

Irrigated Alfalfa Management

for Mediterranean and Desert Zones

 Buy Manual

Diagnostic Key to Problems in Alfalfa

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This key is written as a quick guide to some of the common problems, including insects, diseases, vertebrate pests, herbicide injury, and mineral deficiencies, found in alfalfa. The focus of this chapter is on alfalfa grown for forage, not for seed, and will therefore not key out problems particular to seed alfalfa, such as seed chalcid or lygus bugs. This key is based, wherever possible, on diagnostic damage symptoms, thus it is unnecessary to find the actual organism causing the injury. Further detailed descriptions of these symptoms can be found in respective chapters on these pests and plant stresses.

Not all problems that may be encountered in alfalfa are included. Diseases or insects that are not common may not be identified by this key.

This key may be used to identify several symptoms observed simultaneously in the field. It is highly likely that growers are confronted with two or more problems at the same time. For example, alfalfa weevil feeding damage and common leaf spot or stemphylium leaf spot frequently occur together. These symptoms may be identified by repeatedly going through the key. For example, if leaflets are identified as “chewed or eaten” in late winter or spring, this will likely be alfalfa weevil damage. But, leaf spots may also be present. In a second pass through the key, this time identifying leaflets as “are not chewed or eaten” (Couplet II), you will end up at either “common leaf spot” and/or “stemphylium leaf spot” to identify this symptom.

Dark bands on antennae

Pea Aphid

Antennae uniform color

Blue Alfalfa Aphid



UNIVERSITY OF CALIFORNIA

Division of Agriculture and Natural Resources

Publication 8310

6/2008

<http://anrcatalog.ucdavis.edu>



Chapter 24

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This publication is **Chapter 24** of a 24-chapter series on Irrigated Alfalfa Management published by the University of California Alfalfa & Forage Systems Workgroup. Citation: Summers, C. G. 2007. Diagnostic key to problems in alfalfa. IN C. G. Summers and D. H. Putnam, eds., *Irrigated alfalfa management in Mediterranean and Desert zones*. Chapter 24. Oakland: University of California Agriculture and Natural Resources Publication 8310. See: <http://alfalfa.ucdavis.edu/IrrigatedAlfalfa>

If you are unable to diagnose your problem(s) using this key, please refer to the respective chapters in this volume for more details, or contact your local farm advisor.

Additional information is also available at the UC IPM Web site (<http://www.ipm.ucdavis.edu/PMG/selectnewpest.alfalfa-hay.html>) and at <http://alfalfa.ucdavis.edu>.

Diagnostic Key

I. Leaflets or entire stem(s) chewed or eaten.

A. Leaflets skeletonized or stem epidermis stripped.

1. Stem epidermis "stripped."

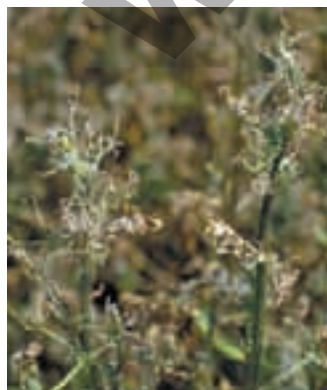
..... *Adult Alfalfa or Egyptian Alfalfa Weevil* [Chapter 9]



2. Leaflets skeletonized; veins eaten.

a. Leaflets skeletonized in winter or early spring.

..... *Alfalfa Weevil or Egyptian Alfalfa Weevil* [Chapter 9]



b. Leaflets skeletonized in summer.

i. Damage associated with webbing in terminals.

..... *Alfalfa Webworm* [Chapter 9]



ii. Damage not associated with webbing.

..... *Alfalfa Caterpillar* [Chapter 9]



3. Leaflet skeletonized, but veins remain intact (summer).

..... *Armyworms* [Chapter 9]



B. Entire stem chewed or cut off.

- 1. Few stems cut off at base of plant, stems frequently found lying on ground, C-shaped larvae often found at base of the plant.

