



# DESERT AG-NOTES

82-675 Highway 111, Rm. 118 Indio, CA 92201 July 2003



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### 2001-02 Coachella Valley Vegetable Disease Review

The Farm Advisor and Coachella Valley Pest Control Advisors collected the plant samples used in this report that covers 2001 and 2002. Where the pathogen was identified it is listed. Note that not every problem led to a pathogen being identified. This is not a complete list of diseases in the Coachella Valley. Future reports will attempt to cover disease control measures.

#### ARTICHOKE

- 01-11-01 **Symptoms:** Mature plants with large dead yellowing areas on leaves. Yellowing areas resembled a mottling.  
**Pathogen:** *Fusarium* sp. was isolated, secondary diseases: *Alternaria*, *Stemphylium* and *Cladosporium* spp. isolated from leaves and crown tissue.
- 01-24-01 **Symptoms:** Mature plants with basal stem and crown rot.  
**Pathogen:** *Sclerotinia sclerotiorum*, secondary diseases: *Botrytis* and *Alternaria* spp. on the leaves and flower buds. These diseases are enhanced by cool and wet conditions. *Alternaria* and *Cladosporium* spp. have caused leaf spots in artichokes in the past, see the 1997-1998 Coachella Valley Disease Review.
- 09-17-01 **Symptoms:** Young transplants are dying shortly after transplanting. This field has a history of disease problems.  
**Pathogen:** *Rhizoctonia* sp. Pathologist suspects that other factors are involved causing this problem. Diseases do not typically spread as much as they have spread in this field.
- 11-07-01 **Symptoms:** Mature artichoke plants are collapsing in large areas of the field.  
**Pathogen:** *Pythium myriotylum* a common warm soil pathogen. Secondary disease: *Pseudomonas*, a saprophyte, is not involved with main problem.
- 09-23-02 **Symptoms:** Roots are developing very poorly. Roots were all winding around themselves.  
**Pathogen:** Some *Fusarium* sp. however does not appear to be the causal agent. Suspect the transplants were too large for the seeding trays.

#### BASIL

- 12-30-02 **Symptoms:** Basil plants in the greenhouse have tip dieback of stems.  
**Pathogen:** *Fusarium oxysporum* f. sp. *basilici*. This disease can persist in the soil for years. Eventually the disease spreads and kills the plant.

#### BELL PEPPERS, CHILI PEPPERS:

- 02-09-01 **Symptoms:** Some plants are showing a necrosis and some dieback.  
**Pathogen:** *Helminthosporium* fungus. None of the pathologists had seen this before, they were not sure where the plants picked up the fungus.
- 03-06-01 **Symptoms:** Wilting and decline of plants in one area of the rows.  
**Pathogen:** No fungi isolated.

- 04-18-01 **Symptoms:** Plants are girdling at crown (stem/soil) level.  
**Pathogen:** *Fusarium* sp. from the roots and *Rhizoctonia* sp. from the girdled area.
- 06-01-01 **Symptoms:** Young fruit with larva inside. Small with flattened head.  
**Pathogen:** Pepper Weevil, was widespread throughout the Coachella Valley. Pepper Weevils may become a problem if peppers are grown year round.
- 06-20-01 **Symptoms:** Red and Yellow bell pepper fruit with unusual markings on skin surface. Markings were very superficial.  
**Pathogen:** No disease isolated, suspect it is chemical injury (petroleum carrier?) that caused cells to split. Several pathologists looked at sample with same results.
- 08-20-01 **Symptoms:** Wilting and stunting of young transplants.  
**Pathogen:** No fungus isolated was isolated.
- 09-11-01 **Symptoms:** Pepper plants are wilting and stunted.  
**Pathogen:** *Pythium* sp., this fungus is enhanced by over watering.
- 09-19-01 **Symptoms:** Pepper plants are dying back.  
**Pathogen:** *Pythium aphanidermatum*. The *Pythium* sp. produce sporangia, in these motile zoospores are produced, these germinate when they come in contact with root hairs. This disease is enhanced by high soil moisture.
- 10-31-01 **Symptoms:** Virus like mottling symptoms on leaves.  
**Pathogen:** No virus isolated.

#### **BROCCOLI**

- 09-17-02 **Symptoms:** Leaves have scalding on several plants.  
**Pathogen:** No disease plated out.
- 10-24-02 **Symptoms:** Stunted Broccoli plants.  
**Pathogen:** *Fusarium oxysporum* f. sp. *conglutinans* can also cause stem rot and wilt on broccoli and cauliflower. Also recovered *Pythium* sp. from sample.

