

## CUCUMBER, MUSKMELON, AND WATERMELON

### MUSKMELON

Varieties	Season	Quality	Remarks
Athena	Early-Mid	Excellent	Medium net, oval very firm flesh
Eclipse	Mid-Late	Excellent	Heavy net, round, very firm flesh
Minerva	Early-Mid	Very Good	Course netting, slight suturing
Odyssey	Early-Mid	Excellent	Round to oval, firm
Starfire (HM 2608)	Mid-Late	Very Good	Very large fruit, good netting
Starship	Early-Mid	Very Good	Excellent size and net, uniform fruit
Superstar	Early	Good	Very large fruit, excellent netting

**Promising Western cantaloupes for the Midwest:** Don Carlos, Explorer, HyMark, Primo, Tastysweet, Veracruz.

**Promising green flesh muskmelons:** Makdimon, Passport, Galor 2, Galor 3.

**Honeydew and Crenshaw melons for trial:** Daybreak, Early Dew, Moonshine, Sunex 7051, Venus.

WATERMELON Varieties	Maturity (days)	Fusarium Wilt* Resistance	Color	Shape	Approx. wt. (lb.)
<b>Seeded Watermelons</b>					
Carnival	86	7	lt. green, striped	blocky	22-26
Crimson Sweet	88	--	green, striped	blocky round	20-30
Fiesta	88	9	dk. green, striped	blocky	22-26
Matador	95	--	dk. green	long oval	25-30
Regency	82	9	dk. green, striped	blocky oblong	18-22
Royal Majesty	90	--	green, thin stripes	long oval	30
Royal Sweet	85	7	lt. green, striped	blocky oval	20-25
Sangria	85	9	dk. green, striped	long blocky oval	20-26
Sultan	88	--	lt. green, striped	oblong	25-30
Summer Flavor 500	88	--	med. green, striped	blocky oblong	25-35
Summer Flavor 800	88	--	dk. green, striped	blocky oval	22-26
<b>Seedless Watermelons**</b>					
Crimson Trio	85	7	med. green, striped	globe	14-16
Freedom	88	--	lt. green, striped	blocky oblong	16-22
Genesis	85	--	dk. green, striped	round	15-18
Millionaire	90	7	lt. green, striped	oblong	13-20
Nova	85	--	dk. green, striped	round	14-16
Shadow	90	7	dk. green, striped	round oval	15-18
SS 5544	88	--	lt. green, striped	oblong, oval	
SummerSweet 5244	90	6	lt. green, striped	round oval	16-20
Tri-X-313	90	6	lt. green, striped	round oval	16-20
<b>Yellow-fleshed Watermelons</b>					
AU-Golden Producer	88	--	lt. green, striped	blocky round	20-30
Yellow Baby	68	--	lt. green, striped	round	9-12

**Suggested Small Ice-box Variety:** Jade Star

**Seeded Varieties for Trial:** Baron, Emperor

\* **Fusarium Wilt Resistance Ratings for Watermelon:** A score of "9" indicates excellent resistance, a rating of "1" indicates little or no resistance. Black Diamond has a rating of 1. Cultivars with a resistance rating less than "6" should not be planted in fields with a history of Fusarium wilt. See Purdue Extension publication BP-19 for a more extensive list of wilt-resistant watermelon varieties.

\*\* Pollinators must be planted with seedless varieties. Use a long watermelon such as Royal Jubilee, Royal Sweet, Sangria, or SF 500 as the pollinating variety. Crimson Sweet works well as a pollinator, but its fruit will be seeded and have a similar appearance to most seedless varieties.

## VARIETIES (CONT.)

## CUCUMBER, MUSKMELON, AND WATERMELON

A. CUCUMBER - Slicing Varieties	Season	Disease Resistance*	
Dasher II	Early	1-2-3-4-5-6	
General Lee	Main	3-4-5-6	
Lightning	Very Early	3-4-6	
Speedway	Very Early	1-2-3-4-5-6	
Thunder	Very Early	3-4-6-7	
For Trial Only: Jazzer			

  

B. CUCUMBER - Pickling Varieties	Season	Spine Color	Disease Resistance*
Calypso	Early to Mid	White	1-2-3-4-5-6
Carolina	Mid	White	1-2-3-4-5-6
Fancipak M	Early to Mid	White	1-2-3-4-5-6
Green Spear 14	Mid	White	1-3-4-5-6
Score**	Early	White	1-2-3-4-5

\*Degree of resistance varies according to variety. Disease resistance codes are as follows: 1) angular leaf spot, 2) anthracnose, 3) cucumber mosaic virus, 4) scab, 5) downy mildew, 6) powdery mildew, 7) zucchini yellow mosaic virus.

