AJPDIS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Public Diplomacy and International Studies
Volume 3, Issue 5, 2025 ISSN (E):2993-2157

Usage, History, Systematics, Morphology and Chicpea (Cicer Arietinum L.) Varieties Grown In Uzbekistan

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Abstract: This article provides a comprehensive overview of chickpea (Cicer arietinum L.), focusing on its usage, historical significance, botanical classification, morphological characteristics, and the main varieties cultivated in Uzbekistan. The paper highlights chickpea's role as a vital leguminous crop with nutritional, agronomic, and economic importance. A review of its domestication history traces its origin to the Fertile Crescent and its subsequent spread to Central Asia. The article explores the systematic placement of the species within the Fabaceae family and describes key morphological features such as seed shape, leaf structure, flowering pattern, and root system. Special attention is given to chickpea varieties adapted to the agro-climatic conditions of Uzbekistan, including local breeding efforts and productivity traits. The study aims to support the conservation, breeding, and sustainable development of chickpea cultivation in the region by compiling critical scientific and agronomic insights.

Keywords: Chickpea, Cicer arietinum L., leguminous crops, Uzbekistan, morphology, taxonomy, systematics, local varieties, agrobiodiversity, cultivation history, pulse crops, plant usage, genetic resources, crop adaptation, sustainable agriculture.

Introduction.

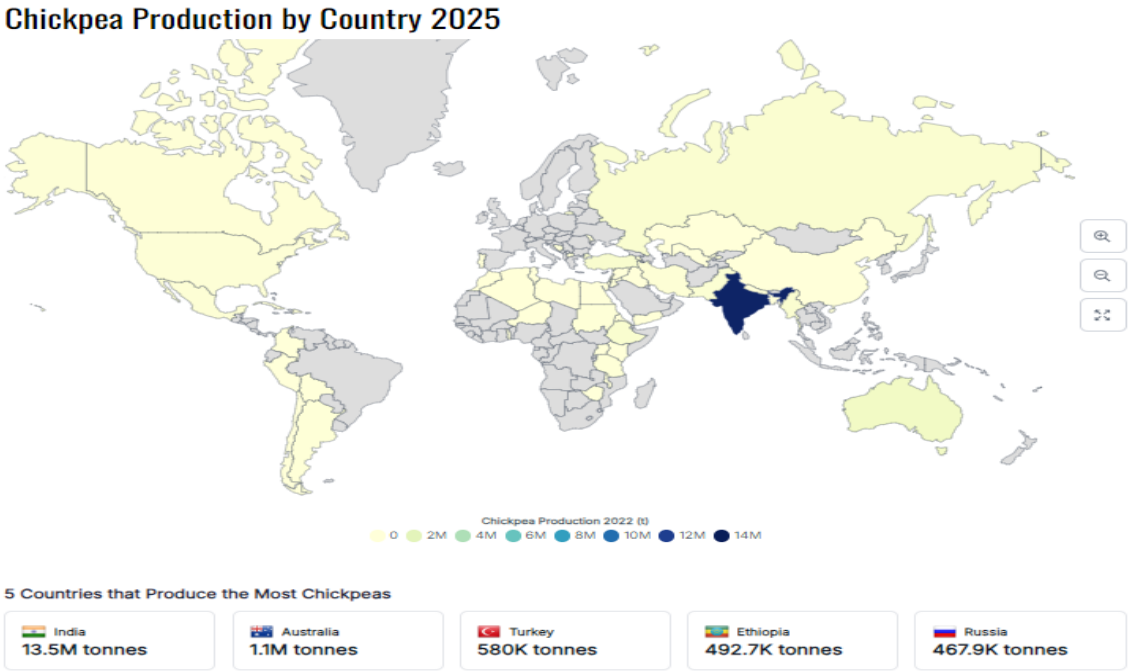
The chickpea is a key ingredient in Mediterranean and Middle Eastern cuisines, used in hummus, and, when soaked and coarsely ground with herbs and spices then made into patties and fried, falafel. As an important part of Indian cuisine, it is used in salads, soups and stews, and curry, in chana masala, and in other food products that contain channa (chickpeas). In 2022, India accounted for 75% of global chickpea production[1; 5].

