

Agro-MAC VET
Multi – Actor Cooperation for Vocational Education and Training
in the Agro-food Sector
LLP LDV PARTNERSHIP No: 2008-1- GR1-LEO04-00281 1

Case study:
Turkey

Seedless Lemon Cultivars Developed by ALATA Horticultural
Research Institute from Turkey



1. Description of the organization:

Name: ALATA Horticultural Research Institute
Address: Alata Bahçe Kül. Araş.Enst. 33740 Erdemli / MERSİN,
Website: www.alata.gov.tr

Activity: (agricultural research and application, farming, on-the-job training)

The ALATA Horticultural Research Institute carries out agricultural researches and improvement studies on the subjects of citrus and other subtropic fruits, mild climate fruits, grape-like fruits, viniculture, vegetable gardening, ornamental plants for indoor and outdoor, medicinal and aromatic plants, apiculture and organic agriculture in the Lower East Mediterranean Region of Turkey.

Also on-the-job training for agricultural technicians, students of agricultural schools and farmers are provided by the Institute, and many kinds of analysis having agricultural aims can be carried out by its Laboratories.

Branches: Improvement and Genetics Branch, Breeding Techniques Branch, Production and Operating Branch, Laboratory Branch and Machinery Branch

In her future development institute aims integration of biodiversity conservation and sustainable use practices into the agricultural research activities.

Research Subjects Distribution In The Institute

Vegetable Gardening	49
Citrus Fruits	35
Subtropic Fruits	27
Grape-like Fruits	11
Ornamental Plants	12
Mild Climate Fruits	13
Hard Crust Fruits	2
Viniculture	6
Apiculture	6
Medicinal and Aromatic Plants	4
Economy and Statistics	4
Soil	2
Total number of research studies	171

Sector or subsector: research, plant production and improvement, husbandry, gardening, flowers, apiculture, food industry...

Target group: agricultural technicians, students of agricultural schools, production companies, farmers.

Geographical coverage: regional (Lower East Mediterranean Region of Turkey)

Funding:

- Public (Ministry of Agriculture), research foundations
- Allowances or subventions from the Scientific and Technological Research Council of Turkey (TÜBİTAK)

Special connections:

- Strategic alliances (Chamber of commerce, Chamber of agriculture, companies, trade unions, professional organizations...)
- The Scientific and Technological Research Council of Turkey (TÜBİTAK),
- Agricultural Unions,
- Private Companies from Agricultural Sectors

2. Seedless Lemon Cultivars Developed by ALATA

As a result of research and improvement studies in Citrus Fruits Improvement Programme carried out by ALATA Institute for about 7 years, the following three cultivars (namely Alata, Gülşen, Uzun), originated from Kütdiken (stubby thorn) type lemon, have been developed. These cultivars are patented and registered and their "Production Rights" are to be sold.

National experts reported that, the quality of these cultivars are unique in the World scale, and with the growing up production, these seedless type lemons will be an important chance for Turkey to compete with lemon exporting countries and therefore to increase Turkey's export share.

ALATA Management expressed that there are no changes in the natural structure of the fruits and these seedless types are the results of mutation improvement studies

and natural variation process carried out in ALATA. There are demands from foreign companies for production rights of these cultivars, especially from USA, South Africa and China. Now, ALATA started to work on mass production of seedless lemons with the objective of being an international trade mark in this sector.

