



---

## **THE DEVELOPMENT OF POMEGRANATE FARMING IN THE FERGANA REGION AND ISSUES OF INDUSTRIAL PROCESSING OF POMEGRANATE HARVEST**

Abdullayev Lazizbek Bannobjon ugli

Student of the International Institute of Food Technology and Engineering

Akramov Shokhrukh Shukhratjon ugli

Associate Professor of the International Institute of Food

Technology and Engineering, Doctor of Agricultural Sciences, PhD.

---

### **Abstract**

This article discusses the importance of pomegranate in the national economy, the biology of pomegranate, cultivation agrotechnology, and methods of controlling diseases and pests. It provides information on pomegranate cultivation methods in the Fergana region, industrial processing techniques, and the production of pomegranate juice, as well as the beneficial properties of pomegranate juice for human health. The processes of pomegranate processing are also examined.

**Keywords:** Pomegranate, cultivation, yield, juice, quality, quantity, profit, product.

### **Introduction**

Pomegranate is one of the leading subtropical fruit crops in Uzbekistan, especially in the Fergana Valley. The main direction of the development of subtropical fruit growing in Uzbekistan is the establishment of large-scale plantations of subtropical crops. The high productivity and early ripening of subtropical fruits determine the high yield and profitability of these crops.



## *Modern American Journal of Biological and Environmental Sciences*

ISSN (E): 3067-7920

Volume 2, Issue 4, April 2026

Website: [usajournals.org](http://usajournals.org)

*This work is Licensed under CC BY 4.0 a Creative Commons Attribution 4.0 International License.*

---

The development of subtropical fruit growing, particularly the cultivation of these crops, requires the study of their biology, analysis of the natural conditions of the region, selection of suitable varieties, cultivation technologies, and the development of scientifically based prospects for the further expansion of subtropical production.

In order to develop pomegranate cultivation in the Fergana region, in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated October 4, 2018 No. 791 “On measures to increase pomegranate cultivation and develop the industry in the Fergana region,” Resolution No. 506 of the regional governor was adopted.

To ensure the implementation of this resolution, in the coming years, orchards covering an area of 20,000 hectares will be established in our region, and 30,000 new jobs will be created. Therefore, for the development of pomegranate cultivation in our country, especially in our region, it is important to study the specific features of its production. [1]

### **Relevance of the research work**

Horticulture plays an important role in meeting the population’s food needs and increasing the economic potential of the country. It is known that the country has fertile soil, favorable climatic conditions, and irrigation systems for the development of horticulture. Increasing yield, improving product quality, and strengthening pest and disease control are among the key regulatory factors of agricultural activity. Control measures should be carried out based on timely and accurate forecasts and the rational use of biological and low-toxicity substances.

In order to meet the population’s demand for medicinal pomegranate and fig fruits, it is necessary to protect these trees and their fruits from various pests. Specialists are well aware that pomegranate trees can be damaged by a number of insects and mites. In recent years, damage caused by the pomegranate fruit moth has created serious problems in horticultural development. Therefore, it is necessary to study these pests, investigate them thoroughly, and develop effective control methods. This is not just simple pest control, but a system-based protection approach that



## *Modern American Journal of Biological and Environmental Sciences*

ISSN (E): 3067-7920

Volume 2, Issue 4, April 2026

Website: [usajournals.org](http://usajournals.org)

*This work is Licensed under CC BY 4.0 a Creative Commons Attribution 4.0 International License.*

---

meets modern requirements. Over the years of research, new approaches have emerged, and corresponding results have been obtained.

Pomegranate fruit moths are widespread in the Fergana Valley, as well as in Surkhandarya, Kashkadarya, Tashkent, and Syrdarya regions. However, there is a risk of further spread to other regions of the country. The pest develops 5–6 generations per year. It overwinters as mature larvae and transforms into a moth in April–May after leaving diapause. In the Fergana region, pomegranate fruits ripen slightly earlier than in Andijan, and egg-laying by overwintered moths has been observed in the first decade of May. When the pomegranate blossoms and fruit formation begins, the moth lays eggs inside the flower calyx. The larvae emerging from the eggs penetrate the fruit and develop by feeding internally.