\*\* Machine harvest only.

## SPACING

**Muskmelons:** Rows 5 to 7 ft. apart. Plants 3 to 5 ft. apart in row. 1 to 2 plants per hill. Plastic mulch is recommended. Clear mulch is suggested only for earliest plantings in northern areas.

**Watermelons:** Rows 6 to 12 ft. apart. Plants 3 to 6 ft. apart in row. One plant per hill. Plastic mulch is recommended.

**Cucumbers:** Rows 4 to 6 ft. apart. Plants 15 to 18 in. apart in row. Pickles (Machine harvest): Rows 18 to 20 in. apart. Plants 5 to 7 in. apart in row. Cucumbers should be planted after the danger of frost is past since they are not frost tolerant. For proper germination, soil temperature must be *above* 60°F. Planting too early when the soil is too cold and wet will result in poor seedling emergence.

## FERTILIZING

**Lime:** To maintain a soil pH of 6.0 to 6.5. Muskmelon in particular is very sensitive to low soil pH and should be limed to 6.3 to 6.8. If your soil test indicates less than 70 ppm magnesium, use dolomitic limestone, or apply 50 lb. Mg per acre broadcast preplant incorporated.

**Preplant:** N, 40 to 60 lb. per acre; P<sub>2</sub>O<sub>5</sub>, 0 to 150 lb. per acre; K<sub>2</sub>O, 0 to 200 lb. per acre. Adjust according to soil type, previous management, and soil test results for your state. For transplants, a starter solution at the rate of 1 cup (8 oz.) per plant is recommended. See p. 3 for fertilizer type suggestions. If the transplant flat receives a heavy fertilizer feeding just prior to setting the starter solution can be eliminated.

**Sidedress N:** Apply 45 lb. N per acre in a band to either side of the row when plants are rapidly vining. At least half of the nitrogen should be in the nitrate (NO<sub>3</sub>) form. For direct seeded watermelon, the preplant N application can be replaced by an early sidedressing of 40 lb. N per acre when plants show the first set of true leaves followed by the 45 lb. N rate at the rapid vining stage of growth. If heavy rains occur in June, 30 lb. N per acre should be applied through the irrigation system at fruit set (late June - early July).

For muskmelons and cucumbers grown on plastic mulch, the N rate can be reduced because N losses from leaching are greatly reduced. For this culture system, apply 50 lb. N per acre broadcast preplant over the row just prior to laying the plastic. Sidedress 30 lb. N per acre on either side of the plastic at vining when the plant roots have reached the edge of the plastic (mid June). If you are using trickle irrigation, then apply the 50 lb. N per acre preplant and apply 0.5 to 1 lb. N per acre daily or 3 to 6 lb. N on a weekly basis through the trickle system until fruit are about 2 inches in diameter.

## IRRIGATION

**Cucumbers:** Maximum yields and fruit quality will only result if the plants receive adequate and timely moisture. Depending upon your soil type, approximately 1 to 2 in. of water per week is needed to obtain high quality cucumbers. An irregular water supply, particularly during blossoming and fruit development, can detrimentally affect fruit quality and result in increased nubs or hooked fruit.

**Muskmelons:** Muskmelon are moderately deep rooted and require adequate soil moisture with good drainage. Natural rainfall may not be adequate. Supplemental irrigation may be required, particularly in the early stages of growth. When irrigating, irrigate the soil in the effective root zone to field capacity. A good steady moisture supply is critical for good melon production. After melons have attained a good size, it is best if irrigation is reduced. Reduced irrigation at this time can in some cases increase the sugar content of the mature fruit. Excessive moisture during fruit ripening can result in poor fruit quality.

**Watermelons:** Watermelons are deep-rooted plants, so natural rainfall often is adequate, and irrigation may not be cost effective on heavier soils. Adequate soil moisture in the early growth stages will help to ensure vigorous growth and is also critical during blossoming and fruit development.

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## HARVESTING

**Cucumbers:** Unless a once-over mechanical harvester is being used, cucumbers should be harvested at 2-4 day intervals to prevent losses from oversized and overmature fruit. Desired harvest size ranges from 5 to 8 in. long and 1.5 to 2 in. in diameter for fresh market. If growing for a processor, be sure to understand the specific terms of their contract at the beginning of the growing season. Prices received are related to the quantity of fruit within specific size ranges as established by either USDA guidelines or by a processor.

