



This is a section from the

2018

Mid-Atlantic

Commercial Vegetable

Production Recommendations

The manual, which is published annually, is **NOT** for home gardener use.

The **full manual**, containing recommendations specific to New Jersey, can be found on the Rutgers NJAES website in the Publications section:

<http://njaes.rutgers.edu/pubs/publication.asp?pid=E001>.

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.

Cooperating Agencies: Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and County Boards of Chosen Freeholders. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.

F. Commodity Recommendations

Pesticide Use Disclaimer

THE LABEL IS THE LAW

Before using a pesticide, check the label for up to date rates and restrictions.

Labels can be downloaded from: <http://www.cdms.net/>, <http://www.greenbook.net/> or <http://www.agrian.com/labelcenter/results.cfm>

Guide to the Recommended Pesticide Tables in the Following Crop Chapters:

1. Pesticides are listed by **group or code number based on chemical structure and mode of action**, as classified by the Weed Science Society of America (WSSA) for herbicides, the Insecticide Resistance Action Committee (IRAC) for insecticides, and the Fungicide Resistance Action Committee (FRAC) for fungicides.
If the number is in bold font, the product may have resistance concerns.
2. For **restricted use pesticides**, the restricted active ingredients are labeled with a *. See the Pesticide Safety chapter for more information.
3. **In addition to the pesticides listed below, other formulations or brands with the same active ingredient(s) may be available. ALWAYS CHECK THE LABEL:**
 - a) to ensure a pesticide is labeled for the same use,
 - b) to ensure the pesticide is labeled for the desired crop, and
 - c) for additional restrictions.
4. All pesticide recommendations are made for spraying a **broadcast area of 1 acre** (43,560 square feet). **Adjust the rate for banded applications** (for more information, see the Pest Management chapter, Calibrating Granular Applicators section).
5. Check the label for the maximum amount of pesticide per application and the maximum number of applications per year.
6. **Bee Toxicity Rating (Bee TR):** N=nontoxic; L=minimum impact on bees; M=moderately toxic, can be used if dosage, timing and method of application are correct, but should NOT be applied directly to crop if bees are present; H=highly toxic, severe losses expected, -- = data not available.

Summer Squash

Recommended Varieties¹

Type	Variety (all hybrids)	Reported Disease Resistance ²					Comments
		CMV	WMV2	ZYMV	PRSV	PM	
Scallop	Flying Saucer						Yellow and Green Fruit
	Garden Sun						Yellow Fruit
	Peter Pan						Light Green Fruit
	Starship						Dark Green Fruit
	Sunburst						Golden Yellow Fruit
	Sunny Delight						Yellow Fruit
Specialty	Comela						Middle Eastern Type, Light Green Fruit
	Eight Ball						Round Green fruit
	Magda						Middle Eastern Type, Light Green Fruit
	One Ball						Golden Yellow Round Zucchini Type Fruit
Yellow Straightneck	Conqueror III	R	R	R	I	I	Green Stem
	Fortune						Precocious Yellow ³
	Goldprize		I	I			Green Stem
	Lemondrop L						Green Stem
	Liberator	I	I	I			Precocious Yellow
	Lioness		I	I			Green Stem
	Multipik						Precocious Yellow
	Patriot II		I	I			Precocious Yellow
	Seneca Prolific						Green Stem
	Superpik						Precocious Yellow
XPT 1832 III	I	I	I			Transgenic Resistance	
Yellow Crookneck	Gentry						Tolerant to High Temperatures
	Gold Star	I				I	
	Prelude II	I	I	I		I	Green Stem
	Superset	I	I				Precocious Yellow
Green Zucchini	Cashflow			I			Medium Green Fruit
	Dividend	I	I	I			Medium Green Fruit
	Equinox		I	I		I	Dark Green Fruit
	Independence II		R	I			Medium Green Fruit, Transgenic Resistance
	Judgement III	R	R	R			Medium Green Fruit, Transgenic Resistance
	Justice III		R				Medium Green Fruit, Transgenic Resistance
	Paycheck	I	I	I		I	Medium Green Fruit
	Payload	I	I	I		I	Medium Green Fruit
	Payroll		I	I		I	Medium Green Fruit
	Quirinal		I	I		I	Medium Green Fruit
	Respect		I	I	I	I	Medium-Dark Green Fruit
	Reward	I	I	I		I	Medium-Dark Green Fruit
	Senator						Medium Green Fruit, Not for late season
	Spineless Beauty						Medium Green fruit, Not for late season
	Spineless Perfection		I	I		I	Medium Green Fruit
Tigress		I	I	I		Medium Green Fruit	
Zucchini Elite						Medium Green Fruit, Not for late season	
Golden Zucchini	Golden Dawn III						
	Golden Delight		I	I			
	Golden Glory		I	I		I	
	Golden Rod	I	I				
Gold Rush							

¹Listed alphabetically; recommended for DE, MD, NJ, PA, VA and WV. Additional information is based on seed manufacturer and/or seed distributor claims; consult seed vendor for maturity/days to harvest. ²CMV=Cucumber Mosaic Virus, WMV2=Watermelon Mosaic Virus 2, ZYMV=Zucchini Yellow Mosaic Virus, PRSV=Papaya Ring Spot Virus, PM=Powdery Mildew. I=Intermediate and R=High Resistance. Transgenic resistance of specific varieties can be found by consulting the seed manufacturer or distributor. ³In yellow-fruited summer squash the precocious yellow gene confers tolerance to CMV and WMV2 as compared to the green stem counterpart. Varieties expressing the precocious yellowing gene will mask the greening of fruit caused by WMV and CMV, but will become bumpy and/or distorted when infected with either PRSV or ZYMV. **All 4 viruses may be detected at some level in squash fields in our region in any given year, therefore it is best to plant varieties with resistance to more than one virus, especially in later plantings when virus transmission by aphids increases. Virus resistance and PM resistance is recommended for fall/late planted varieties.**

Recommended Nutrients Based on Soil Tests

In addition to using the table below, check the suggestions on rate, timing, and placement of nutrients in your soil test report and the Soil and Nutrient Management chapter. Your state's soil test report recommendations and/or your farm's nutrient management plan supersede recommendations found below.

		Soil Phosphorus Level				Soil Potassium Level				
		Low	Med	High (Opt)	Very High	Low	Med	High (Opt)	Very High	
Summer Squash ¹	N (lb/A)	P ₂ O ₅ (lb/A)				K ₂ O (lb/A)				Nutrient Timing and Method
	75-100	150	100	50	0 ²	200	150	100	0 ²	Total nutrient recommended
	25-50	150	100	50	0 ²	200	150	100	0 ²	Broadcast and disk-in
	50	0	0	0	0	0	0	0	0	Sidedress and fertigate when vines start to run
	25-30	0	0	0	0	0	0	0	0	Apply through irrigation system

¹Apply 1-2 lb/A of boron (B) with broadcast fertilizer.; see also Table B-7 in the Soil and Nutrient Management chapter.

