

رئوس مطالب:

بیماریهای مرکبات
بیماریهای خرما
بیماریهای سیب و گلابی
بیماریهای انگور
بیماریهای پسته
بیماریهای انجیر
بیماریهای گردو
بیماریهای هلو، آلو، گیلان، آلبالو، زردآلو، ...
بیماریهای زیتون
بیماریهای فندق
بیماریهای بادام
بیماریهای کیوی
بیماریهای موز و توت

کمیودها و عوارض فیزیولوژیک

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نام درس:
بیماریهای درختان میوه
3 واحد (2 واحد نظری و 1 واحد عملی)

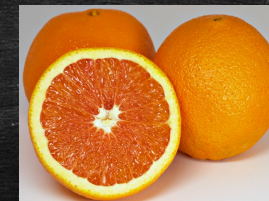
منابع:

اشکان، م. 1381. بیماریهای مهم درختان میوه هسته‌دار. انتشارات آبیژ
اشکان، م. 1385. درسنامه بیماریهای مهم درختان میوه ایران. انتشارات آبیژ

Agrios, N. 2005. Plant Pathology, Academic Press.
Plant Diseases and Phytopathology Journals, www.APSnet.org

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گموز (انگومک) مرکبات
Citrus Gummosis, Crown rot, Foot rot, Collar rot



عامل بیماری

In Iran: *Phytophthora citrophthora*
Ph. nicotiana var. *parasitica*
In the world: *Ph. palmivora*, *Ph. syringae*

Kingdom: Chromaveolata
Phylum: Oomycota
Class: Peronosporomycetes
SubClass: Peronomycetidae
Order: Peronosporales
Genus: *Phytophthora*

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Symptoms:

Disease usually occurs in **high rainfall** areas (or black soil). Symptoms include **rotted roots**; **cracked bark**, accompanied by **gumming**.

Water-soaked, reddish-brown to black bark at the soil line.

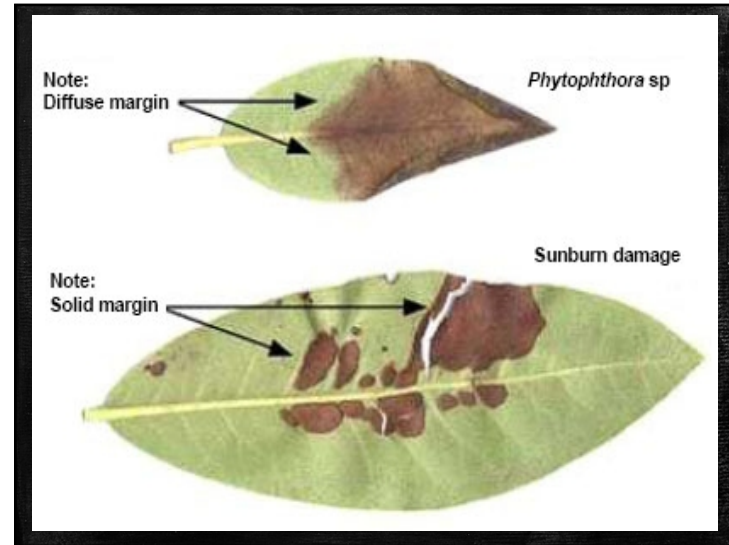
Yellowing, sparse foliage and death of the tree and **brown rot** of fruit.

Diseased barks shows **longitudinal cracks**, completely rot and die before the fruits mature, Profuse **gumming** on the surface of the infected bark

Droplets of gum tickle down the stem and give a conspicuous brown color staining along with hardened masses of gum.

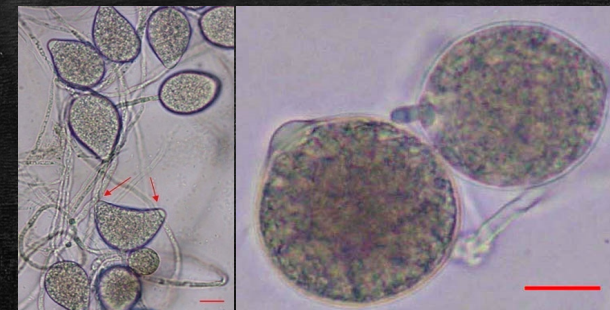
Excess **soil moisture** favors production and spread of zoospores. Therefore, **increased drainage** and **careful irrigation** is an important factor in disease management.

