

Cole Crops and Brassica Leafy Greens

Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Collards, Kale, Mustard, and Turnip Greens

BROCCOLI Varieties	Maturity	Comments
Leprechaun	early	Large beads, slightly domed
Regal	early	Medium to small beads, firm domed heads, side shoots
Green Comet	early	Excellent center head and large side shoots
Emperor	early-mid	Few side shoots
Green Valiant	mid	Small beads, firm head
Premium Crop	mid	Large center heads, few side shoots
Goliath	mid	Large, tight heads
Gypsy	mid	Smooth, domed heads
Marathon	late	Domed
Triathlon	late	Excellent crown cut or bunching broccoli in Missouri
Arcadia	late	Small beads, very domed

BRUSSELS SPROUTS Varieties	Maturity	Comments
Prince Marvel	medium	Medium sprouts, large plants
Oliver	early	Large sprouts, short plants
Dasher	late	Medium sprouts
Jade Cross	early	

CABBAGE Varieties	Season	Head Size	Yellows Resistance	Remarks
Green				
Stone Head	very early	small	no	Solid head for an early type
Head Start	early	medium	no	Excellent field holding for an early type
Charmant	early	small	yes	Flattened round head. Tolerant to tipburn, black speck
Conquest	main	medium	yes	
Bronco	late	medium	yes	
Green Cup	main	medium-large	yes	High tolerance to black rot' tolerant to thrips, tipburn, heat, cold.
Blue Pak	main	medium-large	yes	Good tip burn tolerance, very thrips tolerant
Cheers	late	large	yes	
Rio Verde	late	large	yes	
Hinova	late		yes	For processing, flat, rounded heads, resistant to tipburn; tolerant to black rot, black speck; susceptible to thrips
Red				
Red Acre	main	small	no	A firm head, open pollinated
Regal Red	early	medium	no	Early for a red cabbage
Ruby Perfection	late	small	no	Deep red color, thrips tolerant

CAULIFLOWER Varieties	Season	Comments
Snow Crown-F1 Hybrid	early	Good and reliable for spring and early fall production
Fremont F1	2nd early	
Snowball Y improved op	main	Forming heads should be blanched
Andes op	main	Forming heads should be blanched
White Sails F1	main	Forming heads should be blanched
Self-Blanche op	late	No tying necessary if plants are fertilized properly
Silver Streak	late	For fall harvest
For trial only: Candid Charm (2nd early), Cashmere (early), Cumberland (main), Majestic (early)		

Spacing

Broccoli: Rows 3 feet apart. Plants 12 to 18 inches apart in row.

Brussels sprouts: Rows 3 feet apart. Plants 18 to 24 inches apart in row.

Cabbage for Market: Rows 2 to 3 feet apart. Plants 12 to 15 inches apart in row.

Cabbage for Kraut: Rows 3 feet apart. Plants 18 inches apart in row.

Cauliflower: Rows 3 feet apart. Plants 15 to 18 inches apart in row.

Collards: Rows 3 to 3.5 feet apart. Plants 18 to 24 inches apart in row. Seed 1 to 2 pounds per acre.

Kale: Rows 2 to 3 feet apart. Plants 8 to 16 inches apart in row. Seed 2 to 4 pounds per acre.

Mustard: Rows 1 to 1.5 feet apart. Plants 10 to 12 inches apart in row. Seed 3 to 5 pounds per acre.

Turnip greens: Rows 6 to 12 inches apart. Plants 1 to 4 inches apart in row.

Raised beds (6 inches high, 40 inches wide, with 2 rows 11 inches apart on beds) may be desirable under certain conditions.

Fertilizing

Lime: To maintain a soil pH of 6.0 to 6.5.

