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ANALYSIS OF MELON DISEASES: CAUSES, SYMPTOMS AND CONTROL MEASURES

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Abstarct. Melons are nutritious and delicious fruits that are widely cultivated for their sweet and juicy flesh. However, like any other crop, melon plants are prone to various diseases that can significantly impact their growth, yield, and quality. In this article, we will analyze the most common diseases affecting melon plants, including their causes, symptoms, and effective control measures. By understanding these diseases and implementing appropriate management strategies, farmers and gardeners can protect their melon crops and ensure successful harvests.

Key words: melon crops, common diseases, growth, yield, quality, symptoms.

Introduction. Watermelons are an important vegetable crop in the cucurbit family grown both on commercial farms and in residential gardens. Based on a long history of production, open-pollenated, hybrid and seedless (triploid) varieties can be successfully grown in the state. Watermelons are generally well adapted with adequate irrigation; high-quality melons can be produced under normal summer conditions. Early production for the Fourth of July market is generally started by transplanting into plastic mulch, while main and late-season production is typically direct seeded into warmer soils in May and June. Late-season production can extend until frost if vines are well maintained. Diseases are frequent and can limit watermelon quality and yield.



Figure 1. Early foliar symptoms of Verticillium

Diseases can occur any time during the crop production cycle and can affect all plant parts from roots to fruit. Diseases are most severe when vines are attacked and prematurely killed. However, diseases that attack leaves (foliar diseases) reduce fruit quality by exposing

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melons to sun-scald. Additionally, fruit sweetness and normal ripening are dependent on healthy foliage. When disease affects fruit, they are generally rendered unmarketable and prone to decay, resulting in losses during shipment and transit [1]. Fortunately, it is normally possible to manage watermelon diseases and obtain consistent yield and quality. The purpose of this publication is to aid in the identification of important diseases of watermelons in Oklahoma and to provide general guidelines for their management. Correct disease identification is the first step in effective management. Incorrect identification can lead to the implementation of an ineffective management practice and crop failure. For example, diseases caused by bacteria or viruses are not controlled with most fungicides. Furthermore, select fungicides or resistant varieties may control one disease but not another. Watermelon growers should learn to recognize the more common diseases by their symptoms and have sufficient knowledge of disease development to select appropriate management practices [2]. Some diseases are easy to identify in the field, while others are more difficult. The OSU Plant Disease and Insect Diagnostic Laboratory offers disease diagnosis as a service to commercial growers and residential gardeners. Samples can be submitted to the laboratory through local county OSU Extension offices. Anthracnose is a common foliar disease of watermelon in Oklahoma. It affects all aboveground parts of the plant including leaves, stems, and fruit. The fruit lesions are particularly damaging because they can develop from small, easily overlooked spots on the fruit at harvest into decayed and leaky melons during shipping.



Figure 2. Anthracnose leaf spots and stem lesions

Disease biology: Anthracnose is favored by extended periods of warm and rainy weather. The anthracnose fungus overwinters on infected debris from previous crops, on volunteers from seed of diseased melons left in the field, and may be seedborne in commercial seed. Spores produced

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on the debris and volunteers are spread to plants by splashing rain, sprinkler irrigation or surface runoff. Thereafter, disease increase is a result of infection by spores produced on new lesions, which are spread in the same manner. Fusarium species cause root rots and vascular wilts of many crops. They are persistent soilborne fungi that increase in soils repeatedly cropped to susceptible crops. The strain that attacks watermelon is different from those that attack cantaloupe or cucumber [3]. The fungus produces resistant spores that can survive in the soil for many years. The presence of nearby roots stimulates spore germination and growth, followed by their penetration of roots through natural openings and wounds. The fungus then colonizes the vascular system of the plant, causing the wilt symptoms. There are strains (races) of the fungus that differ in their ability to infect different varieties. The viruses are usually spread by aphids, but they also may be spread mechanically or by cucumber beetles. Aphids acquire the virus by feeding on virus-infected crops or weeds that act as virus reservoirs. Aphids then migrate to cucurbit crops and rapidly infect plants during their probing and feeding activities. Aphids other than the melon aphid, a significant cucurbit pest itself, are usually responsible for initial infection in fields.