.....*Cutworm* [Chapter 9]



- 2. Stem generally not cut off, but entire plant eaten.
 - a. Entire plant consumed, generally around margin of field, only stubble or sometimes chewed stems remaining. Droppings are frequently apparent.

...*Rabbits, Hares, or Deer* [Chapter 12]



- b. Tips of stems or shoots consumed.

- i. Well-worn trails in field.

.....*Meadow Mice* [Chapter 12]



- ii. Burrows inside or outside of the field or along field edges.

.....*Belding Ground Squirrel* or
California Ground Squirrel [Chapter 12]



California. Burrows out of field.



Belding. Burrows in field.

- c. Plant or stems not consumed. Taproot chewed off. Plant(s) frequently seen wilting. Plants easily pulled from soil.

.....*Gopher Damage* [Chapter 12]



II. Leaflets or stems not chewed or eaten.

A. Leaves green, plants not wilted.

1. Leaflets deformed.

a. Plants not stunted.

i. Leaflets cupped, appear clasped together.

..... *Eptam Injury* [Chapter 8]



Moderate



Severe

ii. Leaflets long and narrow—leaf strapping.

..... *Butyrac (2,4-DB)* [Chapter 8]



iii. Leaflets distorted and wrinkled, distortions often appear to arise from the midrib.

..... *Thrips* [Chapter 9]



iv. Leaflets distorted in the terminal, grayish fuzzy appearance on underside, winter or spring.

... *Systemic Downey Mildew* [Chapter 10]



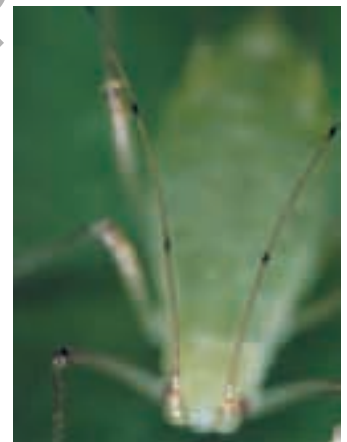
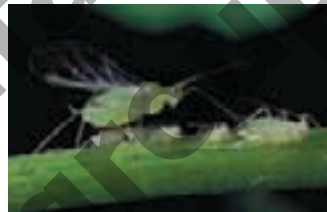
b. Plants stunted.

i. Aphids present.

a. Aphids green.

i. Dark bands on antennae.

..... *Pea Aphid* [Chapter 9]



ii. Antennae uniform color.

..... *Blue Alfalfa Aphid* [Chapter 9]



b. Aphids not green.

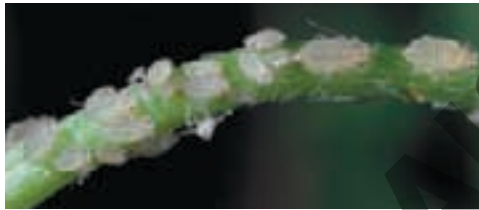
i. Aphids black.

.....Cowpea Aphid [Chapter 9]



ii. Aphids yellowish, five or six rows of black spots on back.

..... Spotted Alfalfa Aphid [Chapter 9]



ii. Aphids not present.

a. Leaflets small and crinkled.

.....Roundup Injury [Chapter 8]



b. Plants severely stunted, internodes greatly shortened, dead stem buds. Plants may also be white.

... Alfalfa Stem Nematode [Chapter 11]



2. Leaves not deformed, plants not stunted.

a. Shortened internodes near top of plant. Upper leaflets rolled inward. V-shaped necrotic area at tip of leaflets.

.....Verticillium Wilt [Chapter 10]



b. Taproot with "gouges" cut across much of the surface.

.....Clover Root Curculio [Chapter 9]



3. Leaves not deformed. Plants not stunted. Roots swollen with galls or nodules.

a. Roots with galls or swollen areas that cannot be dislodged by rubbing.

.....Root-Knot Nematode [Chapter 11]

b. Roots with knots or nodules that are easily dislodged. Pink color shows when nodules are rubbed between fingers.