#### **CAULIFLOWER**

- 01-18-01 **Symptoms:** Leaf spotting became noticeable after rain in the area. The spotting eventually turns into a necrotic area.  
**Pathogen:** No disease agent plated out, suspected Black rot or White spot.

#### **CANTALOUPE**

- 10-16-01 **Symptoms:** Mature plants appear to be declining close to harvest.  
**Pathogen:** *Rhizoctonia* sp. and *Monosporascus cannonballus*.
- 10-25-01 **Symptoms:** Cantaloupe plants a few days from harvest suddenly collapse in large areas of the field.  
**Pathogen:** *Monosporascus cannonballus*. Dr. Mike Stanghellini first identified this fungus in California in 1991. Preplant fumigation of pathogen-infested fields with Methyl bromide has been an effective control measure. Alternative disease management strategies are needed because Methyl bromide is being phased out.
- 05-03-02 **Symptoms:** Cantaloupe and Korean melon with leaves dying.  
**Pathogen:** Negative for disease. Collapse of plants not due to pathogen.
- 11-20-02 **Symptoms:** Cantaloupe fields with widespread virus like symptoms.  
**Pathogen:** Cucurbit Leaf Crumple Virus (CLCV).

#### **CARROTS**

- 04-25-01 **Symptoms:** Larva stage of unknown insect causing cutworm like damage on carrots.  
**Pathogen:** No identification of larva. Widespread leaf damage in the field.
- 01-15-02 **Symptoms:** Carrots with foliar disease symptoms.  
**Pathogen:** *Alternaria dauci*. *Alternaria* leaf blight requires moisture from dew or rain for germination. This fungus has a temperature range of 57°F to 95°F with the optimum temperature at 82°F.

## CELERY

- 09-25-01 **Symptoms:** Transplants are dying back.  
**Pathogen:** *Erwinia cartova*. This bacterium enters plants through wounds or injured tissue. Disease is enhanced by warm, wet conditions.
- 10-01-01 **Symptoms:** Yellowish colored stems and leaves.  
**Pathogen:** Positive for phytoplasmas.
- 12-21-01 **Symptoms:** Plants are stunted and appear sickly.  
**Pathogen:** Negative for phytoplasmas, suspected Aster Yellows.
- 12-17-01 **Symptoms:** Plants have lesions at the soil line.  
**Pathogen:** Crater rot caused by *Rhizoctonia* sp.
- 12-17-01 **Symptoms:** Plants are rotting at the soil line.  
**Results:** Pink rot caused by *Sclerotinia* sp.
- 01-03-02 **Symptoms:** Chinese Celery many plants are dying back. Roots appear to be dead.  
**Pathogen:** *Rhizoctonia* sp., *Alternaria* sp., *Fusarium* sp. and *Verticillium* sp.
- 01-03-02 **Symptoms:** Chinese Celery plants are abnormal in their growth.  
**Pathogen:** *Pythium*, *Alternaria* and *Rhizoctonia* sp. Samples came from same grower, but different fields.
- 09-11-02 **Symptoms:** Celery plants are wilting.  
**Pathogen:** *Phoma apiicola* Klebahn. Root and crown rots are the most frequent symptoms. Disease development is favored by poor drainage and wet conditions. This disease does not develop into huge populations; it can gradually increase in a field once it is introduced.
- 10-24-02 **Symptoms:** Celery plants with leaf dieback.  
**Pathogen:** Bacteria plated out. Bacteria was not identified.

## LETTUCE

- 01-08-01 **Symptoms:** Romaine lettuce with yellowing and stunted growth.  
**Pathogen:** Tomato Bushy Stunt Virus, also called lettuce dieback.
- 01-30-01 **Symptoms:** Boston lettuce with yellowing of outer fringes of older leaves.  
**Pathogen:** No pathogen found. Suspect micronutrient (magnesium) deficiency.
- 01-31-01 **Symptoms:** Romaine transplants have mildew like symptoms on leaves.  
**Pathogen:** *Erysiphe cichoracearum*, Powdery Mildew.
- 02-06-01 **Symptoms:** Green Leaf lettuce with yellowing and decay spots on the leaves.  
**Pathogen:** Tomato Bushy Stunt Virus.
- 02-14-02 **Symptoms:** Plants are stunted and collapse.  
**Pathogen:** *Pythium* sp. and *Rhizoctonia* sp. Negative for bacterium.
- 03-08-01 **Symptoms:** Abnormal growth on green leaf lettuce. Lots of yellowing on the lower leaves.  
**Pathogen:** Tomato Bushy Stunt Virus. Crop losses were minimal in this field.
- 03-08-01 **Symptoms:** Abnormal growth on romaine and green leaf lettuce in the same field.  
**Pathogen:** Tomato bushy stunt virus. Crop losses were high.
- 03-12-01 **Symptoms:** Green leaf lettuce stunted, taproot development was abnormal.  
**Pathogen:** Two species of *Pythium* plated out.
- 11-12-02 **Symptoms:** Romaine lettuce, lower leaves are yellowing, whole plant eventually collapses.  
**Pathogen:** *Pythium* sp. and some *Fusarium* sp. Taproot was damaged in the affected plants. This combination of pathogens caused quite a bit of dieback in the field.
- 11-25-02 **Symptoms:** Romaine lettuce with stunted, yellow leaves. Widespread in some areas of the field.

