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

Plant Pathology Fact Sheet **PPFS-VG-51**

Organic Commercial Spray Schedule for Field Production of Broccoli, Cauliflower & Other Cole Crops

Nicole Gauthier
Plant Pathology
Extension Specialist

Kim Leonberger
Plant Pathology
Extension Associate

Sara Long
Plant Disease
Diagnostic Assistant

Rachel Rudolph
Horticulture
Extension Specialist

Introduction

Commercial field production of organic cole crops 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 cole crop 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/.

SPRING PLANTED COLE CROPS	
Disease	**Time Period**
Pythium root rot	March - May
Black rot	May - June
White mold, Sclerotinia	May - June
Bacterial soft rot	June
Cercospora leaf spot	June
Black leg, Phoma	June

FALL PLANTED COLE CROPS	
Disease	**Time Period**
Cercospora leaf spot	July - Sept
Southern blight	July - Sept
Alternaria leaf spot	July - Oct
Black rot	Aug - Oct
Bacterial soft rot	Sept - Nov
Pythium root rot	Sept - Oct

Timeline of common and important diseases occurring on cole crops

Sclerotinia white mold is a common disease occurring on spring cole crops in Kentucky.

Disease Management for SPRING Planted Cole Crops

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* (SEVEW). See Additional Resources section.

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

PREPLANT

Rotate out of cole crops for at least 3 years, especially for sites with a history of soil-borne diseases. Space plants for maximum air circulation. When available, use resistant cultivars (e.g. black spot or black rot resistant cultivars). Follow cultural practices (rotate crops, improve drainage, practice sanitation). For sites with a history of white mold, incorporate Contans into the soil in January.

TRANSPLANT (Approximately March and April, varies with crop)

Apply LalStop K61, Obtego, or RootShield Plus at transplant if field has a history of Rhizoctonia wirestem or if damping-off disease emerges. Apply LalStop K61 or Obtego if Pythium root rot emerges.

VEGETATIVE GROWTH (Approximately March and April, varies with crop)

Practice good sanitation, such as removing diseased tissue regularly from the field.

Application Timing *Weeks after transplant*	**Application Notes**	**Fungicides**[2]	**Target Diseases**
As needed[1]	Use fungicides preventatively before disease develops. Applications should be made every 1 to 2 weeks.	LalStop K61 Obtego RootShield Plus	Pythium root rot
As needed[1]	Use fungicides preventatively before disease develops. Applications should be made every 1 to 2 weeks.	LalStop K61 OSO RootShield Plus	Rhizoctonia crown rot & wirestem

HEAD/CROWN FORMATION THROUGH HARVEST (Approximately May and June, varies with crop)

Maintain good air circulation. Sanitation is critical. Head/crown formation may occur earlier or later than indicated below, depending on crop, cultivar, and environmental conditions.

Application Timing *Weeks after transplant*	**Application Notes**	**Fungicides/Bactericides**[2]	**Target Diseases**
Weeks 5-12 (may extend longer, depending on specific crop)	Applications should be made every 1 to 2 weeks.	Copper[3,4] Cease/Stargus Leap	Black rot
As needed [1]	Drench every 2 to 3 weeks if disease is present or field has a history of disease.	BotryStop LalStop K61 Obtego	White mold

[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

Disease Management for SPRING Planted Cole Crops

HEAD/CROWN FORMATION THROUGH HARVEST (Approximately May and June, varies with crop) *(cont'd)*

Maintain good air circulation. Sanitation is critical. Head/crown formation may occur earlier or later than indicated below, depending on crop, cultivar, and environmental conditions.

Application Timing *Weeks after transplant*	**Application Notes**	**Fungicides/Bactericides[2]**	**Target Diseases**
As needed[1]	Applications should be made every 1 to 2 weeks when risk is high.	Copper[3,4] Cease/Stargus Leap	Bacterial soft rot
As needed[1]	Applications should be made every 1 to 2 weeks when risk is high. A SAR inducer can help plants build immunity.	Cease/Stargus Copper[3,4] OSO SAR inducer Actinovate/Regalia	Black leg, Cercospora leaf spot, Phoma

[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

Disease Management for FALL Planted Cole Crops

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* (SEVEW). See Additional Resources section.

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

PREPLANT

Rotate out of cole crops for at least 3 years, especially for sites with a history of soil-borne diseases. Space plants for maximum air circulation. When available, use resistant cultivars (e.g. black spot or black rot resistant cultivars). Follow cultural practices (rotate crops, improve drainage, practice sanitation).