... Nitrogen-Fixing Nodules [Chapter 4]



Root-Knot Nematode

Nitrogen-Fixing Nodules

B. Leaves green, plants wilted.

- 1. Seedling plants, fewer than two to four true leaves.
 *Damping Off* [Chapter 10]



- 2. Mature plants, more than two to four true leaves.
 - a. Plant with very dark, bluish-green leaves; soil dry.
 *Moisture Stress* [Chapter 7]



- b. Terminal portion of plant wilted, leaves appear water soaked, later becoming yellow or white.
 *Frost Injury* [Chapter 10]



C. Leaflets yellow or reddish, lacking normal green color. Leaflets not spotted; plants not wilted.

- 1. Leaflets yellowish or reddish, but not spotted.
 - a. Leaflets yellowish or reddish, wedge-shaped area at tip of leaflet.
 *Potato Leafhopper* [Chapter 9]



- b. Leaflet yellowish and/or reddish, but lacking wedge-shaped area at tip of leaf. Few or no leafhoppers present.
 *Boron Deficiency* [Chapter 6]



- c. Leaflet yellowish and/or reddish, lacking wedge shaped area at tip of leaf. Stem girdled at base.
 *Three Cornered Alfalfa Hopper* [Chapter 9]



- 2. Leaves yellowish, but not reddish; not spotted.
 - a. Overall yellowing on all plants, most commonly observed in spring.

.....Sulfur or Molybdenum Deficiency [Chapter 6]



Sulfur Deficiency



Molybdenum Deficiency

- b. Stunted yellow plants interspersed with normal green plants.

.....Nitrogen Deficiency [Chapter 6]



- ii. Spots roughly circular, but confined to leaf margin, particularly near tip of leaflet. No webbing.

..... Potassium Deficiency [Chapter 6]



- b. Spots large.

- i. Spots irregular in shape, found over entire leaflet.

.....Paraquat Injury [Chapter 8]



- ii. Spots irregular in shape, mainly interveinal.

.....Ozone Injury [Chapter 10]



D. Leaflets yellow and/or spotted; plants not wilted.

- 1. Spots white.
 - a. Spots small.
 - i. Spots roughly circular and found over entire leaflet surface. Webbing on underside of leaflet.

.....Mites [Chapter 9]

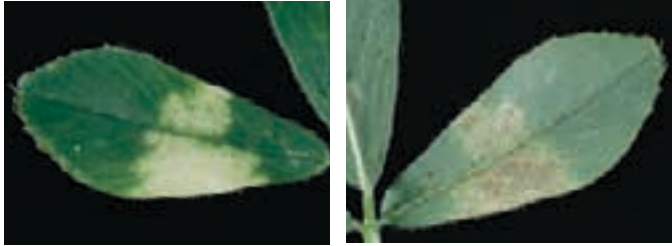


2. Spots yellow or black.

a. Spots yellow.

- i. Spots yellow; underside of leaflet gray or tan; “fuzzy” appearance.

..... Downy Mildew [Chapter 10]



- ii. Spots bright yellow, interveinal and elongated on scattered plants.

..... Alfalfa Mosaic Virus [Chapter 10]



- iii. Interveinal chlorosis widespread, found on majority of plants.

..... Velpar, Karmex, Sencor Injury [Chapter 8]



3. Spots tan or brown.

- a. Small, circular brown spots with a darker brown raised center; on upper side of leaflets.

..... Common Leaf Spot [Chapter 10]



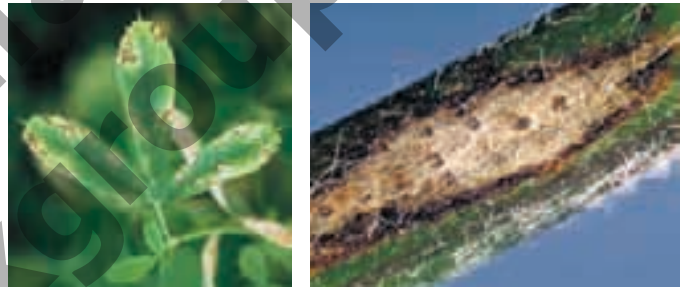
- b. Variably sized spots with a tan center and dark brown border—on upper surface of the leaflet.