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Symptoms caused by *Phytophthora* spp.

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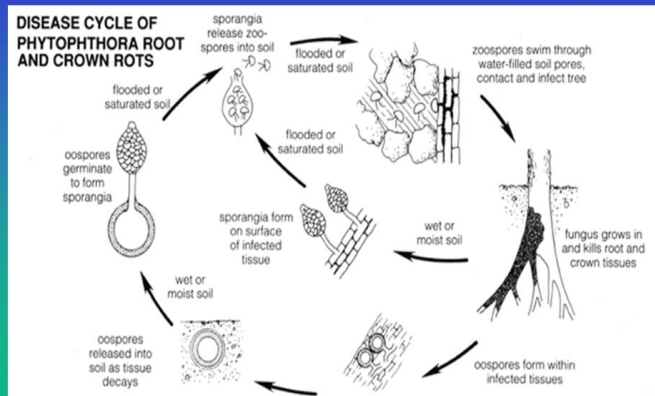
Left: *Ph. citrophthora*, Sporangia: Pyriform, 1-2 Papillates, without Oospore.

Right: *Ph. n. var. parasitica*, Sporangia: Globose, 1 Papillate, with Oospore

Overwintering: Mycelia in infected tissues of plants (root and Crown) and Oospore in soil.

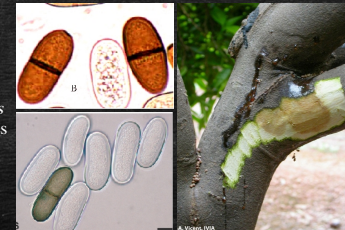
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Disease Cycle: Phytophthora Root Rot



Diplodia gummosis *Diplodia natelensis* (*Botryosphaeria rohdina*)

Kingdom: Fungi
Phylum: Ascomycota
Class: Sordariomycetes
SubClass: *Incertae sedis*
Order: Botryosphaeriales
Genus: *Botryosphaeria*



Epidemiology:

Reduced tree **vigor**, **Insect** damage, **Poor** nutrition, **Old** age trees, **Ethylene** treatment is found to enhance *Diplodia gummosis*

Mode of spread: through air born conidia

Gum oozes out from one or two near **forks/** bigger **limbs** at certain seasons. Bark becomes **black** and killed.

Management: Improve the tree vigor by proper nutrition
Wound in the bark may be scraped and protected with BP

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Control:

Perevention:

Suitable drainage, **Avoid** excess irrigation, Injuries to the plants should be avoided, Avoid continuous contact of trunk with water by **adopting** system.

Diseased leaves and fruits should be **collected** and **burnt**.

Use **resistant** root stocks like *Citrus aurantium* (sour orange) and *Poncirus trifoliata*.

Healthy trees may be painted with **Bordeaux Mixture** upto a height of 50-70 cm above the ground level.

Treatment:

Spray with BM 0.1% or tin sulphate or difolatan 0.3% or metalaxyl- mancozeb 0.2%

Drenching the soil around the base with **BM** 0.1% or Fosetyl AL.

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آنتراکنوز مرکبات Citrus Anthracnose

Kingdom: Fungi
Phylum: Ascomycota
Class: Sordariomycetes
SubClass: *Incertae sedis*
Order: Phylacorales
Genus: *Glomerella*



عامل بیماری

Colletotrichum gloeosporioides (*Glomerella cingulata*)

All **common** citrus cultivars are **susceptible** to anthracnose.
Anthracnose is found **worldwide**.

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Symptoms:

LEAVES:

Spots have **dark brown** margin and **grey** centre with numerous **black dots** arranged in concentric **rings**, **Young leaves** are susceptible

TWIGGS:

Branches begin to wither from the **tip** downward, Black dot like **acervuli** are seen in large numbers on the dead twigs.

FRUITS:

Dark brown to black colour, **sunken**, circular **spots** with pink color spore masses representing **acervuli** under humid condition.