**Muskmelons:** Harvesting is done manually, and great care must be exercised at picking to harvest only the physiologically mature plants. Fruits must be in the half or full slip state. Fruit harvested prior to the half slip stage will be too green and will not ripen properly. The shipping of undermature fruit has been a problem and should be avoided.

**Watermelons:** Harvesting watermelons at the correct stage of maturity is critical and difficult. While each cultivar is different, maturity can be determined in several ways. Ground spots changing in color from white to yellow, browning of tendrils nearest the fruit, ridges on the rind surface, and a hollow or dull sound when “thumped” all indicate correct maturity. Melons should be cut from the plant to avoid vine damage and prevent stem-end rot.

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## DISEASE MANAGEMENT WITH THE MELCAST SYSTEM

**MELCAST** is a disease warning system that can help Indiana farmers schedule their fungicide applications for control of certain diseases of watermelons and muskmelons. The system was developed by researchers in the Department of Botany and Plant Pathology at Purdue University. Using MELCAST each summer involves calling a toll free phone number to obtain the latest assessment of disease risk based on local weather. Educational programs that address the system are conducted each winter by Purdue University Cooperative Extension Service specialists in plant pathology. For more information about

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## DISEASE CONTROL

## CUCUMBER, MUSKMELON, AND WATERMELON

DISEASES CONTROLLED	TREATMENT	COMMENTS
Alternaria leaf blight (muskmelon)	3-4 year crop rotation.	Rotation with non-cucurbit crops will significantly reduce the threat of Alternaria in future melon crops.
<div style="border: 1px solid gray; border-radius: 10px; padding: 5px; background-color: #f0f0f0;"> <p><b>Use MELCAST for scheduling fungicide applications.</b></p> </div>	<p>Bravo 500 at 2.75 to 4.25 pt. per acre, Bravo Ultrex or Equus DF at 1.8 to 2.7 lb. per acre, Bravo WS, Agronil 720 or Equus 720 at 2 to 3 pt. per acre, or Terranil Cu or Echo at labeled rates.</p> <p style="text-align: center;">OR</p> <p>Dithane M45 or DF, or Penncozeb 75DF at 2 to 3 lb. per acre, Manex at 1.2 to 1.6 qt. per acre, or Maneb 75DF or 80WP at 1 to 2 lb. per acre.</p> <p style="text-align: center;">OR</p> <p>Quadris 2.08SC at 11.0 to 15.4 fl. oz. per acre.</p> <p style="text-align: center;">OR</p> <p>Cabrio EG at 12 to 16 oz. per acre.</p>	<p>Apply protective fungicide beginning when vines touch within rows or when disease threatens. Use a 7-10 day application interval. 0 day PHI.</p> <p>Apply protective fungicide beginning when vines touch within rows or when disease threatens. Some muskmelon varieties are sensitive to Gavel 75 DF. See label for specifics. 5 day PHI.</p> <p>Do not apply Quadris more than one time before alternating with a fungicide with a different mode of action. 7-14 day application interval. 1 day PHI.</p> <p>Begin applications before disease development. Apply on a 7-14 day interval. Use no more than 4 applications of Cabrio per season. Do not apply Cabrio more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.</p>
Angular leaf spot (cucumber and muskmelon)	<p>Resistant varieties (cucumbers only).</p> <p>Kocide DF at 2 to 3 lb. per acre.</p> <p style="text-align: center;">OR</p> <p>Champion WP at 2 to 3 lb. per acre.</p>	<p>Several cucumber varieties have genetic resistance to angular leaf spot.</p> <p>Apply copper bactericides at the first sign of disease. Alternate or tank mix with fungicides to maintain protection from other diseases. Sprays will result in marginal chlorosis of leaves. 0 day PHI.</p>
Anthracnose (cucumber, muskmelon, watermelon)	<p>Resistant varieties (cucumbers only).</p> <p>3-4 year crop rotation.</p>	<p>Many cucumber varieties have genetic resistance to anthracnose.</p> <p>Rotation with non-cucurbit crops will decrease the threat of anthracnose in future years.</p>
<div style="border: 1px solid gray; border-radius: 10px; padding: 5px; background-color: #f0f0f0;"> <p><b>Use MELCAST for scheduling fungicide applications.</b></p> </div>		

