RUTGERS
New Jersey Agricultural
Experiment Station

This is a section from the

2016

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 njaes.rutgers.edu

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.

MUSKMELONS and Mixed Melons

Recommended Melon Varieties

Variety[1]	Type	Days[2]	Rind Description	Lbs.	Flesh Color	PM[3]	F[4]
Caribbean Gold	Muskmelon	80	Round, netted, no sutures	3	Orange	2	0,1,2
Sarah's Choice	Muskmelon	76	Round, netted, no sutures	3	Orange	1,2	0,1,2
Sugar Cube	Muskmelon	80	Mini, round, netted, no sutures	2	Orange	1,2	0,1,2
Aphrodite	Muskmelon	80	Light netting, light sutures	7	Orange	1	0,1,2
Athena	Muskmelon	79	Oval, medium netting, light sutures	6	Orange	1,2	0,1,2
Atlantis	Muskmelon	74	Oval, medium netting, light sutures	7	Orange	1,2	0,1,2
Goddess	Muskmelon	68	Oval, medium netting, light sutures	5	Orange	1,2	0,1,2
Grand Slam	Muskmelon	85	Oval, coarse netting, no sutures	7	Orange	1,2	0,2
Minerva	Muskmelon	78	Oval, coarse netting, light sutures	8	Orange	1,2	0,1,2
Strike	Muskmelon	85	Oval, coarse netting, no sutures	7	Orange	1,2	0,2
Halona	Muskmelon	73	Round, netted, heavy sutures	4	Orange	1,2	0,1,2
Majus	Muskmelon	83	Oval, medium netted, heavy sutures	7	Orange	1,2	0,1,2
Orange Sherbert	Muskmelon	80	Oval, medium netted, heavy sutures	7	Orange	1	1,2
Tirreno	Muskmelon	83	Oval, coarse netted, heavy sutures	5	Orange	1,2	0,1,2
Amy	Canary	75	Slight oval, yellow, no net	3	White		
Camposol	Canary	80	Oval, yellow, wrinkled, no net	6	White	1,2	
Sunbeam	Canary	75	Oval, yellow, wrinkled, no net	6	White	1,2	0,1,2
Visa	Galia	75	Slight oval, fine net, no sutures	4	Green	1,2	
Arava	Galia	77	Slight oval, fine net, no sutures	3	Green	1,2	
Courier	Galia	85	Slight oval, fine net, no sutures	5	Green	1,2	0,1,2
Diplomat	Galia	75	Slight oval, fine net, no sutures	5	Green	1,2	
Earli-Dew	Honeydew	80	Round, white, smooth	3	Light green		2
Summer Dew	Honeydew	88	Round, white, smooth	5	Light green	1,2	0,2
Dewlightful	Honeydew	90	Round, white, smooth	7	Light green	1,2	
Angelina	Honeydew	85	Round, white, smooth	5	Light green	1,2	0,2
Sprite	Asian	70	Oval, smooth, white rind	1	White		
Lambkin	Christmas	70	Oval, smooth, green/yellow rind	3	Light green		
French Orange	Mixed	75	Round, netted, light suture	2	Orange		0,1,2

[1]All varieties are hybrids.
[2]Relative days to harvest.
[3]Resistance to powdery mildew races as reported from source seed companies.
[4]Resistance to Fusarium wilt races as reported from source seed companies.

Melon Descriptions

ANANAS MELONS (Middle Eastern melons) are oval shaped with medium-fine netting over pale green to orange rind. Very sweet, aromatic white flesh or orange-pink flesh. Average weight is three to four pounds.

CANARY MELONS have bright yellow rinds and an oblong shape. Inside, the pale, cream-colored flesh is juicy, and the flavor is very mild.

CASABA MELONS have an oval shape with a pointy end and wrinkled yellow skin, weighing four to seven pounds. The pale, almost white flesh is extremely sweet.

CRENSHAW MELONS are a Casaba cross with a slightly more oblong shape, weighing at least 5 pounds. The slightly wrinkled green rind ripens to yellow. Inside, the flesh is pale peachy orange. It has a strong, spicy aroma.

CHARENTAIS MELONS are French melons identifiable by their smooth, gray, or gray-blue rinds with sutures and orange flesh and are small in size.

CHRISTMAS MELONS have a football shape and weighing upwards of 5 to 8 pounds. They have green mottled rinds and pale orange to light green flesh depending upon the variety. Sweet flesh.

GALIA MELONS are Israeli melons that have netted rinds similar to cantaloupes but paler in color. The sweet pale green to almost white flesh has the consistency of a honeydew with what has been described as a spicy-sweet or banana-like aroma. When ripe, they slip from the vine.

HONEYDEWS have smooth, white to greenish-white rinds (some may be yellow) and sweet flesh that may be green, white, or orange. Its texture is similar to a cantaloupe, but the flavor more subtle and sweet.

MUSKMELONS are the familiar American cantaloupes with orange flesh and netted skin. This includes deep sutured round to oval “Superstar” types, Eastern “Athena” types that are oval with slight sutures, and Western shipping types without sutures.

ORIENTAL MELONS are small (weighing a little more than a pound), elongated yellow melons with white sutures, and sweet, pale peach to white flesh. Because the seeds are so small and the rind is so thin, the entire melon can be eaten.

PERSIAN MELONS bigger than cantaloupes, have a dark green rind with light brown netting. As it ripens, the rind turns to light green. Bright pink-orange flesh has a delicate flavor. Unlike most melons in the Reticulatus group, Persian melons do not slip from the vine when mature.

CROSSES are also available. There are a number of crosses between types such as muskmelon x galia and charentais x muskmelon that produce excellent melons.

OTHER SPECIALTY MELONS that do not fit into the above catagories are also available including those catagorized as "Gourmet".

Recommended Nutrients Based on Soil Tests

Before using the table below, refer to important notes in the Soil and Nutrient Management chapter in Section B and your soil test report. These notes and soil test reports provide additional suggestions to adjust rate, timing, and placement of nutrients. Your state's soil test report recommendations and/or your farm's nutrient management plan supercede recommendations found below.

		Soil Phosphorus Level				Soil Potassium Level				
	Pounds N	Low	Med	High (Opt.)	Very High	Low	Med	High (Opt.)	Very High	
Muskmelons	**per Acre**	**Pounds P_2O_5 per Acre**				**Pounds K_2O per Acre**				**Nutrient Timing and Method**
	75-150	150	100	50	0[1]	200	150	100	0[1]	Total nutrient recommended.
	25-50	150	100	50	0[1]	200	150	100	0[1]	Broadcast and disk-in or follow fertigation schedule.
	25-50	0	0	0	0	0	0	0	0	Sidedress when vines begin to run or follow fertigation schedule.
	25-50	0	0	0	0	0	0	0	0	Sidedress prior to first harvest or follow fertigation schedule.

For plasticulture production, fertilization rates are based on a standard row spacing of 6-feet. Apply 1.0 to 2.0 pounds of boron (B) per acre with broadcast fertilizer. See Table B-9 for more specific boron recommendations.

[1]In Virginia, crop replacement values of 25 lbs. P_2O_5 and 50 lbs. K_2O per acre are recommended on soils testing Very High.

Suggested Muskmelon Fertigation Schedule

This table provides examples of fertigation schedules based on two common scenarios - sandy coastal plain soils and heavier upland soils. It should be modified according to specific soil tests and base fertility.

Fertigation recommendations for 100 lbs N and 100 lbs K_2O[1,2]

For soils with organic matter content less than 2% or coarse texture and low to medium or deficient K

			Nitrogen			Potash		
Preplant (lbs/a)[3]			50			100		
			N	N	N	K_2O	K_2O	K_2O
Stage and Description	Weeks	Days	lbs/day	lbs/week	lbs/stage	lbs/day	lbs/week	lbs/stage
1 Early vegetative	1-4	1-28	0.9	6.3	25.2	0.9	6.3	25.2
2 Late vegetative	5-7	29-49	1.3	9.1	27.3	1.3	9.1	27.3
3 Flowering & fruiting	8-11	50-77	1.5	10.5	42	1.5	10.5	42
4 Harvest[4]	12, 13	78-91	0.7	4.9	9.8	0.7	4.9	9.8

Fertigation recommendations for 60 lbs N and 60 lbs K_20[1,2]

For soils with organic matter content greater than 2% or fine texture and high or optimum K

			Nitrogen			Potash		
Preplant (lbs/a)[3]			40			40		
			N	N	N	K_2O	K_2O	K_2O
Stage and Description	Weeks	Days	lbs/day	lbs/week	lbs/stage	lbs/day	lbs/week	lbs/stage
1 Early vegetative	1-4	1-28	0.5	3.5	14	0.5	3.5	14
2 Late vegetative	5-7	29-49	0.8	5.6	16.8	0.8	5.6	16.8
3 Flowering & fruiting	8-11	50-77	0.9	6.3	25.2	0.9	6.3	25.2
4 Harvest[4]	12, 13	78-91	0.4	2.8	5.6	0.4	2.8	5.6

[1]Rates above are based on 7260 linear bed feet per acre (6-ft bed spacing). If beds are closer or wider, fertilizer rates should be adjusted proportionally. Drive rows should not be used in acreage calculations. See Fertigation in C-Irrigation Management for more information.

