



## Edible Chickpea (*Cicer arietinum* L.) Variety “TOLGA 01”

Dürdane MART\*  Meltem TÜRKERİ  İmadettin ÖZKAYA 

Eastern Mediterranean Agricultural Research Institute, Adana, Türkiye

\* Corresponding author e-mail: [durdanemart@yahoo.com](mailto:durdanemart@yahoo.com)

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### ABSTRACT

Tolga 01 was developed and submitted for registration as a result of chickpea breeding studies carried out at the Eastern Mediterranean Agricultural Research Institute Directorate, Adana location; it was registered in 2024 with the name “Tolga 01” as a result of yield, Ascochyta blight tolerance and quality values in registration trials. As a result of chickpea registration yield trials established in different regions of Türkiye, the average yield of Tolga 01 chickpea variety was 247.9 kg/da, while the highest yield value was 395.2 kg/da grain yield. According to the results of the experiment, flowering period of the varieties was 61-154 days, plant height was 38-67 cm and hundred grain weight was 29.3-44.0 g. In terms of technological characteristics, protein ratio was determined in the range of 23.7-27.1%. The gradual seed production of our Tolga 01 edible chickpea variety, which was registered in 2024, will be planted as of 2025 and will be offered to the service of our farmers.

**Keywords:** Edible chickpea, yield, quality

### Introduction

Among edible grain legumes, chickpea is the second most resistant to drought and low temperature after lentil. It is not very selective in terms of soil requirements. It is drought resistant thanks to its small vegetative parts, short development period and taproot system. The importance of chickpea plant in crop rotation increases the importance of its ability to utilize the free nitrogen of the air with *Rhizobium* bacteria in its roots. At the same time, in addition to these, the contribution of protein richness in eliminating the nutritional deficit makes the chickpea plant indispensable. Chickpea has an important place in Türkiye as a human food with its high protein content. It is inevitable to supply the food deficit in the world and in our country from different sources. Chickpea is a protein and vitamin-rich edible grain legume plant that contains 18-31% protein in its grain, as well as important essential amino acids such as leucine, alanine, lysine, isoleucine, methionine,

tryptophan, valine, elements such as K, P, Ca, Mg, S, Fe, Mn and vitamins such as A, B and C, which are the basic building blocks of the human body.

The data for chickpea in Türkiye for 2022 show a cultivation area of 456.480 ha, a production of 580,000 tons, and a grain yield of 1270.0 kg/ha per unit area (FAO, 2024). Chickpea is grown as a winter crop in the Mediterranean and Southeastern Anatolia regions. Chickpea plants to be grown as winter crops should be tolerant/resistant to Ascochyta blight. The most important biotic factor limiting the winter cultivation and yield of chickpea is *Ascochyta rabiei* (Pass) Labr, which causes Ascochyta blight. Ascochyta blight is a fungal disease. The development and rate of the disease varies according to climatic conditions; it occurs mostly in rainy, hot weather with high relative humidity. Especially rain is an important factor in the spread of the disease. For this reason, it is very important that the varieties are tolerant/resistant to diseases and pests in breeding. Our aim in

breeding studies is to identify chickpea varieties with high yield, high market value, good quality values and tolerant/resistant to Ascochyta blight. Tolga 01 Chickpea variety is an edible grain legume chickpea variety registered for this purpose.

## Materials and Methods

Our material sources in our edible grain legume breeding studies; We provide our materials from material sharing within the scope of the national project, The International Center for Agricultural Research in the Dry Areas (ICARDA) material exchange programs, new variations created from our own hybridization programs or local varieties.

Tolga 01 chickpea variety is a variety developed by selection method. Tolga 01 Chickpea (*Cicer arietinum* L.) variety was registered by the Eastern Mediterranean Agricultural Research Institute in 2024, suitable for winter cultivation in the Mediterranean, Aegean and Southeastern Regions and summer cultivation in other regions. Tolga 01 edible chickpea variety was bred from ICARDA origin (FLIP 09 186C) materials by using Introduction breeding method from breeding methods; in 2021 and was registered in 2024 with the variety name "Tolga 01" and offered to the service of farmers.

## Results and Discussion

Grain yield is the most important breeding objective in edible grain legumes as in other cultivated plants; in addition, grain size is also a highly demanded trait in chickpea breeding. However, due to the negative correlation between grain yield and grain size and between grain size and Ascochyta blight, the optimum grain size should be determined very carefully according to the regional conditions.

As a result of the two-year multi-location registration trials carried out, the findings obtained with the "Tolga 01" chickpea variety were determined by the Seed Registration Office (Anonymous, 2024). Biological characteristics of Tolga 01 chickpea variety vary between 61-154 days for flowering and 107-196 days for physiological maturity. The cultivation method is suitable for winter cultivation. Morphological characteristics; plant height 38-67 cm, first pod height 19-42 cm, plant growth form is semi-erect; it is a variety suitable for machine harvesting. Plant grain characteristics 100 grain weight is 29.3-44.0 g, grain color is beige, grain shape is angular round (Figure 1). Technological characteristics of Tolga 01 chickpea variety were determined as water absorption capacity 0.39-0.47 g/grain; swelling capacity 0.36-0.46 ml/grain; water absorption index

1.12-1.25%; swelling index 2.44-2.57%; sieve values 1.6-24.6% for 9 mm sieve; 14.9-58.2% for 8 mm sieve; protein rate 23.7-27.1%.

Grain yield value of Tolga 01 chickpea variety was determined to be 247.9 kg/da on average, the highest yield value was 395.2 kg/da and it was determined to be tolerant for Ascochyta blight. Cooking time for cooking showed a cooking value between 37-43 minutes.

## Conclusions

Improving chickpea agriculture in our country through chickpea breeding studies, increasing cultivation areas, reducing fallow areas by taking chickpea into crop rotation in fallow areas and supporting sustainable agriculture are important for the country's agriculture and our future.

The introduction of new registered varieties such as "Tolga 01" chickpea variety and chickpea varieties that are suitable for winter and summer cultivation, high yielding, suitable for machine harvesting, high quality, tolerant/resistant to diseases and pests, high market value, will carry chickpea agriculture forward.

**Tolga 01**  
**Chickpea (*Cicer arietinum* L.)**



Registration year	2024	
Place and year of breeding	Adana - 2021	
The organization that owns the variety	The Eastern Mediterranean Agricultural Research Institute Directorate-Adana/Türkiye	
Breeding organization	Eastern Mediterranean Agricultural Research Institute Directorate	
Breeding method	Introduction	
Biological properties	Number of days to flowering	61-154 days
	Number of days to Physiological maturity	107-196 days
Morphological features	Plant height(cm)	38-67
	First pod height(cm)	19-42
	Plant growth form	Semi erect
	Cultivation method	Winter sowing
Grain properties	Hundred seed weight(g)	29.3-44.0
	Grain color	Beige
	Grain shape	Round to angular
Technological features	Water absorption capacity (g/grain)	0.39-0.47
	Swelling capacity (ml/grain)	0.36-0.46
	Water absorption index (%)	1.12-1.25
	Swelling index (%)	2.44-2.57
	Cooking time (min.)	37-43
	Protein rate (%)	23.7-27.1
	Sieve values(%)	9 mm----1.6-24.6 8 mm----14.9-58.2
Agricultural properties	In registration trials; Average yield (kg/da)	
	247.9 kg/da Highest yield (kg/da)	
Places where registration trials are carried out	Diyarbakır, Adana, Manisa, Şanlıurfa, Kahramanmaraş	

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