Preplant

Cole crops (broccoli, cabbage, cauliflower, and Brussels sprouts)

N: 120 pounds per acre if soil organic matter less than 3 percent, and 80 pounds per acre if soil organic matter greater than 3 percent. **P₂O₅:** 25 to 200 pounds per acre. **K₂O:** 0 to 250 pounds per acre. Cole crops, particularly cauliflower, are responsive to B on low organic matter soils, sandy soils, or where the pH is greater than 7.0. If B is needed, apply 1 to 2 pounds B per acre broadcast. Soil test and/or perform plant analysis on the previous crop to be sure B is needed. High soil B can be detrimental to rotational crops such as sweet corn, peas, or beans.

Greens (collards, kale, and mustard)

N: 60 pounds per acre. **P₂O₅:** 0 to 150 pounds per acre. **K₂O:** 0 to 200 pounds per acre.

All crops

Adjust recommendations according to soil type, previous management, and soil test results for your state. For transplants, set each plant with 1 cup (8

ounces) of starter solution. See page 8 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

Cole crops

60 pounds N per acre, two to three weeks after setting the transplants and when rapid growth has begun. Eliminate sidedressing if following soybeans. If leaching is likely on sandy soils, apply an additional 30 pounds N as a sidedress. Avoid excessive N fertilization with broccoli as it can cause too rapid growth and a hollow flower stalk.

Greens




30 pounds N per acre on soils with more than 3 percent organic matter and following soybeans, alfalfa, or a grass-legume hay crop. For greens on soils with less than 3 percent organic matter and following those crops, apply 45 pounds N per acre. For greens following corn, small grains, or a vegetable crop, apply 60 pounds N per acre.


Harvesting

Broccoli: Harvesting is done by hand while the head is still compact and before the flowers open. The central heads should be dark blue or green and 4 to 6 inches across when mature. If harvesting too late or when the heads are over mature, woodiness in the stems will develop. Depending on your marketing requirements, the main head is cut with 8 to 10 inches of stem. Sometimes a second harvest of side shoots can be obtained. Broccoli for processing should be cut with less attached stem (6 to 7 inches) and with few or no leaves. Fresh market broccoli should be cut longer, with little trimming. Broccoli quality is based on the degree of compactness, leafiness, head trimness, damage, and freedom from insects and extraneous debris.

Cauliflower: When ready to harvest, the heads should be compact and clear white. The heads become discolored and develop an undesirable flavor when exposed to sunlight. The longest leaves are normally tied loosely together over the head to “blanch” and prevent the head from being exposed to the sun. The desirable harvest size is a diameter of approximately 6 inches. Delaying harvest usually will not result in obtaining larger heads. Instead, consider proper cultivar selection and plant spacing. Cauliflower should be hand-harvested and cut with 1 to 2 whorls of leaves to protect the head.