[2]Base overall application rate on soil test recommendations.

[3]Applied under plastic mulch to effective bed area using modified broadcast method.

[4]For extended harvest after 10 weeks continue fertigation at this rate.

Plant Tissue Testing

Plant tissue testing can be a valuable tool to assess crop nutrient status during the growing season to aid with in-season fertility programs or to evaluate potential deficiencies or toxicities. The following are critical tissue test values for muskmelons.

Critical muskmelon tissue test values.

Timing	Value	N	P	K	Ca	Mg	S	Fe	Mn	Zn	B	Cu	Mo
		%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm
Most recently matured leaves at 12" vine stage	Deficient	<4.0	0.4	5	3	0.35	-	<40	20	20	20	5	0.6
	Adequate range	4	0.4	5	3	0.35	0.2	40	20	20	20	5	0.6
		5	0.7	7	5	0.45	-	100	100	60	80	10	1
	High	>5.0	0.7	7	5	0.45	-	>100	100	60	80	10	1
	Toxic (>)	-	-	-	-	-	-	-	900	-	150	-	-
Most recently matured leaves at early fruit set	Deficient	<3.5	0.3	1.8	1.8	0.3	-	<40	20	20	20	5	0.6
	Adequate range	3.5	0.3	1.8	1.8	0.3	0.2	40	20	20	20	5	0.6
		4.5	0.4	4	5	0.4	-	100	100	60	80	10	1
	High	>4.5	0.4	4	5	0.4	-	>100	100	60	80	10	1
	Toxic (>)	-	-	-	-	-	-	-	900	-	150	-	-

Seed Treatment

Check with your seed company to determine if seed has been treated with an insecticide and fungicide. Seed should be treated to prevent disease, for more information go to the Disease Section.

Plant Production

Transplants should be grown in pots or cells that provide a space of *at least* 2 inches by 2 inches for each plant. Smaller pots or cells will restrict root growth and provide less protection to the newly set transplant. If the seed is of good quality with a high germination test, one seed per pot is sufficient. One ounce of muskmelon seed contains 950 to 1,250 seeds.

Planting and Spacing

Transplant container-grown plants through plastic mulch when daily mean temperatures have reached 60°F (15.6°C). Temperatures below 45°F can stunt plant growth. Planting dates vary from May 1 in southern regions to June 5 in northern areas. Early plantings should be protected from winds with hot caps, tents, row covers, or rye strips.

The recommended spacing for muskmelons is 5 to 6 feet between rows and 2 to 3 feet between plants in the row.

Drip/Trickle Fertilization

Before mulching, adjust soil pH to around 6.5, apply enough farm-grade fertilizer to supply 25-50% of N and K_2O requirements and thoroughly incorporate into the soil. Apply all P_2O_5 pre-plant and incorporate into the soil. Apply the balance of N and K_2O through the drip irrigation system throughout the season. The first fertigation application should be within a week after field transplanting or direct seeding.

Mulching

Fumigated soil aids in the control of weeds and soil-borne diseases. Plastic mulch laid before field plantings conserves moisture, increases soil temperature, and increases early and total yields. Several fumigants can be used on muskmelon depending what the predominant pests are. Plastic and fumigant should be applied to well-prepared planting soil 30 days before field planting. Various widths of plastic mulch are available depending on individual production systems and available equipment. The soil must be moist when laying the plastic. Fumigation alone may not provide satisfactory weed control under plastic. Black plastic or paper can be used without an herbicide. Fertilizer must be applied during bed preparation. At least 50 percent of the nitrogen (N) should be in the nitrate NO_3^{-1} form.

Pollination

Honeybees, squash bees, bumblebees and other wild bees are important for proper 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 bloom is completed before application. See section on "Pollination" in the General Production Recommendations and/or Table D-6 for relative toxicity of various pesticides for hazard to bees.

Harvest and Post Harvest Considerations

Muskmelons should be harvested no sooner than half-slip and preferably at full-slip for optimum fruit quality. Canary melons and Galia melons also slip, but Honeydews do not. Pick honeydew melons when the stem end becomes slightly springy and the skin takes on a creamy yellow appearance. Harvest daily in hot weather. Cooling to remove field heat is desired. Precooling can be done with cold water, cold air, or ice. Hydrocooling is the most efficient method, but room cooling and forced air cooling are also suitable for melons. After precooling, muskmelons should be stored at 36-41°F and 95% relative humidity. A full-slip melon can be kept about 15 days at this temperature. Honeydews and other non-slip melons should not be stored below 40°F, as chilling injury will result. They will retain adequate quality for 2-3 weeks at 45-50°F.

Weed Control

Weed Recommendations and Herbicide Comments are Specific to muskmelon/cantaloupes ONLY

Section 18 Emergency Label requests may be submitted to supplement weed control recommendations in melons.

Identify the weeds in each field and select recommended herbicides that control those weeds. See Tables E-3 and E-4.

Match preplant incorporated and preemergence herbicide rates to soil type and percent organic matter in each field.

See "Mulching" section above for further information on weed control under plastic mulch.

Apply postemergence herbicides when crop and weeds are within the recommended size and/or leaf stage.

Determine the preharvest interval (PHI) for the crop. See Table E-4 and consult the herbicide label.

Find the herbicides you plan to use in the Herbicide Resistance Action Committee's (HRAC) **Herbicide Site of Action Table E-8** and follow the recommended good management practices to minimize the risk of herbicide resistance development by weeds in your fields.

For Weed Control Under Plastic Mulch

Black plastic mulch effectively controls most annual weeds by preventing light from reaching the germinated seedling. Herbicides are used under plastic mulch to control weeds around the planting hole, and under the mulch when plastic mulch is used. Trickle irrigation tubing left on the soil surface may cause weed problems by leaching herbicide away at the emitters. The problem is most serious under clear plastic. Bury the trickle tubing several inches deep in the bed to reduce this problem.

1. Complete soil tillage, and form raised beds, if desired, prior to applying herbicide(s). Do not apply residual herbicides before forming beds, or herbicide rate and depth of incorporation may be increased, raising the risk of crop injury. When beds are formed and plastic mulch laid in a single pass, the herbicide should be applied after the bed is formed, as a part of the same operation.
2. Apply herbicide(s) recommended for use under plastic mulch in a band as wide as the mulch. Condensation that forms on the underside of the mulch will activate the herbicide. Use the trickle irrigation to provide moisture if the soil is too dry for condensation to form on the underside of the mulch.
3. Complete by laying the plastic mulch and trickle irrigation tubing, if used, immediately after the herbicide application. Delay punching the planting holes until seeding or transplanting.

Bensulide--5.0 to 6.0 lb/A. Apply 5.0 to 6.0 quarts per acre Prefar 4E preemergence in a band under the plastic, immediately before laying the mulch. Condensation that forms on the underside of the mulch will activate the herbicide. Annual grasses and certain annual broadleaf weeds will be suppressed or controlled under the mulch and around the plant hole. Use the maximum recommended rate to improve control of annual broadleaf weeds including common lambsquarters, smooth pigweed, and common purslane.

Halosulfuron--0.023 to 0.047 lb/A. **Labeled for use on cantaloupes, honeydew melons, and Crenshaw melons, but not labeled on muskmelons.** Apply 0.5 to 1.0 dry ounce Sandea 75WG under plastic mulch to suppress or control broadleaf weeds including common cocklebur, redroot, pigweed, smooth pigweed, ragweed species, and galinsoga. Use the lower rate on coarse-textured soils low in organic matter and higher rates on fine-textured soils and on soils with high organic matter. Condensation that forms on the underside of the mulch will activate the herbicide. Delay transplanting for seven days after application. Occasionally, slight stunting may be observed following Sandea use early in the season. When observed, recovery is rapid with no effect on yield or maturity. Sandea is an ALS inhibitor. Herbicides with this mode of action have a single site of activity in susceptible weeds. The risk of the development of resistant weed populations is high when herbicides with this mode of action are used continuously and exclusively to control a weed species for several years or in consecutive crops in a rotation. Integrate mechanical methods of control and use herbicides with a different mode of action to control the target broadleaf weeds when growing other crops in the rotation. 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. **DO NOT exceed a total of 0.047 pound per acre, equal to 1.0 dry ounce of Sandea, applied under plastic mulch.**

For Soil Strips Between Rows of Plastic Mulch (Directed and Shielded Band Applications)

Use the following land preparation, treatment, planting sequences, and herbicides labeled for the crop to treat **Soil Strips Between Rows of Plastic Mulch**, or crop injury and/or poor weed control may result.

1. Complete soil preparation, apply herbicide(s) under the mulch (see above), and lay plastic and trickle irrigation (optional) before herbicide application between the rows.
2. Spray preemergence herbicide(s), registered and recommended for use on the crop in bands onto the soil and the shoulders of the plastic mulch before planting and weeds germinate, **OR** apply after planting as a shielded spray combined with a postemergence herbicide to control emerged weeds. **DO NOT broadcast spray over the plastic mulch at any time!**
3. Incorporate preemergence herbicide into the soil with ½ to 1 inch of rainfall or overhead irrigation within 48 hours of application.

