatlariga rioya qilish, sug‘orish va oziqlantirishni to‘g‘ri tashkil etish, begona o‘tlarga qarshi kurashish hamda hosilni o'z vaqtida yig‘ib olish muhim hisoblanadi. Urug‘lik tuganaklarni saqlash davrida harorat, namlik va shamollatish sharoitlarini me'yorida saqlash ularning unuvchanligi va hayotchanligini ta’minlashga yordam beradi.

2. Biological Characteristics and Main Varieties of Potatoes

Potato (Solanum tuberosum L.) is a perennial herbaceous plant belonging to the Solanaceae family. In agricultural production, it is mainly cultivated as an annual crop. Potatoes are widely grown throughout the world because of their high nutritional value, adaptability to different growing conditions, and economic importance. Understanding the biological characteristics of potatoes is essential for selecting suitable varieties and applying appropriate cultivation practices.

The potato plant consists of roots, stems, leaves, flowers, fruits, and underground tubers. Its root system develops from the base of the stem and provides the plant with water and nutrients from the soil. The stems are herbaceous and may be erect or semi-erect. The leaves are compound, and their development plays an important role in photosynthesis and the accumulation of organic substances. Under favorable conditions, potato plants produce flowers, which may vary in color depending on the variety. The fruit is a small, green berry containing botanical seeds.

One of the most important biological characteristics of potatoes is tuber formation. Tubers develop at the ends of underground stolons and serve as storage organs for nutrients, particularly starch. They are also used as the main planting material for vegetative propagation. Tuber formation and development are influenced by temperature, day length, soil moisture, nutrient availability, and the genetic characteristics of the variety.

Potatoes generally grow best in cool conditions. Moderate temperatures favor the development of shoots and leaves, while tuber formation is usually favored by relatively cool soil conditions. High temperatures can reduce tuber formation and yield. Potatoes require sufficient soil moisture, especially during flowering and tuber development. However, excessive moisture and waterlogging can restrict root respiration and increase the risk of diseases. Well-drained, fertile, loose soils are generally suitable for potato cultivation.

Potato varieties differ in maturity period, yield potential, tuber shape, skin and flesh color, starch content, disease resistance, and suitability for processing or direct consumption. According to their maturity period, varieties are commonly classified

as early, medium-early, medium, medium-late, and late. Early varieties are harvested sooner, while late varieties generally require a longer growing season and may be suitable for longer-term storage, depending on their characteristics and storage conditions.

Examples of internationally known potato varieties include 'Agria', 'Desiree', 'Kennebec', 'Russet Burbank', and 'Spunta'. These varieties differ in their agronomic characteristics and uses. For example, some are suitable for processing into French fries and chips, while others are mainly used for cooking or general food consumption. The choice of variety should be based on local soil and climatic conditions, market demand, disease pressure, and the intended purpose of production.

2. Kartoshkaning biologik xususiyatlari va asosiy navlari

Kartoshka (Solanum tuberosum L.) ituzumdoshlar oilasiga mansub ko‘p yillik o‘tsimon o‘simlik hisoblanadi. Qishloq xo‘jaligi ishlab chiqarishida u, asosan, bir yillik ekin sifatida yetishtiriladi. Kartoshka yuqori oziqaviy qiymati, turli o‘sish sharoitlariga moslasha olishi va iqtisodiy ahamiyati tufayli dunyoning ko‘plab mamlakatlarida keng ekiladi. Kartoshkaning biologik xususiyatlarini bilish mos navlarni tanlash va yetishtirish agrotexnikasini to‘g‘ri tashkil etish uchun muhimdir.

Kartoshka o‘simligi ildiz, poya, barg, gul, meva va yerosti tuganaklaridan tashkil topgan. Uning ildiz tizimi poyaning pastki qismidan rivojlanib, tuproqdan suv va oziq moddalarni o‘zlashtirishni ta'minlaydi. Poyalari o‘tsimon bo‘lib, tik yoki yarim tik o'sishi mumkin. Barglari murakkab tuzilishga ega bo'lib, fotosintez jarayoni va organik moddalarning to‘planishida muhim rol o‘ynaydi. Qulay sharoitlarda kartoshka gullaydi, gullarining rangi esa naviga qarab farqlanadi. Mevasi yashil rangli, mayda rezavor bolib, uning ichida botanika urug'lari shakllanadi.

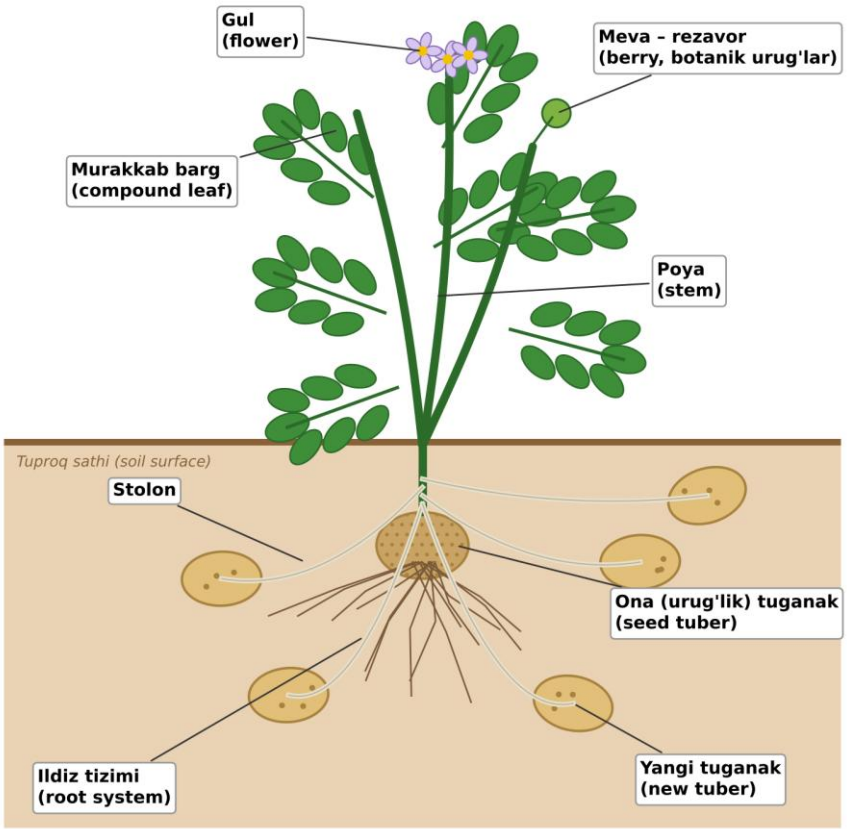
Kartoshkaning eng muhim biologik xususiyatlaridan biri tuganak hosil qilishidir. Tuganaklar yerosti stolonlarining uchki qismlarida rivojlanib, asosan kraxmal kabi oziq moddalarni to‘playdi. Shuningdek, ular kartoshkani vegetativ yo‘l bilan ko‘paytirishda asosiy ekish materiali hisoblanadi. Tuganaklarning hosil bo‘lishi va rivojlanishiga harorat, kun uzunligi, tuproq namligi, oziq moddalar bilan ta’minlanganlik hamda navning genetik xususiyatlari ta’sir ko‘rsatadi.

Kartoshka, odatda, salqin sharoitda yaxshi rivojlanadi. Mo‘tadil harorat poya va barglarning o‘sishiga yordam beradi, nisbatan salqin tuproq sharoiti esa tuganaklarning shakllanishi uchun qulay hisoblanadi. Yuqori harorat tuganak hosil bo’lishini va hosildorlikni kamaytirishi mumkin. Kartoshka, ayniqsa, gullash va tuganaklarning rivojlanish davrida yetarli tuproq namligiga muhtoj. Biroq ortiqcha namlik va tuproqning suv bilan botqoqlanishi ildizlarning nafas olishini

qiyinlashtiradi hamda kasalliklar xavfini oshiradi. Kartoshka yetishtirish uchun unumdor, yumshoq va yaxshi drenajlangan tuproqlar maqsadga muvofiqdir.