**CUCUMBER, MUSKMELON, AND WATERMELON**

**DISEASE CONTROL (CONT.)**

DISEASES CONTROLLED	TREATMENT	COMMENTS
Anthracnose (cucumber, muskmelon, watermelon) (cont.)	Bravo 500 at 2.25 to 2.75 pt. per acre, Bravo Ultrex at 1.4 to 1.8 lb. per acre, Bravo WS or Agronil 720 at 1.5 to 2.0 pt. per acre, or Terranil Cu or Echo at labeled rates.	0 day PHI.
	OR Dithane M45 or DF, or Penncozeb 75DF at 2 to 3 lb. per acre, Manex at 1.2 to 1.6 qt. per acre, or Maneb 75DF or 80WP at 1 to 2 lb. per acre.	5 day PHI.
	OR Quadris 2.08SC at 11.0 to 15.4 fl. oz. per acre.	Do not apply Quadris more than one time before alternating with a fungicide with a different mode of action. 7-14 day application schedule. 1 day PHI.
	Cabrio EG at 12 to 16 oz. per acre.	Begin applications before disease development. Apply on a 7-14 day interval. Use no more than 4 applications of Cabrio per season. Do not apply Cabrio more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.
Bacterial fruit blotch	Plant uncontaminated watermelon seed.	The pathogen is primarily seed-borne (introduced with contaminated watermelon seed), but may overwinter on infested plant material in greenhouses and in the field.
	If fruit blotch has occurred in the past, sanitize the greenhouse thoroughly.	
	Contaminated fields should be fall-plowed and planted to crops other than melon or cucurbits for at least 2 years.	Muskmelons may be infected, but they do not appear as disease-prone as watermelons.
	Subsequent grain crops are suggested for the rotation so that broadleaf herbicides will kill volunteer watermelon seedlings in the spring.	Copper applications may be effective in reducing losses only if the disease is diagnosed early, and sprays are applied before widespread infection has occurred. Repeated use of Copper may result in a reduction of watermelon yield. Copper will not provide
In situations where fruit blotch threatens, applications of copper hydroxide at 10-14 day intervals beginning at fruit set may help reduce the rate of spread of the disease.		

DISEASES CONTROLLED	TREATMENT	COMMENTS
Bacterial fruit blotch (cont.)		<p>acceptable control of fungal diseases such as anthracnose or gummy stem blight.</p> <p>Transplant facility treatment: Copper bacteriacides that are specifically labeled for use in the greenhouse may help slow the spread of bacterial fruit blotch. Growers should be careful to adapt label rates and practices to greenhouse use.</p>
Bacterial wilt (cucumber and muskmelon)	<p>A systemic insecticide (Furadan) should be incorporated into soil before transplanting. contact insecticides should be applied to seedlings before transplanting and then continued on a regular basis after the systemic insecticide loses effectiveness (2-3 weeks).</p>	<p>Control of this disease depends on control of striped and spotted cucumber beetles. Fields should be scouted regularly for the presence of beetles. Insecticides should be applied only when beetles are present. When large numbers are present, treatments may be required twice weekly.</p>
Downy mildew (cucumber, muskmelon, watermelon)	<p>Resistant varieties.</p> <p>Ridomil Gold Bravo at 2 lb. per acre, or Ridomil Gold MZ at 1.5 to 2 lb. per acre.</p> <p style="text-align: center;">OR</p> <p>Maneb 75 DF at 1 to 2 lb. per acre, or Dithane at 1.6 to 2.4 qt. or 2 to 3 lb. per acre or Gavel 75 DF at 1.5 to 2 lb. per acre.</p> <p style="text-align: center;">OR</p> <p>Agronil, Bravo, Echo, Equus, or Terranil Cu at labeled rates.</p> <p style="text-align: center;">OR</p> <p>Quadris 2.08SC at 11.0 to 15.4 fl. oz. per acre.</p> <p style="text-align: center;">OR</p> <p>Aliette at 2 to 5 lb. per acre. Use 2 to 3 lb. rate when tank mixed with another fungicide registered for use on cucurbits. Use 3 to 5 lb. rate when used alone.</p> <p style="text-align: center;">OR</p>	<p>Several cucumber varieties have genetic resistance to downy mildew.</p> <p>Alternate with protective fungicide. 0 day PHI for Ridomil Bold Bravo, 5 days for MZ.</p> <p>Apply protective fungicide beginning when vines touch within rows or when disease threatens. Some muskmelon varieties are sensitive to Gavel 75 DF. See label for specifics. 5 day PHI.</p> <p>See anthracnose for rates. 0 day PHI.</p> <p>Alternate with other fungicides, but not with Flint. 5-7 day application schedule. 1 day PHI.</p> <p>Use 7-14 day interval. 12 hour PHI.</p>