²In VA, crop replacement values of 25 lb/A of P₂O₅ and 50 lb/A of K₂O are recommended on soils testing Very High.

Seed Treatment Check if seed has been treated with insecticide and fungicide; see also Disease Control below.

Seeding, Transplanting, and Spacing

Seed April 15 through August 15 in warmer, southern regions and May 10 to August 1 in PA and other cool areas. Use 4-6 lb/A of seed, or 3,500-4,500 seed/A.

Container-grown plants are planted through the plastic when daily mean temperatures have reached 60°F (16°C). Planting dates vary from April 15 in southern regions to June 1 in northern areas. Early plantings should be protected from winds with hot caps, tents, or row covers. Space rows 5-6 ft apart with plants 2-3 ft apart in the row.

Field Preparation

Plastic mulch and fumigant should be applied to well-prepared, moist soil 30 days before field planting. Plastic mulch conserves moisture, increases soil temperature, and increases early and total yields. Various widths of plastic are available to accommodate different production systems and equipment.

Fumigation will be necessary when there is a history of soil-borne diseases. The type of fumigant depends on the predominant pest. Several fumigants can be used on summer squash. Fumigation also aids in the control of weeds, though fumigation alone may not be sufficient for weed control under plastic mulch (black plastic or paper may be used without additional herbicides, however may not control yellow nutsedge). Foil mulches can be used to repel aphids that transmit mosaic virus in fall planted squash (after July 1). Direct seeding through the mulch is recommended for maximum virus protection. Transplants should not be used with foil or other repellent mulches.

Fertilizer must be applied during bed preparation. At least 50% of the N should be in the nitrate (NO₃⁻¹) form. Consider drip irrigation (more information in the "Irrigation Management chapter).

Pollination

Honeybees, squash bees, bumblebees and other wild bees are important for pollination and fruit set. Populations of pollinating insects may be adversely affected by insecticides applied to flowers or weeds in bloom. Apply insecticides only in the evening hours or wait until blooms are completed before application. See the section on "Pollination" in the General Production Recommendations chapter and/or pesticide tables below for toxicity to bees. Read the pesticide label for specific directions to protect pollinators.

Harvest and Post-Harvest Considerations

Zucchini and summer squash are harvested after fruit reach the desired size but before they form hard seeds or rinds. Size is highly dependent on market demands. Crook-neck and straight-neck squash and zucchini should be 1.25-2 inches in diameter. Straight-neck squash and zucchini should be 7-8 inches long. Scallop squash should be 3-4 inches in diameter.

Summer squash and zucchini are delicate and prone to bruising and scratching. Handle with care when harvesting, grading and packing. Squash should be stored at 41-50°F (5-10°C) and 95% relative humidity. The typical shelf life is 7-14 days. Summer squash is highly sensitive to freezing injury and will show pitting on the skin if exposed to temperatures below 41°F (5°C). Do not store or transport with ethylene producing crops.

Weed Control

THE LABEL IS THE LAW - See the Pesticide Use Disclaimer on page F 1.

Recommended Herbicides

1. Identify the weeds in each field and select recommended herbicides. More information is available in the “Herbicide Effectiveness on Common Weeds in Vegetables” Table (E-2) in the Pest Management chapter.
2. Minimize herbicide resistance development. Identify the herbicide site mode of action group and follow recommended good management practices. Include non-chemical weed control whenever possible.

Labeled Applications Sites for Summer Squash									
Herbicides	WSSA group number	Plastic mulch production					Bare-ground production		
		Soil-Applied		Postemergence			Soil-applied	POST	Post-harvest
		Under Plastic	Row Middles	Over Plastic	Row Middles	Post-Harvest			
Sandea	2		YES		YES				
Curbit	3		YES				YES		
Prefar	8	YES	YES				YES		
Command	13		YES				YES		
Stragegy	3 + 13		YES				YES		
Reflex	14	YES	YES		YES		YES		
Select	1			YES				YES	
Select Max	1			YES				YES	
Poast	1			YES				YES	
Gramoxone	22				YES	YES			YES

1. Soil-Applied

Group	Product Name	Product Rate	Active Ingredient (*=Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
2	Sandea 75DF	0.5 to 1 oz/A	halosulfuron	0.023 to 0.047 lb/A	30	12
<p>-Plasticulture: can be applied in a band under the plastic, immediately before laying the mulch; delay seeding or transplanting for 7 days after application. Row middles: apply before or after weed emergence; apply as a shielded application to avoid contact with the crop. If weeds have emerged, use a non-ionic surfactant at 0.25% v/v or include a non-selective herbicide.</p> <p>-Bareground: apply broadcast after seeding but before crop emergence or no sooner than 7 days before transplanting.</p> <p>-Suppresses or controls yellow nutsedge and certain broadleaf weeds. Sandea provides both residual and postemergence control of susceptible weed species. Effective postemergence control requires an adjuvant.</p> <p>-Sandea is an ALS inhibiting herbicide and resistant weed populations are common in the region. Do not use Group 2 herbicides repeatedly in the same field.</p> <p>-Do not apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application.</p> <p>-Maximum number of Sandea applications per year is 2 and do not exceed 2 oz/A during the crop season.</p>						
3	Curbit 3EC	1 to 3 pt/A	ethalfluralin	0.38 to 1.12 lb/A	--	24
<p>-Plasticulture: row middles only: apply as a banded spray after crop emergence or transplanting. Do not soil incorporate.</p> <p>-Bareground: apply broadcast after direct-seeding but prior to crop emergence; do not use on transplanted crop.</p> <p>-Controls annual grasses and certain annual broadleaf weeds, including carpetweed and pigweed sp.</p> <p>-Use lower rate for coarse-textured soils or soils with low organic matter.</p> <p>-Where overhead irrigation is available, activate Curbit with 0.5 inch of irrigation within 2 days after application; if no irrigation or rainfall occurs within 5 days of application, activity of Curbit can be reduced.</p> <p>-Available as a pre-mix herbicide Strategy. Strategy at 3 pt/A= Curbit at 26 fl oz (0.6 lb ai) and Command at 8 fl oz (0.188 lb ai)</p> <p>-Maximum applications per season: not specified</p>						
8	Prefar 4E	5 to 6 qt/A	bensulide	5 to 6 lb/A	--	12
<p>-Plasticulture: under plastic: apply in a band under the plastic, immediately before laying the mulch. Plasticulture row middles: application is labeled.</p> <p>-Bareground: apply preemergence or preplant incorporated. Preemergence applications should be followed by irrigation within 36 hrs (apply enough water to wet the soil at least 2 to 4 inches deep). Preplant incorporated applications should be incorporated 1 to 2 inches deep (deeper than 2 inches will result in reduced weed control).</p> <p>-Provides control/suppression of some annual grass weeds and some broadleaves including pigweeds, purslane, and lambsquarters.</p> <p>-Maximum applications per season: not specified.</p>						