Kartoshka navlari pishish muddati, hosildorligi, tuganaklarining shakli, po‘stlog‘i va etining rangi, kraxmal miqdori, kasalliklarga chidamliligi hamda qayta ishlash yoki bevosita iste’mol qilishga yaroqliligi bilan farqlanadi. Pishish muddatiga ko‘ra navlar ertapishar, o‘rtacha ertapishar, o‘rtapishar, o‘rtacha kechpishar va kechpishar guruhlarga ajratiladi. Ertapishar navlar qisqa muddatda hosil beradi, kechpishar navlar esa uzoqroq vegetatsiya davrini talab qiladi va o‘z xususiyatlari hamda saqlash sharoitlariga qarab uzoq muddat saqlash uchun mos bo‘lishi mumkin.

Dunyoda keng tanilgan kartoshka navlariga “Agria”, “Desiree”, “Kennebec”, “Russet Burbank” va “Spunta” kiradi. Ushbu navlar agrobiologik xususiyatlari va foydalanish yo‘nalishlari bilan farqlanadi. Masalan, ayrim navlar fri kartoshkasi va chips ishlab chiqarishga mos bo‘lsa, boshqalari pishirish va kundalik oziq-ovqat sifatida iste’mol qilish uchun qo‘llaniladi. Nav tanlashda mahalliy tuproq-iqlim sharoitlari, bozor talabi, kasalliklar tarqalish darajasi va yetishtirishdan qo‘langan maqsad hisobga olinishi kerak.



1-rasm. Kartoshka o'simligining tuzilishi

Figure 1. Structure of the potato plant

3. Potato Seed Production System and Categories of Seed Material

Potato seed production is an organized system of producing, multiplying, maintaining, and distributing high-quality seed potatoes while preserving their genetic identity, varietal purity, and health. It plays an important role in increasing potato productivity, improving tuber quality, and ensuring stable agricultural production. Since potatoes are mainly propagated vegetatively through tubers, the health and quality of the planting material directly influence the development and productivity of the crop.

The potato seed production system consists of several stages, including the selection of suitable varieties, the production of initial seed material, successive multiplication, field inspection, disease control, harvesting, grading, storage, and distribution. Each stage must be carried out carefully to maintain the quality of seed tubers and prevent the spread of diseases, particularly viral infections that may accumulate over successive vegetative generations.

An important component of modern potato seed production is the use of healthy, disease-free starting material. In many seed production systems, initial material is obtained through tissue culture and the production of plantlets or microtubers under controlled conditions. These materials can be used to establish early generations of seed potatoes. Subsequent multiplication takes place in the field under appropriate agricultural practices and regular inspections.

Seed potatoes are classified into categories according to their origin, generation, health status, and compliance with established certification standards. The exact names and requirements of these categories may differ between countries and certification systems. In general, the seed production process includes the following groups:

1. **Pre-basic seed:** The initial high-quality seed material produced under strict conditions to maintain varietal identity and health.
2. **Basic seed:** Seed potatoes produced from pre-basic material and used for further multiplication under controlled conditions.
3. **Certified seed:** Seed potatoes that meet established standards for varietal purity, health, and physical quality and are intended for commercial crop production.

In some seed certification systems, additional classes or generations are used within these categories. The classification and labeling of seed potatoes must therefore follow the applicable national regulations and certification requirements.

The quality of seed potatoes is determined by several factors, including varietal purity, tuber size and condition, freedom from regulated diseases and pests, physical damage, and storage quality. Seed tubers should be uniform, healthy, and

free from serious signs of rotting or disease. Regular field inspections, removal of off-type plants, appropriate crop rotation, and hygienic handling practices help maintain seed quality and reduce the risk of disease transmission.

Proper storage is also essential for preserving the viability of seed potatoes. Suitable temperature, humidity, ventilation, and protection from light help reduce excessive sprouting, dehydration, and rotting. Before planting, seed tubers should be inspected and prepared according to the variety, planting date, and local growing conditions.

3. Kartoshka urug‘chiligi tizimi va urug‘lik materialining toifalari

Kartoshka urug‘chiligi – kartoshkaning genetik xususiyatlari, nav tozaligi va sog‘lomligini saqlagan holda yuqori sifatli urug'lik materialini yetishtirish, ko‘paytirish, saqlash va tarqatishga qaratilgan tashkiliy hamda agrotexnik tadbirlar tizimidir. U kartoshka hosildorligini oshirish, tuganaklar sifatini yaxshilash va qishloq xo‘jaligi ishlab chiqarishining barqarorligini ta’minlashda muhim ahamiyatga ega. Kartoshka asosan tuganaklari orqali vegetativ yo‘l bilan ko‘paytirilgani sababli ekish materialining sog‘lomligi va sifati o‘simlikning rivojlanishi hamda hosildorligiga bevosita ta’sir ko‘rsatadi.

Kartoshka urug‘chiligi tizimi mos navlarni tanlash, dastlabki urug‘lik materialini yetishtirish, uni izchil ko‘paytirish, ekin maydonlarini nazorat qilish, kasalliklarga qarshi kurashish, hosilni yig'ib olish, saralash, saqlash va tarqatish kabi bosqichlardan iborat. Har bir bosqich urug‘lik tuganaklar sifatini saqlash va ayniqsa, vegetativ ko‘payish jarayonida avloddan avlodga o‘tishi mumkin bo‘lgan virusli kasalliklar tarqalishining oldini olish uchun muhimdir.

Zamonaviy kartoshka urug‘chiligida sog‘lom va kasalliklardan xoli boshlang‘ich materialdan foydalanish alohida ahamiyatga ega. Ko‘plab urug‘chilik tizimlarida dastlabki material to‘qima kulturasi usuli orqali, nazorat qilinadigan sharoitda o‘simlik ko'chatlari yoki mikrotuganaklar yetishtirish yo‘li bilan olinadi. Ushbu materiallardan kartoshkaning dastlabki urug‘lik avlodlarini shakllantirishda foydalanish mumkin. Keyingi ko‘paytirish bosqichlari dalada tegishli agrotexnik tadbirlar va muntazam nazorat asosida amalga oshiriladi.

Urug‘lik kartoshka kelib chiqishi, avlodi, sog‘lomlik darajasi va belgilangan sertifikatlash talablariga muvofiqligiga ko‘ra toifalarga ajratiladi. Ushbu toifalarning aniq nomlari va ularga qo‘yiladigan talablar mamlakatlar hamda sertifikatlash tizimlariga qarab farq qilishi mumkin. Umumiy urug‘chilik tizimida quyidagi guruhlar uchraydi:

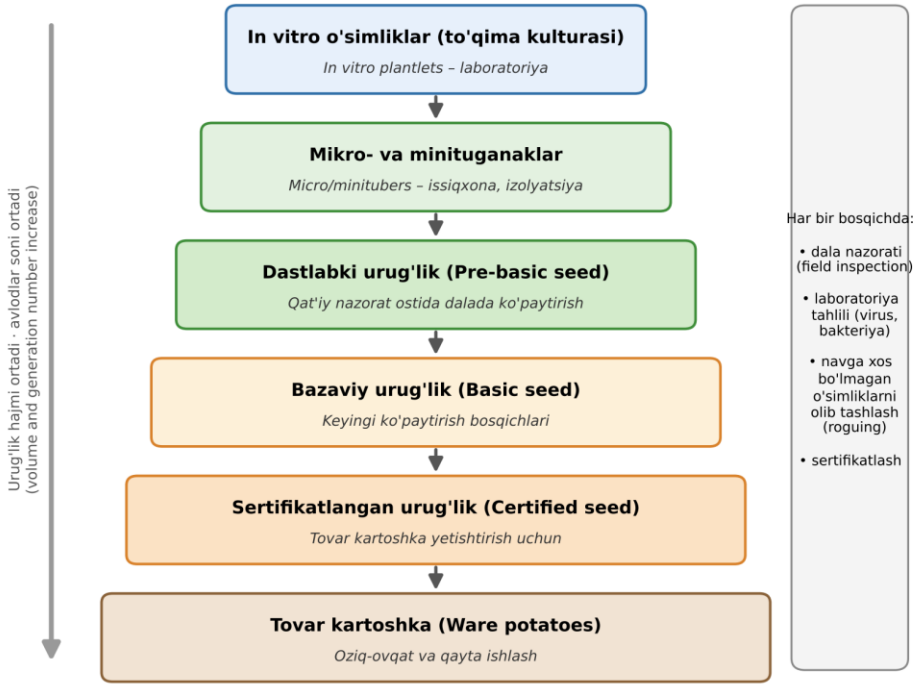
4. **Dastlabki urug'lik material (pre-basic seed):** Navning genetik xususiyatlari va sog‘lomligini saqlash maqsadida qat’iy nazorat sharoitida yetishtiriladigan boshlang‘ich, yuqori sifatli material.

5. **Bazaviy urug'lik material (basic seed):** Dastlabki urug‘lik materialdan yetishtiriladigan va keyingi ko‘paytirish bosqichlarida foydalaniladigan urug‘lik kartoshka.
6. **Sertifikatlangan urug'lik material (certified seed):** Nav tozaligi, sog‘lomligi va fizik sifat ko‘rsatkichlari bo‘yicha belgilangan standartlarga javob beradigan, tovar kartoshka yetishtirish uchun mo‘ljallangan urug‘lik material.

Ayrim urug‘lik sertifikatlash tizimlarida ushbu toifalar doirasida qo‘shimcha sinflar yoki avlodlar ham qo‘llaniladi. Shu sababli urug‘lik kartoshkaning tasnifi va yorliqlanishi amaldagi milliy me’yorlar hamda sertifikatlash talablariga muvofiq amalga oshirilishi lozim.

Urug‘lik kartoshkaning sifati bir qancha omillarga, jumladan, nav tozaligi, tuganaklarning o'lchami va holati, karantin ahamiyatiga ega kasallik va zararkunandalardan xoliligi, mexanik shikastlanish darajasi hamda saqlash sifatiga bog‘liq. Urug‘lik tuganaklar bir xil, sog‘lom, chirish va kasalliklarning jiddiy belgilarisiz bo‘lishi kerak. Dala maydonlarini muntazam tekshirish, navga xos bo‘lmagan o‘simliklarni olib tashlash, almashlab ekishni to‘g‘ri tashkil etish va sanitariya-gigiyena qoidalariga rioya qilish urug‘lik sifatini saqlashga yordam beradi.

Urug‘lik kartoshkani to‘g‘ri saqlash ham uning hayotchanligini saqlab qolishda muhim ahamiyatga ega. Harorat, namlik va shamollatish sharoitlarini me’yorida saqlash, shuningdek, tuganaklarni yorug‘likdan himoya qilish ortiqcha nishlash, suvsizlanish va chirishning oldini olishga yordam beradi. Ekishdan oldin urug‘lik tuganaklar tekshirilishi va nav xususiyatlari, ekish muddati hamda mahalliy sharoitlarga muvofiq tayyorlanishi lozim.



2-rasm. Kartoshka urug‘chiligi tizimi va urug‘lik materialining toifalari

Figure 2. Potato seed production system and categories of seed material

4. Technologies for Producing Seed Potatoes

Seed potato production technology is a system of agricultural practices aimed at obtaining healthy, high-quality seed tubers with high yield potential and stable varietal characteristics. The success of seed potato production depends on the selection of suitable varieties, soil preparation, planting time, planting density, irrigation, fertilization, crop protection, and timely harvesting.

The first stage is the selection of an appropriate field. Potatoes grow best in fertile, loose, well-drained soils with adequate aeration. Fields with a history of serious potato diseases should be avoided. Crop rotation is essential for reducing the accumulation of soil-borne pathogens and pests. Cereals, legumes, and other suitable crops can be included in the rotation according to local agricultural conditions.

Before planting, the soil is prepared by ploughing, cultivating, and leveling the field as necessary. Well-prepared soil promotes uniform emergence, root development, and tuber formation. Healthy, certified seed tubers of a suitable variety should be used to ensure good crop establishment and maintain varietal purity.

Planting time depends on the local climate, soil temperature, variety, and production purpose. Seed tubers should be planted at an appropriate depth and spacing to provide sufficient space for plant development and tuber growth. The

recommended planting density varies according to the variety, tuber size, soil fertility, and intended seed tuber size.

Proper irrigation and balanced fertilization are important throughout the growing season. Nitrogen supports vegetative growth, phosphorus promotes root development, and potassium contributes to water regulation and tuber quality. Fertilizer application should be based on soil analysis and crop requirements. Adequate moisture is particularly important during tuber initiation and enlargement, while excessive watering should be avoided because it may increase the risk of rot and other diseases.

During the growing season, the crop should be inspected regularly. Off-type plants and plants showing symptoms of serious diseases should be removed where appropriate. Weeds must be controlled, and integrated pest management practices should be applied to reduce damage caused by insects and pathogens. Earthing up helps cover developing tubers, protects them from light, and supports proper field management.

Harvesting should take place when the crop has reached the appropriate stage of maturity and the tuber skins are sufficiently firm. The harvested tubers are carefully handled, sorted, and prepared for storage. By following scientifically based cultivation practices, seed potato producers can maintain seed quality, improve productivity, and obtain reliable planting material for subsequent seasons.

4. Urug‘lik kartoshka yetishtirish texnologiyasi

Urug‘lik kartoshka yetishtirish texnologiyasi – yuqori hosildorlik imkoniyatiga ega, sog‘lom, sifatli va nav xususiyatlari saqlangan urug‘lik tuganaklarni yetishtirishga qaratilgan agrotexnik tadbirlar tizimidir. Urug‘lik kartoshka yetishtirishning muvaffaqiyati mos navni tanlash, tuproqni tayyorlash, ekish muddatlari, ekish zichligi, sug'orish, o‘g‘itlash, ekinlarni himoya qilish va hosilni o‘z vaqtida yig‘ib olishga bog‘liq.

Dastlab urug'lik kartoshka ekiladigan maydon to'g'ri tanlanadi. Kartoshka unumdor, yumshoq, havo almashinuvi yaxshi va ortiqcha suvni chiqarib yuboradigan tuproqlarda yaxshi rivojlanadi. Kartoshka kasalliklari keng tarqalgan maydonlardan imkon qadar foydalanmaslik lozim. Almashlab ekishni tashkil etish tuproqda kasallik qo'zg'atuvchilar va zararkunandalar to'planishini kamaytirishga yordam beradi. Mahalliy sharoitga qarab, almashlab ekishda boshoqli don ekinlari, dukkakli ekinlar va boshqa mos ekinlardan foydalanish mumkin.

Ekishdan oldin tuproq haydaladi, yumshatiladi va zaruratga ko‘ra maydon tekislanadi. Tuproqni sifatli tayyorlash nihollarning bir tekis unib chiqishi, ildizlarning rivojlanishi va tuganaklarning shakllanishi uchun qulay sharoit yaratadi. Ekinning yaxshi rivojlanishi va nav tozaligini saqlash uchun sog‘lom,

sertifikatlangan va mahalliy sharoitga mos urug‘lik tuganaklardan foydalanish tavsiya etiladi.