Disease Control

Diseases Controlled	Treatment	Comments
Alternaria Leaf Spot	3-4 year crop rotation.	Rotate to non-cruciferous crops.
	Cabrio® at the following rates: Turnip greens: 8-12 oz. per acre. All others: 12-16 oz. per acre.	3-day PHI for collard, kale, and mustard. 0-day PHI for all others.
	Several chlorothalonil (e.g., Bravo®, Echo®, Equus®) formulations are labeled at 1.4 lbs. per acre for most dry formulations (WP, DF, or DG) and 1.5 pts. per acre for most flowable (F) formulations. Not for use on collard, kale, mustard, or turnip greens.	7-day PHI.
	Endura 70WG® at 6-9 oz. per acre. Not for turnip greens.	14-day PHI for collard, kale, and mustard. 0-day PHI for all others.
	 Quadris® at 6.2-15.4 fl oz per acre.	Do not apply more than once before alternating to a fungicide with a different mode of action. 0-day PHI.
	Reason® at 8.2 fl. oz. per acre.	Do not apply more than once before alternating to a fungicide with a different mode of action. 2-day PHI.
	Ridomil Gold Bravo® at 1.5 lbs. per acre. Not for collard, kale, mustard, or turnip greens.	7-day PHI.
	 Switch® at 11-14 oz per acre.	After 2 applications alternate with a fungicide with a different mode of action. 7-day PHI.
Black Leg	An important disease of broccoli, Brussels sprouts, cauliflower, and turnip.	Since oilseed rape is particularly susceptible to black leg, avoid planting crucifer crops close to oilseed rape.
	3-4 year crop rotation.	Rotate to non-cruciferous crops.
	Plant disease-free seeds or transplants.	Hot water seed treatment helps eliminate seed-borne pathogens.
	Cabrio® at 12-16 oz. per acre. Not for kale, mustard greens, collards, or turnip.	0-day PHI
	Rovral® at 2 pts. per acre for flowable (F) formulations or 1.3 lbs. per acre for dry formulations Broccoli only.	Apply to young plants (2-4 leaf stage) immediately after thinning. A second application may be made until the day of harvest. 0-day PHI.
Black Rot	3-4 year crop rotation.	Rotate to non-cruciferous crops.
	Plant disease-free seeds or transplants.	Hot water seed treatment helps eliminate seed-borne pathogens.
	Plant disease-resistant cabbage varieties.	Several varieties with partial resistance are available.
	Actigard® at 0.5-1 oz. per acre. Suppression only.	See label restrictions if downy mildew present. Do not apply to stressed plants. 7-day PHI.
	 Fixed copper formulations at various rates. Read labels carefully to make sure your crop is included.	Copper applications may slow the spread of black rot.
Club Root	Plant only disease-free transplants.	Club root may be brought in with diseased transplants.
	Cultural controls.	Rotate crops 7 years or more with a non-cruciferous crop between plantings. Avoid poorly drained soils with a history of club root. Serious losses can be avoided by raising the pH to 7.2-7.5.
	Terraclor® flowable fungicide. Rate depends on application method. Not for collards, kale, mustard greens, or turnip.	Terraclor® may be used in a transplant solution or in a band or broadcast application at planting.

 May be acceptable for use in certified organic production. Check with your certifier before use.

 This is a reduced-risk pesticide. See pages 23-24 for details.

Cole Crops and Brassica Leafy Greens (continued)

Disease Control (continued)

Diseases Controlled	Treatment	Comments
Downy Mildew	2-3 year crop rotation.	Rotating to non-cruciferous crops may reduce pathogen populations and increase fungicide efficacy.
