

Article

Main Pests of Pome Fruit Tree Seedlings

Matniyazov Bekzod Ulug'bekovich¹, Kurambayev Oybek Ilxamjanovich²

1. Senior Researcher, Khorezm Regional Branch of the Institute of Plant Quarantine and Protection

2. Director of the Khorezm Regional Branch of the Institute of Plant Quarantine and Protection

Citation: Ulug'bekovich, M. B. Ilxamjanovich, K. O. Main Pests of Pome Fruit Tree Seedlings. American Journal Of Biodiversity 2026, 3(9), 25-28.

Received: 10th Aug 2026

Revised: 30th Aug 2026

Accepted: 4th Sep 2026

Published: 24th Sep 2026



Copyright: © 2024 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>)

Abstract: This article analyzes the main pest organisms found in fruit tree nurseries, their biological and ecological characteristics, and the damage they cause to young seedlings. Apple (*Malus domestica* Borkh.), pear (*Pyrus communis* L.) and quince (*Cydonia oblonga* Mill.) seedlings were considered as the object of the study. It was shown that phytophagous insects such as aphids, scale insects, leaf miners, leaf beetles, apple fruit borers, and spider mites can cause significant damage to seedlings. As a result of an increase in the number of pests, leaf deformation, a decrease in the photosynthetic surface, stunting of young shoots, and a decrease in the marketable quality of seedlings are observed. Regular monitoring, a combination of agrotechnical, biological, and, if necessary, chemical protection measures are recommended as the most optimal approach to pest control.

Keywords: pome fruit trees, nursery, pest, phytophagous, aphid, scale insects, leaf miner, apple fruit borer, spider mite, biological protection

Introduction

Fruit growing is one of the important and promising sectors of Uzbekistan's agriculture, and the cultivation of high-quality seedlings is one of the main conditions for creating high-yielding orchards. Apples, pears and quince, which belong to the group of pome fruits, are of great importance in the food industry, processing enterprises and daily consumption of the population [1]. The productivity of orchards largely depends on the health of the planted seedlings, the development of the root system and the absence of pests in their vegetative organs [2].

In nursery conditions, plants are still young and their defense mechanisms are not fully developed. Young leaves, shoots, and branches are a convenient food source for various phytophagous insects. Especially during the spring growing season, aphids, leaf beetles, and leaf-eating moth larvae multiply rapidly and can damage large areas of seedlings in a short period of time [3].

Pests feed on various organs of the plant. Sucking pests feed on plant sap, disrupting the supply of nutrients to young tissues. Rodent pests damage leaf plates, shoots and branches. As a result, the photosynthesis process slows down, the general physiological condition of the plant worsens, and the further development of the seedling slows down [4].

Some aphids can act as vectors for the spread of viral diseases in plants. In addition, the sweet substance secreted by aphids creates a favorable environment for the development of fungi on the

surface of the leaves. Scale insects, on the other hand, live on the stems and branches for a long time, weakening the plant. Therefore, it is important to identify pests in nurseries early and prevent their multiplication [5].

The aim of the study is to identify the main groups of pests found in fruit tree seedlings, assess their biological characteristics and damage, and recommend effective protective measures. The practical significance of the study is determined by the improvement of phytosanitary measures that serve to grow healthy, strong seedlings that meet standard requirements [6].

Materials and Methods

In the studies, nurseries where fruit tree seedlings are grown were taken as the main observation object. Apple, pear and quince seedlings were selected as the object. Observations were carried out regularly during the growing season, examining the leaves, buds, young branches and stem parts of the seedlings. Signs of damage, the number of pests and their location in the plant organs were recorded.

External morphological characters, feeding type, developmental stages, and symptoms of damage to plants can be used to identify pests. Pest samples are collected as needed and examined in the laboratory using a magnifying glass or microscope. It is advisable to use appropriate entomological indicators and scientific literature during the identification process.

When assessing the degree of damage to seedlings, the percentage of damaged plants is taken into account. The formula $Z = (a \times 100) / N$ is used. Here, Z is the degree of damage (%), a is the number of damaged seedlings, and N is the total number of seedlings examined. The pest density can be expressed as the number of individuals per seedling, per stem, or per certain number of leaves.