Ekish muddati mahalliy iqlim sharoiti, tuproq harorati, navning xususiyatlari va yetishtirish maqsadiga bog‘liq. Urug'lik tuganaklar o‘simliklarning normal rivojlanishi va tuganaklarning shakllanishi uchun yetarli joy qoldiradigan chuqurlik va oraliqda ekiladi. Ekish zichligi nav, tuganak kattaligi, tuproq unumdorligi va olinishi rejalashtirilgan urug‘lik tuganaklarning o‘lchamiga qarab belgilanadi.

Vegetatsiya davrida to‘g‘ri sug‘orish va muvozanatli o‘g‘itlash muhim ahamiyatga ega. Azot o‘simlikning vegetativ o‘sishini ta’minlaydi, fosfor ildiz tizimining rivojlanishiga yordam beradi, kaliy esa suv almashinuvi va tuganaklar sifatida muhim rol o‘ynaydi. O‘g‘itlar tuproq tahlili va o‘simlikning oziq moddalarga bo‘lgan ehtiyojidan kelib chiqib qo‘llanilishi kerak. Ayniqsa, tuganaklar hosil bo‘lishi va kattalashishi davrida tuproq namligini yetarli darajada saqlash zarur. Biroq ortiqcha sug‘orish tuganaklarning chirishi va boshqa kasalliklar xavfini oshirishi mumkin.

O‘suv davrida ekinlar muntazam nazorat qilinadi. Nav xususiyatlariga mos kelmaydigan hamda jiddiy kasallik belgilari kuzatilgan o‘simliklar tegishli tartibda olib tashlanadi. Begona o‘tlarga qarshi kurashish, zararkunandalar va kasalliklarni kamaytirish uchun uyg‘unlashgan himoya usullaridan foydalanish lozim. O‘simlik tupini tuproq bilan ko‘mish, ya’ni jo‘yaklarni qayta ishlash va tuproq tortish, rivojlanayotgan tuganaklarni yorug'likdan himoya qilishga hamda dalani to‘g‘ri parvarishlashga yordam beradi.

Kartoshka hosili ekin tegishli yetilish bosqichiga yetganda va tuganaklar po‘stlog‘i yetarlicha mustahkamlanganda yig‘ib olinadi. Yig‘ilgan tuganaklar ehtiyotkorlik bilan tashiladi, saralanadi va saqlashga tayyorlanadi. Ilmiy asoslangan agrotexnik tadbirlarga rioya qilish urug‘lik sifatini saqlash, hosildorlikni oshirish va keyingi mavsumlar uchun ishonchli ekish materialini olish imkonini beradi.



3-rasm. Urug‘lik kartoshka yetishtirish texnologiyasining asosiy bosqichlari

Figure 3. Main stages of seed potato production technology

5. Selection, Preparation, and Planting of Seed Tubers

The selection, preparation, and planting of seed tubers are essential stages in potato seed production. The quality of the planting material affects crop emergence, plant development, disease incidence, tuber formation, and final yield. Therefore, seed tubers should be selected carefully and prepared according to the variety and local growing conditions.

Seed tubers should come from a reliable source and meet the applicable seed certification requirements. They should be true to variety, healthy, firm, and free from serious mechanical damage, rot, and visible disease symptoms. Tubers with abnormal shapes, suspicious lesions, or signs of pest damage should be excluded. Appropriate grading helps provide a more uniform crop and facilitates the adjustment of planting density.

The size of seed tubers is an important factor in planting. Medium-sized tubers are commonly used because they generally provide sufficient reserves for sprouting and early plant growth. However, the recommended size depends on the variety, production system, and certification standards. Cutting seed tubers is not always advisable because wounds can serve as entry points for pathogens. Where cutting is permitted and necessary, clean tools and appropriate hygiene measures must be used.

Before planting, seed tubers may be warmed or pre-sprouted under suitable conditions to encourage the development of strong, healthy sprouts. This practice can promote more uniform emergence, particularly when the planting schedule and local climate require it. Tubers should be handled gently to avoid damaging sprouts. Any chemical or biological treatment must be selected according to local regulations, product instructions, and the specific disease risks.

Planting should be carried out when soil and weather conditions are suitable. Tubers are placed at a recommended depth and spacing, depending on soil type, tuber size, variety, and the intended production purpose. Proper spacing improves air circulation and provides sufficient room for plant growth and tuber development. Planting too deeply or too shallowly may lead to uneven emergence or tuber exposure.

After planting, soil moisture should be maintained at an appropriate level, and the field should be monitored for emergence and early signs of disease or pest activity. Healthy planting material, careful handling, suitable planting conditions, and good field management contribute to uniform crop establishment and the production of high-quality seed potatoes.

5. Urug‘lik tuganaklarni tanlash, tayyorlash va ekish

Urug‘lik tuganaklarni tanlash, tayyorlash va ekish kartoshka urug‘chiligidagi muhim bosqichlardan hisoblanadi. Ekish materialining sifati nihollarning unib chiqishi, o‘simliklarning rivojlanishi, kasalliklarning tarqalishi, tuganaklar hosil bo‘lishi va yakuniy hosildorlikka ta’sir ko'rsatadi. Shu sababli urug‘lik tuganaklar sinchiklab tanlanishi va nav xususiyatlari hamda mahalliy yetishtirish sharoitlariga muvofiq tayyorlanishi kerak.

Urug‘lik tuganaklar ishonchli manbadan olinishi va amaldagi urug‘lik sertifikatlash talablariga javob berishi lozim. Ular navga xos, sog‘lom, qattiq va jiddiy mexanik shikastlanishlar, chirish hamda ko‘zga ko‘rinadigan kasallik belgilaridan xoli bo‘lishi kerak. G‘ayritabiiy shaklga ega, shubhali dog‘lari mavjud yoki zararkunandalar tomonidan zararlangan tuganaklar ekish uchun ajratilmaydi. Tuganaklarni o‘lchamiga qarab saralash ekinning bir tekis rivojlanishiga va ekish zichligini to‘g‘ri belgilashga yordam beradi.

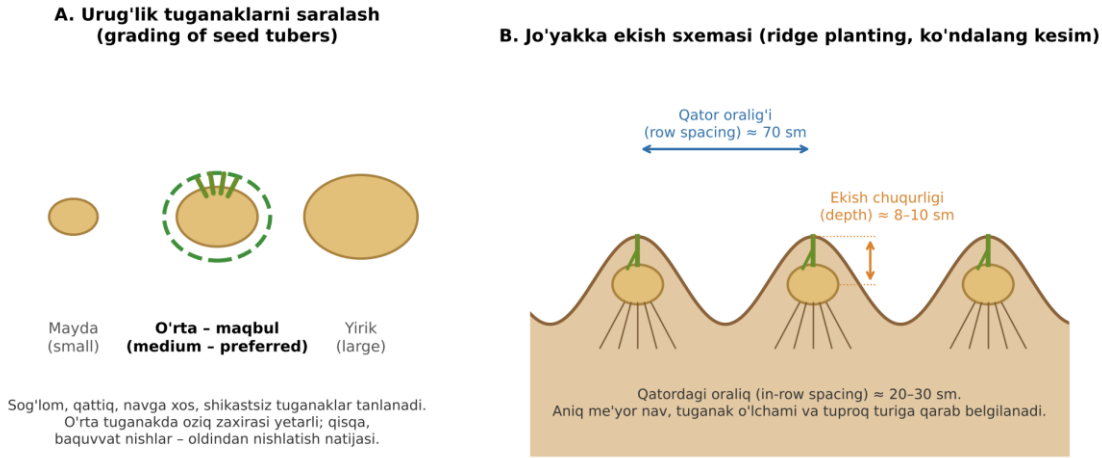
Urug‘lik tuganaklarning o‘lchami ekishda muhim omil hisoblanadi. Odatda, o‘rtacha kattalikdagi tuganaklardan foydalaniladi, chunki ularda nihollarning unib chiqishi va dastlabki o'sishi uchun yetarli oziq moddalar zaxirasi mavjud bo‘ladi. Biroq tavsiya etiladigan o‘lcham nav, yetishtirish tizimi va sertifikatlash talablariga bog‘liq. Urug‘lik tuganaklarni kesish har doim ham tavsiya etilmaydi, chunki kesilgan joylar kasallik qo‘zg‘atuvchilari kirishi uchun sharoit yaratishi mumkin. Kesishga ruxsat berilgan va bu zarur bo'lgan hollarda toza asboblar hamda sanitariya qoidalariga rioya qilish lozim.