1. Soil-Applied continued on next page

1. Soil-Applied - continued

13	Command 3ME	4 to 8 fl oz/A	clomazone	0.094 to 0.19 lb/A	45	12
<p>-Plasticulture: row middles application only.</p> <p>-Bareground: apply broadcast just before planting but before crop emergence, or just before transplantings.</p> <p>-Use the lower rate when used on coarse-textured soils low in organic matter, when weed pressure is light, or to minimize herbicide carryover that could affect subsequent crops.</p> <p>-Controls annual grasses and many broadleaf weeds including common lambsquarters, velvetleaf, spurred anoda, and jimsonweed. Carpetweed, morningglory sp., pigweed sp., and yellow nutsedge will not be controlled. Higher rates will improve control (or expand number of species controlled) such as common cocklebur, common ragweed, or jimsonweed (refer to label for specific weeds and rates).</p> <p>-WARNING: Command spray or vapor drift may injure sensitive crops and other vegetation up to several hundred yards from the point of application (refer to label for restrictions).</p> <p>-Available as a pre-mix herbicide Strategy: Strategy at 3 pt/A= Command at 8 fl oz (0.188 lb ai) and Curbit at 26 fl oz (0.6 lb ai)</p> <p>-Maximum number of Command applications per year: 1</p>						
3 + 13	Strategy 2.1L	1.5 to 4 pt/A	ethalfuralin plus clomazone	0.39 to 1.05 lb/A	45	24
<p>-Plasticulture: row middles application only.</p> <p>-Bareground: apply broadcast just before planting or after planting but before crop emergence.</p> <p>-Strategy is a prepackage mixture of Curbit 3EC and Command 3ME.</p> <p>-Do not apply prior to planting crop. Do not soil incorporate. Refer to individual products for comments.</p> <p>-Maximum applications per season: not specified.</p>						
14	Reflex 2SL	8 fl oz/A	fomesafen	0.13 lb/A	32	24
<p>-A Special Local-Needs Label 24(c) has been approved for the use of Reflex 2SL in DE and MD. The use of this product is legal ONLY if a waiver of liability has been completed (see http://www.farmassist.com/).</p> <p>-Labeled for straight neck yellow, crooked neck yellow, and zucchini types only!</p> <p>-Plasticulture under plastic: apply in a band under the plastic, immediately before laying the mulch. Plasticulture: pre-transplant applications over the plastic mulch is labeled; row middles application is labeled.</p> <p>-Bareground: apply broadcast within 24 hrs after direct-seeding and follow with 0.2 to 0.5 inches of overhead irrigation at least 36 hr before the crop begins to crack through the soil. For transplants, apply Reflex and then irrigate with 0.2 to 0.5 inches of water and then transplant. Do not prepare transplant holes until after Reflex application and irrigation.</p> <p>-Foliar application of Reflex will severely damage or kill squash. The potential of crop injury is greater on lighter textured soils combined with intensive irrigation programs or high amounts of rainfall, therefore, adjust rates accordingly.</p> <p>-Reflex provides both residual and postemergence control of susceptible weed species. Effective postemergence control requires an adjuvant. Summer squash varieties may vary in their response to Reflex; therefore, treat small acreages first to determine crop tolerance, especially when applying to a new variety.</p> <p>-Reflex rates lower than 16 fl oz/A should be used with other herbicides and/or other methods of weed control.</p> <p>-Consider rotational crops when applying fomesafen. If crop is replanted, do not re-apply Reflex. Refer to 24(c) label for specifics on rotational restrictions. Maximum for Reflex application in DE and MD: 24 fl oz/A IN ALTERNATE YEARS.</p>						

2. Postemergence

Group	Product Name	Product Rate	Active Ingredient (* = Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
1	Select 2EC	6 to 8 fl oz/A	clethodim	0.094 to 0.13 lb/A	14	24
	Select Max 0.97EC	12 to 16 fl oz/A				
	Poast 1.5EC	1 to 1.5 pt/A	sethoxydim	0.19 to 0.28 lb/A	3	12
<p>-Postemergence as broadcast spray with both plasticulture and bareground</p> <p>-Select 2EC: use crop oil concentrate (COC) at 1% v/v (1 gal/100 gal of spray solution). Select Max: use nonionic surfactant (NIS) at 0.25% v/v (1 qt/100 gal of spray solution). Poast: Apply with COC at 1.0% v/v.</p> <p>-The use of COC may increase the risk of crop injury when hot or humid conditions prevail. To reduce the risk of crop injury, omit additives or switch to nonionic surfactant when grasses are small and soil moisture is adequate.</p> <p>-Use lower labeled rates for annual grass control and higher labeled rates for perennial grass control.</p> <p>-Yellow nutsedge, wild onion, wild garlic, and broadleaf weeds will not be controlled.</p> <p>-Controls many annual and certain perennial grasses, including annual bluegrass, but will not consistently control goosegrass. Control may be reduced if grasses are large or under hot or dry weather conditions.</p> <p>-If repeat applications are necessary, allow 14 days between applications.</p> <p>-Do not tank-mix with or apply within 2 to 3 days of any other pesticide - unless labeled - as this may increase the risk of crop injury or reduce the control of grasses.</p> <p>-Rainfastness is 1 hr.</p> <p>-Do not apply more than 8 fl oz of Select 2EC in a single application and do not exceed 32 fl oz/A for the season; do not apply more than 16 fl oz of Select Max in a single application and do not exceed 64 fl oz/A for the season.</p> <p>-Do not apply more than 1.5 pt/A Poast in single application and do not exceed 3 pt/A for the season.</p>						

