

# Tomato

## Early Blight of Fruiting Vegetables - *Alternaria* Fungus

This pathogen can infect peppers and tomatoes, but is mainly a problem in tomatoes. This disease initially causes lesions on lower leaves of the tomato plant. After field planting, begin protective fungicide applications on a 7-14 day schedule. May be seedborne.

*Group 11 Resistance:* Strains of the fungus that causes early blight that are resistant to group 11 fungicides have been observed in Indiana and Ohio. Group 11 products labeled for tomato and early blight include Cabrio and Quadris. Tank-mix group 11 fungicides with products that have a different mode of action, or alternate group 11 fungicides with fungicides that have a different group number.

### Non-Pesticide

#### Non-Pesticide Options

Use pathogen-free seed and disease-free transplants. Hot water seed treatment may reduce this seedborne disease. Use temperatures and times of 122 F for 25 minutes for tomato. Avoid fields with a history of Fusarium and Verticillium wilts. Rotate to non-Solanaceous crops for 3-4 years. Varieties with partial resistance are available, and varieties resistant to Fusarium and Verticillium wilt will hold up better against *Alternaria*. Use raised beds, staking, and mulch to improve drainage, air flow, and reduce splashing. Prompt destruction of the finished crop with tillage to rapidly breakdown tissue is an important method to prevent disease build-up.

### Pesticide

**Aprovia Top | benzovindiflupyr , difenoconazole | 10.5-13.5 fl. oz. per acre.**

Use of a spreader sticker is recommended.

REI: 12-hour. PHI: 0-day. FRAC 07 . FRAC 03 .

**azoxystrobin products | azoxystrobin |**

Several formulations are labeled at various rates (Acadia LFC, AZteroid FC 3.3, Dexter SC, Heritage, Quadris, Satori). Use 34.3% formulations at 3.9-9.7 fl. oz. per acre. Use 22.9% formulations at 6.0-15.5 fl. oz. per acre. Use 18.4% formulations at 6.3-7.8 fl. oz. per acre. Use 50% formulations (Heritage) on greenhouse transplants only at 0.024-0.08 oz. per 1,000 sq. ft.

REI: 4-hour. PHI: 0-day. FRAC 11 .

**Azterknot | azoxystrobin , Reynoutria sachalinensis extract | 5.9-7.4 fl. oz. per acre. REI: 4-hour. PHI: 0-day. FRAC 11 . FRAC P05 .**

**Cabrio EG | pyraclostrobin | 8-12 oz. per acre. REI: 12-hour. PHI: 0-day. FRAC 11 .**

**Cevya | mefentrifluconazole | 3-5 fl. oz. per acre. REI: 12-hour. PHI: 0-day. FRAC 03 .**

**chlorothalonil products | chlorothalonil |**

Several formulations are labeled at various rates (Bravo, Echo, Equus, Initiate). Use 38.5% (Zn) formulations at 2.0-4.0 pt. per acre. Use 54% (720) formulations at 1.38-2.75 pt. per acre. Use 82.5% (WDG) formulations at 1.3-2.6 lb. per acre. Use 90% DF formulations at 1.1-2.5 lb. per acre.

REI: 12-hour. PHI: 0-day. FRAC M05 .

**Cymbol Advance | chlorothalonil , cymoxanil | 1.9-3 pts. per acre.**

Also available as Ariston.

REI: 12-hour. PHI: 3-day. FRAC M05 . FRAC 27 .

**Double Nickel 55 | Bacillus amyloliquefaciens strain D-747 | 0.25-3 lbs. per acre.**

Suppression only; can be used in a rotational program with effective fungicides to reduce synthetic fungicide use.

REI: 4-hour. PHI: 0-day. FRAC BM02 . OMRI-listed.

**Endura | boscalid |**

Rates as follows per acre: early blight rates are 2.5-3.5 oz.; Gray mold rates are 9-12.5 oz.; white mold rates 12.5 oz. Suppression only for while mold.