Apply Gramoxone in bands to the soil strips between the plastic mulch before the crop emerges or is transplanted, **AND/OR** as a shielded spray postemergence to control emerged weeds. Use in combination with residual herbicides that are registered for use.

Note. All herbicide rate recommendations are made for spraying a broadcast acre (43,560 ft^2).

Preemergence

Bensulide--5.0 to 6.0 lb/A. Apply 5.0 to 6.0 quarts per acre Prefar 4E before planting and incorporate 1 to 2 inches deep with power-driven rotary cultivators, or apply preemergence and activate with one-half inch of sprinkler irrigation within 36 hours to control most annual grasses. Use the maximum recommended rate preemergence followed by irrigation to suppress certain annual broadleaf weeds including common lambsquarters, smooth pigweed, and common purslane.

Clomazone--0.094 to 0.188 lb/A. Apply 4.0 to 8.0 fluid ounces per acre Command 3ME as a banded directed shielded spray preemergence to the weeds to control annual grasses and many broadleaf weeds including common lambsquarters, velvetleaf, spurred anoda, and jimsonweed. Mustards, morningglory species, and pigweed species will not be controlled. Use lowest recommended rate on coarse-textured, sandy soils low in organic matter. Higher rates should only be used on medium- and fine-textured soils and sites that have been heavily manured. Combine with Curbit 3EC to control pigweed species where Curbit is registered for use, or use Strategy, the jug-mix that contains clomazone (Command) and ethalfluralin (Curbit).

WARNING: Command spray *or* vapor drift may injure sensitive crops and other vegetation up to several hundred yards from the point of application. Do not apply when wind or weather conditions favor herbicide drift. Do not apply to fields adjacent to horticultural, fruit, vegetable, or other sensitive crops (see label). Drift injury from offsite Command movement is extremely apparent; therefore, do not use Command on fields near sensitive locations.

Herbicide residues may limit subsequent cropping options when Command is used for weed control. See planting restrictions on the label or consult your local Cooperative Extension office for information regarding subsequent cropping options when Command is used.

Ethalfluralin--0.38 to 1.12 lb/A. Apply 1.0 to 3.0 pints per acre Curbit 3E as a banded directed shielded spray preemergence to control annual grasses and certain annual broadleaf weeds, including carpetweed and pigweed sp. Control of many other broadleaf weeds, including common lambsquarters, jimsonweed, morningglory sp., ragweed sp., mustard sp., and others may not be acceptable. Dry weather following application may reduce weed control. Cultivate to control emerged weeds if rainfall or irrigation does not occur prior to weed emergence. DO NOT preplant incorporate. DO NOT apply under plastic mulch or tunnels. DO NOT use when soils are cold or wet. Crop injury may result!

Ethalfluralin *plus* Clomazone (jug-mix)--0.394 to 1.575 lb/A. Apply 1.5 to 6.0 pints per acre of Strategy 2.1SC as a banded directed shielded spray preemergence to control annual grasses and many annual broadleaf weeds. Use the lowest recommended rates on coarse-textured sandy soils low in organic matter. Higher rates should only be used on medium- and fine-textured soils and sites that have been heavily manured.

Strategy is a jug-mix of ethalfluralin (Curbit 3E) and clomazone (Command 3ME). Refer to the chart below to determine the amount of each herbicide at commonly used rates:

Curbit and Command Active Ingredients (ai) in Commonly Used Strategy Rates

Strategy pints/A	Ethalfluralin (Curbit) lb ai/A	Clomazone (Command) lb ai/A
1.5	0.3	0.094
2.0	0.4	0.125
3.0	0.6	0.188
4.0	0.8	0.250
5.0	1.0	0.312
6.0	1.2	0.375

Labeled for use in all the Mid-Atlantic states. Read and follow all the recommendations and warnings (above) for ethalfluralin (Curbit) and clomazone (Command).

Halosulfuron--0.023 to 0.047 lb/A. **Labeled for use on cantaloupes, honeydew melons, and Crenshaw melons, but not labeled on muskmelons.** Apply 0.5 to 1.0 dry ounces of Sandea 75WG to suppress or control broadleaf weeds, including common cocklebur, redroot pigweed, smooth pigweed, ragweed species, and galinsoga. Use the lower rate on coarse textured soils low in organic matter and higher rates on fine-textured soils and on soils with high organic matter. Rainfall or irrigation after application is necessary before weeds emerge to obtain good control. Occasionally slight stunting may be observed following Sandea use early in the season, before the vines begin to run. When observed, recovery is rapid, with no effect on yield or maturity. Sandea is an ALS inhibitor. Herbicides with this mode of action have a single site of activity in susceptible weeds. The risk of the development of resistant weed populations is high when herbicides with his mode of action are used continuously and exclusively to control a weed species for several years or in consecutive crops in a rotation. Integrate mechanical methods of control and use herbicides with a different mode of action to control the target broadleaf weeds when growing other crops in the rotation. 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. **DO NOT exceed a total of 0.047 lb/A, equal to 1.0 dry ounce of Sandea, applied preemergence DO NOT exceed a total of 0.078 pounds per acre, equal to 1.66 dry ounces of Sandea, applied preemergence and postemergence, per crop-cycle. DO NOT exceed a total of 0.094 lb/A, equal to 2.0 dry ounces of Sandea, applied preemergence and postemergence to multiple crops in a single year.**

Pendimethalin--1.0 lb/A. Apply 2.1 pints per acre Prowl H_2O as a banded directed shielded spray before transplanting, or before seeded crop has emerged. Activate with one-half inch of rainfall or sprinkler irrigation within 48 hours of application to control most annual grasses and certain broadleaf weeds. A second treatment at the same rate may be applied as a banded directed shielded spray postemergence a minimum of 21 days after the first application, but before the vines begin to run. **DO NOT apply "over the top" of the crop, or severe injury may occur. Observe a 35 day PHI (Pre Harvest Interval).**

Postemergence

Halosulfuron--0.023 to 0.031 lb/A. **Labeled for use on cantaloupes, honeydew melons, and Crenshaw melons, but not labeled on muskmelons.** Apply 0.50 to 0.66 dry ounce Sandea 75WG as a banded directed shielded spray to suppress or control yellow nutsedge and broadleaf weeds including common cocklebur, redroot pigweed, smooth pigweed, ragweed species, and galinsoga when the crop has 2 to 5 true leaves but has not yet begun to bloom or run. Sandea applied postemergence will not control common lambsquarters or eastern black nightshade. Add nonionic surfactant to be 0.25 percent of the spray solution (1 quart per 100 gallons of spray solution). DO NOT use oil concentrate. Susceptible broadleaf weeds usually exhibit injury symptoms within 1 to 2 weeks of treatment. Typical symptoms begin as yellowing in the growing point that spreads to the entire plant

and is followed by death of the weed. Injury symptoms are similar when yellow nutsedge is treated but may require 2 to 3 weeks to become evident and up to a month for the weed to die. Occasionally, slight yellowing of the crop may be observed within a week of Sandea application. When observed, recovery is rapid with no effect on yield or maturity. Sandea is an ALS inhibitor. Herbicides with this mode of action have a single site of activity in susceptible weeds. The risk of the development of resistant weed populations is high when herbicides with this mode of action are used continuously and exclusively to control a weed species for several years or in consecutive crops in a rotation. Integrate mechanical methods of control and use herbicides with a different mode of action to control the target broadleaf weeds when growing other crops in the rotation. DO NOT apply Sandea to crops treated with a soil applied organophosphate (OP) insecticide, or use a foliar applied organophosphate (OP) insecticide within 21 days before or 7 days after a Sandea application. **DO NOT exceed a total of 0.031 pound per acre, equal to 0.66 dry ounces of Sandea, applied postemergence. DO NOT exceed a total of 0.078 pounds per acre, equal to 1.66 dry ounces of Sandea, applied preemergence and postemergence, per crop-cycle. DO NOT exceed a total of 0.094 pound per acre, equal to 2.0 dry ounces of Sandea applied preemergence and postemergence to multiple crops in one year.**

Paraquat--0.6 lb/A. **A Special Local-Needs 24(c) label has been approved for the use of Gramoxone SL 2.0** or OLF **postemergence as a directed shielded spray in Delaware, Maryland, New Jersey, Pennsylvania, and Virginia.** Apply 2.4 pints per acre Gramoxone SL 2.0 or OLF as a banded directed shielded spray to control emerged weeds between the rows after crop establishment. Add nonionic surfactant according to the labeled instructions. Do not allow spray or spray drift to contact the crop or injury may result. Use shields to prevent spray contact with the crop plants. Do not exceed a spray pressure of 30 psi. See the label for additional information and warnings.

Pendimethalin--1.0 lb/A. Apply 2.1 pints per acre Prowl H_2O as a banded directed shielded spray before transplanting, or before seeded crop has emerged. Activate with one-half inch of rainfall or sprinkler irrigation within 48 hours of application to control most annual grasses and certain broadleaf weeds emerging from seed (preemerngence). Tank-mix with Gramoxone plus a nonionic surfactant or another recommended postemergence herbicide to control emerged weeds. **DO NOT apply "over the top" of the crop, or severe injury may occur. Observe a 35 day PHI (PreHarvest Interval).**

Clethodim--0.094 to 0.125 lb/A. Apply 6.0 to 8.0 fluid ounces per acre Select 2EC with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) or 12.0 to 16.0 fluid ounces of Select Max 0.97EC with nonionic surfactant to be 0.25% of the spray solution (1 quart per 100 gallons of spray solution) postemergence to control many annual and certain perennial grasses, including annual bluegrass. Select will not consistently control goosegrass. The use of oil concentrate with Select 2EC 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. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 14 days.