... Stemphylium Leaf Spot [Chapter 10]



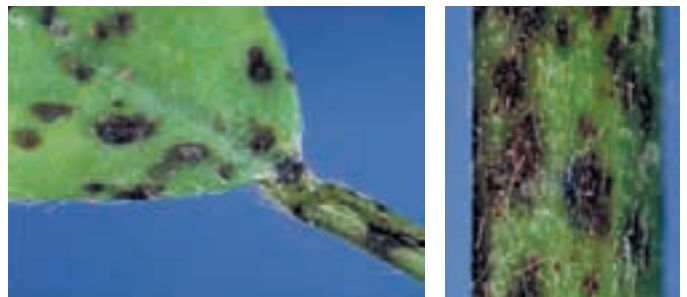
- c. Lesions associated with leaf margins giving appearance of concentric rings. Multiple raised fruiting bodies within individual lesions. Oblong stem lesions also containing multiple fruiting bodies.

..... Stagonospora Crown and Root Rot [Chapter 10]



- 4. Small black spots on leaves and stems. Spots on stems often coalesce to make portions of the stem black.

..... Spring Black Stem [Chapter 10]



E. Leaflets yellow, not spotted; plants wilted.

- 1. Stems with “fluffy” white mycelial growth near crown, most common in cool, wet weather.

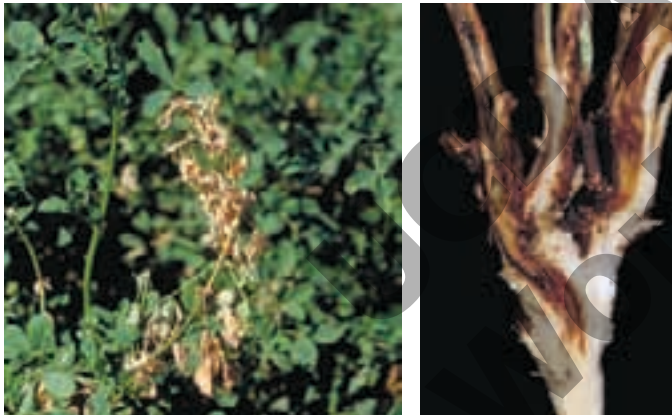
..... *Sclerotinia Stem and Crown Rot* [Chapter 10]



- 2. Stems without “fluffy” mycelial growth, crowns or roots rotted or deformed.

- a. Bluish-black discoloration of crown often joining reddish streaks inside root. Bleached and bent stems frequently found scattered throughout the field.

..... *Anthracnose* [Chapter 10]



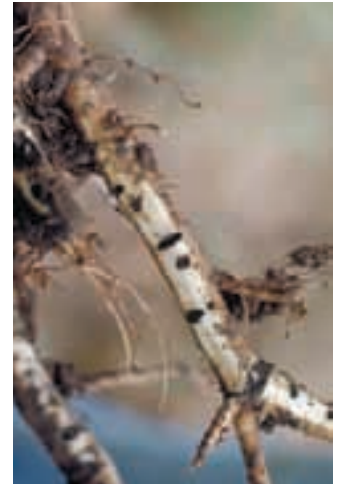
- b. Reddish-orange to yellow streaks spreading from dead areas internally. Rot often starts in lower part of root.

... *Phytophthora Root Rot* [Chapter 10]



- c. Elliptical-shaped sunken lesions, tan in the center and dark on the edges (in hot, wet conditions); lesions black in cool season.

.. *Rhizoctonia Root Canker* [Chapter 10]



- d. Off-color foliage and wilting, even though the soil is wet. Roots may rot and have a putrid odor when removed from the soil. Maximum temperature >100°F (32°C).

..... *Scald* [Chapter 10]



- e. Center core of root dark reddish brown, as seen in longitudinal section.

..... *Fusarium Wilt* [Chapter 10]





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Publication 8310
ISBN-13: 978-1-60107-554-3

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6/08-WFS