	Plant disease-resistant broccoli varieties.	Several broccoli varieties with resistance are available.
	Actigard® at 0.5-1 oz. per acre.	Do not apply to plants stressed by drought, herbicide injury or other factors. See label for other important information. 7-day PHI.
	Aliette® at 2-5 lbs. per acre. Not for turnip.	Label includes several different crops, PHIs, resistance instructions, and other important information.
	BP Agri-Fos 400® at 1.25-2.5 qt. per acre. Not for turnip greens.	Label includes several different crops, PHIs, resistance instructions, and other important information.
	Cabrio® at the following rates: Turnip greens: 8-12 oz. per acre. All others: 12-16 oz. per acre.	3-day PHI for collard, kale, and mustard. 0-day PHI for all others.
	Several chlorothalonil (e.g., Bravo®, Echo®, Equus®) formulations are labeled for use at a variety of rates. Not for collard, kale, mustard or turnip greens.	7-day PHI.
	BP Phostrol® at 2.5-5 pt. per acre Not for turnip greens.	Label includes several different crops, PHIs, resistance instructions, and other important information.
	Presidio® at 3-4 oz. per acre	2-day PHI.
	Prophyt® at 2-4 pt. per acre. Not for turnip greens.	Label includes several different crops, PHIs, resistance instructions, and other important information.
	RR Quadris® at 6.2-15.4 fl. oz per acre.	Do not apply more than once before alternating to a fungicide with a different mode of action. 0-day PHI.
	Reason® at 5.5-8.2 fl. oz per acre.	Do not apply more than once before alternating to a fungicide with a different mode of action. 2-day PHI.
RR Revus 2.09SC® at 8 fl. oz. per acre. Not for turnip greens.	1-day PHI.	
Ridomil Gold Bravo® at 1.5 lbs. per acre. Not for collard, kale, mustard or turnip greens.	7-day PHI.	
Fusarium Yellows	Plant yellows-resistant varieties.	Many resistant varieties are available.
Powdery Mildew	Cabrio® at the following rates: Turnip greens: 8-12 oz. per acre. All others: 12-16 oz. per acre.	3-day PHI for collard, kale, and mustard; 0-day PHI for all others.
	Endura 70WG® at 6-9 oz. per acre. Not for turnip greens. Suppression only.	0-day PHI for broccoli, Brussels sprouts, cabbage, and cauliflower; 14-day PHI for all others. No more than 2 applications per season.
	Microthiol Special® at 3-10 lbs. per acre.	Apply at early leaf stage and repeat every 10-14 days or as needed.
Rhizoctonia Diseases	Sanitation	Clean and sanitize transplant trays, benches etc.
	Bottom Rot: Endura 70 WG® at 6-9 oz. per acre. Not for turnip greens. Suppression only.	0-day PHI for broccoli, Brussels sprouts, cabbage, and cauliflower; 14-day PHI for all others. No more than 2 applications per season.
	Rhizoctonia blight: Cabrio® at the following rates: Turnip greens: 8-12 oz. per acre. All others: 12-16 oz. per acre.	3-day PHI for collard, kale, and mustard. 0-day PHI for other crops.
Sclerotinia Stem Rot	Endura 70WG® at 6-9 oz. per acre. Not for turnip greens.	0-day PHI for broccoli, Brussels sprouts, cabbage, and cauliflower; 14-day PHI for all others. No more than 2 applications per season. 0-day PHI.
Wirestem	Terraclor® flowable or granular. Rate depends on application method. Not for turnip.	Terraclor® may be used in a transplant solution or in a band or broadcast application at planting. Raise seedlings in seedbeds that are disinfected by steam or chemical fumigants.