12-05-02 **Pathogen:** Tomato Bushy Stunt Virus.  
**Symptoms:** Romaine lettuce with necrotic areas on leaves.  
**Pathogen:** No fungi plated out.

## **RADISH**

11-26-01 **Symptoms:** Large circular cracks occur around the middle of the radish. Problem seems to increase during transit. Radishes were grown in the Mexicali Valley.  
**Pathogen:** No organism plated out. Rapid growth in the field combined with heavy fertilization, irregular irrigation and hot and cold extreme weather during the growing period all contribute to this problem.

02-28-02 **Symptoms:** Korean radish with root rot.  
**Pathogen:** *Pythium polymastum*. The literature reports that this disease can also infect lettuce. Radish roots also had secondary infections of *Alternaria* sp.

12-04-02 **Symptoms:** Korean radish with soft rot at the crown. Widespread in field.  
**Pathogen:** *Erwinia caratova*.

12-15-02 **Symptoms:** Korean radish with fungal growth.  
**Pathogen:** *Pythium aphanidermatum*.

## **SNAP BEAN**

01-11-01 **Symptoms:** Foliage has discoloration, roots have lesions.  
**Pathogen:** Primarily *Pythium* sp. and some *Fusarium* sp. isolated.

09-12-01 **Symptoms:** Roots are growing normally, and then tips start to grow upwards.  
**Pathogen:** No pathogen isolated.

11-08-01 **Symptoms:** Roots appear to be unhealthy; can see reddening on the roots.  
**Pathogen:** Rootknot nematode.

09-23-02 **Symptoms:** Widespread dieback of beans in the field. Roots had cankers on them.  
**Pathogen:** *Rhizoctonia solani*. Reddish-brown sunken areas on the stem near the soil line characterize *Rhizoctonia* Root Rot. There was also some *Fusarium solani* f. sp. *phaseoli* on the sample.

11-13-02 **Symptoms:** Snap beans with leaf bronzing and leaf crumpling.  
**Pathogen:** Cucurbit leaf crumple virus. I do not know if CuLCrV caused yield losses.

## **SQUASH, ALL**

04-31-01 **Symptoms:** Powdery mildew on various types of squash.  
**Pathogen:** *Sphaerotheca fuliginea*, Powdery Mildew. Powdery Mildew has been difficult to control.

05-02-01 **Symptoms:** Squash plants have powdery mildew like symptoms.  
**Pathogen:** *Sphaerotheca fuliginea*, Powdery Mildew.

08-29-01 **Symptoms:** Yellow crookneck squash fruit with blossom end greening.  
**Pathogen:** No viruses detected.

09-07-01 **Symptoms:** Yellow crookneck with typical virus symptoms.  
**Pathogen:** Squash Leaf Curl Virus.

10-03-01 **Symptoms:** Yellow crookneck with typical virus symptoms: stunted, deformed leaves and field with almost 100% infection.

**Pathogen:** Squash Leaf Curl Virus (SLCV). This virus is whitefly-transmitted.  
10-17-01 **Symptoms:** Yellow crookneck squash with virus symptoms on leaves.  
**Pathogen:** SLCV.

08-14-02 **Symptoms:** Yellow crookneck squash with virus symptoms on leaves.  
**Pathogen:** Cucurbit leaf crumple virus (CuLCrV) and SLCV. Infections caused economic damage.

09-18-02 **Symptoms:** Crookneck squash samples collected from a field with some plants showing virus symptoms. Three samples were collected from field.

**Pathogen:** Healthy looking plant had no virus. Another plant had healthy leaves but the fruit was not turning yellow as it should be, no virus was found. Plant number three had virus symptoms on leaves and was positive for Cucurbit leaf crumple virus. No SLCV detected in these samples.