Pomegranate fruits are damaged as the pest feeds exclusively on them. Infected fruits rot and become covered with mold due to secondary microorganisms. This significantly reduces yield and product quality. The damage level of the pest after 1–2 generations is very high. Today, in the valley, there are many private farms where half or even more of the pomegranate harvest is lost. According to S. Mirzaeva, in Izboskan district of Andijan region, if no protective measures are taken, 31.7–50.6% of the total pomegranate yield may be lost; in Bagdad district of Fergana region, losses may exceed 50.3–77.5%. The pest overwinters mainly as mature larvae in protected places. It develops by producing 5–6 generations per season. Since pomegranate has a long flowering period, spring damage continues for an extended time depending on moth flight activity. The significance of this factor is reduced due to the natural resistance mechanisms of pomegranate fruits, which live in a relatively hidden environment. Therefore, it is necessary to develop effective control methods. [2]

Since the pomegranate fruit moth mainly enters the fruit through the flower calyx, it is considered that the flower of this fruit should possess an attractive property. Accordingly, after pomegranate flowering and fruit formation, a difference was achieved by mechanically removing the remaining floral parts using a wooden tool without a tip. In addition, the inner part of the fruits was cleaned from floral residues and sprayed with non-toxic soil or soil contaminated with Karate and



## *Modern American Journal of Biological and Environmental Sciences*

ISSN (E): 3067-7920

Volume 2, Issue 4, April 2026

Website: [usajournals.org](http://usajournals.org)

*This work is Licensed under CC BY 4.0 a Creative Commons Attribution 4.0 International License.*

Cyperfos. Experiments were conducted in the Andijan and Fergana regions. According to the results, a biological efficiency of 54% was achieved when untreated soil was applied to the calyx, and 83–95% when soil mixed with Karate or Cyperfos was used. In another experiment, the effectiveness of biological control against pomegranate fruit pests was studied considering the seasonal development of the pest. In this case, the experiment consisted of three variants. Once a week (18 times per season), *Trichogramma* (*Trichogramma pintoi*) was released onto trees at a rate of 0.05 g (3000 individuals) per shrub of fruit trees using a practically applicable method. In the second variant, pomegranate trees were treated with both *Trichogramma* and the female *Bracon* species, released for each shrub simultaneously. The third variant served as a control, where natural fruit damage in the control trees was 44.0%, while in the first variant it was 20.0%, and in the second variant 8.9%. This means that the use of *Trichogramma* alone provided 45.4% effectiveness, whereas the combined use of *Trichogramma* and *Bracon* resulted in 79.8% effectiveness. According to the plan, chemical substances and control systems against the pomegranate fruit moth were also evaluated.

Since pomegranate larvae live inside the fruit, it is difficult to achieve satisfactory results using chemical treatments alone. However, according to (Khodjaev, 1990; Eshmatov, 2006), trees can be treated with motorized sprayers when the pest moth begins active flight. Fruit damage after treatment was 22.3%, meaning that complete protection was not achieved. The biological effectiveness was 71.0%. [3] Pomegranate fruits are mainly consumed fresh and are also used for producing juice, wine, and compote. Pomegranate juice contains 8–19% sugar, 0.4–2.5% citric acid, and vitamin C, making it a good remedy against psoriasis. The high sugar and acid content, as well as its unique taste, determine the highly purifying effect of pomegranate juice. Pomegranate juice is not only sweet but also highly beneficial. Its high content of tannins, significant amount of iron, presence of citric acid, and other beneficial properties give pomegranate juice medicinal qualities against atherosclerosis, fever, and other diseases. Pomegranate peel is used in medicine in the form of decoctions and extracts as an anthelmintic agent.