RR This is a reduced-risk pesticide. See pages 23-24 for details.

BP This is a biopesticide, see pages 23-24 for details.











Weed Control

Weeds Controlled ¹	Treatment ²	Comments
Annuals (emerged) — treatment applied before crop emergence or transplanting	Gramoxone Inteon® 2L at 2-4 pts. per acre. Not for turnip greens.	Include 1 qt. of COC or 4-8 fl. oz. of nonionic surfactant per 25 gallons of spray solution. Apply before seeding or transplanting, or after seeding but before crop emergence. RUP.
Annuals and Perennials (emerged) — crop not present or protected from spray	Glyphosate products at 0.75-3.75 lbs. acid equivalent (ae) per acre. Use formulations containing 3 lbs. ae/gal. (4 lbs. isopropylamine salt/gal.) at 1-5 qts. per acre, or formulations containing 4.5 lbs. ae/gal. (5 lbs. potassium salt/gal.) at 0.66-3.3 qts. per acre. Not for turnip greens.	Broadcast before seeding or transplanting, after seeding but before crop emergence, or apply between crop rows with hooded or shielded sprayers. Use low rate for annuals and higher rates for perennials. See label for suggested application volume and adjuvants. 14-day PHI.
Broadleaves and Grasses (not emerged)	Command 3ME® at the following rates: Directed-seeded crops: 0.67 pt. per acre. Transplants: up to 1.3 pts. per acre. Cabbage only.	45-day PHI.
	Devrinol 50DF® at 2 lbs. per acre. Not for collards, kale, mustard greens, or turnip greens.	Apply and incorporate 1-2 inches before seeding or transplanting or apply after seeding and irrigate to wet soil 2-4 inches deep. After harvest or prior to planting succeeding crops, deep moldboard or disk plow. Do not seed alfalfa, small grains, sorghum, corn, or lettuce for 12 months after application.
	Trifluralin products at 0.5-0.75 lbs. a.i. per acre. Use 4EC formulations at 1-1.5 pts. per acre. Not for turnip greens.	Use low rate on soils with less than 2% organic matter. Apply before seeding or transplanting and incorporate 2-3 inches immediately. Not effective on muck or high organic matter soils. Delayed emergence or stunting may occur when soil is cool.
Broadleaves (not emerged or emerged)	Spartan Charge® at 2.9-15.2 fl. oz. per acre. Transplanted cabbage only. Not for broccoli, cauliflower, Brussels sprouts, collards, kale, mustard greens, or turnip greens.	Apply before transplanting, or band between rows within 72 hours after transplanting. May be incorporated no deeper than 2 inches before transplanting. Do not use on sandy soils with less than 1% organic matter. Has not been tested on all varieties. Refer to label for additional precautions. Maximum 15.2 fl. oz. per acre.
Broadleaves (not emerged)	Goal 2XL® at 1-2 pts. per acre. Not for direct-seeded crops. Not for use on Brussels sprouts, collards, kale, mustard greens, or turnip greens.	Use lower rate on coarse-textured soils. Apply after preparing soil but before transplanting. Transplant within 7 days of application.
Grasses (not emerged)	Dacthal W-75® at 6-14 lbs. per acre, or Dacthal Flowable® at 6-14 pts. per acre.	Apply at seeding or transplanting. May be incorporated. May be applied over top of transplants.
	Prefar 4E® at 5-6 qts. per acre. Not for turnip greens.	Use low rate on soils with less than 1% organic matter. Apply before planting and incorporate 1-2 inches or apply after seeding before crop emerges and irrigate within 24 hours.
Broadleaves (emerged)	Aim EC® at 0.5-2 fl. oz. per acre.	Apply with hooded sprayers as a directed application between crop rows. Use COC or nonionic surfactant. Weeds must be actively growing and less than 4 inches tall. Do not allow spray to contact crop. Do not exceed 6.1 fl. oz. per acre per season.
Grasses (emerged)	Clethodim products at the following rates: Select Max® at 9-16 fl. oz. per acre. 2EC formulations of clethodim products at 6-8 fl. oz. per acre. Use low rates for annual grasses, the high rates for perennial grasses.	Use Select Max® with 8 fl. oz. of NIS per 25 gallons of spray solution (0.25% v/v). Use 2EC formulations with 1 qt. COC per 25 gallons of spray solution (1% v/v). Spray on actively growing grass. Wait at least 14 days between applications. Do not exceed 64 fl. oz. of Select Max® per acre per season. Do not exceed 32 fl. oz. of 2EC formulations per acre per season. 14-day PHI for greens. 30-day PHI for broccoli, cauliflower, cabbage, Brussels sprouts, and kohlrabi.
	Poast 1.5E® at 1-1.5 pts. per acre, plus 1 qt. COC per acre.	Spray on actively growing grass. Use high rate on quackgrass. Do not exceed 2.5 pts. per acre per season for turnip greens, or 3 pts. per acre per season for other crops. 14-day PHI for turnip greens. 30-day PHI for other crops.


¹For specific weeds controlled by each herbicide, check Table 21 on page 39.


²Rates given are for overall coverage. For band treatment, reduce amounts according to the portion of acre treated.