Below, it's given the cultivar specifications:

Cultivar Name: Alata

Origin: Kutdiken (Stubby thorn) lemon cultivar

Breeding Method: Irradiation (Mutation)

Fruit Weight (gr): 105.7

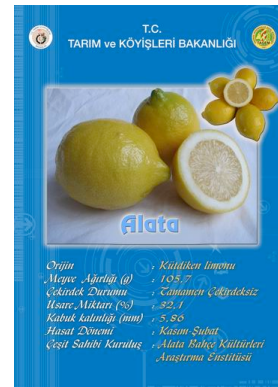
Seed status: Completely seedless

Juice (%): 32.1

Rind thickness (mm): 5.86

Harvest period: November-February

Breeder: ALATA Horticultural Research Institute/Turkey



Product Name: Gülşen

Origin: Kutdiken (Stubby thorn) lemon cultivar

Breeding Method: Irradiation (Mutation)

Fruit Weight (gr): 130.8

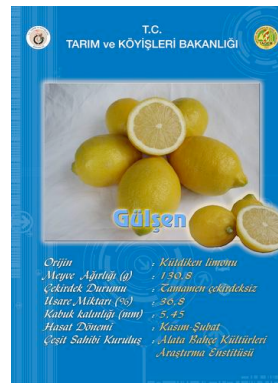
Stone status: Completely seedless

Juice (%): 36.8

Rind thickness (mm): 5.45

Harvest period: November-February

Breeder: ALATA Horticultural Research Institute/Turkey



Product Name: Uzun

Origin: Kutdiken (Stubby thorn) lemon cultivar

Breeding Method: Irradiation (Mutation)

Fruit Weight (gr): 117.0

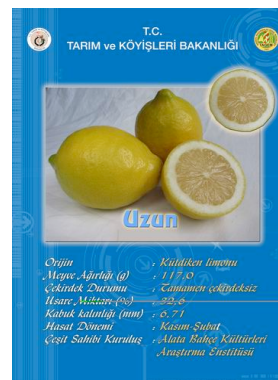
Stone status: Completely seedless

Juice (%): 32.6

Rind thickness (mm): 6.71

Harvest period: November-February

Breeder: ALATA Horticultural Research Institute/Turkey



3. Comments:

This example is chosen as a case study because the quality of the cultivars obtained is unique in the worlds' scale.

Results and findings of the research project are being offered to regions and countries agriculture, farmers, agricultural technicians and students of agricultural schools; efforts are continuing for education towards presenting the results and developments of the project. Also cooperations are continuing with various universities, Institutes of Technology and entities of the Ministry of Agriculture and Rural Affairs.

No need to say that, researches made have great importance as they provide infrastructure for new studies besides being source for science and education; this readily available knowledge facilitates dissemination and sharing of itself, and makes it possible not to spend much time for preliminary preparation for further or new studies and constitutes a practical reference source. Thus, this is a perfect example to lead similar VET efforts and train new farmers in innovative and open-minded scale.

Studies about the subject are led some international publications¹.

An example in this sense is that the storage endurance of seedless lemons are in the trial stage and studies in a big scale project supported by The Scientific and Technological Research Council of Turkey (TÜBİTAK) are continuing to produce early (precocious) lemons also as seedless. Also, Similar methods and techniques are in use in the Institute to produce seedless tangerine and positive results are expected.



Education and Culture DG

Lifelong Learning Programme

This project has been funded with support from the European Commission under the framework of the Leonardo da Vinci Lifelong Learning Programme.

This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

¹ **Uzun, A.**, Gulsen, O., Kafa, G., Seday, U., 2008. 'Alata', 'Gulsen', and 'Uzun' Seedless Lemons and 'Eylul' Early-maturing Lemon. Hortscience, 43:1920–1921.

A. Uzun., O. Gulsen., G. Kafa., U. Seday., 2009. Field performance and molecular diversification of lemon selection. Scientia Horticulturae, doi:10.1016/j.scienta.2008.12.003.

Uzun, A., Gulsen, O., Kafa, G., Seday, U., 2008. Effect of budwood irradiation on fruit weight of 'Kutdiken' lemon. XI. International Citrus Congress, 26-30 October, Wuhan, China (basýmada)

Gulsen, O., **Uzun, A.**, Pala, H., Canihos, E., Kafa, G., 2007. Development of seedless and Mal Secco tolerant mutant lemons through budwood irradiation. Scientia Horticulturae, Volume 112, Issue 2:184-190