**CUCUMBER, MUSKMELON, AND WATERMELON**

**DISEASE CONTROL (CONT.)**

DISEASES CONTROLLED	TREATMENT	COMMENTS
Downy mildew (cucumber, muskmelon, watermelon) (cont.)	Flint at 4.0 oz. per acre.	Use a 7-14 day interval. Do not apply Flint more than one time before alternating with a fungicide with a different mode of action. Do not alternate with Quadris. 0 day PHI.
	OR	
	Cabrio EG at 8 to 12 oz. per acre.	Begin applications before disease development. Apply on a 7-14 day interval. Use no more than 4 applications of Cabrio per season. Do not apply Cabrio more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.
Fusarium wilt (muskmelon)	Use resistant muskmelon cultivars: Legend, Eclipse, and Superstar.	These cultivars have good resistance to strains of Fusarium found in Indiana and Illinois.
Fusarium wilt (watermelons)	Use watermelon cultivars with partial resistance: Royal Jubilee, Royal Star, Royal Sweet, and Sangria. Check table on page 58.	Rotation with non-cucurbit crops will decrease incidence of wilt.
Gummy stem blight (cucumber, muskmelon, watermelon)	3-4 year crop rotation.	Rotation with other crops will significantly decrease the threat of gummy stem blight in future years.
	Apply chlorothalonil products at rates listed under Alternaria leaf blight.	0 day PHI.
	OR	
	Apply mancozeb products at rates listed under Alternaria leaf blight.	5 day PHI.
	OR	
	Quadris 2.08SC at 11.0 to 15.4 fl. oz. per acre.	Do not apply Quadris more than one time before alternating with a fungicide with a different mode of action 7-14 day application schedule. 1 day PHI.
	Cabrio EG at 12 to 16 oz. per acre.	Begin applications before disease development. Apply on a 7-14 day interval. Use no more than 4 applications of Cabrio per season. Do not apply cabrio more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.

**DISEASE CONTROL (CONT.)**

**CUCUMBER, MUSKMELON, AND WATERMELON**

DISEASES CONTROLLED	TREATMENT	COMMENTS
Nematodes (muskmelon and watermelon)	Methyl bromide. OR Telone II or Telone C-35. OR Sodium methyl dithiocarbamate. OR Vydate L at 1 to 2 gal. per acre in 20 gal. water broadcast. Incorporate 2 to 4 inches.	Methyl bromide and Sodium methyl dithiocarbamate give best results when nematode populations are moderate to high. Vydate gives adequate control when nematode populations are low to moderate and most of all product is applied under plastic mulch.  Apply in spring before planting.
Phytophthora fruit and root rot	Crop rotations of 4 years or longer.  Avoid fields with a history of the disease on cucurbits, eggplants, peppers and tomatoes.	No resistant variety is available. No adequately effective fungicide is available.
Powdery mildew (cucumber and muskmelon)	Use resistant varieties whenever possible.  Procure 50 WS at 4 to 8 oz. per acre. OR Nova 40 W at 2.5 to 5 oz. per acre.  OR Topsin 70WSB at 4 oz. per acre or Topsin 40W at 1/4 to 1/2 lb. per acre.  OR  Quadris 2.08SC at 11.0 to 15.4 fl. oz. per acre. OR  Flint at 1.5 to 2.0 oz. per acre.  OR	Many cucumber and muskmelon varieties are resistant to powdery mildew.  Make initial application 7-10 days before first harvest for muskmelon. Make a second application 2-3 weeks later. 0 day PHI.  The fungi which cause powdery mildew may become resistant to the systemic fungicides listed here unless precautions are taken. It is a good idea to always alternate between fungicides with different modes of action. Cabrio, Flint, and Quadris have the same mode of action and must never be applied in back to back sequence. Similarly, Nova and Procure 50WS have the same mode of action. Topsin has yet a different mode of action.  Alternate with fungicides with a different mode of action. 5-7 day application interval. 1 day PHI.  Use 7-14 day interval. Do not make consecutive applications. Alternate with fungicides with a different mode of action. 0 day PHI.