Ekishdan oldin urug‘lik tuganaklar mos sharoitda isitilishi yoki nishlatilishi mumkin. Bu jarayon sog‘lom va baquvvat nihollarning shakllanishiga yordam beradi. Ayniqsa, ekish muddati va mahalliy iqlim sharoiti shuni talab qilganda, oldindan nishlatish nihollarning bir tekis unib chiqishini ta’minlashi mumkin. Nishlarni shikastlamaslik uchun tuganaklarni ehtiyotkorlik bilan tashish va ishlov

berish kerak. Kimyoviy yoki biologik preparatlardan foydalanishda mahalliy me'yoriy talablar, mahsulot yo‘riqnomasi va mavjud kasallik xavflari hisobga olinishi zarur.

Ekish tuproq va ob-havo sharoitlari qulay bo‘lgan davrda amalga oshiriladi. Tuganaklar tuproq turi, tuganak o'lchami, nav xususiyatlari va yetishtirish maqsadiga muvofiq belgilangan chuqurlik hamda oraliqda ekiladi. To‘g‘ri ekish oralig‘i havo almashinuvini yaxshilaydi, o'simliklarning rivojlanishi va tuganaklarning shakllanishi uchun yetarli joy yaratadi. Tuganaklarni haddan tashqari chuqur yoki sayoz ekish nihollarning notekis unib chiqishiga yoxud tuganaklarning tuproq yuzasiga ochilib qolishiga sabab bo‘lishi mumkin.

Ekishdan keyin tuproq namligi me’yorida saqlanadi, nihollarning unib chiqishi va kasallik yoki zararkunandalarning dastlabki belgilari muntazam kuzatib boriladi. Sog‘lom ekish materiali, ehtiyotkorlik bilan ishlov berish, qulay ekish sharoitlari va dalani to‘g‘ri parvarishlash ekinning bir tekis rivojlanishi hamda yuqori sifatli urug'lik kartoshka yetishtirishga yordam beradi.



4-rasm. Urug’lik tuganaklarni saralash va jo‘yakka ekish sxemasi

Figure 4. Grading of seed tubers and ridge planting scheme

6. Harvesting and Storage Technologies for Seed Potatoes

Harvesting and storage are critical stages in seed potato production because they directly affect tuber health, viability, and suitability for planting in the following season. Poor harvesting practices can cause mechanical damage, while unsuitable storage conditions may lead to dehydration, excessive sprouting, rotting, and the spread of diseases.

Seed potatoes should be harvested when the crop has reached the appropriate stage of maturity and the tuber skins are sufficiently firm. Before harvesting, the field should be inspected to assess crop maturity and identify any disease-related concerns. In some production systems, haulm destruction or removal is carried out

before harvesting to help control tuber size, strengthen the skins, and facilitate harvest. The timing of this operation should be determined according to crop condition, variety, disease risk, and local regulations.

Harvesting should be performed carefully to minimize cuts, bruises, and other mechanical injuries. Damaged tubers are more susceptible to infection and deterioration during storage. Harvested potatoes should not be left exposed to direct sunlight for long periods because this can cause greening and reduce their quality. Tubers should be handled gently during lifting, transport, and sorting. After harvesting, seed tubers are graded according to size, health, varietal characteristics, and the applicable seed standards. Tubers showing rot, serious damage, or signs of disease should be removed. A suitable curing period may be used under controlled conditions to allow minor skin injuries to heal before long-term storage. However, curing conditions must be selected carefully to avoid promoting disease development.

Storage facilities should be clean, well ventilated, and protected from excessive moisture and temperature fluctuations. Temperature and humidity requirements depend on the variety, storage duration, and intended use of the seed potatoes. Appropriate conditions help reduce weight loss, limit rotting, and maintain the physiological condition of the tubers. Seed potatoes are generally stored in darkness or under conditions that prevent unwanted greening.

Regular inspection during storage is essential. Rotten or diseased tubers should be removed promptly, and the temperature, humidity, and ventilation should be monitored. Before planting, the stored material should be inspected again and prepared according to the planting schedule and local growing conditions.

In conclusion, careful harvesting, proper grading, suitable curing, and well-managed storage are essential for preserving the quality of seed potatoes. These practices help maintain tuber viability, reduce losses, and ensure the availability of healthy planting material for the next growing season.

6. Urug'lik kartoshkani yig'ib olish va saqlash texnologiyasi

Urug‘lik kartoshkani yig‘ib olish va saqlash urug‘chilikning muhim bosqichlari bo‘lib, ular tuganaklarning sog‘lomligi, hayotchanligi va keyingi mavsumda ekish uchun yaroqliligiga bevosita ta’sir ko‘rsatadi. Hosilni noto‘g‘ri yig‘ib olish mexanik shikastlanishga, saqlash sharoitlarining talabga javob bermasligi esa tuganaklarning suvsizlanishi, ortiqcha nishlashi, chirishi va kasalliklar tarqalishiga olib kelishi mumkin.

Urug‘lik kartoshka ekin tegishli yetilish bosqichiga yetganda va tuganaklar po‘stlog‘i yetarlicha mustahkamlanganda yig‘ib olinadi. Hosilni yig‘ishdan oldin

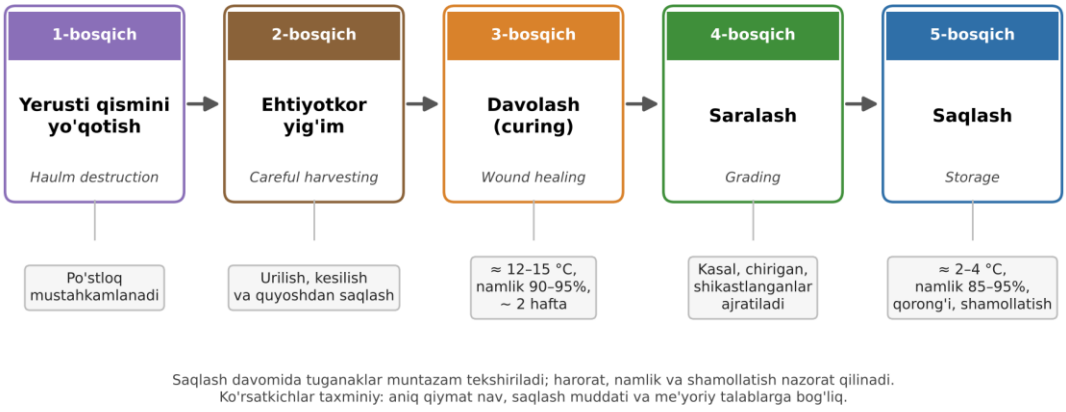
daladagi ekinlarning yetilganlik darajasi baholanadi va kasallik bilan bog‘liq xavflar aniqlanadi. Ayrim yetishtirish tizimlarida hosilni yig‘ishdan oldin kartoshkaning yerusti poya va barg qismlari quritiladi yoki olib tashlanadi. Bu tadbir tuganaklar o‘lchamini boshqarish, po‘stlog‘ining mustahkamlanishi va hosilni yig‘ib olishni yengillashtirishga yordam beradi. Bunday ishlarning muddati ekinning holati, nav xususiyatlari, kasallik xavfi va mahalliy talablarga muvofiq belgilanadi.

