2020/2021
Mid-Atlantic Commercial Vegetable Production Recommendations

Delaware
University of Delaware Cooperative Extension (EB137)

Maryland
University of Maryland Extension (EB-236)

New Jersey
Rutgers Cooperative Extension (E001)

Pennsylvania
Penn State Extension (AGRS-028)

Virginia
Virginia Cooperative Extension (456-420)

West Virginia
West Virginia University Extension Service

For Immediate Medical Attention

Call 911

For a Pesticide Exposure Poisoning

Emergency Call

For All States

This number will automatically connect you to the poison center nearest to you.
Anyone with a poisoning emergency can call the toll-free telephone number for help. Personnel at the Center will give you first-aid information and direct you to local treatment centers if necessary.

For Pesticide Spills

Small Spills: See the product label for cleanup advice.
Large spills: Call the National Response Center at 1-800-424-8802 or CHEMTREC at 800-424-9300 (24 hours) - Industry assistance with emergency response cleanup procedures for large, dangerous spills.
Be aware of your responsibility to report spills to the proper state agency.

Preface

NOT TO BE USED BY HOME GARDENERS

This copy of the 2020/2021 Mid-Atlantic Commercial Vegetable Production Recommendations replaces all previous editions of the Commercial Vegetable Production Recommendations published individually for Delaware, Maryland, New Jersey, Pennsylvania, Virginia, and West Virginia. Information presented in this publication is based on research results from the University of Delaware, the University of Maryland, Rutgers - The State University of New Jersey, The Pennsylvania State University, Virginia Polytechnic Institute and State University, West Virginia University, and the U.S. Department of Agriculture, combined with industry and grower knowledge and experience.

This publication will be revised biennially. **In January 2021, a critical update with important updates for this publication will be communicated through local Extension Agents and Vegetable Specialists.** The editors welcome constructive criticism and suggestions from growers and industry personnel who may wish to help improve future editions of this publication.

These recommendations are intended for the commercial vegetable grower who has to make numerous managerial decisions. Although the proper choices of variety, pesticides, equipment, irrigation, fertilizer, and cultural practices are the individual vegetable grower's responsibility, it is intended that these recommendations will facilitate decision-making. Recommended planting dates will vary across the six-state region. Local weather conditions, grower experience, and variety may facilitate successful harvest on crops planted outside the planting dates listed in this guide. This can be evaluated in consultation with the local agents and state specialists. Government agencies and other organizations administrating crop insurance programs or other support programs should contact local Extension agents and/or vegetable specialists for guidance.

DISCLAIMER

- The label is a legally-binding contract between the user and the manufacturer.
- The user MUST follow all rates and restrictions as per label directions.
- The use of any pesticide inconsistent with the label directions is a violation of Federal law.

Pesticide User Responsibility

Always follow the label and use pesticides safely. For Special Local Needs Label 24(c) registrations or Section 18 exemptions, do not use the material without a copy of the special label or written instructions from your Extension Agent or another recognized authority. **The user is always responsible for the proper use of pesticides, residues on crops, storage and disposal, as well as for damage caused by drift.**

State and federal pesticide regulations are constantly under revision. Be sure to determine if such changes apply to your situation. Using pesticides inconsistent with label directions is illegal.

Days Between Last Application and Harvest

The minimum number of days between the last application and harvest (**PHI**, Pre-Harvest Interval, in days) and reentry information (**REI**, Restricted Entry Interval, in hours) are listed in the herbicide, insecticide and fungicide recommendation tables in chapter F Commodity Recommendations. Always follow the label to avoid the occurrence of deleterious chemical residues on harvested crops.

Trade or Brand Names

The trade or brand names given herein are supplied with the understanding that no discrimination is intended and no endorsement is implied. Furthermore, in some instances the same compound may be sold under different trade names, which may vary as to label clearances. For the convenience of our users, both product names and active ingredients are provided and any product name omissions are unintended.

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2020/2021 Mid-Atlantic Commercial Vegetable Production Recommendations

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University of Delaware Agricultural Extension: *https://www.udel.edu/canr/cooperative-extension/*
Vegetable Program Trial Reports, Publications, and Budgets:
https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/commercial-crops/vegetable-crops/
Weekly Crop Update Newsletter: *https://sites.udel.edu/weeklycropupdate/*
Insect Trap Program:
https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/pest-management/insect-trapping/
UD Plant Diagnostic Clinic: *https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/plant-diagnostic-clinic/*
University of Delaware Weed Science:
https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/weed-science/

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University of Maryland Extension: *https://extension.umd.edu/topics/agriculture*
Maryland Vegetables: *https://extension.umd.edu/mdvegetables*
Vegetable & Fruit Headline News:
https://extension.umd.edu/anne-arundel-county/agriculture/vegetable-fruit-headline-news

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State Extension Information

NEW JERSEY

Rutgers, The State University of New Jersey
New Jersey Agricultural Experiment Station: *http://njaes.rutgers.edu/ag/*
Fact Sheets and Bulletins: *https://njaes.rutgers.edu/pubs/*
Plant & Pest Advisory: *http://plant-pest-advisory.rutgers.edu*
Rutgers Vegetable Crops Online Resources: *https://nj-vegetable-crops-online-resources.rutgers.edu/*
Mid-Atlantic Commercial Vegetable Production Recommendations:
http://njaes.rutgers.edu/pubs/publication.asp?pid=E001
Rutgers Pest Management Office: *https://pestmanagement.rutgers.edu/*

Rutgers NJAES Extension Specialists and IPM Program Personnel
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Mercer County, Meredith Melendez, 609-989-6830, *melendez@njaes.rutgers.edu*
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Morris County, Peter Nitzsche, 973-285-8304, *nitzsche@njaes.rutgers.edu*

Rutgers Vegetable Working Group Directory
For complete listing and contact information see:
https://nj-vegetable-crops-online-resources.rutgers.edu/ and go to "members" section.