DISEASES CONTROLLED	TREATMENT**	COMMENTS
Powdery mildew (cucumber and muskmelon) (cont.)	Cabrio EG at 12 to 14 oz. per acre.	Begin applications before disease development. Apply on a 7-14 day interval. Use no more than 4 applications of Cabrio per season. Do not apply Cabrio more than once before alternating to a fungicide with a different mode of action. See label to avoid practices that could result in crop injury. 0 day PHI.
Scab (cucumber)	Resistant varieties.	Several cucumber varieties are resistant to scab infection.
	3-4 year crop rotation.	Rotation will significantly reduce the threat of scab infection in subsequent cucumber crops.
	Bravo 500 at 2.75 to 4.25 pt. per acre, Bravo Ultrex at 1.8 to 2.7 lb. per acre, Bravo WS at 2 to 3 pt. per acre, or Terranil or Echo at labeled rates.	0 day PHI.
	OR	
	Dithane M45 or DF or Penncozeb 75DF at 2 to 3 lb. per acre, Dithane F45 at 1.2 to 2.4 qt. per acre, Manex at 1.2 to 1.6 qt. per acre, or Maneb 75DF or 80WP at 1 to 2 lb. per acre.	Apply fungicides on a 7-14 day schedule. 5 day PHI for mancozeb fungicides.
	OR	
	Quadris 2.08SC at 11.0 to 15.4 fl. oz. per acre.	Do not apply Quadris more than one time before alternating with a fungicide with a different mode of action. 7-14 day application schedule. 1 day PHI.
Virus diseases	Apply insecticides for aphid and cucumber beetle control since viruses are transmitted by these insects.	Several virus diseases, including cucumber mosaic virus, watermelon mosaic virus, squash mosaic virus, and zucchini yellow mosaic virus, can occur in the Midwest. Squash mosaic virus is seed transmitted. Inspect seedlings and discard those with virus-like symptoms. Obtain seed from reliable sources.
	Insect control will not be effective in reducing virus incidence in late-season cucurbits.	

## WEED CONTROL

## CUCUMBER, MUSKMELON, AND WATERMELON

HERBICIDE*	TREATMENT**	COMMENTS
<u>PREEMERGENCE</u>		
Alanap 2L	6 to 8 qt. per acre. Use lower rate on light-colored sandy soils (less than 1% organic matter).	Normally tank mixed with Prefar. A second broadcast application of Alanap made just before plants vine will give some control of small broadleaves. Not recommended for early spring use due to potential for crop injury.
Prefar 4E	5 qt. per acre on light-colored sandy soils, 6 qt. on other soils.	Apply before seeding or transplanting and incorporate lightly.
Curbit 3EC	3 to 4 pt. per acre.	<b>Direct seeded:</b> Use low rate on light soil. Apply to soil surface within 2 days after seeding. Do not incorporate. Needs 1/2 in. water within 5 days to activate. If no rain occurs, cultivate shallowly. <b>Transplants:</b> Apply as a banded spray to soil between rows of plastic mulch. <b>Do not</b> apply over or under hot caps, row covers, or plastic mulch. <b>Do not</b> broadcast over top of plants.
Dacthal 75WP	8 lb. per acre on light-colored soils (less than 1.5% organic), 14 lb. on darker colored soils in at least 50 gal. water.	<b>Direct seeded crop:</b> Apply to soil (no emerged weeds) after plants have 4 to 5 true leaves. Apply to moist soil or irrigate lightly after application to improve weed control. May be applied between rows of plastic mulch.
Command 3ME	0.4 pt. per acre, up to 1 pt. for cucumbers.	Apply prior to seeding or transplanting, or after seeding before crop emerges.
Strategy	2 to 6 pt. per acre. Use lower rates on coarse soils.	<b>Direct seeded:</b> Apply after planting before crop emerges. <b>Transplants:</b> Apply after transplanting as a banded spray between rows. If no rain within 5 days of application, shallow incorporation will improve control. Do not incorporate prior to planting. Do not apply under or over plastic mulch and do not use under row covers or hot caps. Under cool temperatures may cause crop injury or failure. 45 day PHI for cucumbers.

\* For specific weeds controlled by each herbicide, check table on page 29.

\*\* Rates given are for overall coverage. For band treatment, reduce amounts according to the portion of acre treated.

**CUCUMBER, MUSKMELON, AND WATERMELON**

**WEED CONTROL (CONT.)**

<b>HERBICIDE*</b>	<b>TREATMENT</b>	<b>COMMENTS</b>
<u>POSTEMERGENCE</u>		
Poast 1.5E	1 to 1.5 pt. per acre plus 1 qt. COC per acre.	Apply to actively growing grasses. Maximum of 3 pt. per acre per season. 14 day PHI.
Select 2EC	6 to 8 fl. oz. for annual grasses; 8 fl. oz. for perennial grasses; plus 1 qt. COC per 25 gal. spray solution (1% v/v).	Apply to actively growing grasses. Wait at least 14 days between applications. Maximum 32 fl. oz. per seeseason. 14 day PHI.