Hosilni yig‘ib olishda tuganaklarni kesib yuborish, urib olish yoki boshqa mexanik shikastlanishlardan saqlash lozim. Shikastlangan tuganaklar saqlash davrida kasallik qo‘zg‘atuvchilar bilan zararlanishga va sifatining pasayishiga ko‘proq moyil bo'ladi. Yig‘ib olingan kartoshkani uzoq vaqt to‘g‘ridan-to‘g‘ri quyosh nuri ostida qoldirmaslik kerak, chunki bu tuganaklarning yashillanishiga va sifatining pasayishiga sabab bo‘lishi mumkin. Tuganaklarni kovlash, tashish va saralash jarayonlarida ehtiyotkorlik bilan ishlov berish muhimdir.

Hosil yig‘ib olingach, urug‘lik tuganaklar o‘lchami, sog‘lomligi, nav xususiyatlari va amaldagi urug‘lik standartlariga muvofiqligiga qarab saralanadi. Chirigan, jiddiy shikastlangan yoki kasallik belgilari mavjud tuganaklar ajratib olinadi. Uzoq muddat saqlashdan oldin mayda po‘stloq shikastlanishlarining bitishiga yordam beruvchi maxsus davolash davri tashkil etilishi mumkin. Bunda kasalliklar rivojlanishiga sharoit yaratmaslik uchun harorat va namlik sharoitlari to‘g‘ri tanlanishi zarur.

Saqlash omborlari toza, yaxshi shamollatiladigan va ortiqcha namlik hamda haroratning keskin o‘zgarishlaridan himoyalangan bo'lishi kerak. Harorat va namlikka bo‘lgan talablar nav xususiyatlari, saqlash muddati va urug‘lik kartoshkadan foydalanish maqsadiga bog'liq. To‘g‘ri saqlash sharoitlari tuganaklarning vazn yo‘qotishini kamaytirish, chirishning oldini olish va fiziologik holatini saqlashga yordam beradi. Urug'lik kartoshka, odatda, qorong‘i sharoitda yoki tuganaklarning istalmagan yashillanishiga yo‘l qo‘ymaydigan muhitda saqlanadi.

Saqlash davrida tuganaklarni muntazam tekshirish zarur. Chirigan yoki kasallangan tuganaklar o‘z vaqtida olib tashlanadi, harorat, namlik va shamollatish holati nazorat qilinadi. Ekishdan oldin saqlangan urug‘lik material yana bir bor tekshirilib, ekish muddati va mahalliy sharoitlarga muvofiq tayyorlanadi.



5-rasm. Urug‘lik kartoshkani yig‘ib olish va saqlash bosqichlari

Figure 5. Stages of harvesting and storing seed potatoes

7. Measures to Control Potato Diseases and Pests

Potato diseases and pests are among the major factors that can reduce crop yield, tuber quality, and the value of seed material. Seed potato production requires particular attention to plant health because many pathogens, especially viruses and some bacterial and fungal organisms, can spread through infected tubers. Effective crop protection is therefore essential for maintaining seed quality and preventing the transmission of diseases to subsequent generations.

Potatoes may be affected by various diseases, including late blight, early blight, common scab, blackleg, bacterial soft rot, and viral diseases. Late blight, caused by Phytophthora infestans, can rapidly damage leaves and stems under favorable weather conditions and may also affect tubers. Early blight is commonly associated with Alternaria species. Common scab affects the tuber surface, while bacterial soft rot causes tissue breakdown and decay. Viral infections can lead to leaf symptoms, reduced plant vigor, and lower yields.

Important potato pests include the Colorado potato beetle, aphids, potato tuber moth in affected regions, and certain soil-dwelling pests. These organisms may damage leaves, stems, roots, or tubers. Aphids are particularly important in seed production because they can transmit several potato viruses from infected plants to healthy ones.

The first step in disease and pest management is prevention. Certified, healthy seed tubers should be planted, and fields should be selected carefully. Crop rotation, removal of infected plants and volunteer potatoes, control of weeds that may host pests or pathogens, and cleaning of equipment help reduce the spread of diseases. Regular field inspection allows problems to be detected early.

Integrated pest management combines several methods, including cultural, mechanical, biological, and, when necessary, chemical control. Monitoring pest

populations and disease symptoms helps determine whether control measures are required. Biological control and conservation of beneficial organisms can reduce dependence on pesticides. When pesticides are necessary, only locally registered products should be used in accordance with label instructions, recommended rates, protective equipment requirements, and pre-harvest intervals.

In seed potato fields, the removal of diseased and off-type plants, known as roguing, is an important practice. It helps maintain varietal purity and reduces sources of infection. In areas where virus transmission by aphids is a significant risk, appropriate monitoring and locally recommended measures are especially important. Equipment, storage facilities, and handling areas should also be kept clean to minimize contamination and post-harvest losses.

After harvesting, tubers should be sorted carefully, and those showing signs of disease, rot, or serious damage should be removed. Proper storage conditions help prevent the development of storage diseases. Regular monitoring during storage allows affected tubers to be identified and removed before the problem spreads.

7. Kartoshka kasalliklari va zararkunandalariga qarshi kurash choralari

Kartoshka kasalliklari va zararkunandalari hosildorlik, tuganaklar sifati hamda urug‘lik materialining qiymatini pasaytiruvchi asosiy omillardan hisoblanadi. Urug‘lik kartoshka yetishtirishda o‘simliklarning sog'lomligiga alohida e’tibor berish zarur, chunki ko‘plab kasallik qo‘zg‘atuvchilar, ayniqsa viruslar hamda ayrim bakteriya va zamburug‘lar zararlangan tuganaklar orqali tarqalishi mumkin. Shu sababli ekinlarni samarali himoya qilish urug'lik sifatini saqlash va kasalliklarning keyingi avlodlarga o'tishining oldini olishda muhim ahamiyatga ega.

Kartoshkada fitoftoroz, alternarioz, oddiy parsha, qora oyoq, bakterial yumshoq chirish va virusli kasalliklar uchrashi mumkin. Phytophthora infestans qo‘zg‘atuvchisi keltirib chiqaradigan fitoftoroz qulay ob-havo sharoitida barg va poyalarni tez zararlaydi, ayrim hollarda tuganaklarga ham ta’sir ko'rsatadi. Alternarioz ko‘pincha Alternaria turkumiga mansub zamburug‘lar bilan bog‘liq. Oddiy parsha tuganaklar yuzasini zararlaydi, bakterial yumshoq chirish esa to'qimalarning yumshashi va parchalanishiga olib keladi. Virusli kasalliklar barglarda turli belgilar paydo bo'lishi, o‘simliklarning zaiflashishi va hosildorlikning pasayishi bilan namoyon bo'lishi mumkin.