Food in Evropian countries including falafel, hummus, and salad

Hummus(/ˈhʊməs/,/ˈhʌməs/; Arabic:□□□□□□ ḥummuṣ, chickpeas, (full name: Hummus Bi Tahini)

Tahini next to lemon and whole garlic

Chickpea grain is used in human nutrition, cereals are prepared from grain, various dishes can be prepared, flour is added to pastries, in bread making, 10-20% wheat flour is added to bread making, and artificial coffee is prepared. Grains contain 19-33% of protein, 4-7% of fat, 48-61% of carbohydrates, 2-12% of fiber, 2-5% of ash and vitamins.



Organic acids (malic and others) contain in the biomass and hay, therefore, animals are not eaten in pure form. Chickpea is a good preceding crop for field crops; during the growing season, 50-70 kg of biological nitrogen accumulates in the soil [1].

History. Homeland of chickpeas are South-Western Asia. Chickpeas are cultivated in India, Italy, Greece, Bulgaria, Egypt, Algeria, Morocco, Turkey, and Iran. In India, organic acids are obtained from chickpeas. In Central Asia, chickpeas have long been cultivated [4].

In 2022, world production of chickpeas was 18 million tonnes, led by India with 75% of the global total (table-1)

Table-1

Production of chickpeas - 2022

Country	**Production (millions of tonnes)**
India	**13.5**
Turkey	**0.6**
Russia	**0.5**
Ethiopia	**0.5**
Myanmar	**0.4**
Pakistan	**0.3**
World	**18.1**

Source:FAOSTAT of the United Nations [9]

Systematics. Chickpea belongs to the legume family – *Fabaceae* to the genus Cicer L. The genus includes 27 species, of which 22 are perennial species. Widely distributed along the Mediterranean. Only one type of chickpea is cultivated – *Cicer arietinum L.* It is cultivated, annual, grassy, widely distributed. Varieties of cultural chickpeas: 1) Southern European – *proles loheneicum G. Pop,* 2) Middle European – *proles franscaucasicum G. Pop.* 3) Anatolian – *proles turcicum G Pop.* To determine the types of chickpeas: the shape of the grain, the color of the grain, branching are determined [1].

The chickpea or chick pea (*Cicer arietinum L*) is an annual legume of the family Fabaceae, subfamily Faboideae, cultivated for its edible seeds. Its different types are variously known as gram Bengal gram, chhola, chhana, chana, channa, garbanzo, garbanzo bean, or Egyptian pea. It is one of the earliest cultivated legumes, the oldest archaeological evidence of which was found in Syria[4].

Research and methods.

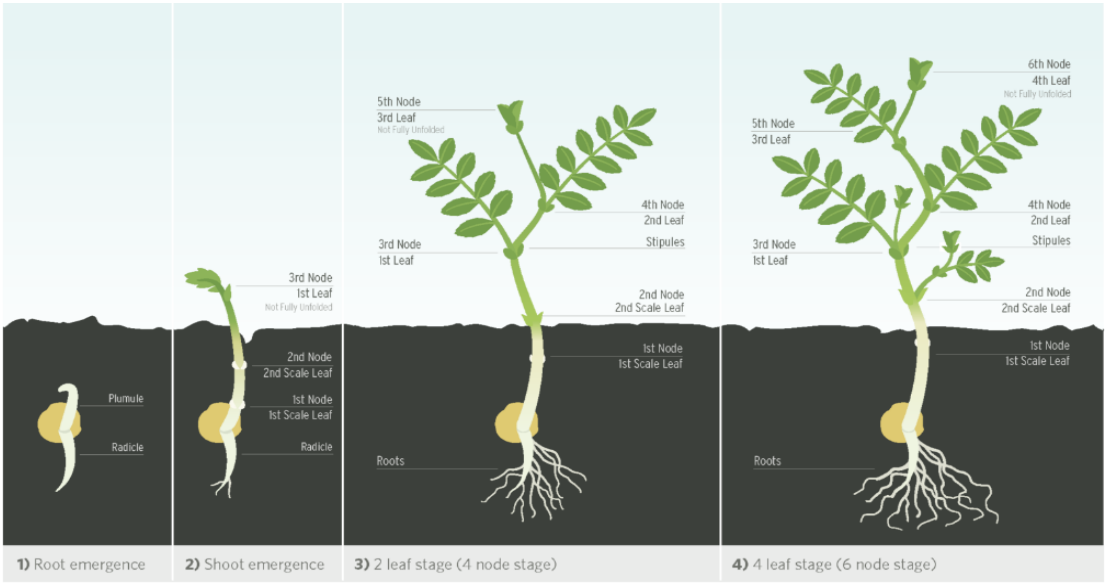
Morphology. Root is tap, well developed, extends into the soil to a depth of 1 m and more, branched. The stem is strong, upright, well bent at a height of 15-40 cm, with irrigation 45-70 cm. The leaves are complex, unpaved, short petiole, the number of leaf blades is 5-15 pieces, the leaves are small, the edges are serrated, haired. In the pubescence, there are organic acids that cause burning. The leaves are light and dark green.