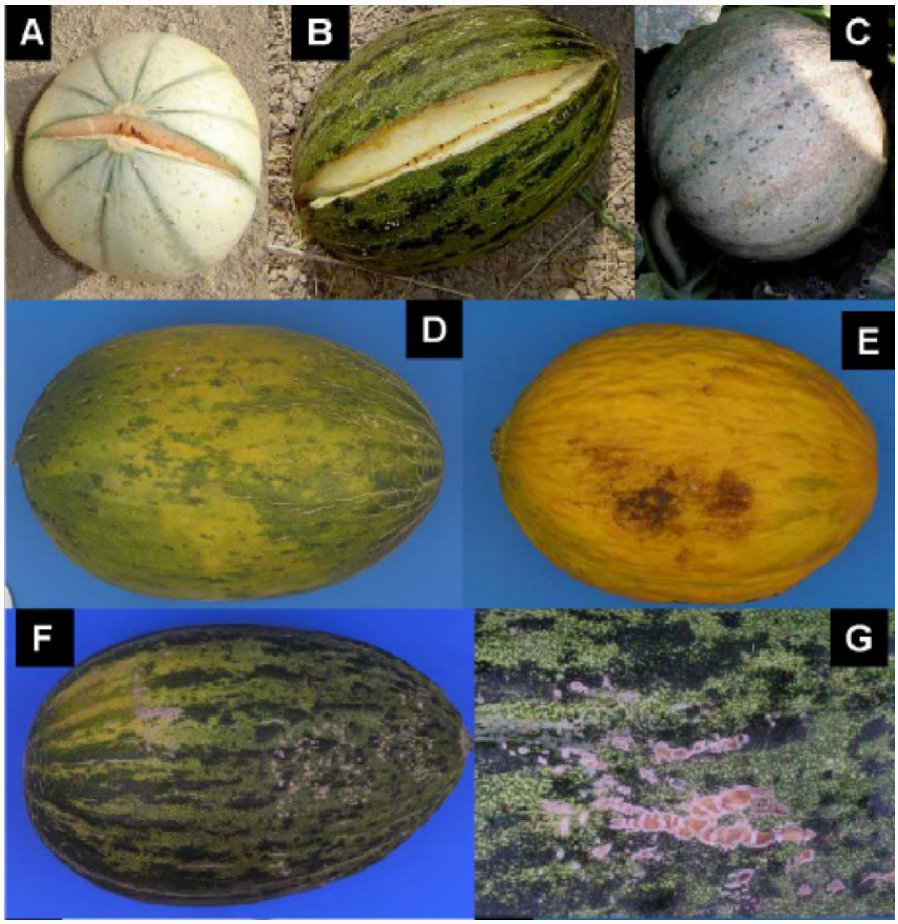


Figure 3. Skin and flesh disorders and decay at harvest in fruits of melon and reference cultivars

Generally, only a few plants are initially infected from aphids moving from field to field. Melon aphid activity within fields then accounts for secondary spread, which can be extensive. Aphid numbers in an area increase as the growing season progresses, making late-season plantings particularly vulnerable [4]. Control of viral diseases of watermelon is difficult because there are no virus-resistant varieties. Planting early to avoid late-season aphid build-up can be an effective way to escape virus disease. Aphid control with insecticides is not effective because insecticides do not kill aphids before they infect plants. Reflective plastic mulches that repel aphids are

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partially effective. Weed management should be practiced in and around cucurbit fields because weeds may harbor aphids and/or cucurbit viruses. Watermelon plantings, particularly those planted late in the season, should not be situated near or downwind of other fields or areas with virus symptoms. Planting alternating strips of grain sorghum or another short-statured summer grass with watermelons may be effective in reducing virus disease by acting as a 'virus sieve'. Aphids intercepted by the grassy boarder may lose infectivity as they taste or 'probe' the grass crop. Squash bugs overwinter as adults in brushy field perimeters and lay groups of shiny bronze-colored eggs on the undersides of leaves. It was originally thought that yellow vine was caused by a toxin injected by the squash bug, however no toxin has ever been identified [5]. The bacterium Serratia marcescens has recently been implicated as a plant pathogen vectored by the squash bug. Compounds from roots cause the eggs to hatch and form larvae, which move into roots and use a rigid straw-like mouth-part called a stylet to pierce cells and remove nutrients. Female larvae eventually become sedentary and form feeding sites, which become swollen and produce the characteristic root galls. Large numbers of eggs are produced in the galled roots, then released into the soil upon root decomposition, where they are available for infecting future crops. Several cycles of nematode feeding and reproduction may occur during a single growing season. The degree of root galling and damage is proportional to levels of nematode in the soil. Therefore, its best to prevent nematode introduction into fields and gardens. Avoid carrying infested soil on tools, equipment, transplants or other plant material and accompanying soil. Rotation with a non-host crop is a way to reduce levels of root-knot nematodes and to prevent their buildup in soil. In theory, crop rotation with non-host crops results in egg hatch, but resulting larvae cannot feed or reproduce and die. Several crop cycles with non-hosts is required to reduce nematode to non-damaging levels [6]. However, the southern root-knot nematode has a wide host range including most broadleaf vegetable crops, including corn. Genetic resistance to root-knot nematodes is currently unavailable in watermelon. Soil solarization the heating of soil by capturing solar radiation is beneficial for reducing nematodes and some other soil-borne plant pathogens. A drawback of solarization is that crops cannot be grown during the summer while the solarization is ongoing. Because nematodes thrive in course, sandy soils low in organic matter, adding organic matter or using soil management practices that favor organic matter accumulation in soil may help reduce nematode levels.

Conclusion. Melon diseases can cause significant losses in terms of yield and quality. It is crucial for farmers, gardeners, and researchers to have a comprehensive understanding of the causes, symptoms, and control measures for these diseases. By adopting preventive practices, implementing integrated pest management strategies, and staying informed about the latest research, we can effectively manage and mitigate the impact of melon diseases. Continued research and collaboration among scientists, farmers, and agricultural organizations will play a vital role in developing sustainable and effective solutions to ensure the health and productivity of melon crops.

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