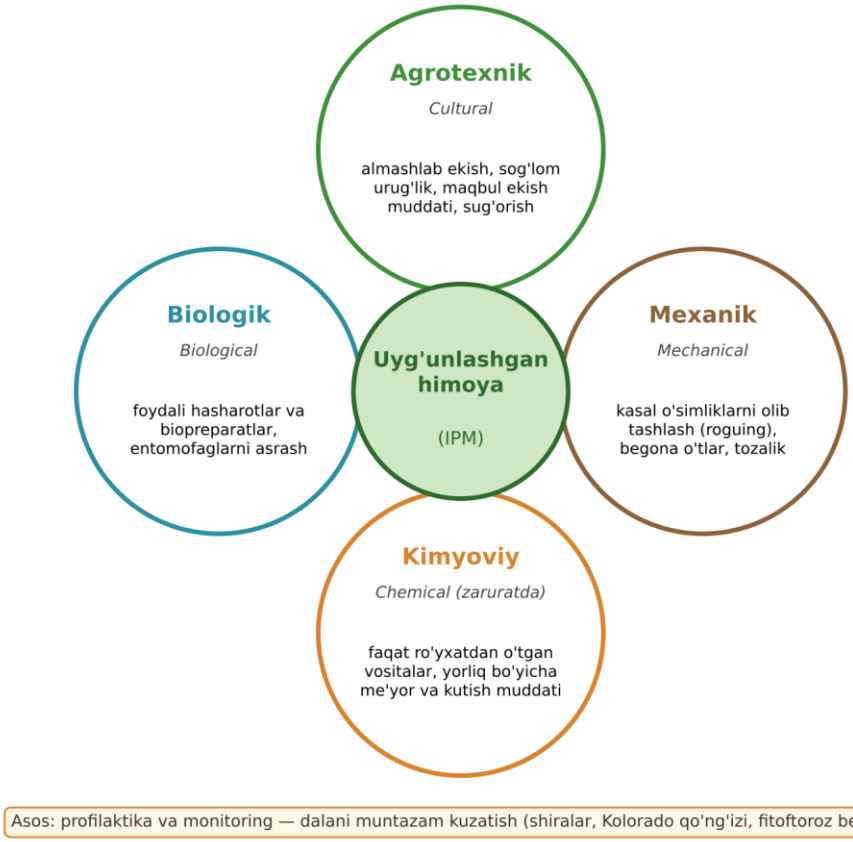
Kartoshkaning muhim zararkunandalariga Kolorado qo‘ng‘izi, shiralar, ayrim hududlarda kartoshka kuyasi va tuproqda yashovchi ba’zi zararkunandalar kiradi. Ular barglar, poyalar, ildizlar yoki tuganaklarga zarar yetkazishi mumkin. Shiralar urug‘lik kartoshka yetishtirishda alohida ahamiyatga ega, chunki ular ayrim viruslarni zararlangan o‘simliklardan sog‘lom o'simliklarga yuqtirishi mumkin.

Kasallik va zararkunandalarga qarshi kurashning birinchi bosqichi profilaktik tadbirlardan iborat. Ekishda sog‘lom, sertifikatlangan urug‘lik tuganaklardan foydalanish va dalani to‘g‘ri tanlash zarur. Almashlab ekish, kasallangan o‘simliklar va o'z-o'zidan o'sib chiqqan kartoshkalarni olib tashlash, zararkunanda yoki kasallik qo‘zg‘atuvchilar uchun makon bo‘lishi mumkin bo'lgan begona o‘tlarni nazorat qilish hamda asbob-uskunalarni tozalash kasalliklar tarqalishini kamaytiradi. Dalani muntazam kuzatish muammolarni erta aniqlash imkonini beradi.

Uyg‘unlashgan himoya tizimi agrotexnik, mexanik, biologik va zarurat tug‘ilganda kimyoviy kurash usullarini birgalikda qo'llashni nazarda tutadi. Zararkunandalar soni va kasallik belgilarini kuzatib borish himoya tadbirlarini qachon amalga oshirish kerakligini aniqlashga yordam beradi. Biologik kurash usullari va foydali organizmlarni asrash pestitsidlarga bo'lgan ehtiyojni kamaytirishi mumkin. Kimyoviy preparatlardan foydalanish zarur bo'lganda faqat mahalliy tartibda ro‘yxatdan o‘tkazilgan vositalarni ularning yorlig‘idagi ko'rsatmalar, tavsiya etilgan me’yorlar, shaxsiy himoya vositalari va hosil yig’imigacha bo'lgan kutish muddatiga rioya qilgan holda qo'llash lozim.

Urug‘lik kartoshka daalarida kasallangan va nav xususiyatlariga mos kelmaydigan o‘simliklarni aniqlab, olib tashlash muhim tadbir hisoblanadi. Bu usul nav tozaligini saqlash va kasallik manbalarini kamaytirishga yordam beradi. Shiralar orqali viruslar tarqalishi xavfi yuqori bo‘lgan hududlarda zararkunandalarni muntazam kuzatish va mahalliy tavsiyalarga muvofiq choralar ko‘rish ayniqsa muhimdir. Kasalliklar bilan zararlanishni kamaytirish uchun asbob-uskunalar, saqlash omborlari va mahsulot bilan ishlov beriladigan joylar ham toza saqlanishi kerak.

Hosil yig‘ib olingandan keyin tuganaklar sinchiklab saralanadi, kasallik, chirish yoki jiddiy shikastlanish belgilari mavjud bo‘lganlari ajratib tashlanadi. Saqlash sharoitlarini to‘g‘ri tashkil etish ombor kasalliklarining rivojlanish xavfini kamaytiradi. Saqlash davrida muntazam tekshiruv o'tkazish zararlangan tuganaklarni kasallik keng tarqalishidan oldin aniqlash va olib tashlash imkonini beradi.



6-rasm. Kasallik va zararkunandalarga qarshi uyg‘unlashgan himoya tizimi

Figure 6. Integrated pest management (IPM) in potato production

Conclusion

Potato seed production is the foundation of stable and high potato yields. Because potatoes are propagated vegetatively, every characteristic of the seed tuber – its varietal identity, health status and physiological condition – is transferred directly to the next crop. For this reason, seed production is organised as a controlled system that begins with healthy initial material obtained through tissue culture and minitubers and continues through pre-basic, basic and certified seed generations.

The lecture has shown that the quality of seed potatoes depends on a chain of interconnected measures: choosing varieties adapted to local soil and climatic conditions, selecting suitable fields and crop rotations, proper soil preparation, timely planting of graded and pre-sprouted tubers, balanced irrigation and fertilisation, regular field inspection and roguing, careful harvesting, curing, grading and well-managed storage. A failure at any stage can reduce seed quality and cause losses in subsequent seasons.

Protection against diseases and pests, especially late blight, bacterial rots, viral diseases and the aphids that transmit them, is a central task of seed production. The most effective approach is integrated pest management, which combines prevention, monitoring, cultural, mechanical and biological measures, and the responsible use of registered chemical products only when necessary. Mastering these principles enables future specialists to produce healthy, high-quality seed potatoes and to contribute to food security of the country.

Xulosa

Kartoshka urug‘chiligi barqaror va yuqori hosil olishning asosi hisoblanadi. Kartoshka vegetativ yo‘l bilan ko‘paytirilgani sababli urug'lik tuganakning barcha xususiyatlari – nav belgilari, sog‘lomlik darajasi va fiziologik holati – bevosita keyingi hosilga o‘tadi. Shu boisdan urug'chilik to‘qima kulturasi va minituganaklar orqali olingan sog‘lom boshlang'ich materialdan boshlanib, dastlabki, bazaviy va sertifikatlangan urug‘lik avlodlari orqali davom etadigan nazorat ostidagi tizim sifatida tashkil etiladi.

Ma’ruzada urug'lik kartoshka sifati o‘zaro bog‘liq tadbirlar zanjiriga bog‘liq ekani ko‘rsatib berildi: mahalliy tuproq-iqlim sharoitiga mos navlarni tanlash, dala va almashlab ekish tizimini to‘g‘ri belgilash, tuproqni sifatli tayyorlash, saralangan va nishlatilgan tuganaklarni o‘z vaqtida ekish, muvozanatli sug‘orish va o‘g‘itlash, ekinlarni muntazam nazorat qilish va kasallangan o‘simliklarni olib tashlash, hosilni ehtiyotkorlik bilan yig‘ish, davolash, saralash va to‘g‘ri saqlash. Bu bosqichlarning birortasida yo‘l qo‘yilgan xato urug‘lik sifatini pasaytirib, keyingi mavsumlarda yo‘qotishlarga olib kelishi mumkin.