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Disease cycle:

Anthrachnose is a **primary colonizer** of injured and **senescent** tissue. Fungus survive in the **dead twigs** and **branches** as **Mycelia** and **acervuli**, and it spreads short distances by rain **splash**, heavy dew, and overhead irrigation. Such movement deposits the spores on susceptible tissues of **young leaves** or **immature fruit**. **Sexual spores**, although less numerous, are **significant for long distance dispersal because of their ability to become airborne**. Once the spores germinate, they form a resting **structure** that allows them to remain dormant until an injury occurs or until degreening. The disease is especially troublesome on fruit that are **harvested** early and **degreened** for over 24 hours because **ethylene** stimulates the growth of the **fungus**.

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Symptoms caused by *Colletotrichum gleosporioides*

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Management:

Prevention:

Dried twigs should be **pruned** and Cut end should be **painted** with BP.

Apply **Carbendazim** 0.1% after **pruning**.

Proper **irrigation** and **manuring** with **urea** 100g/10 liters water solution, Improve **drainage**

Treatment:

Periodical **spray** with 1% or **ferbam** or **mancozeb** or **zineb** **benomyl** or **captan** 0.2%, two times:

A: **Emergence of young leaves**

B: **After falling the petals.**

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پوسیدگی های میوه مرکبات

A: Blue mould, Green mould,

Kingdom: Fungi
Phylum: Ascomycota
Class: Eurotiomycetes
Order: Eurotiales
Genus: *Penicillium*
Aspergillus



عامل بیماری
Penicillium italicum (Blue mould)
P. digitatum (Green mould)

All common citrus cultivars are susceptible to fruit rot.
Fruit rot is found during storage and transit.

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پوسیدگی های میوه مرکبات

B: Stem end rot

1. *Diplodia natalensis*

Occur during storage and transit, Rot develop at both ends.

Management:

Post harvest treatment with Bordeaux mixture 6-8% or mycostalin 300-400ppm



2. *Phomopsis citri*

Rot starts around the bottom of the fruits and cause softening of the rind and the affected area develops brown colour.

Management:

Pre harvest spray with benomyl 500ppm.



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Condition:

Occur during storage and transit

Entire fruit rot and emit a bad odour

Green or blue fungal growth is seen on the surface of the fruits

Disease is spread by air born spores

Fungi enter through wounds, stem end glands

Management:

Pre storage dip in thiabendazole 500ppm for 2-3 minute is effective.

Boric acid 4% or imazalil 4% is also effective.



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پوسیدگی های میوه مرکبات

C: Brown rot

1. *Phytophthora nicotiana*

Surface is covered by cottony fungal growth and emit foul smell.

Management:

Spray with BM 1% in the crop.



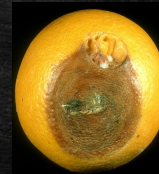
D: Alternaria fruit rot

1. *A. citri*

Initially small discoloured spots appear on the fruits and later turn brown. Fungus enter through wounds.

Management:

Spray BM 0.8% or pre harvest spray of dinocap 0.1%.



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پوسیدگی های میوه مرکبات

E: Soft rot

1. *Aspergillus niger*

Fruits are apparently **healthy** and **normal**. Rot begins as a **small circular, water soaked** spot which enlarge and turn **brown**.



F: Sour rot

1. *Geotrichum candidum*

Infects only **ripe** or over ripe fruits. Diseased fruits emits **strong** odour of fermented juice.

Fungal growth is not seen on **fruits normally**

Management:

Injuries should be **avoided**, **Store** at **low temperature**.

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شانگر باکتریایی مرکبات

Bacterial canker of citrus



عامل بیماری

Xanthomonas axonopodis pv. *citri*

Gram **negative**, **rod shaped**, with **polar** flagellum

Noticed on the **leaves**, **twigs**, **thorns** and **fruits**.
Serious in **acid lime**, **lemon** and **grape** fruits

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پوسیدگی های میوه مرکبات

G: Trichoderma rot

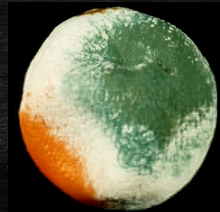
1. *T. lignorum*

Water soaked patches appear with the growth of fungus on the **entire** fruits.