Flowers are bisexual, located in the axils of the leaves. Coloring is white, red-violet, and pink. The beans are swollen, oval, rhombic, have 1-3 grains. The length of the bean is 1.5-3.5 cm, the color is light yellow, brown. Stem, beans and leaves are haired. The seeds are round, spherical, angular, wrinkled, have a protrusion, the color of the grain is light yellow, brown, black. The mass of 1000 seeds is 100 - 600 g.

Staging at the Vegetative Stage

Chickpeas germinate with the cotyledon remaining below ground (hypogeal germination). The epicotyl (part of the stem above cotyledons) grows toward soil surface and pushes the main shoot (plumule) above ground. As the shoot grows towards the soil surface and emerges, growing points (nodes) become evident. The first two nodes of chickpeas develop below or at soil surface and the small leaves associated at these nodes are called scale leaves. Regrowth is possible from buds at the base of these scale leaves.

The first true leaf is produced at the third node position. Desi chickpea and newer Kabuli varieties have leaves about five centimetres long with nine to 15 leaflets, and are described as having a fern-leaf structure. Some older Kabuli varieties, such as CDC Xena, have a single (unifoliate) leaf structure instead of leaflets.



Growth is rapid during vegetative stages and chickpea seedlings can produce new nodes every three to four days. Chickpea plants will produce up to seven primary branches originating near ground level, usually leading to an erect growth habit. A large number of secondary branches are produced on the main stem and primary branches.

When staging at the vegetative stage, some guides refer to true leaf stage, node stage, or above-ground node stage. When considering pesticide applications, make sure you know which stage the products are referring to. In the Chickpea Growth Stages Diagram, the two leaf stage would also be equivalent to the third above-ground node stage, as one of the lower nodes (scale leaves) is above-ground [6].

Staging can be difficult and sometimes the true leaves or scale leaves have been removed due to environmental damage, insect pressure, or for some other reason. When determining crop stage, include nodes where the leaves are fully opened or unfolded. Youngest or newly emerging leaves are not included in staging unless completely open. Closely inspect the stem and identify potential growing points or nodes. Not only can regrowth occur from these locations but regrowth can also occur from the seed. In the case of regrowth, expect delays in maturity.

Biology. Relationship with the soil. Chickpeas are sown on loose, sandy, light, slightly saline soils.

Reaction to heat. The chickpea is a heat-loving plant, but the seeds can germinate at + 2-5°C. Seeds slowly germinate at low temperatures, but do not rot. Shoots withstand -7-10°C of cold. Chickpea demands heat in the flowering phase and the formation of beans.

Relationship with water. Among leguminous, chickpea is a drought-resistant plant. It is resistant to soil and air drought. This is not only due to the development of root systems – chickpeas use water very economically. If the humidity is above normal, chickpeas fall ill, the flowers fall. In the year of harvest, chickpea seed germination is high, in the second and third year, germination is reduced. Chickpea is a self-pollinated plant. The chickpea is pollinated in the budding phase, and then flowers. The growing season is 60 - 120 days.

Result and discussion.

Chickpea production in Uzbekistan. Chickpea varieties are grown in various soil and climatic conditions in Uzbekistan. According to data from 2024, Chickpea varieties were planted on 49.1 thousand hectares in the Republic of Uzbekistan, and the total yield was 38.9 thousand tons.

Table-2 Information by the State Register of agricultural crops Recommended for sowing in the territory of the Republic of Uzbekistan

Order number	Name of the variety	Originator's order number	Code of the country	Year of inclusion in the register	Regions recommended for cultivation *(look to Appendix 1)*
2023001	Darmon	9	UZ	2025	5 (IA)
2005020	Jahongir	5	UZ	2008	1-13 (RA)
2005021	Zumrad	434	UZ	2008	1-13 (IA)
1997017	Iroda 96	5	UZ	2010	1-13(RA)
2018033	Iftixor	5	UZ	2020	4, 8 (RA)
9200754	Lazzat	5	UZ	1996	4,5, 9 (RA)
2007024	Malxotra	10, 319	UZ	2015	4,5,8 (RA)
2006022	Polvon	434	UZ	2011	1-13 (IA)
2005019	Umid	12	UZ	2020	4,8 (RA)
8603715	Uzbekistanskiy 32	5	UZ	1992	1-13(RA)
2007028	Khalima	10,319	UZ	2015	4, 5, 8 (RA)
7602910	Yulduz	5	UZ	1982	4, 5, 8-11 (RA)
					IA - Irrigated Area ***RA - Rainfed Area***