09-26-02

**Symptoms:** Yellow crookneck squash with virus symptoms.

**Pathogen:** Cucurbit Leaf Crumple Virus (CuLCrV), one also positive for SLCV, a mixed infection.

09-29-02

**Symptoms:** Yellow crookneck squash field with 100% with virus symptoms.

**Pathogen:** Squash Leaf Curl Virus.

11-20-02

**Symptoms:** Yellow crookneck squash with virus symptoms.

**Pathogen:** SLCV and Cucurbit Leaf Crumple Virus (CuLCrV). Strongest signals were for SLCV.

### SWEET CORN

05-29-01

**Symptoms:** Ear is almost ready to harvest and is flagging downwards.

**Pathogen:** *Pythium* and *Fusarium* sp. Every year we see some plants with this combination of diseases.

### STRAWBERRY

11-12-01

**Symptoms:** Lower leaves exhibit a burning on the outer leaf margin.

**Pathogen:** No pathogen plated out. Suspect salinity problem. This problem also occurred in 2000. Strawberries are reported to be very salt sensitive.

### TOMATO

01-12-01

**Symptoms:** Plants are wilting.

**Pathogen:** *Fusarium* sp. and *Rhizoctonia* sp.

04-21-01

Lots of plants are stunted and have curled leaves.

**Pathogen:** Positive for virus, suspect curly top virus, virus not identified further.

### WATERMELON

02-15-02

**Symptoms:** Watermelon transplants died in the field.

**Pathogen:** *Pythium ultimum*, and some *Rhizoctonia* sp.

09-14-02

**Symptoms:** Watermelon plants have virus like symptoms. Yellowing, mottling on leaves, not all leaves on a runner are affected.

**Pathogen:** Cucurbit Leaf Crumple Virus (CuLCrV). Plants eventually recovered, but yields were reduced.

11-20-02

**Symptoms:** Watermelon volunteer plant in a cantaloupe field had virus symptoms.

**Pathogen:** Cucurbit Leaf Crumple Virus.

### OTHER CROPS/PROBLEMS

01-17-01

**Symptoms:** Gai Choy, Ong Choy, Kan Kong: water spinach with foliar leaf spotting.

**Pathogen:** *Alternaria* sp. Cold freezing weather may have contributed to the problem.

01-17-01

**Symptoms:** Callas lilies grown in shade house had widespread yellowing and stunting.

**Pathogen:** *Fusarium* sp. and *Rhizoctonia* sp. Cold weather mentioned above may have contributed to this problem also.

01-23-01

**Symptoms:** Chinese spinach with leaf spotting.

**Pathogen:** *Cercospora* and *Alternaria* sp.

01-30-01

**Symptoms:** Larkspur/Delphinium had leaf tip dieback, some of the stems were browning at the soil line.

**Pathogen:** *Pseudomonas syringae pv delphini*. This bacteria is favored by cool wet weather.

03-13-01

**Symptoms:** Larkspur has a gummy residue on top of plants.

- 03-19-01 **Pathogen:** *Erwinia caratova*.  
**Symptoms:** Sunflowers are decaying during transit.
- 03-19-01 **Pathogen:** *Botrytis* sp.  
**Symptoms:** Stock with leaf chlorosis.
- 03-19-01 **Pathogen:** Downy Mildew.  
**Symptoms:** Delphinium (larkspur) showing a decline.
- 03-19-01 **Pathogen:** Bacteria and it was not identified.  
**Symptoms:** Vinca declining in field.
- 03-19-01 **Pathogen:** No pathogen found, suspect wind damage.  
**Symptoms:** Sunflower plants are wilting in small areas in the field.
- 03-21-01 **Pathogen:** *Fusarium* sp. and *Alternaria* sp.  
**Symptoms:** Stock plants are wilting.
- 03-23-01 **Pathogen:** *Cladosporium* and *Alternaria* sp. Plants also had Downy Mildew.  
**Symptoms:** Larkspur has abnormal growth.
- 05-01-02 **Pathogen:** *Sclerotinia sclerotiorum*. Disease enhanced by overwatering/rain.  
**Symptoms:** Caterpillars all over the roads near desert areas.
- 11-26-01 **Pathogen:** White-lined sphinx moth.  
**Symptoms:** Sunflower plants are wilting in several areas of the field.
- 12-20-01 **Pathogen:** No pathogen found.  
**Symptoms:** Lo Bok: Korean radish, roots have a mold growing on the top.
- 01-03-02 **Pathogen:** *Pythium* sp. and *Alternaria* sp.  
**Symptoms:** Tung Ho plants are stunted, roots appear damaged.
- 01-30-02 **Pathogen:** Negative for pathogen, suspect mechanical or wind injury.  
**Symptoms:** Palm seedling with dieback. Plants are in containers.
- 01-30-02 **Pathogen:** *Fusarium* sp. and *Rhizoctonia* sp. *Fusarium* recovered in higher numbers.  
**Symptoms:** Large palm plants with dieback.
- 03-13-02 **Pathogen:** *Pythium* sp., *Fusarium* sp. and *Rhizoctonia* sp. These fungi are causing root rot and result in wilting of the plants.  
**Symptoms:** Ornamental sunflower petals are showing discoloration at the tips.
- 09-19-02 **Pathogen:** No disease agent, suspect frost damage.  
**Symptoms:** Bell pepper plants with mite infestation.
- 12-19-02 **Pathogen:** *Stenotarsonemus* spp. a tarsonemid mite.  
**Symptoms:** Napa cabbage with larva and pupa.
- 12-30-02 **Pathogen:** Pyralid moth. Species was not indicated. Was neither a cabbageworm nor a cabbage webworm.  
**Symptoms:** Tarragon with spotting on leaves.