## *Modern American Journal of Biological and Environmental Sciences*

ISSN (E): 3067-7920

Volume 2, Issue 4, April 2026

Website: [usajournals.org](http://usajournals.org)

*This work is Licensed under CC BY 4.0 a Creative Commons Attribution 4.0 International License.*

Depending on the acid content, juice is divided into three groups: sweet (up to 0.9% acid), sweet-and-sour (0.9–1.8%), and sour (above 1.8%). In Uzbekistan, there are pomegranate varieties comparable to world-class standards in taste, juice quality, origin, and chemical composition. The most common varieties include Kazakh pomegranate, Red pomegranate, Birch pomegranate, Bitter seed, and others. High-quality juice is obtained from sweet-and-sour varieties. For juice production, dark red or crimson sweet-and-sour and sour fruits are carefully selected and washed. The top colored part of the peel is carefully removed using a stainless-steel knife. The fruit is then divided into four parts without damaging the seeds inside the peel. Larger fruits are cut into six or eight parts. The seeds are carefully extracted without crushing them. During separation, seeds must not come into contact with peel fragments or internal membranes, otherwise the juice becomes rich in tannins and turns dark brown. The seeds are collected in an enamel container and pressed using manual presses. The pressed seeds are mixed several times and pressed again. The pressing process is slow. Up to 30% juice can be obtained from pomegranate fruits. Fresh juice is collected in an enamel pot and left to settle. It is then heated to 70–75°C and filtered. Dense fabric (flannel) or 3–4 layers of gauze are used for filtration. Regardless of filtration quality, the juice must be left undisturbed for a certain period so that remaining fine particles settle, making the juice clearer. To preserve the taste and aroma of fresh fruit juice, the filtered juice is heated to 85°C and filled into pre-prepared hot bottles or jars. They are immediately sealed and placed in a water bath heated to 80°C for pasteurization. Pasteurization regimes are: at 85°C — 15 minutes for 0.5 L jars, 20 minutes for 1 L jars, 30 minutes for 2 L jars, and 40 minutes for 3 L jars, while maintaining a constant temperature of 85°C in the bath. After pasteurization, jars are sealed, inverted, covered, and cooled. During storage, the juice becomes clearer, and a dark sediment forms at the bottom. Therefore, when consuming the juice, it should be poured carefully without disturbing the sediment. To produce 1 liter of pomegranate juice, 3330 grams of pomegranate fruit are required. After pressing sour pomegranates, 15–20% sugar is added to the juice, then it is heated to 70–75°C, filtered, and preserved using the method described above.



## *Modern American Journal of Biological and Environmental Sciences*

ISSN (E): 3067-7920

Volume 2, Issue 4, April 2026

Website: [usajournals.org](http://usajournals.org)

*This work is Licensed under CC BY 4.0 a Creative Commons Attribution 4.0 International License.*

---

In conclusion, to obtain high-quality juice, it is first necessary to select well-ripened, high-yielding, dark-colored, undamaged fruits. In addition, juice production requires strict adherence to cleanliness, hygiene, and processing standards.

### **References:**

1. Decree of the President of the Republic of Uzbekistan No. PF-4947 dated February 7, 2017, "On the Action Strategy for the Five Priority Areas of Development of the Republic of Uzbekistan for 2017–2021."
2. Mirziyoyev Sh.M. Decree of the President of the Republic of Uzbekistan dated March 29, 2018, No. PF-5388 "On additional measures for the accelerated development of fruit and vegetable production in the Republic of Uzbekistan." Narodnoye Slovo newspaper, March 30, 2018.
3. Alimov O., Juraev R. Modern Technologies of Processing Vegetables and Fruits (Lecture notes for master's students). Tashkent, Tashkent State Agrarian University, 2003.
4. Marufjanov A. "Organization of the Development and Processing of Advanced Pomegranate Agrotechnologies Meeting Modern Requirements." Master's thesis, Fergana Polytechnic Institute, 2020.