Insect Control

Insects Controlled	Treatment	Comments
Aphids, Leafminers	Conserve natural enemies.	Limit the use of insecticides to conserve predators and parasites.
	 Actara® at 1.5-3 oz. per acre. Aphids only.	Do not exceed 11 oz. per acre pre season. 0-day PHI for broccoli, Brussels sprouts, cabbage and cauliflower. 7-day PHI for leafy greens.
	Admire PRO® at 4.4-10.5 fl. oz. per acre.	Do not exceed 0.38 lb. a.i. per acre per season. 21-day PHI.
	 Assail 30SG® at 2-4 oz. per acre. Aphids only.	Do not exceed 0.375 lb. a.i. per acre per season. 7-day PHI.
	Dimethoate 400® or Dimethoate 4E® at 0.5-1 pt. per acre, or Dimethoate 2.67EC® at 0.75-1.5 pts. per acre.	7-day PHI for broccoli and cauliflower. 14-day PHI for kale and mustard.
	Endosulfan 3EC® at 1-1.33 qts. per acre. Cabbage only.	Do not exceed 2.66 qts. per acre per season. 17-day PHI. Do not use after July 31, 2012.
	 Entrust® at 1.25-3 oz. per acre. Leafminers only.	Do not exceed 9 oz. per acre per season. 1-day PHI.
	 Fulfill® at 2.75 oz. per acre.	Do not exceed 5.5 oz. per acre per crop per season. 7-day PHI.
	 Movento® at 4-5 fl. oz. per acre.	1-day PHI.
	M-Pede® at 1-2% by volume.	Must contact aphids to be effective. 0-day PHI.
	Orthene 97® at 0.5-1.0 lb. per acre. Brussels sprouts and cauliflower only.	Do not exceed 2 1/8 lbs. per acre per season. 14-day PHI. RUP.
	 Platinum® at 5-11 fl. oz. per acre.	30-day PHI.
	Provado 1.6F® at 3.8 fl. oz. per acre.	Do not exceed 0.23 lb. a.i. per acre per season. 7-day PHI.
	 Radiant SC® at 6-10 fl. oz. per acre. Leafminers only.	Do not exceed 34 fl. oz. per acre per season. 1-day PHI.
	Rimon 0.83EC® at 6-12 fl. oz. per acre. Leafminers only.	Do not exceed 24 fl. oz. per acre per season. 7-day PHI.
	 SpinTor 2SC® at 4-10 fl. oz. per acre. Leafminers only.	Do not exceed 29 fl. oz. per acre per season. 1-day PHI.
	Trigard® at 2.66 oz. per acre. Leafminers only.	Do not exceed 6 applications per season. 7-day PHI.
Use when tiny worms and/or loopers first appear:	Use of some insecticides may reduce populations of beneficial insects that suppress caterpillar populations.	
Caterpillars (Imported Cabbageworms, Cabbage Loopers, Diamondback Moth Larvae. Cross-Striped Cabbageworms)	Ambush 25W® at 3.2-12.8 oz. per acre. Rate varies with crop. See label.	Do not exceed 0.8 lb. a.i. per acre per season to broccoli, cauliflower, collards, and Brussels sprouts. Do not exceed 1 lb. a.i. per acre per season for cabbage. 1-day PHI. RUP.
	Asana XI® at 2.9-9.6 fl. oz. per acre. Cole crops and collards only.	Cole crops: Do not exceed 0.4 lb. a.i. per acre per season. 3-day PHI. Collards: Do not exceed 0.2 lb. a.i. per acre per season. 7-day PHI. RUP.
	 Avaunt 30WDG® at 2.5-3.5 oz. per acre.	Do not exceed 14 oz. per acre per season. 3-day PHI.
 Several <i>Bacillus thuringiensis</i> products (Agree®, Biobit®, Dipel®, Javelin®, Lepinox®, Xentari®) are available. Follow label directions.	Begin applications when worms are small. Using <i>Bt</i> products will help conserve beneficial insects. 0-day PHI.	


 This is a reduced-risk pesticide. See pages 23-24 for details.

 This is a biopesticide, see pages 23-24 for details.

 May be acceptable for use in certified organic production. Check with your certifier before use.