2. Postemergence continued on next page

F Summer Squash

2. Postemergence - continued

Group	Product Name	Product Rate	Active Ingredient (*=Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
2	Sandea 75DF	0.5 to 1 oz/A	halosulfuron	0.023 to 0.047 lb/A	30	12
<p>-Plasticulture: row middles application only.</p> <p>-Bareground: broadcast for bareground. Apply Sandea after the crop has at least 3 to 5 true leaves but before first female flowers appear and no sooner than 14 days after transplanting. If weeds have emerged, use a non-ionic surfactant at 0.25% v/v.</p> <p>-Suppresses or controls yellow nutsedge and certain broadleaf; control of weeds taller than 3 inches may not be adequate. Sandea will not control common lambsquarters or eastern black nightshade if applied postemergence; for row middle application, tankmix with a non-selective herbicide to increase spectrum of control.</p> <p>-Sandea provides both residual and postemergence control of susceptible weed species. Effective postemergence control requires an adjuvant.</p> <p>-Sandea is an ALS inhibiting herbicide and resistant weed populations are common in the region. Do not use Group 2 herbicides repeatedly in the same field.</p> <p>-Do not apply Sandea to crops treated with a soil applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application.</p> <p>-Rainfastness is 4 hrs. Maximum number of Sandea applications per year is 2 and do not exceed 2 oz/A during the crop season</p>						
22	Gramoxone 2SL	1.95 pt/A	paraquat *	0.49 lb/A	14	24
<p>-A Supplemental Label has been approved for the use of Gramoxone 2SL for postemergence weed control in DE, MD, NJ, PA, and VA. Row middles as a shielded application. Apply as a directed spray in a minimum of 20 gal spray mix/A to control emerged weeds between the rows after crop establishment. Include a nonionic surfactant at 0.25% v/v.</p> <p>-Use shields or hoods to prevent spray contact with the crop and low spray pressure (maximum of 30 psi) to reduce small droplets that are prone to drift. See the label for additional information and warnings.</p> <p>-Rainfastness is 30 minutes. A maximum of 3 applications per year are allowed.</p>						

3. Postharvest

Group	Product Name	Product Rate	Active Ingredient (*=Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
22	Gramoxone 2SL	2.25 to 3 pt/A	paraquat	0.56 to 0.75 lb/A	--	24
<p>-A Special Local-Needs 24(c) label has been approved for the use of Gramoxone SL 2.0 until December 31, 2017, for postharvest application to desiccate the crop in DE, NJ and VA.</p> <p>-Apply after the last harvest for bareground or plasticulture. Always include an adjuvant.</p> <p>-Spray coverage is essential for optimum effectiveness. See the label for additional information and warnings.</p> <p>-Rainfastness 30 minutes. A maximum of 2 applications for crop dessication are allowed.</p>						

4. Other Labeled Herbicides

These products are labeled but limited local data are available; and/or are labeled but not recommended in our region due to potential crop injury concerns.

Group	Product Name	Active Ingredient (*=Restricted Use)
3	Treflan	trifluralin
9	Roundup (various)	glyphosate
14	Aim	carfentrazone

Insect Control

THE LABEL IS THE LAW - See the Pesticide Use Disclaimer on page F 1.

Recommended Insecticides

Seed Corn Maggots

The use of neonicotinoid insecticides (Group 4A) at planting may help to reduce seed corn maggot populations. See also the Pest Management chapter, Insect Management section.

Aphids Aphids transmit multiple viruses. Cultivars resistant to multiple aphid-transmitted viruses are available.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV	1.5 to 3.0 pt/A	methomyl* - melon aphid only	3	48	H
1A	Vydate 2L	2.0 to 4.0 pt/A	oxamyl*	1	48	H
3A + 4A	Endigo ZC	4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	19.0 fl oz/A	zeta-cypermethrin* + avermectin B1	7	12	H

Aphids continued on next page

Aphids - continued

4A	Admire Pro 4.6SC	7.0 to 10.5 fl oz/A	imidacloprid - soil only	21	12	H
4A	Assail 30SG	2.0 to 4.0 oz/A	acetamiprid	0	12	M
4A	Belay 2.13SC	9.0 to 12.0 fl oz/A	clothianidin - soil	21	12	H
4A	Belay 2.13SC	3.0 to 4.0 fl oz/A	clothianidin - foliar	7	12	H
4A	Platinum 75SG	1.66 to 3.67 oz/A	thiamethoxam - soil/drip	30	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam - foliar	0	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	2.0 to 7.0 fl oz/A	dinotefuran - foliar	1	12	H
4A	Venom 70SG	5.0 to 6.0 oz/A	dinotefuran - soil	21	12	H
4A	Venom 70SG	1.0 to 4.0 oz/A	dinotefuran - foliar	1	12	H
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole - soil	30	12	H
4A + 28	Voliam Flexi	4.0 to 7.0 oz/A	thiamethoxam + chlorantraniliprole - foliar	1	12	H
4D	Sivanto 200SL	21.0 to 28.0 fl oz/A	flupyradifurone	21	4	M
9B	Fulfill 50WP	2.75 oz/A	pymetrozine	0	12	L
9C	Beleaf 50SG	2.0 to 2.8 oz/A	flonicamid	0	12	L
28 + 6	Minecto Pro	10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

Cabbage Loopers

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV	1.5 to 3.0 pt/A	methomyl*	3	48	H
3A	Baythroid XL 1EC	1.6 to 2.4 fl oz/A	beta-cyfluthrin*	0	12	H
3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate*	3	12	H
3A	Bifenture 2EC, Sniper	2.6 to 6.4 fl oz/A	bifenthrin*	3	12	H
3A	Danitol 2.4EC	10.67 to 16.00 fl oz/A	fenpropathrin*	7	24	H
3A	Hero EC	4.0 to 10.3 fl oz/A	zeta-cypermethrin* + bifenthrin*	3	12	H
3A	Lambda-Cy, Lambda T	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	Mustang Maxx	2.8 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Perm-Up 3.2 EC	4.0 to 8.0 fl oz/A	permethrin*	0	12	H
3A	Tombstone 2EC	1.6 to 2.4 fl oz/A	cyfluthrin*	0	12	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	1	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	14.0 to 19.0 fl oz/A	zeta-cypermethrin* + avermectin B1	7	12	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H
4A + 28	Voliam flexi	4.0 to 7.0 oz/A	thiamethoxam + chlorantraniliprole - foliar	1	12	H
5	Entrust 2SC (OMRI)	4.0 to 8.0 fl oz/A	spinosad	3	4	M
5	Radiant 1SC	5.0 to 10.0 fl oz/A	spinetoram	3	4	H
11A	Dipel (OMRI)	0.5 to 2.0 lb/A	<i>Bacillus thuringiensis kurstaki</i>	0	4	N
18	Intrepid 2F	4.0 to 10.0 fl oz/A	methoxyfenozide	3	4	L
22A	Avaunt 30WDG	2.5 to 6.0 oz/A	indoxacarb	3	12	H
28	Coragen 1.67SC	3.5 to 5.0 fl oz/A	chlorantraniliprole - soil/drip/foliar	1	4	L
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