APPENDIX 1

Regions for cultivation of agricultural crops recommended for sowing in the territory of the Republic of Uzbekistan

CHIKPEA (Cicer arietinum L)

NAMES OF REGIONS	NUMBERS
REPUBLIC OF KARAKALPAKSTAN	1
ANDIJAN REGION	2
BUKHARA REGION	3
JIZZAKH REGION	4
KASHKADARYA REGION	5
NAVOI REGION	6
NAMANGAN REGION	7
SAMARKAND REGION	8
SURKHANDARYA REGION	9
SYRDARYA REGION	10
TASHKENT REGION	11
FERGANA REGION	12
KHOREZM REGION	13

Here, you will be able to read a brief description of some varieties of chickpea varieties which are grown in Uzbekistan.

"MALKHOTRA" variety. Morphology and valuable characteristics of the variety "MALKHOTRA". The variety "MALKHOTRA" has been recommended for cultivation in the Jizzakh, Kashkadarya and Samarkand regions of our country since 2015 and has been included in the state register.

It was created by Kh. Atabayeva, G. Mirsharipova, B. Dzhumakhanov at Tashkent State Agrarian University and Gulistan State University.

Biological autumn. Average weight of 1000 seeds is 344-365 g. Vegetation period is 76-82 days in spring, 210 days in autumn. Drought and lodging resistance is 4.5 points. Number of pods per plant is 5-8. Average yield: 4.2-6.4 t/ha on fertile soils. 3.1 t/ha on wet soils. No agricultural diseases were observed during the trial period.

"LAZZAT" variety - a selection variety of the Scientific Research Institute of Grain Production of Uzbekistan (Scientific Production Association "Don").

Authors: Eshmirzaev K.E, Ergashev N, Oleynik P.P, Abdiev Kh, Amanov A.A, Isakov K.

Included in the State Register for planting in the arable lands of Jizzakh, Kashkadarya, Surkhandarya regions since 1996. The variety is Transcaucasian - lutescens, belongs to the Central European group. The plant is bushy, compact, 40-45 cm high. The stem is semi-trunk, straight, green, light gray, densely pubescent.

Axillary flowers are solitary, medium-sized, white. Pods are rhombic, pointed, and sparsely hairy. Seeds are angular, rough, light yellow. Small-seeded variety. Weight of 1000 grains is 164-168.2 g.

In the 2000-2004 testing years, the average grain yield in the Lalmikor variety testing stations was 5.4 centners per hectare. In years with favorable weather conditions, up to 8.0 centners per hectare were produced. The variety is medium-hardy, resistant to drought and pod cracking. It is characterized by good taste. The protein content is 26.0-28.0%. It is weakly affected by ascochyta blight.

"OBOD" variety. Morphology and economic value of the chickpea variety "Obod". The chickpea variety "Obod" was used as a reference variety. This variety was selected by the

Kashkadarya branch of the Research Institute of Grain and Legume Crops from a hybrid combination of the chickpea variety:

Carneum (Flip 97-149) and submitted to the Center for Testing Agricultural Crop Varieties in 2018 for testing.

In 2020, it was introduced as a promising variety for planting in dry areas of Samarkand region. This variety is wrapped in 86-88 days. The height of the plant is 75-80 cm, the yield is 9.5-13.8 tons/ha, the weight of 1000 grains is 368.3-369.4 g.

Conclusion. Chickpea grain is used in human nutrition, cereals are prepared from grain, various dishes can be prepared, flour is added to pastries, in bread making, 10-20% wheat flour is added to bread making, and artificial coffee is prepared.

Chickpea varieties are grown in various soil and climatic conditions in Uzbekistan. According to data from 2024, Chickpea varieties were planted on 49.1 thousand hectares in the Republic of Uzbekistan, and the total yield was 38.9 thousand tons.

It should be noted that the varieties grown in Uzbekistan, such as Darmon, Jahongir, Zumrad, Iroda96, Iftikhor, Lazzat, Malhotra, Polvon, Umid, Uzbek 32, Halima and Yulduz, are local varieties.

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