Sethoxydim--0.2 to 0.3 lb/A. Apply 1.0 to 1.5 pints per acre Poast 1.5EC with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) postemergence as a banded directed shielded spray to control annual grasses and certain perennial grasses. **The use of oil concentrate 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. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 14 days and apply no more than 3 pints per acre in one season.

For Seeding Into Soil Without Plastic Mulch (Broadcast Applications)

Use the following land preparation, treatment, planting sequences, and herbicides labeled for the crop when **Seeding into Soil Without Plastic Mulch**, or crop injury and/or poor weed control may result.

1. Complete soil tillage, apply preplant incorporated herbicide(s), and incorporate. Use a finishing disk or field cultivator that sweeps at least 100% of the soil surface twice, at right angles, operated at a minimum of 7 miles per hour (mph), OR a PTO driven implement once, operated at less than 2 miles per hour (mph).
2. Seed and apply preemergence herbicide(s) immediately after completing soil tillage, and mechanical incorporation of preplant herbicides. Irrigate if rainfall does not occur, to move the herbicide into the soil and improve availability to germinating weed seeds within 2 days of when the field was last tilled, or plan to control escaped weeds by other methods.

Note. All herbicide rate recommendations are made for spraying a broadcast acre (43,560 ft^2).

Preplant Incorporated or Preemergence

Bensulide--5.0 to 6.0 lb/A. Apply 5.0 to 6.0 quarts per acre Prefar 4E before planting and incorporate 1 to 2 inches deep with power-driven rotary cultivators, or apply preemergence and activate with one-half inch of sprinkler irrigation within 36 hours to control most annual grasses. Use the maximum recommended rate preemergence followed by irrigation to suppress certain annual broadleaf weeds including common lambsquarters, smooth pigweed, and common purslane.

Preemergence

Clomazone--0.094 to 0.188 lb/A. Apply 4.0 to 8.0 fluid ounces per acre Command 3ME preemergence to a direct-seeded crop to control annual grasses and many broadleaf weeds including common lambsquarters, velvetleaf, spurred anoda, and jimsonweed. Mustards, morningglory species, and pigweed species will not be controlled. Use lowest recommended rate on coarse-textured, sandy soils low in organic matter. Higher rates should only be used on medium- and fine-textured soils and sites that have been heavily manured. Combine with Curbit 3EC to control pigweed species where Curbit is registered for use. Some temporary crop injury (partial whitening of leaf or stem tissue) may be apparent after crop emergence. Complete recovery will occur from minor early injury without affecting yield or earliness. Banding the herbicide reduces the risk of crop injury and offsite movement due to vapor drift.

WARNING: Command spray *or* vapor drift may injure sensitive crops and other vegetation up to several hundred yards from the point of application. Do not apply when wind or weather conditions favor herbicide drift. Do not apply to fields adjacent to horticultural, fruit, vegetable, or other sensitive crops (see label). Drift injury from offsite Command movement is extremely apparent; therefore, do not use Command on fields near sensitive locations.

Herbicide residues may limit subsequent cropping options when Command is used for weed control. See planting restrictions on the label or consult your local Cooperative Extension office for information regarding subsequent cropping options when Command is used.

Ethalfluralin--0.38 to 0.94 lb/A. Apply 1.0 to 2.5 pints per acre Curbit 3E preemergence to control annual grasses and certain annual broadleaf weeds, including carpetweed and pigweed sp. Control of many other broadleaf weeds, including common lambsquarters, jimsonweed, morningglory sp., ragweed sp., mustard sp., and others may not be acceptable. Dry weather following application may reduce weed control. Cultivate to control emerged weeds if rainfall or irrigation does not occur prior to weed emergence. DO NOT preplant incorporate. DO NOT apply under plastic mulch or tunnels. DO NOT use when soils are cold or wet. Crop injury may result!

Ethalfluralin *plus* Clomazone (jug-mix)--0.394 to 1.575 lb/A. Apply 1.5 to 6.0 pints per acre of Strategy 2.1SC preemergence to control annual grasses and many annual broadleaf weeds. Use the lowest recommended rates on coarse-textured sandy soils low in organic matter. Higher rates should only be used on medium- and fine-textured soils and sites that have been heavily manured.

Strategy is a **jug-mix** of ethalfluralin (Curbit 3E) and clomazone (Command 3ME). Refer to the chart under Ethalfuralin *plus* clomazone (jug-mix) in the section **For Soil Strips between Rows of Plastic Mulch** to determine the amount of each herbicide at commonly used rates. Read and follow all the recommendations and warnings (above) for ethalfluralin (Curbit) and clomazone (Command).

Halosulfuron--0.023 to 0.047 lb/A. **Labeled for use on cantaloupes, honeydew melons, and Crenshaw melons, but not labeled on muskmelons.** Apply 0.5 to 1.0 dry ounce Sandea 75WG to suppress or control broadleaf weeds including common cocklebur, redroot, pigweed, smooth pigweed, ragweed species, and galinsoga. Use the lower rate on coarse-textured soils low in organic matter and higher rates on fine-textured soils and on soils with high organic matter. Rainfall or irrigation after application is necessary before weeds emerge to obtain good control. Occasionally, slight stunting may be observed following Sandea use early in the season. When observed, recovery is rapid with no effect on yield or maturity. Sandea is an ALS inhibitor. Herbicides with this mode of action have a single site of activity in susceptible weeds. The risk of the development of resistant weed populations is high when herbicides with this mode of action are used continuously and exclusively to control a weed species for several years or in consecutive crops in a rotation. Integrate mechanical methods of control and use herbicides with a different mode of action to control the target broadleaf weeds when growing other crops in the rotation. 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. **DO NOT exceed a total of 0.047 pound per acre, equal to 1 dry ounce of Sandea, applied preemergence. DO NOT exceed a total of 0.078 pounds per acre, equal to 1.66 dry ounces of Sandea, applied preemergence and postemergence, per crop-cycle. DO NOT exceed a total of 0.094 pound per acre, equal to 2.0 dry ounces of Sandea, applied preemergence and postemergence to multiple crops in a single year.**

Postemergence

Halosulfuron--0.023 to 0.031 lb/A. **Labeled for use on cantaloupes, honeydew melons, and Crenshaw melons, but not labeled on muskmelons.** Apply 0.50 to 0.66 dry ounce Sandea 75WG to suppress or control yellow nutsedge and broadleaf weeds including common cocklebur, redroot pigweed, smooth pigweed, ragweed species, and galinsoga when the crop has 2 to 5 true leaves but has not yet begun to bloom or run. Sandea applied postemergence will not control common lambsquarters or eastern black nightshade. Add nonionic surfactant to be 0.25 percent of the spray solution (1 quart per 100 gallons of spray solution). DO NOT use oil concentrate. Susceptible broadleaf weeds usually exhibit injury symptoms within 1 to 2 weeks of treatment. Typical symptoms begin as yellowing in the growing point that spreads to the entire plant and is followed by death of the weed. Injury symptoms are similar when yellow nutsedge is treated but may require 2 to 3 weeks to become evident and up to a month for the weed to die. Occasionally, slight yellowing of the crop may be observed within a week of Sandea application. When observed, recovery is rapid with no effect on yield or maturity. Sandea is an ALS inhibitor. Herbicides with this mode of action have a single site of activity in susceptible weeds. The risk of the development of resistant weed populations is high when herbicides with this mode of action are used continuously and exclusively to control a weed species for several years or in consecutive crops in a rotation. Integrate mechanical methods of control and use herbicides with a different mode of action to control the target broadleaf weeds when growing other crops in the rotation. DO NOT apply Sandea to crops treated with a soil applied organophosphate (OP) insecticide, or use a foliar applied organophosphate (OP) insecticide within 21 days before or 7 days after a Sandea application. **DO NOTexceed a total of 0.031 pound per acre, equal to 0.66 dry ounces of Sandea, applied postemergence. DO NOT**

exceed a total of 0.078 pounds per acre, equal to 1.66 dry ounces of Sandea, applied preemergence and postemergence, per crop-cycle. DO NOT exceed a total of 0.094 pound per acre, equal to 2.0 dry ounces of Sandea applied preemergence and postemergence to multiple crops in one year.

Paraquat--0.6 lb/A. **A Special Local-Needs 24(c) label has been approved for the use of Gramoxone SL 2.0 or OLF postemergence as a directed shielded spray in Delaware, Maryland, New Jersey, Pennsylvania, and Virginia.** Apply 2.4 pints per acre Gramoxone SL 2.0 **or OLF** as a directed spray to control emerged weeds between the rows after crop establishment. Add nonionic surfactant according to the labeled instructions. Do not allow spray or spray drift to contact the crop or injury may result. Use shields to prevent spray contact with the crop plants. Do not exceed a spray pressure of 30 psi. See the label for additional information and warnings

Clethodim--0.094 to 0.125 lb/A. Apply 6.0 to 8.0 fluid ounces per acre Select 2EC with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) or 12.0 to 16.0 fluid ounces of Select Max 0.97EC with nonionic surfactant to be 0.25% of the spray solution (1 quart per 100 gallons of spray solution) postemergence to control many annual and certain perennial grasses, including annual bluegrass. Select will not consistently control goosegrass. The use of crop oil concentrate with Select 2EC 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. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 14 days.