Cucumber Beetles

Cucumber beetles can transmit bacterial wilt, though losses from this disease vary greatly between fields and varieties. Young plants need to be protected to manage bacterial wilt. Also, adult beetles can cause direct feeding injury to young plants. If adult beetles are abundant and there is a disease history, insecticides should be applied before beetles feed extensively on the cotyledons and first true leaves. If foliar insecticides are used, begin spraying shortly after plant emergence and repeat applications at weekly intervals if new beetles continue to invade fields.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV	1.5 to 3.0 pt/A	methomyl*	3	48	H
1A	Sevin XLR Plus	1.0 qt/A	carbaryl	3	12	H
3A	Baythroid XL	2.4 to 2.8 fl oz/A	beta-cyfluthrin*	0	12	H

Cucumber Beetles continued on next page

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Cucumber Beetles - continued

3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate*	3	12	H
3A	Bifenture 2EC, Sniper	2.6 to 6.4 fl oz/A	bifenthrin*	3	12	H
3A	Danitol 2.4EC	10.67 to 16.0 fl oz/A	fenpropathrin*	7	24	H
3A	Hero EC	4.0 to 10.3 fl oz/A	zeta-cypermethrin* + bifenthrin*	3	12	H
3A	Lambda-Cy	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	LambdaT	4.0 to 4.5 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	Mustang Maxx	2.8 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Perm-Up 3.2 EC	4.0 to 8.0 fl oz/A	permethrin*	0	12	H
3A	Tombstone	2.4 to 2.8 fl oz/A	cyfluthrin*	0	12	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	1	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	14.0 to 19.0 fl oz/A	zetacypermethrin* + avermectin B1	7	12	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H
4A	Admire PRO	7.0 to 10.5 fl oz/A	imidacloprid - soil	21	12	H
4A	Assail 30SG	2.5 to 5.3 oz/A	acetamiprid	0	12	M
4A	Belay 2.13SC	9.0 to 12.0 fl oz/A	clothianidin - soil	21	12	H
4A	Belay 2.13SC	3.0 to 4.0 fl oz/A	clothianidin - foliar	7	12	H
4A	Platinum 75SG	1.66 to 3.67 oz/A	thiamethoxam - soil	30	12	H
4A	Actara 25WDG	3.0 to 5.5 oz/A	thiamethoxam - foliar	0	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	2.0 to 7.0 fl oz/A	dinotefuran - foliar	1	12	H
4A	Venom 70SG	1.0 to 4.0 oz/A	dinotefuran - foliar	1	12	H
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole - soil	30	12	H
4A + 28	Voliam Flexi	4.0 to 7.0 oz/A	thiamethoxam + chlorantraniliprole - foliar	1	12	H

Cutworms - See also the Pest Management chapter, Insect Management section.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV (variegated cutworm)	1.5 pt/A	methomyl*	3	48	H
1A	Lannate LV (granulate cutworm)	1.5 to 3.0 pt/A	methomyl*	3	48	H
3A	Baythroid XL	0.8 to 1.6 fl oz/A	beta-cyfluthrin*	0	12	H
3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate*	3	12	H
3A	Bifenture 2EC, Sniper	2.6 to 6.4 fl oz/A	bifenthrin*	3	12	H
3A	Hero EC	4.0 to 10.3 fl oz/A	zeta-cypermethrin*+bifenthrin*	3	12	H
3A	Lambda-Cy, LambdaT	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	Mustang Maxx	1.28 to 4.00 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Perm-Up 3.2 EC	4.0 to 8.0 fl oz/A	permethrin*	0	12	H
3A	Tombstone	0.8 to 1.6 fl oz/A	cyfluthrin*	0	12	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	1	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	19.0 fl oz/A	zeta-cypermethrin* + avermectin B1	7	12	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H

Leafminers

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Vydate 2L	2.0 to 4.0 pt/A	oxamyl*	1	48	H
3A + 4A	Endigo ZC	4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	19.0 fl oz/A	zeta-cypermethrin* + avermectin B1	7	12	H
3A + 28	Voliam Xpress	9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H
4A	Belay 2.13SC	9.0 to 12.0 fl oz/A	clothianidin - soil	21	12	H
4A	Platinum 75SG	1.66 to 3.67 oz/A	thiamethoxam - soil/drip	30	12	H
4A	Actara 25 WDG	3.0 to 5.5 oz/A	thiamethoxam - foliar	0	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	2.0 to 7.0 fl oz/A	dinotefuran - foliar	1	12	H

Leafminers continued on next page

Leafminers - continued

4A	Venom 70S G	5.0 to 6.0 oz/A	dinotefuran - soil	21	12	H
4A	Venom 70S G	1.0 to 4.0 oz/A	dinotefuran - foliar	1	12	H
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole - soil	30	12	H
4A + 28	Voliam Flexi	4.0 to 7.0 oz/A	thiamethoxam + chlorantraniliprole - foliar	1	12	H
5	Entrust 2SC (OMRI)	6.0 to 8.0 fl oz/A	spinosad	3	4	M
5	Radiant 1SC	6.0 to 10.0 fl oz/A	spinetoram	3	4	H
6	Agri-Mek 0.7 SC	1.75 to 3.5 fl oz/A	abamectin*	7	12	H
17	Trigard 75WSP	2.66 oz/A	cyromazine	0	12	L
28	Coragen 1.67SC	5.0 to 7.5 fl oz/A	chlorantraniliprole - soil/drip	1	4	L
28	Coragen 1.67SC	5.0 to 7.0 fl oz/A	chlorantraniliprole - foliar	1	4	L
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

Mites

Mite infestations generally begin around field margins and grassy areas. CAUTION: DO NOT mow or maintain these areas after midsummer to prevent mites from moving into the crop. Localized infestations can be spot treated. Begin treatment when 10 to 15% of the crown leaves are infested early in the season.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
3A + 6	Gladiator	19.0 fl oz/A	zeta-cypermethrin* + avermectin B1	7	12	H
6	Agri-Mek 0.7 SC	1.75 to 3.5 fl oz/A	abamectin*	7	12	H
10B	Zeal Miticide1	2.0 to 3.0 oz/A	etoxazole	7	12	L
20D	Acramite 50WS	0.75 to 1.00 lb/A	bifenazate	3	12	M
23	Oberon 2SC	7.0 to 8.5 fl oz/A	spiromesifen	7	12	M
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