NON-SELECTIVE HERBICIDES

paraquat	1.6 to 3.2 pt. per acre of 2.5L or 1.3 to 2.7 pt. per acre of 3L plus 1 qt. COC or 4 to 8 fl. oz. nonionic surfactant per 25 gal. spray solution.	Apply to emerged weeds before seeding or transplanting or after seeding but before crop emergence. RUP. Some formulations allow post directed spray for muskmelons and watermelons, check label.
glyphosate	0.75 to 1.1 lb. acid equivalent (ae) per acre, equivalent to: 32 to 48 fl. oz. of 3 lb. ae/gal.; 26 to 40 fl. oz. of 3.7 lb. ae/gal.; 24 to 36 fl. oz. of 4 lb. ae/gal.; 1.2 to 1.8 lb. of 64.9% ae WSG.	Some formulations permit spot spray application - check label. Apply to emerged weeds at least 3 days before planting the crop. These rates are for annual weeds at application volumes of 10-40 gal. per acre. See label for rates at lower application volumes, for perennial weeds, and suggested adjuvants.

\* For specific weeds controlled by each herbicide, check table on page 29.

\*\* Rates given are for overall coverage. For band treatment, reduce amounts according to the portion of acre treated.

<b>INSECTS CONTROLLED</b>	<b>TREATMENT</b>	<b>COMMENTS</b>
Seed corn maggots and cucumber beetles in seed beds	Treat seeds with a combination fungicide-insecticide, such as captan-lindane, at 1 oz. per 25 lb. of seed. AND Spray emerging seedlings with a mixture of 3 tablespoons methoxychlor 50WP per 2 gal. of water <i>plus</i> an approved fungicide at a rate of 2 gal. of water.	Early clean plowing of cover crops will generally result in less damage to seedling plants in the field.  This is enough spray to treat one 10-sash bed, or about 400 sq. ft. Do not expect a fumigant used on the soil-manure mixture before seeding to protect seedling plants because flies can continue to lay eggs after plant emergence. Use low pressure when spraying to avoid seedling injury.

**INSECT CONTROL (CONT.)**

**CUCUMBER, MUSKMELON, AND WATERMELON**

INSECTS CONTROLLED	TREATMENT	COMMENTS
Cucumber beetles	Admire 2F at 16 to 24 fl. oz. per acre.	Apply pre-plant in a 2 inch or smaller band, as an in-furrow spray at planting, as a post-plant drench, as a sidedress application, or through trickle irrigation water. Do not exceed 24 fl. oz. per acre per season. 21 day PHI.
	Furadan 4F at 2.5 fl. oz. per 1000 linear feet of row.	Apply directly into seed furrow or as a 7-inch band over the row. This application is for seedling protection and beetle control after seedlings emerge or as transplants become established. <b>Indiana and Illinois only.</b>
Cucumber beetles and other insects listed on the labels	Monitoring.	Fields should be monitored frequently (2-3 times per week) to detect mass emergence of beetles in the spring. Insecticide applications should be focused on periods of heavy beetle activity. Evening sprays will reduce bee kill.
	<i>Apply throughout the season when beetles exceed threshold.</i>	If Furadan 4F was applied just before or during transplanting, plants will need one spray to protect plants until plant uptake of Furadan has occurred.
	Adios at 0.5 to 0.75 lb. per acre. OR	Apply when beetle populations reach economic thresholds. 0 day PHI.
	Pounce 3.2EC at 4 to 8 fl. oz., or 25WP at 6.4 to 12.8 oz. per acre. OR	Apply a minimum of 4 gal. finished spray per acre by air or 20 gal. finished spray per acre with ground equipment. 0 day PHI.
	Ambush 2EC at 6.4 to 12.8 fl. oz. OR	Apply with ground equipment, using sufficient water to obtain full coverage of foliage. Do not apply more than 1.6 lb. a.i. per acre per season. 0 day PHI.
	Capture 2EC at 2.6 to 6.4 fl. oz. per acre per season. OR Asana XL at 5.8 to 9.6 fl. oz. per acre. OR	Do not exceed 19.2 fl. oz. per acre per season. 3 day PHI.  0.25 lb. a.i. per acre per season. 3 day PHI.