Insects Controlled	Treatment	Comments
Caterpillars (Imported Cabbageworms, Cabbage Loopers, Diamondback Moth Larvae. Cross-Striped Cabbageworms) (continued)	Baythroid® at 1.6-3.2 fl. oz. per acre.	Do not exceed 12.8 fl. oz. per acre per season. 0-day PHI. RUP.
	Brigade 2EC® at 2.1-6.4 fl. oz., or Brigade WBS® at 5.3-16 oz. per acre.	Do not exceed 0.5 lb a.i. per acre per season. 7-day PHI. RUP.
	Confirm 2F® at 6.0-8.0 fl. oz. per acre.	Do not exceed 56 fl. oz. per season. 7-day PHI.
	 Coragen® at 3.5-5.0 fl. oz. per acre.	Do not exceed 15.4 fl. oz. per acre per season. 3-day PHI.
	Diazinon AG500® at 0.5-1 pt. per acre, or Diazinon 50W® at 0.5-1 lb. per acre. Diamondback moth and imported cabbageworms only.	Do not exceed 5 applications per season. 7-day PHI for broccoli, Brussels sprouts, and cauliflower. 21-day PHI for cabbage. 10-day PHI for collards, kale, and mustard. RUP.
	Endosulfan 3EC® at 1-1.33 qts. per acre. Cabbage only.	Do not exceed 2.66 qts. per acre per season. 17-day PHI. Do not use after July 31, 2012.
	 Entrust® at 1.0-2.0 oz. per acre.	Do not exceed 9 oz. per acre per season. Observe resistance management restrictions. 1-day PHI.
	 Intrepid® at 4-10 fl. oz. per acre.	1-day PHI.
	Lannate SP® at 0.5-1 lb. per acre. Add wetting agent.	Do not exceed 6.3 lbs. a.i. per acre per season for broccoli. Do not exceed 5.4 lbs. a.i. per acre per season for Brussels sprouts and collards. Do not exceed 7.2 lbs. a.i. per acre per season for cabbage and cauliflower. Do not exceed 3.6 lbs. a.i. for kale and mustard. 1-day PHI for cabbage. 3-day PHI for broccoli, Brussels sprouts and cauliflower. 10-day PHI for collards, kale, and mustard. RUP.
	Larvin 3.2® at 16-40 fl. oz. per acre. Broccoli, cabbage, and cauliflower only.	Do not exceed 160 fl. oz. per acre per season. 7-day PHI. RUP.
	Mustang MAX® at 2.24-4.0 fl. oz. per acre.	Do not exceed 0.15 lb. a.i. per acre per season. Allow 7 days between applications. 1-day PHI. RUP.
	Orthene 97® at 1 lb. per acre. Brussels sprouts and cauliflower only.	Do not exceed 2 lbs. per acre per season. 14-day PHI.
	Pounce 25WP® at 3.2-12.8 oz. per acre. Rate varies with crop. See label.	Do not exceed 0.8 lb. a.i. per acre per season to broccoli, cauliflower, collards, and Brussels sprouts. Do not exceed 1 lb. a.i. per acre per season for cabbage. 1-day PHI. RUP.
	Proclaim® at 2.4-4.8 oz. per acre.	Do not exceed 28.8 oz. per acre per season. Allow at least 7 days between applications. 7-day PHI for brassica head and stem vegetables. 14-day PHI for brassica leaf vegetables. RUP.
	 Radiant SC® at 5-10 fl. oz. per acre.	Do not exceed 34 fl. oz. per acre per season. 1-day PHI.
	Rimon 0.83EC® at 6-12 fl. oz. per acre.	Do not exceed 24 fl. oz. per acre per season. 7-day PHI.
	Sevin XLR PLUS® at 1-2 qts. per acre.	Do not exceed 6 qts. per acre per crop. 3-day PHI for broccoli, Brussels sprouts, cabbage, and cauliflower. 14-day PHI for collards, kale, and mustard.
 SpinTor 2SC® at 1.5-6 fl. oz. per acre.	Do not exceed 29 fl. oz. per acre per season. Observe resistance management restrictions. 1-day PHI.	
Warrior II® at 0.96-1.6 fl. oz. per acre. Cole crops only.	Do not exceed 15.36 fl. oz. per acre per season. 1-day PHI. RUP.	

 This is a reduced-risk pesticide. See pages 23-24 for details.

 May be acceptable for use in certified organic production. Check with your certifier before use.