Kasallik va zararkunandalardan, ayniqsa fitoftoroz, bakterial chirishlar, virusli kasalliklar va ularni tarqatuvchi shiralardan himoya qilish urug‘chilikning markaziy vazifalaridan biridir. Eng samarali yondashuv – profilaktika, monitoring, agrotexnik, mexanik va biologik usullarni birlashtirib, ro‘yxatdan o‘tgan kimyoviy vositalardan faqat zarurat tug‘ilganda mas’uliyat bilan foydalanadigan uyg‘unlashgan himoya tizimidir. Ushbu tamoyillarni o‘zlashtirish bo‘lajak mutaxassislarga sog‘lom, yuqori sifatli urug‘lik kartoshka yetishtirish va mamlakat oziq-ovqat xavfsizligini ta’minlashga hissa qo‘shish imkonini beradi.

Control Questions

1. Why is seed production of special importance for potatoes as a vegetatively propagated crop?
2. What are the main objectives of potato seed production?
3. Describe the structure of the potato plant. Where and how are tubers formed?
4. Which environmental factors influence tuber formation and development?
5. How are potato varieties classified according to their maturity period? Give examples of well-known varieties.
6. What are the main stages of the potato seed production system?
7. What is the role of tissue culture and minitubers in modern seed production?
8. Explain the differences between pre-basic, basic and certified seed.
9. What agronomic practices are used in growing seed potatoes (field selection, crop rotation, planting, irrigation, fertilisation)?
10. What requirements must seed tubers meet? Why is cutting of seed tubers not always advisable?
11. What is pre-sprouting and how does it affect crop emergence?
12. Why are haulm destruction and curing carried out? What conditions are required for storing seed potatoes?
13. Name the main potato diseases and pests. Why are aphids especially dangerous in seed production?
14. What is roguing and what is its importance in seed potato fields?
15. Explain the principles of integrated pest management (IPM) in potato production.

Nazorat savollari

1. Nima uchun vegetativ ko‘payadigan ekin sifatida kartoshkada urug‘chilik alohida ahamiyatga ega?
2. Kartoshka urug‘chiligining asosiy vazifalari nimalardan iborat?
3. Kartoshka o'simligining tuzilishini tavsiflang. Tuganaklar qayerda va qanday hosil bo‘ladi?
4. Tuganak hosil bo‘lishi va rivojlanishiga qaysi tashqi muhit omillari ta'sir ko‘rsatadi?
5. Kartoshka navlari pishish muddatiga ko'ra qanday guruhlarga ajratiladi? Keng tanilgan navlarga misollar keltiring.
6. Kartoshka urug‘chiligi tizimi qanday bosqichlardan iborat?

7. Zamonaviy urug‘chilikda to‘qima kulturasi va minituganaklarning roli qanday?
8. Dastlabki, bazaviy va sertifikatlangan urug'lik materiallarining farqini tushuntiring.
9. Urug‘lik kartoshka yetishtirishda qanday agrotexnik tadbirlar qo‘llaniladi (dala tanlash, almashlab ekish, ekish, sug‘orish, o‘g‘itlash)?
10. Urug‘lik tuganaklar qanday talablarga javob berishi kerak? Nima uchun tuganaklarni kesib ekish har doim ham tavsiya etilmaydi?
11. Oldindan nishlatish nima va u nihollarning unib chiqishiga qanday ta‘sir qiladi?
12. Yerusti qismini yo‘qotish va davolash (curing) nima maqsadda o'tkaziladi? Urug‘lik kartoshkani saqlash uchun qanday sharoitlar zarur?
13. Kartoshkaning asosiy kasallik va zararkunandalarini sanab bering. Nima uchun urug'chilikda shiralar ayniqsa xavfli?
14. Roguing nima va uning urug‘lik kartoshka dalalaridagi ahamiyati qanday?
15. Kartoshka yetishtirishda uyg‘unlashgan himoya tizimi (IPM) tamoyillarini tushuntiring.

Glossary / Glossariy

Term (English)	Atama (o'zbekcha)	Izoh
1. Seed potato	*Urug'lik kartoshka*	Ekish uchun mo'ljallangan, nav tozaligi va sog'lomlik talablariga javob beradigan tuganaklar.
2. Tuber	*Tuganak*	Stolon uchida hosil bo'ladigan, kraxmal to'playdigan yo'g'onlashgan yerosti poya.
3. Stolon	*Stolon*	Poyaning yerosti qismidan o'sib chiqadigan, uchida tuganak hosil qiladigan novda.
4. Vegetative propagation	*Vegetativ ko'payish*	O'simlikni urug' orqali emas, tuganak kabi vegetativ organlar yordamida ko'paytirish.
5. Varietal purity	*Nav tozaligi*	Ekin yoki urug'lik partiyasida faqat bitta navga xos o'simlik va tuganaklar bo'lishi.
6. Tissue culture (in vitro)	*To'qima kulturasi*	Steril laboratoriya sharoitida o'simlik to'qimasidan kasalliklardan xoli ko'chat olish usuli.
7. Minituber	*Minituganak*	In vitro o'simliklardan issiqxonada yetishtiriladigan mayda, sog'lom tuganak.
8. Pre-basic seed	*Dastlabki urug'lik*	Qat'iy nazorat ostida yetishtiriladigan, eng yuqori sifatli boshlang'ich urug'lik material.
9. Basic seed	*Bazaviy urug'lik*	Dastlabki urug'likdan olinib, keyingi ko'paytirish uchun ishlatiladigan urug'lik.
10. Certified seed	*Sertifikatlangan urug'lik*	Belgilangan standartlarga muvofiqligi tasdiqlangan, tovar kartoshka ekish uchun mo'ljallangan urug'lik.

Term (English)	Atama (o'zbekcha)	Izoh
11. Roguing	*Ekinni tozalash (roguing)*	Kasallangan va navga xos bo'lmagan o'simliklarni daladan aniqlab, olib tashlash.
12. Pre-sprouting	*Oldindan nishlatish*	Ekishdan oldin tuganaklarda qisqa, baquvvat nishlar hosil qilish.
13. Earthing up	*Tuproq tortish (chopiq)*	O'simlik tupiga tuproq uyib, tuganaklarni yorug'likdan himoya qilish.
14. Haulm destruction	*Yerusti qismini yo'qotish*	Yig'imdan oldin poya va barglarni quritish yoki olib tashlash; po'stloqni mustahkamlaydi.
15. Curing	*Davolash (jarohat bitishi)*	Yig'imdan keyin tuganak po'stidagi mayda jarohatlarning bitishi uchun maxsus sharoitda saqlash.
16. Greening	*Yashillanish*	Yorug'lik ta'sirida tuganakda xlorofill va zaharli solanin to'planishi.
17. Late blight	*Fitoftoroz*	Phytophthora infestans qo'zg'atadigan, barg, poya va tuganaklarni zararlaydigan xavfli kasallik.
18. Aphid	*Shira*	O'simlik shirasini so'radigan, kartoshka viruslarini tarqatuvchi mayda hasharot.
19. Colorado potato beetle	*Kolorado qo'ng'izi*	Kartoshka barglarini kemiruvchi asosiy zararkunanda (Leptinotarsa decemlineata).
20. Integrated pest management (IPM)	*Uyg'unlashgan himoya tizimi*	Profilaktika, monitoring hamda agrotexnik, biologik va zaruratda kimyoviy usullarni birgalikda qo'llash.