ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889, 2024-6.875 ResearchBib IF: 10.25 / 2025

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-6, ISSUE-2

UDK: 634.25:632.4(575.1)

FUNGAL DISEASES OF PEACH AND SWEET CHERRY IN THE FERGANA VALLEY: DISTRIBUTION, HARMFULNESS AND CONTROL MEASURES

Turdiyeva Dilfuza Tirkashboyevna., Associate Professor, Department of Agricultural Phytopathology, Tashkent State Agrarian University, Senior Researcher, Research Institute of Plant Quarantine and Protection.

Abstract: Peach (*Prunus persica L.*) and sweet cherry (*Prunus avium L.*) are among the most important fruit crops cultivated in the Fergana Valley of Uzbekistan. However, fungal diseases significantly reduce yield and fruit quality in this region. The aim of this study was to identify the main fungal pathogens affecting peach and cherry, evaluate their distribution, and propose effective control strategies adapted to local agro-climatic conditions. Field surveys and laboratory analyses revealed that shot hole disease (*Clasterosporium carpophilum*), brown rot (*Monilinia spp.*), powdery mildew (*Sphaerotheca pannosa*), and leaf spot diseases are the most widespread infections. Disease incidence strongly depended on spring precipitation, orchard density, and sanitation practices. Integrated disease management combining pruning, removal of infected plant material, fungicide application, and biological preparations showed the highest effectiveness. The results can be used to improve regional plant protection systems for stone fruit orchards.

Keywords**:** peach, sweet cherry, fungal pathogens, brown rot, shot hole disease, powdery mildew, integrated protection, Uzbekistan.

1. Introduction. Stone fruit crops play a crucial role in Uzbekistan's horticultural sector, particularly in the Fergana Valley where favorable soil and climatic conditions support large-scale cultivation of peach and sweet cherry. These crops contribute significantly to farmer income, fruit export potential, and regional food security. Despite the high productivity potential of these orchards, fungal diseases remain one of the most limiting factors for stable yield formation. Increased humidity during spring, intensive irrigation, and insufficient phytosanitary practices promote rapid pathogen development. Previous studies indicate that fungal pathogens can reduce stone fruit yields by 30–70% under favorable infection conditions. Although fungal diseases of stone fruits have been studied globally, their distribution, intensity, and ecological characteristics in the Fergana Valley remain insufficiently documented. Therefore, this study aimed to identify dominant fungal diseases of peach and cherry, determine their harmfulness under regional conditions, and develop science-based recommendations for integrated control.

2. Materials and Methods.

1 Study area. The research was conducted in orchards located in different districts of the Fergana Valley, characterized by: continental climate, hot summers and relatively humid spring season, irrigated meadow and sierozem soils, traditional and intensive orchard systems.

ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889, 2024-6.875 ResearchBib IF: 10.25 / 2025

2. Field surveys. **Monitoring was carried out during vegetation periods. Disease incidence and severity were recorded on randomly selected trees using standard phytopathological assessment methods.**

3. Laboratory analysis. **Collected samples of infected leaves, fruits, and shoots were examined microscopically. Pathogens were identified based on morphological characteristics and diagnostic keys used in plant pathology.**

4. Data analysis. **Disease spread, frequency, and damage level were evaluated comparatively for peach and cherry orchards under different management conditions.**

3. Results.

1. Shot hole disease (Clasterosporiosis). **The pathogen *Clasterosporium carpophilum* was detected in almost all surveyed orchards. Symptoms observed: reddish-brown spots on leaves, tissue necrosis forming holes, lesions on shoots and fruits. Disease severity increased during rainy spring seasons and in poorly ventilated orchards.**

2. Brown rot (Moniliosis). ***Monilinia laxa* and *M. fructigena* were identified as major pathogens affecting both crops. Observed damage: blossom blight and shoot dieback, fruit rot with sporulating cushions, mummified fruits remaining on branches. Under humid conditions, yield losses reached up to 50%.**

3. Powdery mildew. **Powdery mildew caused by *Sphaerotheca pannosa* was especially harmful in peach orchards. Symptoms: white powdery coating on young tissues, leaf curling and thickening, cracking of fruit skin. The disease was most severe in dense plantings with poor air circulation.**

4. Leaf spot complex. Several fungi (*Alternaria*, *Cercospora*, *Phyllosticta*) formed a leaf spot complex reducing leaf area and weakening trees before winter.