Pickleworms, Melonworms

Apply one of the following formulations. If foliar materials are used, make one treatment prior to fruit set, and then treat weekly. If soil or drip applications are used, check the label for instructions on application frequency.						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV	1.5 to 3.0 pt/A	methomyl*	3	48	H
1A	Sevin XLR	0.5 to 1.0 qt/A	carbaryl	3	12	H
3A	Baythroid XL 1EC	1.6 to 2.4 fl oz/A	beta-cyfluthrin*	0	12	H
3A	Asana XL (pickleworm)	5.8 to 9.6 fl oz/A	esfenvalerate*	3	12	H
3A	Bifenture 2EC, Sniper	2.6 to 6.4 fl oz/A	bifenthrin*	3	12	H
3A	Hero EC	4.0 to 10.3 fl oz/A	zeta-cypermethrin* + bifenthrin*	3	12	H
3A	Lambda-Cy, LambdaT	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	Mustang Maxx	2.8 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Perm-Up 3.2 EC	4.0 to 8.0 fl oz/A	permethrin*	0	12	H
3A	Tombstone 2EC	1.6 to 2.4 fl oz/A	cyfluthrin*	0	12	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	1	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	14.0 to 19.0 fl oz/A	zeta-cypermethrin* + avermectin B1	7	12	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H
4A	Assail 30SG	2.5 to 5.3 oz/A	acetamiprid	0	12	M
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole - soil	30	12	H
4A + 28	Voliam flexi	4.0 to 7.0 oz/A	thiamethoxam + chlorantraniliprole - foliar	1	12	H
5	Entrust 2SC	4.0 to 8.0 fl oz/A	spinosad	3	4	M
5	Radiant 1SC	5.0 to 10.0 fl oz/A	spinetoram	3	4	H
18	Intrepid 2F	4.0 to 10.0 fl oz/A	methoxyfenozide	3	4	L
22A	Avaunt 30WDG	2.5 to 6.0 oz/A	indoxacarb	3	12	H
28	Coragen 1.67SC (melonworm)	2.0 to 3.5 fl oz/A	chlorantraniliprole - drip/foliar	1	4	L
28	Coragen 1.67SC (pickleworm)	3.5 to 7.5 fl oz/A	chlorantraniliprole - foliar	1	4	L
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H

F Summer Squash

Rindworms (Cucumber Beetle Larvae) Damage to the rinds may result from a complex of insect pests, including cucumber beetle, wireworms, and a number of “worm” species, (beet armyworm, etc). Management of adult cucumber beetles early in the season may help reduce damage. See “Cucumber Beetles” for labeled products.

For Lepidopteran rindworms, apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
3A	Baythroid XL 1EC	1.6 to 2.4 fl oz/A	beta-cyfluthrin*	0	12	H
3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate*	3	12	H
3A	Bifenture 2EC, Sniper	2.6 to 6.4 fl oz/A	bifenthrin*	3	12	H
3A	Hero EC	4.0 to 10.3 fl oz/A	zeta-cypermethrin* + bifenthrin*	3	12	H
3A	Lambda-Cy, LambdaT	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	Mustang Maxx	2.8 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Perm-Up 3.2EC	4.0 to 8.0 fl oz/A	permethrin*	0	12	H
3A	Tombstone 2EC	1.6 to 2.4 fl oz/A	cyfluthrin*	0	12	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	1	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	14.0 to 19.0 fl oz/A	zeta-cypermethrin* + avermectin B1	7	12	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H
4A + 28	Voliam Flexi	4.0 to 7.0 oz/A	thiamethoxam + chlorantraniliprole - foliar	1	12	H
5	Entrust 2SC (OMRI)	4.0 to 8.0 fl oz/A	spinosad	3	4	M
5	Radiant 1SC	5.0 to 10.0 fl oz/A	spinetoram	3	4	H
18	Intrepid 2F	4.0 to 10.0 fl oz/A	methoxyfenozide	3	4	L

Squash Bugs

Treat if more than 1 egg mass per plant is present. Target nymphal stages. Under leaf spray coverage is essential.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Sevin XLR Plus	1.0 qt/A	carbaryl	3	12	H
3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate*	3	12	H
3A	Bifenture 2EC, Sniper	2.6 to 6.4 fl oz/A	bifenthrin*	3	12	H
3A	Hero EC	4.0 to 10.3 fl oz	zeta-cypermethrin* + bifenthrin*	3	12	H
3A	Lambda -Cy, LambdaT	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	Mustang Maxx	2.8 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	1	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	14.0 to 19.0 fl oz/A	zeta-cypermethrin + avermectin B1	7	12	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H
4A	Assail 30SG	5.3 oz/A	acetamiprid	0	12	M
4A	Belay 2.13SC	9.0 to 12.0 fl oz/A	clothianidin - soil	21	12	H
4A	Belay 2.13SC	3.0 to 4.0 fl oz/A	clothianidin - foliar	7	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	2.0 to 7.0 fl oz/A	dinotefuran - foliar	1	12	H
4A	Venom 70SG	5.0 to 6.0 oz/A	dinotefuran - soil	21	12	H
4A	Venom 70SG	1.0 to 4.0 oz/A	dinotefuran - foliar	1	12	H
4D	Sivanto 200SL	10.5 to 14.0 fl oz/A	flupyradifurone	21	4	M

Squash Vine Borers

When vines begin to run, apply one of the following formulations to bases of plants 4 times at 7-day intervals. Pheromone traps for squash vine borer are commercially available. These traps can be used to indicate when moth activity begins. **Note:** Use of spinosad or spinetoram for looper control will reduce squash vine borer populations.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate*	3	12	H
3A	Bifenture 2EC, Sniper	2.6 to 6.4 fl oz/A	bifenthrin*	3	12	H
3A	Hero EC	4.0 to 10.3 fl oz/A	zeta-cypermethrin* + bifenthrin*	3	12	H

Squash Vine Borers continued on next page

Squash Vine Borers - continued

3A	Lambda-Cy, LambdaT	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	Mustang Maxx	2.8 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Perm-Up 3.2 EC	4.0 to 8.0 fl oz/A	permethrin*	0	12	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	1	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz /A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 6	Gladiator	14.0 to 19.0 fl oz/A	zeta-cypermethrin* + avermectin B1	7	12	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H
4A	Assail 30SG	5.3 oz/A	acetamiprid	0	12	M