Rind becomes very **soft** and **pulpy**.

Management:

Injuries should be **avoided**. **Store** at **low temperature**



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Symptoms:

Seedlings: badly cankered leaves **shed** and cause **girdling** of **stems** and ultimately lead to **death** of seedlings.

Leaves: initially small **watery** translucent raised spots of yellow color appear on the **upper surface**. Mature spots become whitish/greyish, **rough**, hard, **corky** and crater like with a **yellow halo**. Severe spotting results in defoliation.

Twigs: similar lesions produced on the **twigs** and branches lead to the **die back**.

Fruits: **crater** like cankerous spot without **yellow halo** present on the infected fruits. **Juice content** of the infected fruit is reduced. **Market** value of the fruit is **reduced**.

Root: rarely **grapefruit** roots exposed above **ground** surface show the cankerous growth.

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Symptoms caused by *X. a. p.v. citri*

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Management:

In older orchards **affected** plant parts should be **pruned** and **sprayed** with **BM 1%** at periodical intervals. Maintain the **vigour** of tree with proper **manuring** and **fertilizer** application. Avoid the attack of **leaf miner**.

Spray with **streptomycin sulphate** 500- 1000 ppm at 15 days interval.

Spray **neem** cake infusion once or twice in a year.

Control measures developed in Japan include **wind breakers** of trees or **netting**.

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Mode of spread:

Survive in **cankorous** leaves, twigs and branches, **Spread** by wind **splashed rain**.

Injury caused by **leaf miner** **paves** the way for the **entry**

Epidemiology:

Temperature between 20-35°C with evenly distributed rains.

Management:

Fallen cankered leaves and twigs should be **collected** and **burnt**.

Disease **free** seedlings should be **used**.

Young seedlings should be **sprayed** in new orchards with **BM 1%** before planting or with **streptocycline** 100 ppm at monthly intervals

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If you don't **like** where you are,
Change it!
You are not a **tree**....

Jim Rohn

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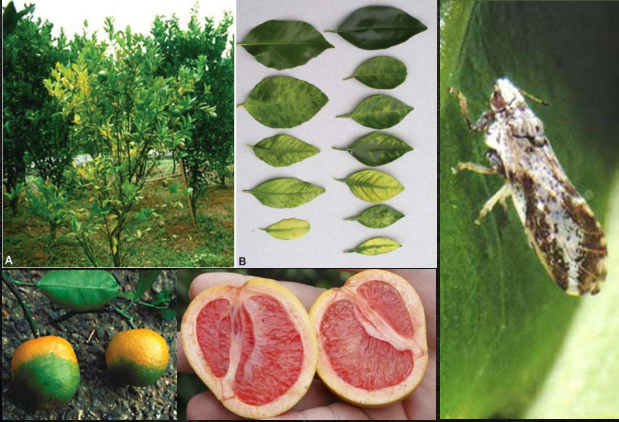
میوه سبز مرکبات
Citrus Greening, Huanglongbing, yellow dragon disease



عامل بیماری
In Asia: *Candidatus liberobacter asiaticus*
In Africa: *C. liberobacter africanus*.
(fastidious phloem-limited bacterium)

All types of citrus are susceptible.

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Symptoms caused by Citrus greening

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Symptoms:

Leaves: smaller leaves, **yellowing** of the leaves of part or, usually, the **entire** canopy of the trees, **reduced** foliage.

Twigs: **dieback**.

Fruit: The **most** characteristic symptoms occur in **fruit**, infected trees produce fruit that is **lopsided**, **fails to ripen**, and instead **remains green** and imparts an unpleasant flavor to **juice** produced from such fruit.

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Epidemiology:
The pathogen is spread by **vegetative propagation** and by two **psyllid insects**. The **Asian** strain is spread primarily by *Diaphorina citri*, whereas the primary vector for the **African** strain is *Trioza erytreae*, but **both insect vectors can transmit** either strain of the bacterium.

Management:
Control of citrus greening depends on **exclusion** of the **pathogen** from a citrus-producing area, use of **disease-free** propagating material, **removal** of infected trees as soon as they are detected, and **attempts to control** the **insect** vectors with insecticides or by bio-logical control.

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