

Dying Plants Caused by Crown and Root Rots

Pathogens: *Phytophthora cactorum*, *P. citricola*, *P. parasitica*, and *P. megasperma*; *Macrophomina phaseolina*; *Cylindrocarpon* spp. , *Verticillium dahliae*, others

PHYTOPHTHORA ROOT ROT



Scientific name: *Phytophthora cactorum*, *P. citricola*, *P. parasitica*, and *P. megasperma*



VERTICILLIUM WILT



Scientific name: *Verticillium dahliae*



BLACK ROOT ROT



Scientific name: *Cylindrocarpon* spp.



MACROPHOMINA ROOT ROT



Scientific name: *Macrophomina phaseolina*



Crown and Root Rots

Damage and description:

- Crown and root rots caused by *Verticillium*, *Phytophthora*, *Macrophomina*, *Cylindrocarpon* have very similar symptoms, and can be controlled using similar methods.
- Symptoms (or signs of problem): Small, stunted plants and small leaves. Wilted plants collapse and die. Crown has red or brown colored patches, or roots are black. Lack of new, healthy young roots.
- Pathogens come from the soil. A pathogen is an agent that causes a disease.
- Too much water or heavy, wet soils can make more disease.
- Pathogens can survive for years in the soil.

Wilting and dying plants can also be caused by overwatering, under watering, heavy clay soils with poor drainage, high salts in the soil or water, and/or over fertilizing.

Crown and Root Rots

How to Control: (You need to do several things to manage diseases in the soil)

-Take whole plants, roots and some surrounding soil to UCCE or a lab to test what is causing the problem.

You can send diseased plants to: Steve Koike, UCCE Monterey County

1432 Abbott St.
Salinas, CA 93901

**Make sure to include your name and phone number, and the variety of strawberry that is diseased

Farming Practices:

- Always use certified transplants on raised beds
- Do not farm in poorly drained fields
- Improve drainage if possible (ex. ripping, and/or make higher beds)
- Increase soil organic matter to improve soil and water infiltration (ex. Use cover crops and/or compost)
- Plant stronger varieties. Seascape better for Macrophomina; Albion for Phytophthora.
- Irrigate properly to avoid soils getting too wet (Phytophthora) or too dry (Macrophomina).

Soil Solarization and Soil Management:

- Rotate with broccoli to control Verticillium, and disk the plant residues into the soil
- Add compost to soil to increase organic matter
- High soil temperatures from solarization helps kill root rot pathogens

Chemical:

- Apply Vapam fumigant pre-plant to help control root rot pathogens and weeds. However, Vapam does NOT provide 100% control of soil borne diseases.
- Dip plant roots in fungicides or apply fungicides through drip lines for Phytophthora (Fungicides: Fosphite, Aliette)

Nematodes

Northern root knot nematode: *Meloidogyne hapla*



Description and Damage

- Nematodes are microscopic roundworms that live in the soil, water or plant tissue
- Microscopic, you can not see them
- Need laboratory test to identify them
- Aboveground symptoms: wilting during hot days, stunting, chlorosis (pale yellow leaves with green veins), and lower fruit yields.
- Belowground symptoms: Root galls (swelling) formed near the root tips and lots of branching at and above these galls.

How to Manage Nematodes

- Using certified transplants and fumigation are the best known control measures

Farming Practices

- Rotate strawberries with another crop that does not get nematodes
- Control weeds
- Plant nothing, leave the soil bare
- Soil solarization
- Use only certified strawberry transplants

Chemical Control

- Fumigation: Vapam