REI: 12-hour. PHI: 0-day. FRAC 07 .

**Evito | fluoxastrobin |**

Rates depend on formulation. Other products include Aftershock, Tepera.

REI: 12-hour. PHI: 3-day. FRAC 11 .

**Flint Extra | trifloxystrobin | 3.0-3.8 fl. oz. per acre.**

Use Gem 500 SC at same rate. Use Flint (50%) formulation at 3-4 fl. oz. per acre.

REI: 12-hour. PHI: 3-day. FRAC 11 .

**Fontelis | penthiopyrad |**

16-24 fl. oz per acre for all diseases listed here except anthracnose at 24 fl. oz. Suppression only for anthracnose. In the greenhouse use a rate of 0.75 fl. oz. per gallon per 1,360 sq. ft.

REI: 12-hour. PHI: 0-day. FRAC 07 .

**Gavel 75DF | mancozeb , zoxamide | 1.5-2 lbs. per acre. REI: 48-hour. PHI: 5-day. FRAC M03 . FRAC 22**

**Inspire Super | cyprodinil , difenoconazole | 16-20 fl. oz. per acre.**

Do not apply to small fruited varieties such as cherry tomato.

REI: 12-hour. PHI: 0-day. FRAC 09 . FRAC 03 .

**LifeGard WG | Bacillus mycoides isolate J | 1-4.5 oz. per acre.**

1-4.5 oz. per acre or 4.5 oz. per 100 gals. water. Suppression only; can be used in a rotational program with effective fungicides to reduce synthetic fungicide use

REI: 4-hour. PHI: 0-day. FRAC BM02 . OMRI-listed.

**Luna Sensation | fluopyram , trifloxystrobin |**

Rates are as follows per acre: early blight, powdery mildew, Septoria leaf spot at 5-7.6 fl. oz.; anthracnose, gray mold, white mold and southern blight at 7.6 fl. oz. Suppression only for anthracnose and white mold.

REI: 12-hour. PHI: 3-day. FRAC 07 . FRAC 11 .

**Luna Tranquility | fluopyram , pyrimethanil | 11.2 fl. oz. per acre.**

Disease suppression of powdery mildew. Labeled for field use and in greenhouses with good fungicide resistance management programs

REI: 12-hour. PHI: 1-day. FRAC 07 . FRAC 09 .

**mancozeb products | mancozeb |**

Several formulations are labeled at various rates (Dithane, Koverall, Manzate, Penncozeb). Use 37% formulations at 0.6-2.4 qt. per acre. Use 75% and 80% formulations at 0.75-3.0 lb. per acre.

REI: 24-hour. PHI: 5-day. FRAC M03 .

**Mettle 125ME | tetraconazole | 6-8 fl. oz. per acre. REI: 12-hour. PHI: 0-day. FRAC 03 .**

**Miravis Prime | fludioxonil , pydiflumetofen | 9.2-11.4 fl. oz. per acre.**

Use high rate for gray mold, suppression only.

REI: 12-hour. PHI: 0-day. FRAC 12 . FRAC 07 .

**Mural | azoxystrobin , benzovindiflupyr | 0.6 oz. per 1,000 sq. ft.**

*Tomato Transplants for Home Consumer Market.*

REI: 12-hour. PHI: 0-day. FRAC 11 . FRAC 07 .

**Orondis Opti | chlorothalonil , oxathiapiprolin | 1.75-2.5 pt. per acre. REI: 12-hour. PHI: 3-day. FRAC M05 . FRAC 49 .**

**Pageant Intrinsic | boscalid , pyraclostrobin |**

Rates are as follows per acre.: Gray mold, 23 oz.; anthracnose and early blight 12.25-23 oz. Labeled for greenhouse-/high tunnel-grown tomatoes. Do not apply on seedlings meant for transplanting in the field. For Pythium and Rhizoctonia spp. use 12-18 oz. per 100 gals. water. Do not apply on seedlings meant for transplanting in the field.