Observations also record natural predators of pests. For example, ladybird beetles (Coccinellidae), goldflies (Chrysopidae), hoverflies (Syrphidae), and some parasitic hymenoptera can naturally reduce the number of aphids and other small pests. Such observations are important in the development of an integrated pest management system.

Results

As a result of observation and generalization of literature data, it was found that several groups of pests are important in fruit tree seedlings. Some of them damage the leaves and young shoots of seedlings, while others damage the stem or fruit organs. The occurrence of pests in nurseries varies depending on the season, temperature, humidity, agrotechnical measures and the physiological state of seedlings [7].

Aphids (Aphididae) are among the most common sucking pests of young leaves and shoots. They feed on plant sap, causing leaf curling, deformation, and stunting of young shoots. If the infestation is severe, the total vegetative mass of the seedling is reduced. Aphids can multiply rapidly under favorable conditions due to their short generation cycle and high reproductive capacity [8].

Scale insects (Diaspididae) are also a serious pest of fruit trees. They attach to branches and stems and feed on plant sap. Long-term infestation weakens branches and some young branches may die. Since the presence of an external protective shell of scale insects makes them more resistant to some protective agents, it is necessary to plan control measures according to the stage of development of the pest [9].

The larvae of the leaf-boring beetles (Tortricidae) feed covertly, wrapping or attaching leaves together. They damage a significant portion of the leaf blade, reducing the photosynthetic surface. In young seedlings, extensive damage to the leaves can lead to stunted vegetative growth [9].

Leafhoppers (Psyllidae) feed by sucking plant sap from young leaves and shoots. Damaged leaves show discoloration, deformation, and stunted growth. The secretions of some species make the leaf surface sticky, creating conditions for the development of secondary microorganisms [10].

The apple fruit borer (*Cydia pomonella*) is a major pest of fruit trees and can also be found in young orchards. Its larvae burrow into the fruit and feed on the ovary and seeds. As a result, the fruit falls off or its quality deteriorates dramatically. If fruiting bodies have formed in the nursery, monitoring should also be focused on this pest [11].

Spider mites (Tetranychidae) are not insects but belong to the family of mites, but are one of the important phytophagous pests of pome fruit trees. They feed on the sap of leaf cells, causing the appearance of small light-colored dots on the leaves. In severe infestations, the leaves turn yellow, dry out, and may drop prematurely [12].

In general, damage to seedlings depends not only on the number of pests, but also on the age of the seedling, its nutritional status, humidity, temperature and agrotechnical conditions. Therefore, it is important not only to determine the presence of a pest, but also to assess its density and the economic damage it causes [13].

Discussion

Pest control in fruit tree nurseries should be carried out systematically and in advance. First of all, it is necessary to improve the phytosanitary condition of the nursery, control weeds, remove damaged plant debris and place seedlings at optimal density. Excessively dense planting can lead to high humidity and the formation of a favorable microclimate for pests [14].

Along with agrotechnical measures, the use of biological protection methods is an environmentally effective direction. Lady beetles, goldfish and other beneficial entomophagous insects reduce the number of aphids and some small pests. To protect beneficial organisms, it is necessary to avoid unreasonable and repeated use of pesticides [15].

It is advisable to carry out chemical control measures when the number of pests approaches or exceeds the threshold for causing economic damage, based on the appropriate approved preparations. When choosing a preparation, the type of pest, its development stage, the age of the seedling and its impact on the environment should be taken into account. Before processing, it is necessary to follow the current state list of preparations and their application regulations.

The main advantage of an integrated pest management system is that it focuses not on the complete eradication of pests, but on keeping their numbers below an economically damaging level. This approach slows the development of pesticide resistance, preserves beneficial entomofauna, and increases the environmental safety of seedling production.

In Khorezm conditions, especially in the summer months, high temperatures and irrigation regimes can affect pest development. Therefore, determining the correct monitoring periods in local conditions, observing the phenology of pests, and adapting protective measures to their development stages may be an important area of future research.