Rutgers NJAES Plant Diagnostic Lab and Nematode Detection Service
http://njaes.rutgers.edu/plantdiagnosticlab/; *clinic@njaes.rutgers.edu*
20 Indyk-Engel Way, North Brunswick, NJ 08902, phone: 732-932-9140, fax: 732-932-1270,

Rutgers Soil Testing Lab *http://njaes.rutgers.edu/soiltestinglab/*
57 US Highway 1, New Brunswick, NJ 08901, 848-932-9295, *soiltest@njaes.rutgers.edu*

PENNSYLVANIA

The Pennsylvania State University
Penn State Extension, including publications, fact sheets, and more: *http://extension.psu.edu*
Penn State Vegetable Production: *https://extension.psu.edu/forage-and-food-crops/vegetables* (click on the "News" button to see recent articles related to vegetable and small fruit production)

Penn State Vegetable Team Directory
For complete listing and contact information see:
https://extension.psu.edu/forage-and-food-crops/vegetables/vegetables-experts

Plant Disease Clinic: *http://plantpath.psu.edu/facilities/plant-disease-clinic*
220 Buckhout Laboratory, University Park, PA 16802, 814-865-2204

Insect Advice from Extension/Insect Identification Laboratory: *https://ento.psu.edu/extension*
501 Agricultural Sciences and Industries Building, University Park, PA 16802, 814-865-3256

Agricultural Analytical Services Laboratory: *https://agsci.psu.edu/aasl*
111 Ag Analytical Services Lab, University Park, PA 1682, 814-863-4540, *aaslab@psu.edu*

State Extension Information

VIRGINIA

Virginia Tech & Virginia State University
Virginia Cooperative Extension (VCE): *https://ext.vt.edu/*
VCE Publications and Educational Resources:
http://pubs.ext.vt.edu/ and
https://ext.vt.edu/agriculture.html
Virginia Tech Pesticide Programs (VTPP): *http://vtpp.ext.vt.edu*

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Insect Identification Lab
205A Price Hall, 170 Drillfeld Drive, Virginia Tech Blacksburg, VA 24061-0319
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WEST VIRGINIA

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Plant Diagnostic Clinic
https://extension.wvu.edu/lawn-gardening-pests/plant-disease/plant-diagnostic-clinic
G102 South Ag. Sciences Building, PO Box 6108, Morgantown, WV 26506-6108
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Soil Testing Lab
https://soiltesting.wvu.edu
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Table of Contents

Table of Contents - continued on next page

Table of Contents - continued

Table of Contents - continued on next page

Table of Contents - continued

Listing of Tables and Figures

Abbreviations and Acronyms

Units of Measurement

/A	per acre
bu	bushel(s)
°C	degrees Celsius
cc	cubic centimeter(s)
cu ft	cubic foot (feet)
cu yd	cubic yard(s)
cwt	hundredweight
d	day(s)
°F	degrees Fahrenheit
ft	foot (feet)
fl oz	fluid ounce(s)
g	gram(s)
gal	gallon(s)
gpm	gallons per minute
h	hour(s)
in	inch
lb	pound(s)
min	minute(s)
mph	miles per hour
oz	ounce(s)
ppm	parts per million
psi	pounds per square inch
pt	pint(s)
qt	quart(s)
sq ft	square foot (feet)
tbs	tablespoon(s)
tsp	teaspoon(s)
wk	week(s)
yr	year(s)

Product Formulations

COC	crop oil concentrate
D	dust
DF	dry flowable
DP	dry prill
DS	dry salt
E	emulsion
EC	emulsifiable concentrate
ES	emulsifiable suspension
EW	emulsion in water
F	flowable
FC	flowable concentrate
FL	fluid
FM	flowable micro-encapsulated
G	granule
L	liquid
LC	liquid concentrate
LF	liquid flowable
ME	micro-encapsulated
OF	oil formulation
OLF	other labeled formulations

Product Formulations - continued

SC	spray concentrate, soluble concentrate
SG	soluble granules
SP	soluble powder
W	wettable
WBE	water-based emulsion
WDG	water-dispersible granules
WDL	water-dispersible liquid
WP	wettable powder
WSB	water-soluble bag
WSP	water-soluble packet

Diseases

AMV	alfalfa mosaic virus
EBDC	early blight disease control
FR	Fusarium wilt resistance
LR	leaf roll resistant
MT	mosaic tested
PMR	powdery mildew resistant
PMT	powdery mildew tolerant
PR	Phytophthora resistance
PT	Phytophthora tolerant
PVX	potato virus X
PVY	potato virus Y
WMV	watermelon mosaic virus
WMV2	watermelon mosaic virus race2
WRR	white rust resistance
ZYMV	zucchini yellow mosaic virus

Other

ai	active ingredient
AP	at planting
ALS	acetolactate synthase
AMS	ammonium sulfate
FRAC	Fungicide Resistance Action Committee
IRAC	Insecticide Resistance Action Committee
K	potassium
K_2O	available potash
N	nitrogen
OMRI	Organic Materials Research Institute
P	phosphorus
P_2O_5	available phosphoric acid
PHI	Pre Harvest Interval (in days)
REI	Restricted Entry Interval (in hours)
WSSA	Weed Science Society of America