

## How to Manage Pests

### UC Pest Management Guidelines

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## Almond

### Scab

**Pathogen:** *Cladosporium carpophilum*

(Reviewed 3/09, updated 11/12)

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#### SYMPTOMS AND SIGNS

Grayish black, soft looking spots form on leaves, fruit, and twigs. Young lesions are indistinct [small yellow specks](#), best seen by holding a leaf up to the light. Lesions usually are not visible until late spring or early summer.

#### COMMENTS ON THE DISEASE

The fungus survives in [twig lesions](#), and spores are spread by wind or rain. The disease is favored by prolonged wet spring weather, and is most prevalent in the Sacramento Valley. Severe scab infections cause early defoliation; if left uncontrolled for several years, infected trees become weakened. The disease often occurs in sprinkler-irrigated orchards where water reaches foliage.

#### MANAGEMENT

Scab may be controlled by shot hole sprays. However, a scab treatment may be required if rain occurs into mid- to late spring. One application as late as 5 weeks after petal fall can protect against scab, but an earlier application (2 weeks after petal fall) may improve control.

In severe outbreaks, dormant or delayed dormant applications of copper/oil or liquid lime sulfur can be used effectively to reduce and delay sporulation of twig infections in spring. Copper/oil has been found to be the most effective delayed dormant treatment and when used in combination with petal fall applications of protective fungicides the disease can be effectively managed.

Scab resistance to quinone outside inhibitor fungicides (also known as strobilurins) has been documented; do not use FRAC mode of action Group number 11 fungicides in these orchards.

Common name (trade name)	Amount/Acre	R.E.I. + (hours)	P.H.I. + (days)
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**When choosing a pesticide, consider its usefulness in an IPM program by reviewing the pesticide's [properties](#), [efficacy](#), [application timing](#), and information relating to [resistance management](#), [honey bees](#) (PDF), and [environmental impact](#). Not all registered pesticides are listed. Always read the label of the product being used.**

#### DORMANT

- |    |   |             |            |           |
|----|---|-------------|------------|-----------|
| A. | LIME SULFUR#<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): Multi-site contact (M2)<br>COMMENTS: Can improve spring control of scab, especially if a wet spring delays treatment. Check with your certifier to determine which products are organically acceptable. | Label rates | See label  | See label |
| B. | COPPER/OIL#<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): Multi-site contact (M1)/contact<br>COMMENTS: Not all copper and oil products are organically acceptable; check with your certifier.  | Label rates | See labels | See label |
| C. | CHLOROTHALONIL/OIL<br>(various)<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): Multi-site contact (M1)/contact<br>COMMENTS: Apply as dormant or delayed dormant treatment. Do not apply within two weeks of bud swell.  | Label rates | See label  | See label |

**PETAL FALL (BEGINNING OF SPORULATION OF TWIG INFECTIONS)**

- |    |   |                 |    |                 |
|----|---|-----------------|----|-----------------|
| A. | FLUOPYRAM/TRIFLOXYSTROBIN<br>(Luna Sensation)<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): succinate dehydrogenase inhibitor (7) and Quinone outside inhibitor (11)<br>COMMENTS: Do not make more than two successive applications, and no more than 4 per season, to limit the development of resistance.  | 5.0-7.6 fl oz   | 12 | 60              |
| B. | FLUOPYRAM/TEBUCONAZOLE<br>(Luna Experience)<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): succinate dehydrogenase inhibitor (7) and demethylation (sterol) inhibitor (3)<br>COMMENTS: Do not make more than two successive applications and no more than 2 per season to limit the development of resistance.  | 6-8 fl oz       | 12 | 35              |
| C. | AZOXYSTROBIN/PROPICONAZOLE<br>(Quilt Xcel)<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): Quinone outside inhibitor (11) and demethylation (sterol) inhibitor (3)<br>COMMENTS: Do not make more than two successive applications, and no more than 4 per season, to limit the development of resistance.  | 17.5-26.0 fl oz | 12 | 60              |
| D. | PYRACLOSTROBIN/BOSCALID<br>(Pristine)<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): Quinone outside inhibitor (11) and succinate dehydrogenase inhibitor (7)<br>COMMENTS: Do not make more than 4 applications per season of QoIs or succinate dehydrogenase inhibitor to limit the potential for the development of resistance.   | 10.5-14.5 oz    | 12 | 25              |
| E. | AZOXYSTROBIN<br>(Abound/Quadris Top)<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): Quinone outside inhibitor (11)<br>COMMENTS: Do not apply more than 2 sequential sprays before alternating with a fungicide that has a different mode of action. Do not apply more than 4 applications of strobilurin fungicides/year or apply more than 2.88 qt/product /acre/season. | 11-15.4 oz      | 4  | 28              |
| F. | TRIFLOXYSTROBIN<br>(Gem)<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): Quinone outside inhibitor (11)<br>COMMENTS: Do not apply within 60 days of harvest or after hullsplit. Do not exceed more than 3 applications of all QoIs per season to limit the potential for the development of resistance. Do not apply more than 12 oz/acre/season.                          | 3.8 oz          | 12 | 60-see comments |
| G. | METCONAZOLE<br>(Quash)<br>MODE OF ACTION GROUP NAME (NUMBER <sup>1</sup> ): demethylation (sterol) inhibitor (3)  | 3.0 oz          | 12 | 25              |

