



Martin-Gatton
College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet

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Organic Commercial Spray Schedule for Field Production of Summer Squash & Zucchini

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INTRODUCTION

Commercial field production of organic summer squash and zucchini allows growers to yield premium crop prices. However, numerous plant pathogens can cause disease, resulting in plant damage and yield loss. Applications of fungicides and bactericides are often necessary to limit the impact of plant diseases. These products provide the greatest efficacy when applied prior to disease onset. Growers should develop a preventative spray schedule for each crop and season to limit the impact of diseases. Organic growers will rely on specific products to maintain certifications or be able to market produce as organically produced. This document provides information on the timing of the most common squash diseases, as well as an example spray schedule. Fungicides recommended here include a few of the most common products; a complete list of registered fungicides can be found in *Vegetable Production Guide for Commercial Growers* (ID-36) and *Southeastern U.S. Vegetable Crop Handbook* (SEVEW); generic products may also be available. Information on OMRI approved products is available at <https://www.omri.org/>.

Summer Squash & Zucchini	
Disease	Time Period
Pythium root rot	May - June
Bacterial wilt	June - Aug
Cercospora leaf spot	June - Aug
Fusarium wilt	June - Aug
Powdery mildew	June - Aug
Downy mildew	July - Aug
Angular leaf spot	July - Sept
Fusarium crown & foot rot	July - Sept

TIMELINE OF COMMON AND IMPORTANT DISEASES
OCCURRING ON SUMMER SQUASH AND ZUCCHINI.



BACTERIAL WILT (*left*) AND ANGULAR LEAF SPOT (*right*) CAN BE CAUSE
SERIOUS DAMAGE IN ORGANIC PRODUCTION OF SUMMER SQUASH AND
ZUCCHINI.

Disease Management for Organic Field Summer Squash & Zucchini

GENERAL NOTES

The following includes an example of products; this list is not comprehensive. A complete list of fungicides and their efficacy can be found in the *Vegetable Production Guide for Commercial Growers* (ID-36) and the *Southeastern U.S. Vegetable Crop Handbook*. See Additional Resources section.

Always read product labels for specific use instructions. The label is the law.

PREPLANT

Rotate out of cucurbit crops for at least 3 years in the same field, especially for sites with a history of soilborne diseases. Space plants for maximum air circulation. When available, use resistant cultivars (e.g. powdery mildew resistant cultivars). Follow cultural practices (rotate crops, improve drainage, practice sanitation).

AT PLANTING (Approximately early May)

Apply LalStop K61, Obtego, or RootShield Plus if Pythium root rot or damping off disease emerges or if field has a history of belly rot, cottony leak, or Fusarium fruit rot. To prevent bacterial wilt, manage cucumber beetles beginning at seedling stage (See *Cucumber Beetles* Entfact-311 publication).

VEGETATIVE GROWTH (Approximately early May through mid-June)

Practice good sanitation, such as removing diseased or senescing tissue regularly and removing clippings and debris from the field.

Application Timing <i>Weeks after planting</i>	Application Notes	Fungicides ²	Target Diseases
Week 1 to 5	Use fungicides preventively before disease develops. Applications should be made every 1 to 2 weeks. A SAR inducer can help plants build immunity.	Cease/Stargus	Leaf diseases
		Copper ^{3,4}	
		OSO	
		SAR inducer Actinovate/Regalia	

FLOWERING THROUGH HARVEST (Approximately mid-June through mid-August)

Application Timing <i>Weeks after planting</i>	Application Notes	Fungicides/Bactericides ²	Target Diseases
Week 6 to 10	Use fungicides preventively before disease develops. Applications should be made every 1 to 2 weeks.	Cease/Stargus	Cercospora leaf spot, powdery mildew
		Copper ^{3,4}	
		OSO	
As needed ¹	For severe powdery mildew or high risk plantings, add an additional product to tank mix or add additional sprays.	Sulfur ⁵	Powdery mildew
		Cease/Stargus	
		MilStop	
		EcoSwing	
As needed ¹	Applications should be made every 1 to 2 weeks when risk is high. Monitor disease via ipmpipe.org forecasting site.	Copper ^{3,4}	Downy mildew
		MilStop	
		Zonix	

¹ Application necessary when diagnostic results confirm presence of disease or if field has history of disease.

² See SEVEW Table 3-51 Biopesticides for alternative products. (Note: This production guide is revised annually and location of this information could change.)

³ Copper products can include Badge, Basic Cop, Nordox, or NuCop.

⁴ Combining copper fungicides with SAR products like Actinovate, Regalia, and some Bacillus products can enhance efficacy of copper-based fungicides.

⁵ Sulfur should not be applied within 7 days of Bacillus products.

Disease Management for Organic Field Summer Squash & Zucchini

FLOWERING THROUGH HARVEST (Approximately mid-June through mid-August) (*cont'd*)

Application Timing <i>Weeks after planting</i>	Application Notes	Fungicides/Bactericides ²	Target Diseases
As needed ¹	Applications should be made every 1 to 2 weeks. A SAR inducer can help plants build immunity.	Copper ^{3,4}	Angular leaf spot
		Cease/Stargus	
		Leap	
		SAR inducer Actinovate/Regalia	
As needed ¹	Applications should be made every 1 to 2 weeks.	LalStop K61	Fusarium crown & foot rot
		Obtego	
		RootShield Plus	
		Cease/Stargus	

¹ Application necessary when diagnostic results confirm presence of disease or if field has history of disease.

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³ Copper products can include Badge, Basic Cop, Nordox, or NuCop.

⁴ Combining copper fungicides with SAR products like Actinovate, Regalia, and some Bacillus products can enhance efficacy of copper-based fungicides.

⁵ Sulfur should not be applied within 7 days of Bacillus products.

EXAMPLE SPRAY SCHEDULE FOR ORGANIC FIELD PRODUCTION OF SUMMER SQUASH AND ZUCCHINI.

Summer Squash & Zucchini		
Weeks after Planting	Fungicide(s)	Target Diseases
1-5	Actinovate+Cease	LS
Weeks during Harvest	Fungicide(s)	Target Diseases
6	Cease+EcoSwing	LS, PM
7	NuCop+MilStop	DM, LS, PM
8	Cease+EcoSwing	DM, LS, PM
9	NuCop+MilStop	DM, LS, PM
10	Cease+EcoSwing	DM, LS, PM

DM – DOWNY MILDEW; LS – FUNGAL LEAF SPOTS;
PM – POWDERY MILDEW

DISCLAIMER

Fungicides listed here include a few of the most common products available and were selected to simplify information in this publication.

No endorsement is intended nor is criticism implied of similar products that are not named.

ADDITIONAL RESOURCES

Additional information can be found on the UK Plant Pathology Extension Publications webpage
<https://plantpathology.ca.uky.edu/extension/publications>

- Vegetable Production Guide for Commercial Growers (ID-36)
- Southeastern U.S. Vegetable Crop Handbook (SEVEW)
- OMRI Product Website <https://www.omri.org/>

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Editor: Cheryl Kaiser, Plant Pathology Extension Support

Photos: Bugwood.org—Howard F. Schwartz, Colorado State University (bacterial wilt) and Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo (angular leaf spot)