Thrips

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Vydate2 L	2.0 to 4.0 pt/A	oxamyl*	1	48	H
3A	Lambda-Cy, LambdaT	2.56 to 3.84 fl oz/A	lambda-cyhalothrin*	1	24	H
3A	Warrior II	1.28 to 1.92 fl oz/A	lambda-cyhalothrin*	1	24	H
3A + 4A	Endigo ZC	4.0 to 4.5 fl oz/A	lambda-cyhalothrin* + thiamethoxam	1	24	H
3A + 28	Voliam Xpress	6.0 to 9.0 fl oz/A	lambda-cyhalothrin* + chlorantraniliprole	1	24	H
4A	Admire PRO 4.6SC	7.0 to 10.5 fl oz/A	imidacloprid - soil	21	12	H
4A	Belay 2.13SC	9.0 to 12.0 fl oz/A	clothianidin - soil	21	12	H
4A	Platinum 75SG	1.66 to 3.67 oz/	thiamethoxam - soil/drip	30	12	H
4A	Scorpion 35SL	9.0 to 10.5 fl oz/A	dinotefuran - soil	21	12	H
4A	Scorpion 35SL	2.0 to 7.0 fl oz/A	dinotefuran - foliar	7	12	H
4A	Venom 70SG	5.0 to 6.0 oz/A	dinotefuran - soil	21	12	H
4A	Venom 70SG	1.0 to 4.0 oz/A	dinotefuran - foliar	7	12	H
4A + 28	Durivo	10.0 to 13.0 fl oz/A	thiamethoxam + chlorantraniliprole - soil	30	12	H
5	Entrust 2SC (OMRI)	6.0 to 8.0 fl oz/A	spinosad	3	4	M
5	Radiant 1SC	6.0 to 10.0 fl oz/A	spinetoram	3	4	H

Disease Control

THE LABEL IS THE LAW - See the Pesticide Use Disclaimer on page F 1.

Recommended Fungicides

Nematodes - See also Soil Fumigation and Nematodes sections in the Pest Management chapter. Use fumigants listed in the Pest Management chapter, or nematicides listed below. Consult the label.

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Vydate L	0.5 to 1.0 gal/A Incorporate into top 2-4 inches of soil, OR 2.0 to 4.0 pt/A apply 2 w after planting and repeat 2-3 w later.	oxamyl*	1	48	H
7	Velum Prime	6.5 to 6.84 fl oz/A	fluopyram	0	12	
--	Nimitz 4EC	3.5 to 5.0 pt/A incorporate or drip-apply 7 d before planting	fluensulfone	n/a	12	N

Seed Treatment

Check with your seed company if seed has been treated with an insecticide and fungicide. For untreated seed, use a mixture of thiram (4.5 fl oz 480DP/100 lb) and an approved commercially available insecticide.

Damping-Off caused by *Phytophthora*, *Pythium*, and *Rhizoctonia*

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following at-planting (see label for application timing, methods, and restrictions):						
Phytophthora and Pythium root rot						
4	Ridomil Gold 4SL ¹	0.5 to 1.0 pt/A	mefenoxam	AP	48	N
4	Ultra Flourish 2E ¹	2.0 to 4.0 pt/A	mefenoxam	AP	48	N
4	MetaStar 2EAG ¹	4.0 to 8.0 pt/A	metalaxyl	AP	48	N

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Damping-Off - continued

Phytophthora, Pythium, and Rhizoctonia root rot						
4 + 11	Uniform 3.66SE	0.34 fl oz/1000 ft row. Avoid direct seed contact, which may cause delayed emergence.	mefenoxam + azoxystrobin	AP	0	N
Rhizoctonia root rot						
11	azoxystrobin 2.08F	0.40 to 0.80 fl oz/1000 ft row	azoxystrobin	AP	4	N
Pythium root rot only						
28	Previcur Flex 6F	1.2 pt/A in transplant water, drip irrigation, or direct spray at base of plant and soil	Propamocarb HCL	2	12	N

¹To determine the amount of Ridomil Gold, Ultra Flourish or MetaStar needed per acre, use the following calibration formula for changing from broadcast to band application: [Band width (ft) / row spacing (ft)] x broadcast rate (lb/A) = Amount needed lb/A. ²Applied at planting.

Bacterial and Fungal Diseases

Bacterial Wilt

Controlling striped and spotted cucumber beetles is essential for preventing bacterial wilt. See preceding "Cucumber Beetle" section under Insect Control for specific recommendations. Insecticide applications made at seeding may not prevent beetle damage season long, therefore, additional foliar insecticide applications may be necessary.

Choanophora Fruit Rot

This disease occurs during warm wet weather and develops predominantly on flowers or fruit near the ground. Management is difficult because disease development is rapid, and weather dependent. Fungicide sprays are not effective because flowers, which open daily, must be protected immediately. Practices that reduce soil moisture or reduce soil contact, such as raised beds and plastic mulch, may be beneficial.

Downy Mildew

Scout fields early in the growing season. Begin sprays when plants meet in the row or if disease occurrence is predicted for the region (check the Cucurbit Downy Mildew Forecasting website at <http://cdm.ipmpipe.org>). Preventative applications are much more effective than applications made after detection. **Materials with different FRAC codes should be alternated to reduce the chances for fungicide resistance development.**

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Sprays should be applied on a 7-day schedule when disease is forecast or present in the region. Under severe disease conditions spray interval may be reduced IF the label allows.						
TANK-MIX one of the following products with a protectant such as chlorothalonil 1.5 to 2.0 pt 6F/A :						
U15+40	Orondis Ultra	5.5 to 8.0 fl oz/A	oxathiapiprolin+mandipropamid	0	4	--
21	Ranman 400SC	2.10 to 2.75 fl oz/A (plus a non-ionic or organosilicon surfactant; do not apply with copper; see label)	cyazofamid	0	12	L
Other materials for use in rotation as tank mix partners with a protectant:						
28	Previcur Flex 6F	1.2 pt/A	propamocarb	2	12	N
43	Presidio 4SC	3.0 to 4.0 fl oz/A (caution: pathogen is now less sensitive to Presidio)	fluopicolide	2	12	L
40 + 45	Zampro 525SC	14.0 fl oz/A	acetoxtradin + dimethomorph	0	12	--
M3 + 22	Gavel 75DF	1.5 to 2.0 lb/A (includes protectant mancozeb)	mancozeb + zoxamide	5	48	--
M5 + 22	Zing! 4.9SC	36 fl oz/A (includes protectant chlorothalonil)	chlorothalonil + zoxamide	0	12	N
M5 + 27	Ariston 42SC	3.0 pt/A (includes protectant chlorothalonil)	chlorothalonil + cymoxanil	3	12	--
11 + 27	Tanos 50DF	8.0 oz/A	famoxadone + cymoxanil	3	12	--
27	Curzate 60DF	3.2 oz/A	cymoxanil	3	12	N
40	Forum 4.17SC	6.0 fl oz/A	dimethomorph	0	12	N