COMMENTS: Do not make more than 2 applications successive and no more than 4 per season to limit the development of resistance. Do not apply after hullsplit.

H. AZOXYSTROBIN/DIFENOCONAZOLE

(Quadris Top) 14 oz 12 28

MODE OF ACTION GROUP NAME (NUMBER<sup>1</sup>): Quinone outside inhibitor (11) and demethylation (sterol) inhibitor (3)

COMMENTS: Do not make more than two successive applications, and no more than 4 per season, to limit the development of resistance.

I. THIOPHANATE-METHYL

(Topsin M 70WP) 1.5 lb 3 days 1

MODE OF ACTION GROUP NAME (NUMBER<sup>1</sup>): Methyl benzimidazole (1)

COMMENTS: Strains of scab pathogen resistant to thiophanate-methyl may occur. Do not apply more than once a year.

J. CHLOROTHALONIL

(Echo 720, etc.) Label rates See label See label

MODE OF ACTION GROUP NAME (NUMBER<sup>1</sup>): Multi-site contact (M5)

COMMENTS: Do not apply one week before or after a treatment containing oil or an oil-based pesticide.

K. ZIRAM 76DF

8 lb 48 0

MODE OF ACTION GROUP NAME (NUMBER<sup>1</sup>): Multi-site contact (M3)

COMMENTS: Do not apply more than 32 lb/acre/season. Do not apply later than 5 weeks after petal fall.

L. CAPTAN

(various 50WP) Label rates See label See label

MODE OF ACTION GROUP NAME (NUMBER<sup>1</sup>): Multi-site contact (M4)

COMMENTS: See label for preharvest interval, which varies depending on formulation and if hulls are to be fed to livestock. Do not apply in combination with, immediately before, or closely following oil sprays.

+ Restricted entry interval (R.E.I.) is the number of hours (unless otherwise noted) from treatment until the treated area can be safely entered without protective clothing. Preharvest interval (P.H.I.) is the number of days from treatment to harvest. In some cases the REI exceeds the PHI. The longer of these two intervals is the minimum time that must elapse before harvest may occur.

# Acceptable for use on organically grown produce.

<sup>1</sup> Group numbers are assigned by the Fungicide Resistance Action Committee (FRAC) according to different modes of actions (For more information, see [www.frac.info](http://www.frac.info)). Fungicides with a different group number are suitable to alternate in a resistance management program. In California, make no more than one application of fungicides with mode of action Group numbers 1, 4, 9, 11, or 17 before rotating to a fungicide with a different mode of action Group number; for fungicides with other Group numbers, make no more than two consecutive applications before rotating to fungicide with a different mode of action Group number.

## PRECAUTIONS

### PUBLICATION



UC IPM Pest Management Guidelines: Almond  
UC ANR Publication 3431

### Diseases

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Unfortunately, we cannot provide individual solutions to specific pest problems. See our [Home page](#), or in the U.S., contact your [local Cooperative Extension office](#) for assistance. /PMG/r3100411.html revised: January 23, 2013. [Contact webmaster](#).