TRANSPLANT (Approximately July and August, varies with crop)

Apply LalStop K61, Obtego, or RootShield Plus at transplant if field has a history of Rhizoctonia wirestem or if damping-off disease emerges. Apply LalStop K61 or Obtego if Pythium root rot emerges. Apply Obtego if site has a history of southern blight.

VEGETATIVE GROWTH (Approximately July and August, varies with crop)

Practice good sanitation, such as removing diseased tissue regularly from the field.

Application Timing *Weeks after transplant*	**Application Notes**	**Fungicides[2]**	**Target Diseases**
As needed[1]	Use fungicides preventatively before disease develops. Applications should be made every 1 to 2 weeks.	LalStop K61 Obtego RootShield Plus	Pythium root rot

[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

Disease Management for FALL Planted Cole Crops

VEGETATIVE GROWTH (Approximately July and August, varies with crop) *(cont'd)*
Practice good sanitation, such as removing diseased tissue regularly from the field.

Application Timing *Weeks after transplant*	**Application Notes**	**Fungicides**[2]	**Target Diseases**
As needed[1]	Use fungicides preventatively before disease develops. Applications should be made every 1 to 2 weeks.	LalStop K61	Rhizoctonia crown rot & wirestem
		Obtego	
		RootShield Plus	

HEAD/CROWN FORMATION THROUGH HARVEST (Approximately August through October, varies with crop)
Maintain good air circulation. Sanitation is critical. Head/crown formation may occur earlier or later than indicated below, depending on crop, cultivar, and environmental conditions.

Application Timing *Weeks after transplant*	**Application Notes**	**Fungicides/Bactericides**[2]	**Target Diseases**
Weeks 5-12 (may extend longer, depending on specific crop)	Applications should be made every 1 to 2 weeks. A SAR inducer can help plants build immunity.	Copper[3,4]	Black rot
		Cease/Stargus	
		Leap	
		SAR inducer Actinovate/Regalia	
Weeks 5-12 (may extend longer, depending on specific crop)	Applications should be made every 1 to 2 weeks. A SAR inducer can help plants build immunity.	Cease/Stargus	Alternaria leaf spot, Cercospora leaf spot
		Copper[3,4]	
		OSO	
		SAR inducer Actinovate/Regalia	
As needed[1]	Applications should be made every 1 to 2 weeks. A SAR inducer can help plants build immunity.	Cease/Stargus	Bacterial soft rot
		Copper[3,4]	
		Leap	
		SAR inducer Actinovate/Regalia	
As needed[1]	Applications should be made every 1 to 2 weeks	Obtego	Southern blight
		OSO	

[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

Example spray schedules for organic field production of cole crops.

SPRING Planted Cole Crops		
0	LalStop K61	SP
Weeks after Transplant	**Fungicide(s)**	**Target Diseases**
1	Actinovate	LS, BS
2	Actinovate	LS, BS
3	Actinovate	LS, BS
4	Actinovate	LS, BS
Weeks during Head/Crown Formation and Harvest	**Fungicide(s)**	**Target Diseases**
5	NuCop+OSO	LS, BS
6	Cease	LS, BS
7	NuCop+OSO	LS, BS
8	Cease	LS, BS
9	NuCop+OSO	LS, BS
10	Cease	LS, BS
11	NuCop+OSO	LS, BS
12	Cease	LS, BS

FALL Planted Cole Crops		
0	LalStop K61	SP
Weeks after Transplant	**Fungicide(s)**	**Target Diseases**
1	Actinovate	LS, BS
2	Actinovate	LS, BS
3	Actinovate	LS, BS
4	Actinovate	LS, BS
Weeks during Head/Crown Formation and Harvest	**Fungicide(s)**	**Target Diseases**
5	NuCop+OSO	LS, BS
6	Cease	LS, BS
7	NuCop+OSO	LS, BS
8	Cease	LS, BS
9	NuCop+OSO	LS, BS
10	Cease	LS, BS
11	NuCop+OSO	LS, BS
12	Cease	LS, BS

BS – Bacterial leaf diseases; LS – Fungal leaf spots; SP – Soilborne pathogens

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/

May 2025

Editor: Cheryl Kaiser, Plant Pathology Extension Support
Photo: Edward Sikora, Auburn University, Bugwood.org