Sethoxydim--0.2 to 0.3 lb/A. Apply 1.0 to 1.5 pints per acre Poast 1.5EC with oil concentrate to be 1 percent of the spray solution (1 gallon per 100 gallons of spray solution) postemergence to control annual grasses and certain perennial grasses. **The use of oil concentrate 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. Control may be reduced if grasses are large or if hot, dry weather or drought conditions occur. For best results, treat annual grasses when they are actively growing and before tillers are present. Repeated applications may be needed to control certain perennial grasses. Yellow nutsedge, wild onion, or broadleaf weeds will not be controlled. Do not tank-mix with or apply within 2 to 3 days of any other pesticide unless labeled, as the risk of crop injury may be increased, or reduced control of grasses may result. Observe a minimum preharvest interval of 14 days and apply no more than 3.0 pints per acre in one season.

Postharvest
With or Without Plastic Mulch

Paraquat--0.6 lb/A. **A Special Local-Needs 24(c) label has been approved for the use of Gramoxone SL 2.0 or OLF for postharvest desiccation of the crop in Delaware, New Jersey and Virginia.** Apply 2.4 pints per acre Gramoxone SL 2.0 or OLF as a broadcast spray after the last harvest. Add nonionic surfactant according to the labeled instructions. Use to prepare plastic mulch for replanting, or to aid in the removal of the mulch. See the label for additional information and warnings.

Note. All herbicide rate recommendations are made for spraying a broadcast acre (43,560 ft^2).

Insect Control

THE LABEL IS THE LAW. PLEASE REFER TO THE LABEL FOR UP TO DATE RATES AND RESTRICTIONS

NOTE: Copies of specific insecticide product labels can be downloaded by visiting the websites www.CDMS.net or www.greenbook.net. Also, specific labels can be obtained via web search engines.

Seed Corn Maggot

To prevent maggot damage to transplants, a banded application of a soil-incorporated insecticide may be needed. Also see Chapter E – Pest Management under the heading of "Soil Pests--Their Detection and Control" Maggots. **Note:** The use of imidacloprid at planting may help to reduce seed corn maggot populations.

Aphids

Note. Aphids transmit multiple viruses. For chemical control of aphids, apply one of the following formulations:

acetamiprid--2.5 to 4.0 oz/A Assail 30G
clothianidin--**soil** 9.0 to 12.0 fl oz/A Belay 2.13SC; **foliar** 3.0 to 4.0 fl oz/A Belay 2.13SC
dimethoate--0.5 to 1 pt/A Dimethoate 400 (or OLF)
dinotefuran--**soil** 9.0 to 10.5 fl oz/A Scorpion 35SL or 5.0 to 6.0 oz/A Venom 70SG; **foliar** 2.0 to 7.0 fl oz/A Scorpion 35SL or 1.0 to 4.0 oz/A Venom 70SG
flonicamid--2.0 to 2.8 oz/A Beleaf 50SG
imidacloprid--**soil only** 7.0 to 10.5 fl oz/A Admire PRO 4.6SC (or OLF)
lambda-cyhalothrin+thiamethoxam--4.5 fl oz/A Endigo ZC
methomyl--(**melon aphid only**) 1.5 to 3.0 pts/A Lannate LV
oxamyl--2.0 to 4.0 pts/A Vydate 2L
pymetrozine--2.75 oz/A Fulfill 50WP
thiamethoxam--**soil/drip** 1.66 to 3.67 oz/A Platinum 75SG ; **foliar** 1.5 to 3.0 oz/A Actara 25WDG (or other labelled mixtures containing thiamethoxam like Durivo and Voliam flexi)
zeta-cypermethrin+ avermectin B1-19.0 fl oz/A Gladiator

Beet Armyworm

Apply one of the following formulations:

chlorantraniliprole--**soil/drip/foliar** 3.5 to 5.0 fl oz/A Coragen 1.67SC (or other labelled mixtures containing chlorantraniliprol like Voliam flexi)
flubendiamide--1.5 fl oz/A Belt 4SC (or other labelled mixtures containing flubendiamide like Vetica)
indoxacarb--3.5 to 6.0 oz/A Avaunt 30WDG

lambda-cyhalothrin + chlorantraniliprole--6 .0 to 9.0 fl oz/A Voliam Xpress
methomyl--1.5 to 3.0 pts/A Lannate LV
methoxyfenozide--4.0 to 10.0 fl oz/A Intrepid 2F
spinetoram--5.0 to 10.0 fl oz/A Radiant 1SC
spinosad--4.0 to 8.0 fl oz/A Entrust 2SC
zeta-cypermethrin+ avermectin B1- 19.0 fl oz/A Gladiator

Cabbage Looper

Apply one of the following formulations:

Bacillus thuringiensis--0.5 to 2.0 lb/A Dipel (or OLF)
beta-cyfluthrin--1.6 to 2.4 fl oz/A Baythroid XL 1EC
bifenthrin--2.6 to 6.4 fl oz/A Bifenture 2EC (Sniper or OLF)
chlorantraniliprole--**soil/drip/foliar** 3.5 to 5.0 fl oz/A Coragen 1.67SC (or other labelled mixtures containing chlorantraniliprol like Voliam flexi)
cyfluthrin--1.6 to 2.4 fl oz/A Tombstone 2EC (or OLF)
esfenvalerate--5.8 to 9.6 fl oz/A Asana XL
fenpropathrin--10.67 to 16.00 fl oz/A Danitol 2.4EC
flubendiamide--1.5 fl oz/A Belt 4SC (or other labelled mixtures containing flubendiamide like Vetica)
lambda-cyhalothrin--1.28 to 1.92 fl oz/A Warrior II or 2.56 to 3.84 fl oz/A Lambda-Cy EC (LambdaT CS, or OLF)
lambda-cyhalothrin + chlorantraniliprole--6.0 to 9.0 fl oz/A Voliam Xpress
lambda-cyhalothrin+thiamethoxam--4.0 to 4.5 fl oz/A Endigo ZC
methomyl--1.5 to 3.0 pts/A Lannate LV
methoxyfenozide--4.0 to 10.0 fl oz/A Intrepid 2F
permethrin--4.0 to 8.0 fl oz/A Perm-Up 3.2 EC (or OLF)
spinetoram--5.0 to 10.0 fl oz/A Radiant 1SC
spinosad--4.0 to 8.0 fl oz/A Entrust 2SC
zeta-cypermethrin--2.8 to 4.0 fl oz/A Mustang Maxx 0.8EC
zeta-cypermethrin+ avermectin B1- 14.0 to 19.0 fl oz/A Gladiator
zeta-cypermethrin+bifenthrin--4.0 to 10.3 fl oz/A Hero EC

Cucumber Beetle

Cucumber beetles transmit bacterial wilt, and most varieties of muskmelons are highly susceptible to this disease. Also, adult beetles can cause direct feeding injury to young plants. Insecticides should be used to control adult beetles before they 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. Treatments may be required until vines begin to run. Seeds pretreated with a neonicotinoid such Farmore DI-400 should provide up to 21 days of control of cucumber beetle. Otherwise, apply one of the following formulations:

acetamiprid--2.5 to 5.3 oz/A Assail 30SG
beta-cyfluthrin--2.4 to 2.8 fl oz/A Baythroid XL 1EC
bifenthrin--2.6 to 6.4 fl oz/A Bifenture 2EC (Sniper, or OLF)
carbaryl--1.0 qt/A Sevin XLR Plus
clothianidin--**soil** 9.0 to 12.0 fl oz/A Belay 2.13SC; **foliar** 3.0 to 4.0 fl oz/A Belay 2.13SC
cyfluthrin--2.4 to 2.8 fl oz/A Tombstone 2EC (or OLF)
dinotefuran--**soil** 9.0 to 10.5 fl oz/A Scorpion 35SL; **foliar** 2.0 to 7.0 fl oz/A Scorpion 35SL or 1.0 to 4.0 oz/A Venom 70SG
esfenvalerate--5.8 to 9.6 fl oz/A Asana XL
fenpropathrin--10.67 to 16.0 fl oz/A Danitol 2.4EC
imidacloprid--**soil only** 7.0 to 10.5 fl oz/A Admire PRO 4.6SC (or OLF)
lambda-cyhalothrin--1.28 to 1.92 fl oz/A Warrior II or 2.56 to 3.84 fl oz/A Lambda-Cy EC (LambdaT CS, or OLF)
lambda-cyhalothrin + chlorantraniliprole--6.0 to 9.0 fl oz/A Voliam Xpress
lambda-cyhalothrin+thiamethoxam--4.0 to 4.5 fl oz/A Endigo ZC
methomyl--1.5 to 3.0 pts/A Lannate LV
permethrin--4.0 to 8.0 fl oz/A Perm-Up 3.2 EC (or OLF)
thiamethoxam+chlorantraniliprole--**soil** 10.0 to 13.0 fl oz/A Durivo; **foliar** 4.0 to 7.0 oz/A Voliam Flexi
zeta-cypermethrin--2.8 to 4.0 fl oz/A Mustang Maxx 0.8EC
zeta-cypermethrin+ avermectin B1- 14.0 to 19.0 fl oz/A Gladiator
zeta-cypermethrin+bifenthrin--4.0 to 10.3 fl oz/A Hero EC

Cutworms (Also see Chapter E "Cutworms" section in Soil Pests--Their Detection and Control.)