**Contributors to this report:** Dr. Frank Wong, UCR Plant Pathology, Miguel Vilchez, Staff Research Associate, Dr. Don Ferrin, UCR Plant Pathology, Dr. Mike Stanghellini, UCR Plant Pathology, Tom Turini, UCCE Imperial County, Keith Mayberry, UCCE Imperial County, Dr. Mike Davis, UCD Plant Pathology, Dr. Bob Gilbertson UCD Plant Pathology, Gregg Ballmer, UCR Entomology, Eric Natwick, UCCE Imperial County. Viruses are especially costly and difficult to identify.

**Special thanks to the folks at: Foster & Gardner, Western Farm Service and Helena for their assistance.**

## 2003 Coachella Valley Farmers Educational Meetings

USDA Service Center 82-901 Bliss Street Indio, California

Noon to 1:00 p.m. (Unless stated otherwise)

- MARCH 5: 3<sup>rd</sup> Soil Health Symposium: Conservation Tillage Comes to the Coachella Valley: Jeff Mitchell Vegetable Specialists-UCD, Aref Abdul-Baki, USDA-ARS-PSI Vegetable Laboratory, Dr. Robert Linderman, USDA-Corvallis, Oregon, Ron Morse, USDA-ARS-PSI Vegetable Laboratory, Jose Aguiar UCCE Riverside County. Information will be presented on farming practices that may be applicable in the Coachella Valley. Meeting will start at 10:00 a.m. and last to 1:30 p.m.
- APRIL 2 Benefits of Cover Crops: effects on insects, weeds and diseases: Dr. Milt McGiffen and Dr. Ole Becker, UCR. **1 hour of Continuing Education granted.**
- MAY 7 Salinity testing and Irrigation Scheduling: Kevin Carpenter, Irrigation Specialist-CVRCD and Khaled Bali, UCCE Farm Advisor, Imperial County. Irrigation management information will be presented that is of interest to all growers.
- JUNE 4 Soil Reclamation and Soil Salinity Mapping. Dr. Don Suarez, Dr. Scott Lesch from USDA Salinity Lab, Riverside. Dave Koller, CVWD.
- July 2 Update on Citrus Research: Dr. Peggy Mauk, Dr. Carol Lovatt. Information will be presented that will be of interest to citrus growers. 1 Hour of CE granted.
- August 6 Strawberry Culture and Diseases of Vegetables in the Coachella Valley: Kirk Larson UCR, Jose Aguiar UCCE Riverside County. Information on strawberry breeding for disease and insects will be presented. 1 hour of Continuing Education requested.

Programs may be changed or modified depending on the speaker's schedule. If you need assistance to attend these programs or if you need more information please call Jose Aguiar at 863-7949. Please call to reserve a spot prior to the meetings, seating is limited.

In Cooperation with Coachella Valley Resource Conservation District, University of California Cooperative Extension Riverside County, Natural Resource Conservation Service United States Department of Agriculture and Coachella Valley Mosquito and Vector Abatement District.

If you would like to be added or removed from our mailing list, please contact Jose Aguiar at the number listed above.

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Jose L. Aguiar, Farm Advisor  
JA/WS 07-01-03/480



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