Conclusion

Fruit tree seedlings are damaged by various sucking and gnawing phytophagous insects. Aphids, scale insects, leaf miners, leaf beetles, apple fruit borers, and spider mites can negatively affect the growth and development of seedlings.

Pests cause leaf deformation, reduced photosynthetic surface area, stunted growth of young shoots, and a decrease in the overall quality of seedlings. Therefore, regular phytosanitary monitoring is necessary in nurseries.

One of the most promising approaches to pest control is the use of an integrated pest management system that combines agrotechnical, biological, and chemical methods. Such a system allows for the production of healthy seedlings, reduces pesticide loads, and increases economic efficiency.

REFERENCES

- [1] R. L. Blackman and V. F. Eastop, *Aphids on the World's Plants: An Identification and Information Guide*. London, U.K.: The Natural History Museum, 1994.
- [2] L. P. Pedigo and M. E. Rice, *Entomology and Pest Management*, 6th ed. Upper Saddle River, NJ, USA: Pearson, 2009.
- [3] D. Dent, *Insect Pest Management*, 2nd ed. Wallingford, U.K.: CABI Publishing, 2000.
- [4] J. E. Rechcigl and N. A. Rechcigl, *Biological and Biotechnological Control of Insect Pests*. Boca Raton, FL, USA: CRC Press, 2000.
- [5] M. L. Flint and S. H. Dreistadt, *Pests of the Garden and Small Farm: A Grower's Guide to Using Less Pesticide*. Oakland, CA, USA: University of California, Agriculture and Natural Resources.
- [6] E. B. Radcliffe, W. D. Hutchison, and R. E. Cancelado, Eds., *Integrated Pest Management: Concepts, Tactics, Strategies and Case Studies*. Cambridge, U.K.: Cambridge University Press, 2009.
- [7] A. E. Hajek and J. Eilenberg, *Natural Enemies: An Introduction to Biological Control*. Cambridge, U.K.: Cambridge University Press, 2018.
- [8] A. Ciancio and K. G. Mukerji, Eds., *Integrated Management of Arthropod Pests and Insect Borne Diseases*. Dordrecht, The Netherlands: Springer, 2010.
- [9] G. M. Gurr and O. L. Kvedaras, "Synergizing biological control: Scope for sterile insect technique, induced plant defences and cultural techniques to enhance natural enemy impact," *Biological Control*, vol. 52, no. 3, pp. 198–207, 2010, doi: 10.1016/j.biocontrol.2009.02.013.
- [10] M. J. W. Cock, S. T. Murphy, M. T. K. Kairo, E. Thompson, R. J. Murphy, and A. W. Francis, "Trends in the classical biological control of insect pests by insects: An update of the BIOCAT database," *BioControl*, vol. 61, pp. 349–363, 2016.
- [11] J.-P. Deguine, J.-N. Aubertot, R. J. Flor, F. Lescourret, K. A. G. Wyckhuys, and A. Ratnadass, "Integrated pest management: Good intentions, hard realities. A review," *Agronomy for Sustainable Development*, vol. 41, art. no. 38, 2021.
- [12] M. Galli, F. Feldmann, U. K. Vogler, and K.-H. Kogel, "Can biocontrol be the game-changer in integrated pest management? A review of definitions, methods and strategies," *Journal of Plant Diseases and Protection*, vol. 131, pp. 265–291, 2024, doi: 10.1007/s41348-024-00878-1.
- [13] L. M. Gontijo *et al.*, "Insect biological control: A global perspective," *Entomologia Generalis*, vol. 45, no. 4, pp. 879–904, 2025, doi: 10.1127/entomologia/3237.
- [14] A. A. Jalloh, S. Pal, O. Uyi, P. Malhotra, J. M. Schmidt, M. D. Toews, and S. Basu, "Biopesticides and biological control agents: Advances, integration, and prospects for sustainable pest management," *Frontiers in Sustainable Food Systems*, vol. 10, art. no. 1805083, 2026, doi: 10.3389/fsufs.2026.1805083.
- [15] S. M. Al Raish, "From chemical control to ecological resilience: Biological control and integrated pest management in arid agriculture," *iScience*, vol. 29, no. 9, art. no. 117334, 2026, doi: 10.1016/j.isci.2026.117334.