Apply one of the following formulations:

beta-cyfluthrin--0.8 to 1.6 fl oz/A Baythroid XL 1EC
bifenthrin--2.6 to 6.4 fl oz/A Bifenture 2EC (Sniper, or OLF)
cyfluthrin--0.8 to 1.6 fl oz/A Tombstone 2EC(or OLF)
esfenvalerate--5.8 to 9.6 fl oz/A Asana XL
flubendiamide--1.5 fl oz/A Belt 4SC (or other labeled mixtures containing flubendiamide like Vetica)
lambda-cyhalothrin + chlorantraniliprole--6.0 to 9.0 fl oz/A Voliam Xpress
lambda-cyhalothrin+thiamethoxam--4.0 to 4.5 fl oz/A Endigo ZC
methomyl--(**variegated cutworm only**) 1.5 pts/A Lannate LV, (**granulate cutworm**) 1.5 to 3.0 pts/A Lannate LV (or OLF)
permethrin--4.0 to 8.0 fl oz/A Perm-Up 3.2 EC (or OLF)
zeta-cypermethrin--1.28 to 4.00 fl oz/A Mustang Maxx 0.8EC
zeta-cypermethrin+ avermectin B1—6.0 to 19.0 fl oz/A Gladiator
zeta-cypermethrin+bifenthrin--4.0 to 10.3 fl oz/A Hero EC

Leafhoppers

High levels of leafhoppers cause leaf yellowing (chlorosis) known as hopper burn which will result in yield loss. Apply one of the following formulations

acetamiprid--2.5 to 4.0 oz/A Assail 30SG
beta-cyfluthrin--0.8 to 1.6 fl oz/A Baythroid XL 1EC
bifenthrin--2.6 to 6.4 fl oz/A Bifenture 2EC (Sniper, or OLF)
clothianidin--**soil** 9.0 to 12.0 fl oz/A Belay 2.13SC; **foliar** 3.0 to 4.0 fl oz/A Belay 2.13SC
cyfluthrin--0.8 to 1.6 fl oz/A Tombstone 2EC (or OLF)
dimethoate--1.0 pt/A Dimethoate 400 (or OLF)
dinotefuran--**soil** 9.0 to 10.5 fl oz/A Scorpion 35SL or 5.0 to 6.0 oz/A Venom70SG; **foliar** 2.0 to 7.0 fl oz/A Scorpion 35SL or 1.0 to 4.0 oz/A Venom 70SG
esfenvalerate--5.8 to 9.6 fl oz/A Asana XL
flubendiamide+ buprofezin--14.0 to 17.0 fl oz/A Vetica
imidacloprid--**soil only** 7.0 to 10.5 fl oz/A Admire PRO 4.6SC (or OLF)
lambda-cyhalothrin--1.28 to 1.92 fl oz/A Warrior II or 2.56 to 3.84 fl oz/A Lambda-Cy EC (LambdaT CS, or OLF)
lambda-cyhalothrin + chlorantraniliprole--6 .0 to 9.0 fl oz/A Voliam Xpress
lambda-cyhalothrin+thiamethoxam--4.0 to 4.5 fl oz/A Endigo ZC
permethrin--4.0 to 8.0 fl oz/A Perm-Up 3.2 EC (or OLF)

thiamethoxam--**soil/drip** only1.66 to 3.67 oz/A Platinum 75SG
thiamethoxam+chlorantraniliprole—**soil** 10.0 to 13.0 fl oz/A Durivo
zeta-cypermethrin--2.8 to 4.0 fl oz/A Mustang Maxx 0.8EC
zeta-cypermethrin +avermectin B1—14.0 to 19.0 fl oz/A Gladiator
zeta-cypermethrin+bifenthrin--4.0 to 10.3 fl oz/A Hero EC

Leafminers

Apply one of the following formulations:

abamectin--1.75 to 3.5 fl oz/A Agri-Mek 0.7 SC (or OLF)
chlorantraniliprole--**soil/drip** 5.0 to 7.5 fl oz/A Coragen 1.67SC; **foliar** 5.0 to 7.0 fl oz/A Coragen 1.67SC
clothianidin--**soil** 9.0 to 12.0 fl oz/A Belay 2.13SC
cyromazine--2.66 oz/A Trigard 75WSP
dimethoate--1.0 pt/A Dimethoate 400 (or OLF)
dinotefuran--**soil** 9.0 to 10.5 fl oz/A Scorpion 35SL or 5.0 to 6.0 oz/A Venom 70S G ; **foliar** 2.0 to 7.0 fl oz/A Scorpion 35SL or 1.0 to 4.0 oz/A Venom 70SG
lambda-cyhalothrin+chlorantraniliprole-- 9.0 fl oz/A Voliam Xpress
lambda-cyhalothrin+thiamethoxam--4.5 fl oz/A Endigo ZC
oxamyl--2.0 to 4.0 pts/A Vydate 2L
spinetoram--6.0 to 10.0 fl oz/A Radiant 1SC
spinosad--6.0 to 8.0 fl oz/A Entrust 2SC
thiamethoxam--**soil/drip** 1.66 to 3.67 oz/A Platinum 75SG; **foliar** 3.0 to 5.5 oz/A Actara 25 WDG
thiamethoxam+chlorantraniliprole—**soil** 10.0 to 13.0 fl oz/A Durivo; **foliar** 4.0 to 7.0 oz/A Voliam Flexi
zeta-cypermethrin+avermectin B1—19.0 fl oz/A Gladiator

Mites

Mite infestations generally begin around field margins and grassy areas. **CAUTION: DO NOT** mow or maintain these areas after midsummer since this forces mites into the crop. Localized infestations can be spot treated. Begin treatment when 10 to 15 percent of the crown leaves are infested early in the season. Apply one of the following formulations:

Note: Continuous use of carbaryl or pyrethroids may result in mite outbreaks.

abamectin--1.75 to 3.5 fl oz/A Agri-Mek 0.7 SC (or OLF)
bifenazate--0.75 to 1.00 lb/A Acramite 50WS
etoxazole--2.0 to 3.0 oz/A Zeal Miticide[1]
fenpyroximate--2.0 pts/A Portal
spiromesifen--7.0 to 8.5 fl oz/A Oberon 2SC
zeta-cypermethrin+avermectin B1--19.0 fl oz/A Gladiator

Pickleworm, Melonworm

When using foliar materials, make one treatment prior to fruit set, and then treat weekly. If using soil or drip applications, follow instructions on the label.

acetamiprid--2.5 to 5.3 oz/A Assail 30SG
beta-cyfluthrin--1.6 to 2.4 fl oz/A Baythroid XL 1EC
bifenthrin--2.6 to 6.4 fl oz/A Bifenture 2EC (Sniper, or OLF)
carbaryl--0.5 to 1.0 qt/A Sevin XLR
chlorantraniliprole—(melonworm) **drip** 2.0 to 3.5 fl oz/A Coragen 1.67SC, **foliar** 2.0 to 5.0 fl oz/A Coragen 1.67SC (pickleworm) **drip/foliar** 3.5 to 5.0 fl oz/A Coragen 1.67SC (or other labelled mixtures containing chlorantraniliprole like Durivo and Voliam flexi)
cyfluthrin--1.6 to 2.4 fl oz/A Tombstone 2EC (or OLF)
esfenvalerate-- pickleworm only 5.8 to 9.6 fl oz/A Asana XL
flubendiamide--1.5 fl oz/A Belt 4SC (or other labelled mixtures containing flubendiamide like Vetica)
indoxacarb--2.5 to 6.0 oz/A Avaunt 30WDG
lambda-cyhalothrin--1.28 to 1.92 fl oz/A Warrior II or 2.56 to 3.84 fl oz/A Lambda-Cy EC (LambdaT CS, or OLF)
lambda-cyhalothrin + chlorantraniliprole--6.0 to 9.0 fl oz/A Voliam Xpress
lambda-cyhalothrin+thiamethoxam--4.0 to 4.5 fl oz/A Endigo ZC
methomyl--1.5 to 3.0 pts/A Lannate LV
methoxyfenozide--4.0 to 10.0 fl oz/A Intrepid 2F
permethrin--4.0 to 8.0 fl oz/A Perm-Up 3.2 EC (or OLF)
spinetoram--5.0 to 10.0 fl oz/A Radiant 1SC
spinosad--4.0 to 8.0 fl oz/A Entrust 2SC
zeta-cypermethrin--2.8 to 4.0 fl oz/A Mustang Maxx 0.8EC
zeta-cypermethrin +avermectin B1—14.0 to 19.0 fl oz/A Gladiator
zeta-cypermethrin+bifenthrin--4.0 to 10.3 fl oz/A Hero EC