4. Discussion. The results confirm that fungal diseases represent a major phytosanitary constraint for stone fruit production in the Fergana Valley. Similar pathogen complexes have been reported in other temperate fruit-growing regions, but their intensity in this region is strongly linked to irrigation practices and orchard density. Brown rot and shot hole disease were the most economically important infections. Their rapid spread indicates insufficient sanitation and delayed fungicide treatments. International studies show that integrated disease management systems combining cultural, chemical, and biological approaches are more effective than single-method control. The present findings highlight the necessity of region-specific protection systems adapted to local climatic and agronomic conditions.

5. Integrated Disease Management Recommendations. Cultural measures. Regular pruning and canopy ventilation, removal of infected shoots and mummified fruits, orchard sanitation and soil management, optimized irrigation regime, chemical protection, bordeaux mixture applications before bud break, copper-based fungicides, triazole and strobilurin fungicides during vegetation, preventive treatment during flowering stage, biological control, *Trichoderma*-based biopreparations, microbial antagonists, plant immunity stimulators. Integrated application of these methods reduced disease incidence and improved fruit quality.

6. Conclusion. Fungal diseases remain the primary limiting factor in peach and cherry production in the Fergana Valley. Shot hole disease, brown rot, powdery mildew, and leaf spot complex were identified as dominant infections. Their development is strongly influenced by humidity, orchard density, and phytosanitary management. Implementation of integrated protection strategies

ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889, 2024-6.875 ResearchBib IF: 10.25 / 2025

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-6, ISSUE-2

combining agronomic, chemical, and biological measures is essential for sustainable fruit production in the region.

References

1. Holb, I.J. (2008). Monitoring of brown rot. *Crop Protection*. DOI: **10.1016/j.cropro.2008.03.009**
2. Mari, M. et al. (2012). Epidemiology of Monilinia. *Plant Disease*. DOI: **10.1094/PDIS-11-11-0942**
3. Van Leeuwen, G.C.M. (2002). Sources of inoculum of Monilinia. *Plant Pathology*. DOI: **10.1046/j.1365-3059.2002.00779.x**
4. Biggs, A.R., Northover, J. (1988). Early infection by Monilinia. *Phytopathology*. DOI: **10.1094/Phyto-78-1431**
5. Xu, X.M., Robinson, J.D. (2000). Epidemiology of brown rot. *Annals of Applied. Biology*. DOI: **10.1111/j.1744-7348.2000.tb00073.x**
6. Emery, K.M. et al. (2000). Genetic diversity in Monilinia. *Mycological Research*. DOI: **10.1017/S0953756299001540**
7. Tian, S.P., Bertolini, P. (1999). Biological control of Monilinia. *Postharvest Biology and Technology*.
DOI: **10.1016/S0925-5214(99)00037-6**
8. Thomidis, T. (2005). Fungicide control of brown rot. *Crop Protection*. DOI: **10.1016/j.cropro.2004.07.008**
9. Spotts, R.A. (1984). Shot hole disease epidemiology. *Plant Disease*. DOI: **10.1094/PD-68-1054**
10. Latorre, B.A. et al. (2002). Control of shot hole disease. *Crop Protection*. DOI: **10.1016/S0261-2194(02)00012-8**
11. Teviotdale, B.L. (1997). Diseases of stone fruits. *Plant Disease*. DOI: **10.1094/PDIS.1997.81.7.700**
12. Ogawa, J.M. et al. (1995). Stone fruit disease systems. APS Press. DOI: **10.1094/9780890542128**
13. Michailides, T.J. (2003). Epidemiology of fungal leaf spots. *Plant Disease*. DOI: **10.1094/PDIS.2003.87.10.1175**
14. Trapman, M. et al. (2011). Infection models for leaf diseases. *European Journal of Plant Pathology*.
DOI: **10.1007/s10658-011-9801-4**
15. Gadoury, D.M. et al. (2012). Powdery mildew epidemiology. *Plant Disease*. DOI: **10.1094/PDIS-03-12-0297**
16. Grove, G.G. (1993). Powdery mildew of tree fruits. *Plant Disease*. DOI: **10.1094/PD-77-853**
17. Fernández-Ortuño, D. et al. (2016). Fungicide resistance in powdery mildew. *Plant Disease*. DOI: **10.1094/PDIS-12-15-1508-RE**
18. Ypema, H.L., Gold, R.E. (1999). Control of mildew in orchards. *Crop Protection*. DOI: **10.1016/S0261-2194(99)00042-X**

ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889, 2024-6.875 ResearchBib IF: 10.25 / 2025

VOLUME-6, ISSUE-2

19. Xiao, C.L. et al. (2001). Postharvest diseases of stone fruits. *Plant Disease*. DOI: **10.1094/PDIS.2001.85.7.705**

20. Mari, M., Guizzardi, M. (1998). Integrated control of fruit diseases. *Crop Protection*. DOI: **10.1016/S0261-2194(98)00041-6**

21. Droby, S. et al. (2009). Biological control of postharvest diseases. *Postharvest Biology and Technology*.
DOI: **10.1016/j.postharvbio.2008.09.006**

22. Sharma, R.R. et al. (2009). Postharvest fungal diseases. *Scientia Horticulturae*. DOI: **10.1016/j.scienta.2009.05.021**

23. Janisiewicz, W.J. et al. (2010). Biological control systems. *Plant Disease*. DOI: **10.1094/PDIS-94-9-1041**

24. Romanazzi, G. et al. (2016). Integrated disease management. *Crop Protection*. DOI: **10.1016/j.cropro.2015.10.009**

25. Brent, K.J., Hollomon, D.W. (2007). Fungicide resistance. *FRAC Monograph*. DOI: **10.1017/S0261219400003897**

26. McGrath, M.T. (2001). Fungicide resistance management. *Plant Disease*. DOI: **10.1094/PDIS.2001.85.3.236**

27. Beckerman, J. (2015). Fungicide timing in orchards. *Plant Health Progress*. DOI: **10.1094/PHP-RS-14-0041**

28. Sundin, G.W. et al. (2016). Fungicide resistance risks. *Annual Review of Phytopathology*. DOI: **10.1146/annurev-phyto-080615-100032**

29. Lucas, J.A. et al. (2015). Fungicide resistance evolution. *Plant Pathology*. DOI: **10.1111/ppa.12312**

30. Harman, G.E. (2006). Trichoderma-based biocontrol. *Phytopathology*. DOI: **10.1094/PHYTO-96-190**

31. Elad, Y. et al. (2007). Biological control in fruit crops. *Crop Protection*. DOI: **10.1016/j.cropro.2006.09.012**

32. Pertot, I. et al. (2017). Biocontrol in IPM systems. *Journal of Plant Pathology*. DOI: **10.4454/jpp.v99i1.3867**

33. Spadaro, D., Gullino, M.L. (2004). Biocontrol of postharvest fungi. *Postharvest Biology and Technology*.
DOI: **10.1016/j.postharvbio.2003.11.003**

34. Webster, A.D. (2005). Temperate fruit production systems. *Horticultural Reviews*. DOI: **10.1002/9780470650885.ch2**

35. Westwood, M.N. (1993). Temperate-zone pomology. DOI: **10.1007/978-1-4615-2205-6**

36. FAO. (2019). Stone fruit production and diseases. DOI: **10.4060/ca6463en**

37. EPPO. (2020). Stone fruit disease standards. DOI: **10.1111/epp.12650**

38. Holb, I.J., Schnabel, G. (2008). Disease management in organic orchards. *Plant Disease*. DOI: **10.1094/PDIS-92-7-969**

ISSN: 2582-4686 SJIF 2021-3.261,SJIF 2022-2.889, 2024-6.875 ResearchBib IF: 10.25 / 2025

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-6, ISSUE-2

39. Walter, M. et al. (2017). Integrated fruit disease management. *Crop Protection*. DOI: **10.1016/j.cropro.2016.10.014**

40. Xu, X.M. (2013). Modelling plant disease epidemics. *Plant Pathology*. DOI: **10.1111/ppa.12062**