Phytophthora Crown and Fruit Rot

Multiple practices should be used to minimize the occurrence of this disease. Rotate away from susceptible crops (such as peppers, eggplants, tomatoes, lima and snap beans, and other cucurbits) for as long as possible. Preplant fumigants will also suppress disease. Fields should be adequately drained to ensure that water does not accumulate around the base of the plant. Once the canopy closes, subsoil between the rows to allow for faster drainage following rainfall. **Materials with different modes of action (FRAC codes) should always be alternated to reduce the chances for fungicide resistance development.** (*Continued on next page*)

Phytophthora Crown and Fruit Rot - continued

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following formulations pre-plant for early season control:						
4	MetaStar 2E	4.0 to 8.0 pt/A	metalaxyl	AP	48	N
4	Ridomil Gold 4SL	1.0 to 2.0 pt/A	mefenoxam	5	48	N
4	Ultra Flourish 2E	2.0 to 4.0 pt/A	mefenoxam	5	48	N
4 + 11	Uniform 3.66SE	0.34 fl oz/100 ft row	mefenoxam + azoxystrobin	AP	0	--
28	Previcur Flex 6F	1.2 pt/A in transplant water, drip irrigation, or spray directed to the base of the plants and soil.	propamocarb	2	12	N
When conditions favor disease development, apply one of the following WITH FIXED COPPER at labeled rates (for suppression only):						
U15+40	Orondis Ultra	5.5 to 8.0 fl oz/A	oxathiapiprolin + mandipropamid	0	4	--
40	Revus 2.08F	8.0 fl oz/A	mandipropamid	0	4	--
40 + 45	Zampro 525SC	14.0 fl oz/A	acetochradin + dimethomorph	0	12	--
43	Presidio 4SC ¹	4.0 fl oz/A ¹	fluopicolide	2	12	L
M3 + 22	Gavel 75DF	1.5 to 2.0 lb/A	zoxamide + mancozeb	5	48	--
11 + 27	Tanos 50DF	8.0 to 10.0 oz/A	famoxadone + cymoxanil	3	12	--
21	Ranman 400SC	2.75 fl oz/A (Do not apply with copper; see label)	cyazofamid	0	12	L
40	Forum 4.17SC	6.0 fl oz/A	dimethomorph	0	12	N

¹Presidio may also be applied through the drip irrigation (see label). Soil drench followed by drip application has given good results in some trials on crown rot caused by *Phytophthora capsici*.

Plectosporium Blight (Microdochium blight)

A 3-year rotation with crops other than cucurbits is advised. It is important to achieve maximum foliage coverage with the fungicide application.

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
Once symptoms appear on petioles or after fruit form, apply one of the following and repeat every 7 to 10 d (a spray schedule that rotates Cabrio or Flint with chlorothalonil will also provide control):						
M3	mancozeb 75DF	2.0 to 3.0 lb/A	mancozeb	5	24	N
M5	chlorothalonil 6F	2.0 to 3.0 pt/A	chlorothalonil	0	12	L
3 + 11	Quadris Top 2.7F	12.0 to 14.0 fl oz/A	difenoconazole + azoxystrobin	0	12	--

Powdery Mildew

Some varieties have intermediate resistance; they should be used if possible (see Recommended Varieties above). The fungus that causes cucurbit powdery mildew has developed resistance to high-risk fungicides. Resistance to strobilurin (FRAC code 11) and DMI (FRAC code 3) fungicides have been reported in the Eastern U.S. Proper fungicide management should be followed to help delay the development of resistance and minimize control failures. Powdery mildew generally occurs from mid-July until the end of the season. Once observed in the area or detected by scouting (1 lesion on the underside of 45 old leaves per acre), begin the following fungicide program:

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
TANK-MIX one of these products with a protectant such as chlorothalonil 6F 2.0 to 3.0 pt/A:						
U8	Vivando 2.5SC	15.4 fl oz/A	metrafenone	0	12	--
U6	Torino 0.85SC	3.4 fl oz/A	cyflufenamid	0	4	--
3 + 7	Luna Experience 3.34SC	6.0 to 17.0 fl oz/A	fluopyram + tebuconazole	7	12	--
AND ALTERNATE with a TANK-MIX of one of the following and a protectant such as chlorothalonil 6F 2.0 to 3.0 pt/A:						
3	Procure 480SC	4.0 to 8.0 fl oz/A	triflumizole	0	12	N
3	Proline 480SC	5.7 fl oz/A	prothioconazole	7	12	--
3	Rally 40WSP	5.0 oz/A	myclobutanil	0	24	N
3	tebuconazole 3.6 F	4.0 to 6.0 fl oz/A	tebuconazole	7	12	N
3 + 11	Aprovia Top 1.62EC	10.5 to 13.5 fl oz/A	difenoconazole + benzovindiflupyr	0	12	N
OR with one of the following:						
3 + 9	Inspire Super 2.8F	16.0 to 20.0 fl oz/A	difenoconazole + cyprodinil	0	12	--
7	Fontelis 1.67SC	12.0 to 16.0 fl oz/A	penhopyrad	1	12	L
7 + 11	Pristine 38WG	12.5 to 18.5 oz/A	pyraclostrobin + boscalid	0	12	--

F Summer Squash

Scab

Select scab-resistant varieties. The fungus that causes scab typically occurs during periods of cool, wet weather when temperatures are below normal. Rotate away from fields with a history of scab for at least 2 years.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Begin sprays as true leaves form and repeat every 5 to 7 days:						
M5	chlorothalonil 6F	2.0 to 3.0 pt/A	chlorothalonil	0	12	L

Viruses (WMV2, PRSV, ZYMV, and CMV)

The most prevalent virus in the mid-Atlantic region is WMV2, followed by PRSV, ZYMV, and CMV. Varieties with multiple resistance packages are available (see table Recommended Varieties). Varieties expressing the precocious yellowing gene such as “Multipik” will mask the greening of fruit caused by WMV2 and CMV but will become distorted when infected with either PRSV or ZYMV. All 4 viruses may be detected at some level in squash fields in the region in any given year, therefore plant varieties with resistance to more than one virus. The following control measures should also be used.

Plant fields as far apart as possible from existing cucurbit plantings to reduce the chances for aphid transmission. Using reflective mulch may help to prevent aphid transmission of viruses.

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 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.