REI: 12-hour. PHI: 0-day. FRAC 07 . FRAC 11 .

**Priaxor | fluxapyroxad , pyraclostrobin |**

6-8 fl. oz. per acre. Late blight, 8 fl. oz. per acre. Gray mold and white mold suppression only.

REI: 12-hour. PHI: 0-day. FRAC 07 . FRAC 11 .

**Quadris 2.08SC | azoxystrobin** | 5-6.2 fl. oz. per acre. REI: 4-hour. PHI: 0-day. FRAC 11 .

**Quadris Opti | azoxystrobin , chlorothalonil** | 1.6 pts. per acre. REI: 12-hour. PHI: 0-day. FRAC 11 .  
FRAC M05 .

**Quadris Top | azoxystrobin , difenoconazole** | 8 fl. oz. per acre. REI: 12-hour. PHI: 0-day. FRAC 11 .  
FRAC 03 .

**Reason 500SC | fenamidone** | 5.5-8.2 fl. oz. per acre.

Septoria leaf spot disease suppression.

REI: 12-hour. PHI: 14-day. FRAC 11 .

**Regalia | Reynoutria sachalinensis extract** | 1-4 qts. per acre.

Use in a program with copper products. On greenhouse-produced seedlings, drench planting medium with 1-2 qts. per gal. water or dip seedlings in solution of 1-2 qts. per 100 gal. water immediately before transplanting.

REI: 4-hour. PHI: 0-day. FRAC P05 . OMRI-listed.

**Regev | difenoconazole , tea tree oil** | 4-8.5 fl. oz. per acre. REI: 12-hour. PHI: 2-day. FRAC 03 . IRAC  
UNE , FRAC BM01 .

**Revus Top | difenoconazole , mandipropamid** | 5.5-7.0 fl. oz. per acre.

Do not use on small-fruited varieties.

REI: 12-hour. PHI: 1-day. FRAC 03 . FRAC 40 .

**Rhyme | flutriafol** | 3.5-7 fl. oz. per acre. REI: 12-hour. PHI: 0-day. FRAC 03 .

**Scala | pyrimethanil** | 7 fl. oz. per acre.

Tank-mix with another fungicide. Allow greenhouse/high tunnel to ventilate for 2 hours.

REI: 12-hour. PHI: 1-day. FRAC 09 .

**Spirato GHN | fludioxonil** | 5.0-5.7 fl. oz. per acre.

This is a foliar-applied formulation of fludioxonil, which is more typically a seed treatment ingredient. Only for greenhouse/high tunnel-produced eggplant, pepper, and tomato.

REI: 12-hour. PHI: 0-day. FRAC 12 .

**Switch 62.5WG | cyprodinil , fludioxonil** | 11-14 oz. per acre.

Do not apply to small fruited varieties in the greenhouse.

REI: 12-hour. PHI: 0-day. FRAC 09 . FRAC 12 .

**Tanos | cymoxanil , famoxadone** |

Tomato: Early blight at 6-8 oz. per acre. Late blight and anthracnose at 8 oz per acre. For suppression of bacterial diseases of tomato, 8 oz. For late blight, tank-mix with a contact fungicide with a different mode of action. Pepper: Anthracnose at 8-10 fl. oz.

REI: 12-hour. FRAC 27 . FRAC 11 .

**tebuconazole products | tebuconazole | 8 fl. o.z per acre.**

There are many 38.7% formulations (Monsoon, Onset, Toledo, Vibe) that use the same rate.

REI: 12-hour to 18-day. PHI: 7-day. FRAC 03 .

**Topguard EQ | azoxystrobin , flutriafol | 4-8 fl. oz. per acre. REI: 12-hour to 3-day. PHI: 0-day. FRAC 11 . FRAC 03 .**

**Zing! | chlorothalonil , zoxamide |**

Application rate: 34 fl. oz. per acre for pepper; 36 fl. oz for tomato.

REI: 12-hour. PHI: 3-day. FRAC M05 . FRAC 22 .

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