Rindworms

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 beetle section for labeled products. For Lepidopteran rindworms, use one of the following formulations:

beta-cyfluthrin—1.6 to 2.4 fl oz/A Baythroid XL 1EC
bifenthrin--2.6 to 6.4 fl oz/A Bifenture 2EC (Sniper, or OLF)
cyfluthrin--1.6 to 2.4 fl oz/A Tombstone 2EC(or OLF)
esfenvalerate--5.8 to 9.6 fl oz/A Asana XL
flubendiamide--1.5 fl oz/A Belt 4SC
flubendiamide + buprofezin—12.0 to 17.0 fl oz/A Vetica
lambda-cyhalothrin--1.28 to 1.92 fl oz/A Warrior II or 2.56 to 3.84 fl oz/A Lambda-Cy EC (LambdaT CS, or OLF)
lambda-cyhalothrin+chlorantraniliprole--6.0 to 9.0 fl oz/A Voliam Xpress
lambda-cyhalothrin+thiamethoxam--4.0 to 4.5 fl oz/A Endigo ZC
methoxyfenozide--4.0 to 10.0 fl oz/A Intrepid 2F
permethrin—4.0 to 8.0 fl oz/A Perm-Up 3.2EC (or OLF)
spinetoram--5.0 to 10.0 fl oz/A Radiant 1SC
spinosad--4.0 to 8.0 fl oz/A Entrust 2SC
thiamethoxam +chlorantraniliprole—**foliar** 4.0 to 7.0 oz/A Voliam Flexi
zeta-cypermethrin—2.8 to 4.0 fl oz/A Mustang Maxx 0.8EC
zeta-cypermethrin+ avermectin B1—14.0 to 19.0 fl oz/A Gladiator
zeta-cypermethrin+bifenthrin--4.0 to 10.3 fl oz/A Hero EC

Thrips

Apply one of the following formulations:

clothianidin--**soil** 9.0 to 12.0 fl oz/A Belay 2.13SC
dimethoate--1.0 pt/A Dimethoate 400 (or OLF)
dinotefuran--**soil** 9.0 to 10.5 fl oz/A Scorpion 35SL or 5.0 to 6.0 oz/A Venom 70SG; **foliar** 2.0 to 7.0 fl oz/A Scorpion 35SL or 1.0 to 4.0 oz/A Venom 70SG
imidacloprid--**soil only** 7.0 to 10.5 fl oz/A Admire PRO 4.6SC(or OLF)
lambda-cyhalothrin--1.28 to 1.92 fl oz/A Warrior II or 2.56 to 3.84 fl oz/A Lambda-Cy EC (LambdaT CS, or OLF)

lambda-cyhalothrin + chlorantraniliprole--6.0 to 9.0 fl oz/A Voliam Xpress
lambda-cyhalothrin+thiamethoxam--4.0 to 4.5 fl oz/A Endigo ZC
oxamyl--2.0 to 4.0 pts/A Vydate2 L
spinetoram--6.0 to 10.0 fl oz/A Radiant 1SC
spinosad--6.0 to 8.0 fl oz/A Entrust 2SC
thiamethoxam--**soil/drip only** 1.66 to 3.67 oz/A Platinum 75SG
thiamethoxam + chlorantraniliprole--**soil** 10.0 to 13.0 fl oz/A Durivo

Whiteflies

Apply one of the following formulations:

clothianidin--**soil** 9.0 to 12.0 fl oz/A Belay 2.13SC; **foliar** 3.0 to 4.0 fl oz/A Belay 2.13SC
dinotefuran--**soil** 9.0 to 10.5 fl oz/A Scorpion 35SL or 5.0 to 6.0 oz/A Venom 70SG; **foliar** 2.0 to 7.0 fl oz/A Scorpion 35SL or 1.0 to 4.0 oz/A Venom 70SG
fenpyroximate--2.0 pts/A Portal XLO
flonicamid--2.8 oz/A Beleaf 50SG
flubendiamide+ buprofezin--14.0 to 17.0 fl oz/A Vetica
imidacloprid--**soil only** 7.0 to 10.5 fl oz/A Admire PRO 4.6SC (or OLF)
lambda-cyhalothrin+thiamethoxam--4.5 fl oz/A Endigo ZC
pymetrozine--2.75 oz/A Fulfill 50WDG
pyriproxyfen--8.0 to 10.0 fl oz/A Knack
spiromesifen--7.0 to 8.5 fl oz/A Oberon 2SC
thiamethoxam-- **soil/drip** 1.66 to 3.67 oz/A Platinum 75SG; **foliar** 3.0 to 5.5 oz/A Actara 25WDG
thiamethoxam + chlorantraniliprole--**soil/drip** 10.0 to 13.0 fl oz/A Durivo; **foliar** 4.0 to 7.0 oz/A Voliam Flexi

Pesticide	Use Category[1]	Hours to Reentry[2]	Days to Harvest[3]
INSECTICIDE			
abamectin	R	12	7
acetamiprid	G	12	0
Bacillus thuringiensis	G	4	0
beta-cyfluthrin	R	12	0
bifenthrin	R	12	3
bifenazate	G	12	3
carbaryl	G	12	3
chlorantraniliprole	G	4	1
clothianidin(soil/foliar)	G	12	21/7
cyfluthrin	R	12	0
cyromazine	G	12	0
dimethoate	G	48	3
dinotefuran (soil/foliar)	G	12	21/1
esfenvalerate	R	12	3
etoxazole	G	12	7
fenpropathrin	R	24	7
fenpyroximate	G	12	3
flonicamid	G	12	0
flubendiamide	G	12	1
flubendiamide+buprofezin	G	12	1
imidacloprid (soil only)	G	12	21
indoxacarb	G	12	3
lambda-cyhalothrin	R	24	1
lambda-cyhalothrin + chlorantraniliprole	R	24	1
lambda-cyhalothrin + thiamethoxam	R	24	1

(table continued next column

Pesticide	Use Category[1]	Hours to Reentry[2]	Days to Harvest[3]
INSECTICIDE *(cont'd)*			
methomyl	R	48	3
methoxyfenozide	G	4	3
oxamyl	R	48	1
permethrin	R	12	0
pymetrozine	G	12	0
pyriproxyfen	G	12	7
spinetoram	G	4	3
spinosad	G	4	3
spiromesifen	G	12	7
thiamethoxam (soil/drip)	G	12	30
(foliar)	G	12	0
thiamethoxam+chlorantraniliprole			
(soil/drip)	G	12	30
(foliar)	G	12	1
zeta-cypermethrin	R	12	1
zeta-cypermethrin+avermectin B1	R	12	7
zeta-cypermethrin+bifenthrin	R	12	3
FUNGICIDE (FRAC code)			
Aprovia Top (Groups 11 + 3)	G	12	0
Ariston (Groups M5 + 27)	G	12	3
azoxystrobin (Group 11)	G	4	1
Cabrio (Group 11)	G	12	0
chlorothalonil (Group M5)	G	12	0
copper, fixed (Group M1)	G	see label	0
Curzate (Group 27)	G	12	3
Fontelis (Group 7)	G	12	1
Forum (Group 40)	G	12	0
Gavel (Groups 22 + M3)	G	48	5
Inspire Super (Groups 3 + 9)	G	12	7
mancozeb (Group M3)	G	24	5
Merivon (Groups 7 + 11)	G	12	0
MetaStar (Group 4)	G	48	AP
Presidio (Group 43)	G	12	2
Previcur Flex (Group 28)	G	12	2
Pristine (Groups 11 + 7)	G	12	0
Procure (Group 3)	G	12	0
Proline (Group 3)	G	12	7
Quadris Top (Groups 11+3)	G	12	1
Quintec (Group 13)	G	12	3
Rally (Group 3)	G	24	0
Ranman (Group 21)	G	12	0
Reason (Group 11)	G	12	14
Revus (Group 40)	G	4	0
Ridomil Gold (Group 4)	G	48	5
Switch (Groups 9 +12)	G	12	1
Tanos (Groups 11 + 27)	G	12	3
tebuconazole (Group 3)	G	12	7
Torino (Group U6)	G	4	0
Ultra Flourish (Group 4)	G	48	5
Uniform (Groups 4 + 11)	G	0	AP
Vivando (Group U8)	G	12	0
Zampro (Groups 45 + 40)	G	12	0
Zing! (Groups 22 + M5)	G	12	0

See Table D-6.

[1] G = general, R = restricted,

[2] Chemicals with multiple designations are based on product and/or formulation differences. CONSULT LABEL

[3] AP = At plant

Nematode Control

See Chapter E – Pest Management the Nematodes section under Soil Pests--Their Detection and Control. Use fumigants listed in the "Soil Fumigation" section of the same chapter, or Vydate L--1.0-2.0 gal 2L/A. Incorporate into the top 2 to 4 inches of soil or 2.0 to 4.0 pts 2L/A applied 2 weeks after planting and repeat 2 to 3 weeks later;or Nimitz 4EC--3.5 to 5.0 pt 4EC/A. Incorporate or drip-apply 7 days before planting.

Disease Control

Seed Treatment

Check with your seed company to determine if seed has been treated with an insecticide and fungicide. If it has not been treated, use a mixture of thiram 480DP (4.5 fl oz/100 lb) and an approved commercially available insecticide.