INSECTS CONTROLLED	TREATMENT	COMMENTS	
Cucumber beetles and other insects listed on the labels (cont.)	Sevin 50 WP at 2 lb. or XLR Plus at 1 qt. per acre.	Some phytotoxicity may result when carbaryl is applied during hot humid weather, especially on seedlings and newly set plants. Carbaryl may be highly toxic to bees visiting plants during bloom. 3 day PHI.	
<div style="border: 1px solid black; border-radius: 10px; padding: 10px; background-color: #f0f0f0;"> <p><b>Thresholds</b></p> <p><b>Cantaloupe and Cucumber - 1 beetle/plant</b></p> <p><b>Watermelon - 5 beetles/plant</b></p> </div>	OR	Relatively non-toxic to bees. 7 day PHI.	
	Methoxychlor 2EC at 2 to 6 qt. pr acre.	OR	Do not exceed 6 applications or 3 lb. a.i. per acre per season. 2 day PHI.
	Thiodan, Endosulfan, or Phaser 50WP at 1 to 2 lb. or 3EC at 0.6 to 1.3 qt. per acre.	OR	3 day PHI for melons, not for cucumbers.
	Diazinon AG500 at 1 pt. or 50WP at 1 lb. per acre.	Conserve natural enemies.	Limiting the use of insecticides will conserve predators and parasites that help keep aphid populations under control.
	Aphids	Monitoring.	Look for the presence of predators or parasitized aphids. Several predators per aphid colony will probably bring the aphid population under control without insecticide. Virus diseases carried by aphids <b>cannot</b> be prevented by killing aphids with insecticides.
	Admire 2F at 16 to 24 fl. oz. per acre.	Apply pre-plant in a 2 inch or smaller band, as an in-furrow spray at planting, as a post-plant drench, as a sidedress application, or through trickle irrigation water. Do not exceed 24 fl. oz. per acre per season. 21 day PHI.	
	OR		
	Thiodan, endosulfan, or Phaser 50WP at 1 to 2 lb. or 3EC at 0.6 to 1.3 qt. per acre.	2 day PHI.	
	OR		
	Dimethoate at 1.5 pt. per acre.	<b>Do not use on cucumbers.</b> 3 day PHI.	
	OR		
	Capture 2EC at 2.6 to 6.4 fl. oz. per acre per season.	Do not exceed 19.2 fl. oz. per acre per season. 3 day PHI.	
	OR		
	Fulfill 50WG at 2.75 oz. per acre.	Do not exceed 5.5 oz. per acre per season. 0 day PHI.	
	OR		

**INSECT CONTROL (CONT.)**

**CUCUMBER, MUSKMELON, AND WATERMELON**

INSECTS CONTROLLED	TREATMENT	COMMENTS
Aphids (cont.)	M-Pede at 1 to 2% by volume. OR	Must contact aphids to be effective. 0 day PHI.
	Metasystox-R 2SC at 2 pt. per acre. OR	14 day PHI for muskmelon, 7 day PHI for watermelons, and 3 day PHI for cucumbers.
	Actara 25 WDG at 2-3 oz. per acre.	Do not exceed 8.0 oz. per acre per season. 0 day PHI.
Mites	Kelthane 35WP at 1 to 1.6 lb. per acre. OR	2 day PHI.
	Dimethoate at 1.5 pt. per acre. OR	<b>Do not use on cucumbers.</b> 3 day PHI.
	Agri-mek 0.15EC at 8 to 16 fl. oz. per acre. OR	Do not exceed 48 fl. oz. per acre per season. Allow at least 7 days between applications. Do not make more than two sequential applications. 7 day PHI.
	Capture 2EC at 5.2 to 6.4 fl. oz. per acre. OR	Do not exceed 19.2 fl. oz. per acre per season. 3 day PHI.
	Danitol 2.4EC at 10 2/3 fl. oz. per acre.	Do not exceed 42 2/3 fl. oz. per acre per season. 7 day PHI.
Whiteflies	Admire 2F at 16 to 24 fl. oz. per acre. OR	Apply pre-plant in a 2 inch or smaller band, as an in-furrow spray at planting, as a post-plant drench, as a sidedress application, or through trickle irrigation water. Do not exceed 24 fl. oz. Admire or 8.0 fl. oz. Platinum acre per season. 21 day PHI for Admire. 30 day PHI for Platinum.
	Platinum 2SC at 5 to 8 fl. oz. per acre.	
	Capture 2EC at 5.2 to 6.4 fl. oz. per acre. OR	Do not exceed 19.2 fl. oz. per acre per season. 3 day PHI.
	Align or Neemix according to label directions. OR	0 day PHI.
	M-Pede at 1.25 fl. oz. pr 50 gal. water. OR	Must contact whiteflies to be effective. 0 day PHI.
	Actara 25WDG at 3 to 4 oz. per acre.	Do not exceed 8.0 oz. per acre per season. 0 day PHI.