Damping-Off and Pythium Crown Rot

Apply the following in a 7-inch band after seeding. Use formula given in the "Calibration for Changing from Broadcast to Band Application" of Section E for calibrating Granular Application Equipment to determine amount of Ridomil Gold, Ultra Flourish or MetaStar needed per acre. Apply one of the following:

mefenoxam (Ridomil Gold--1.0 to 2.0 pt 4SL/A or Ultra Flourish--2.0 to 4.0 pt 2E/A)
metalaxyl (MetaStar--4.0 to 8.0 pt 2E/A)
Uniform--0.34 fl oz 3.66SE/1000 ft row
Previcur Flex--1.2 pt 6F/A applied in transplant water, drip irrigation,or a spray directed to the base of the plant and soil.

Viruses (WMV2, PRSV, ZYMV, and CMV)

The most prevalent virus in the mid-Atlantic region is WMV2, followed by PRSV, ZYMV, and CMV. Plant fields as far away from existing cucurbit plantings as possible to help reduce the chances of aphid transmission of viruses from existing fields to new fields.

Bacterial Wilt

Controlling striped and spotted cucumber beetles is essential for preventing bacterial wilt. See the 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.

Bacterial Leaf Spot and Angular Leaf Spot

At first sign of disease, apply the labeled rates of fixed copper. Repeat every 7 days. To minimize the spread of disease, avoid working in field while foliage is wet.

Fusarium Wilt

Rotate to allow 5 years between muskmelon plantings in any given location. Use resistant cultivars when possible. The cultivars 'Athena', 'Minerva', and 'Aphrodite' have resistance to Race 0, 1, and 2 (predominant races present in the area). Cultivars 'Eclipse' and 'Superstar' have resistance to Race 2 only.

Application of Proline--5.7 fl oz 480SC/A through drip irrigation may reduce Fusarium wilt early season.

Phytophthora Crown and Fruit Rot

Multiple practices should be used to minimize the occurrence of this disease. Muskmelons should be grown on raised beds and fields should be adequately drained to ensure water does not accumulate around the base of the plants. Rotate away from susceptible crops (cucurbits, peppers, lima beans and snap beans, eggplants, and tomatoes) for as long as possible. Apply preplant fumigants to suppress disease. Apply one of the following when conditions are favorable for disease development and always tank-mix with a fixed copper (may cause phytotoxicity):

The following materials provide suppression only:
Revus--8.0 fl oz 2.08F/A
Ranman--2.75 fl oz 400SC/A (plus a non-ionic or organosilicon surfactant; do not apply with copper; see label for additional precautions)
Presidio--4.0 fl oz 4SC/A
Forum--6.0 fl oz 4.17SC/A
Gavel--1.5 to 2.0 lb 75DF/A (**Note: some muskmelon cultivars are sensitive to Gavel**)
Tanos--8.0 to 10.0 oz 50DF/A
Zampro--14 fl oz 525SC/A

Materials with different modes of action (FRAC codes) should always be alternated.

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

Powdery Mildew

Excellent host resistance is available in most recommended muskmelon varieties (see recommended varieties Table). 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 US. Proper fungicide resistance management should be followed to help delay the development of resistance and minimize control failures. Materials with different FRAC codes should always be alternated. Powdery mildew generally occurs from mid-July until the end of the season. Scout fields for the presence of powdery mildew. If one lesion is found on the underside of 45 old leaves, begin the following fungicide program:

Alternate one of the following tank mixes:

Quintec--6.0 fl oz 2.08SC/A *plus* chlorothalonil--2.0 to 3.0 pt 6F/A or OLF
Torino--3.4 fl oz 0.85SC/A *plus* chlorothalonil--2.0 to 3.0 pt 6F/A or OLF
Proline--5.7 fl oz 480SC/A plus chlorothalonil 2.0 or 3.0 pt 6F/A
Procure--4.0 to 8.0 fl oz 480SC/A *plus* chlorothalonil--2.0 to 3.0 pt 6F/A or OLF
Rally--5.0 oz 40 WSP/A *plus* chlorothalonil--2.0 to 3.0 pt 6F/A or OLF
tebuconazole--4.0 to 6.0 fl oz 3.6 F/A or OLF *plus* chlorothalonil--2.0 to 3.0 pt 6F/A
Inspire Super--16.0 to 20.0 fl oz 2.8F/A *plus* chlorothalonil 2.0 to 3.0 pt 6F/A
Aprovia Top--10.5 to 13.5 fl oz 1.62EC /A

with:
Fontelis--12.0 to 16.0 fl oz 1.67SC/A *plus* chlorothalonil--2.0 to 3.0 pt 6F/A or OLF

Pristine--12.5 to 18.5 oz 38WG/A *plus* chlorothalonil--2.0 to 3.0 pt 6F/A or OLF
Vivando--15.4 fl oz 2.5SC/A

Downy Mildew

Scout fields for disease incidence beginning in early summer. Begin sprays when vines run or if disease is predicted for the region. Refer to the Cucurbit Downy Mildew Forecasting website (http://cdm.ipmpipe.org) for current status of the disease. Preventative applications are much more effective than applications made after downy mildew is detected. The following are the most effective materials (tank-mix these products with a protectant such as chlorothalonil (1.5 to 2.0 pt 6F/A or OLF) or mancozeb (3.0 lb 75 DF/A) and rotate between different FRAC codes.

Note: some cultivars are sensitive to mancozeb. Apply one of the following formulations:

Ranman--2.10 to 2.75 fl. oz. 400SC/A (plus a non-ionic or organosilicon surfactant; do not apply with copper; see label for additional precautions)
Previcur Flex--1.2 pt 6F/A

Other materials for use in rotation as tank mix partners with a protectant:
Zampro--14.0 fl oz 525SC/A
Tanos--8.0 oz 50WDG/A
Curzate--3.2 oz 60DF/A
Zing!--(contains chlorothalonil) 36.0 fl oz 4.9SC/A
Forum 6.0 fl oz 4.17SC/A
Gavel--1.5 to 2.0 lb 75DF/A (Gavel contains mancozeb, which is a protectant fungicide and therefore does not need a tank-mix partner.) **Note: Some muskmelon varieties are sensitive to Gavel.**
Presidio--4.0 fl oz 4SC/A
Ariston--3.0 pt 42SC/A (contains chlorothalonil)

Materials with different modes of action (FRAC codes) should always be alternated.

Sprays should be applied on a 7-day schedule. Under severe disease conditions spray interval may be reduced if the label allows.

Alternaria Leaf Blight

Rotate muskmelons with unrelated crops. Begin sprays when vines begin to run, or earlier if symptoms are detected.

Alternate one of the following:
chlorothalonil--2.0 to 3.0 pt 6F/A or OLF
mancozeb--2.0 to 3.0 lb 75DF/A or OLF (Muskmelon varieties, 'Harvest Queen', 'Gold Star', 'Super Star', 'Sweet and Early', and 'Saticoy' are sensitive to mancozeb.)

With:
Pristine--12.5 to 18.5 oz 38WG/A

a tank-mix containing chlorothalonil *plus* one of the following every 14 days:

Reason--5.5 fl oz 500SC/A
Inspire Super--16.0 to 20.0 fl oz 2.8F/A
Quadris Top--12.0 to 14.0 fl oz 2.7F/A
azoxystrobin--11.0 to 15.5 fl oz 2.08F/A or OLF (Do not apply near apples, see label for details)
Cabrio--12.0 to 16.0 oz 20EG/A

Materials with different modes of action (FRAC codes) should always be alternated.

Scab

Scab typically occurs during cool periods. Begin sprays as true leaves form. Repeat every 5 to 7 days.

chlorothalonil--2.0 to 3.0 pt 6F/A or OLF

Gummy Stem Blight

Fungicides solo products within the FRAC code 11 (Cabrio, Quadris and Flint) are not recommended in the mid-Atlantic region. Pristine, which contains both FRAC code 11 and 7 components should always be tank-mixed with a protectant fungicide to reduce the possibility of resistance development (See Table E-12). When tank-mixing, use the minimum labeled rate of each fungicide in the tank-mix. Do not apply FRAC code 11 fungicides more than 4 times total per season.

Begin sprays when vines begin to run, apply the following:

Under low disease pressure:
Apply chlorothalonil every 7 days at 2.0 to 3.0 pt/A or OLF

Under high disease pressure:
Alternate:
chlorothalonil--2.0 to 3.0 pt 6F/A or OLF (Use low rate early in season)

With:
A tank-mix containing a protectant fungicide (such as chlorothalonil) *plus one of the following:*
Aprovia Top--10.5 to 13.5 fl oz EC/A
Pristine--12.5 to 18.5 oz 38WG/A
Switch--11.0 to 14.0 oz 62.5WG/A
Proline--5.7 fl oz 480 SC/A
tebuconazole--8.0 fl oz 3.6F/A, or OLF **Note: resistance to tebuconazole has been found in the Southern U.S.**
Inspire Super--16.0 to 20.0 fl oz 2.8F/A
Fontelis--12.0 to 16.0 fl oz 1.67SC/A
Merivon--5.5 fl oz 500SC/A

Manganese Toxicity

This disorder occurs in acid soils (pH less than 5.8). Maintain soil pH at 6.5 to avoid toxicity.