Caterpillar Thresholds

Crop	Stage	% Infested	
		Diamondback Moth Larvae	Imported Cabbageworm & Cabbage Looper
Cabbage — Fresh	seed bed	not applicable	not applicable
	transplant to cupping	50% with ≥ 5 larvae/plant	30%
	cupping to early head	50% with ≥ 5 larvae/plant	20%
	early head to harvest	10% with ≥ 1 larva/plant	10%
Broccoli, Cauliflower	seedbed	10%	10%
	transplant to first curl	40%	20%
	first curd to harvest	10%	10%

Insects Controlled	Treatment	Comments
Flea Beetles	RR Actara® at 1.5-3 oz. per acre.	Do not exceed 11 oz. per acre per season. 0-day PHI for broccoli, Brussels sprouts, cabbage and cauliflower. 7-day PHI for leafy greens.
	Ambush 25W® at 3.2-12.8 oz. per acre.	Do not exceed 1 lb. a.i. per acre per season. 1-day PHI. RUP.
	Asana XL® at 5.8-9.6 fl. oz. per acre. Cole crops and collards only.	Cole crops: Do not exceed 0.4 lb. a.i. per acre per season. 3-day PHI. Collards: Do not exceed 0.2 lb. a.i. per acre per season. 7-day PHI. RUP.
	Baythroid® at 2.4-3.2 fl. oz. per acre.	Do not exceed 12.8 fl. oz. per acre per season. 0-day PHI. RUP.
	Brigade 2EC® at 2.1-6.4 fl. oz. per acre, or Brigade WBS® at 5.3-16 oz. per acre.	Do not exceed 0.5 lb. a.i. per acre per season. 7-day PHI. RUP.
	Endosulfan 3EC® at 1-1.33 qts. per acre. Cabbage only.	Do not exceed 2.66 qts. per acre per season. 17-day PHI. Do not use after July 31, 2012.
	Kryocide® at 8-16 lbs. per acre.	Do not exceed 96 lbs. per acre per season. 7-day PHI for broccoli, Brussels sprouts, and cauliflower. 14-day PHI for cabbage and collards.
	Larvin 3.2® at 16-32 fl. oz. per acre. Broccoli, cabbage and cauliflower only.	Do not exceed 160 fl. oz. per acre per season. 7-day PHI. RUP.
	Mustang MAX® at 2.24-4.0 fl. oz. per acre.	Do not exceed 0.15 lb. a.i. per acre per season. Allow 7 days between applications. 1-day PHI. RUP.
	Pounce 25WP® at 3.2-12.8 oz. per acre.	Do not exceed 1 lb. a.i. per acre per season. 1-day PHI. RUP.
	Prokil Cryolite 50D® at 15-30.5 lbs. per acre.	Do not exceed 184 lbs. per acre per season. 7-day PHI for broccoli, Brussels sprouts, and cauliflower. 14-day PHI for cabbage and collards.
	Provado 1.6F® at 3.8 fl. oz. per acre.	Do not exceed 18.8 fl. oz. per acre per season. 7-day PHI.
	Sevin XLR PLUS® at 0.5-1 qt. per acre.	Do not exceed 6 qts. per acre per crop. 3-day PHI for broccoli, Brussels sprouts, cabbage, and cauliflower. 14-day PHI for collards, kale, and mustard.
Warrior II® at 1.28-1.92 fl. oz. per acre. Cole crops only.	Do not exceed 15.36 fl. oz. per acre per season. 1-day PHI. RUP.	

RR This is a reduced-risk pesticide. See pages 23-24 for details.


Insects Controlled	Treatment	Comments
Root Maggots	Cabbage maggot injury is usually more severe when fields have decaying organic matter present, such as plowed down cover crop, or when cool, wet conditions prevail.	
	For use in transplanting water, mix any one of the following in 50 gallons of water. Refer to Comments or product labels regarding drench application):	The transplant mixture application (insecticide plus water) will require about 200-300 gallons of water per acre, based on the number of plants set per acre.
	Capture LFR® at 0.39-0.49 fl. oz. per 1,000 linear ft. of row.	See label. RUP.
	Diazinon AG500® at 2-3 qts. per acre, or Diazinon 50W® at 4-6 lbs. in 50 gals. of water (for drench application).	Water treatments may reduce stands due to plant stress at time of transplanting. Make drench application at the rate of 0.5-1 cup per plant, either by hand or tractor-mounted sprayer with drop nozzles to direct spray to base of plants. In some areas, cabbage maggots are exhibiting resistance to diazinon, resulting in control failures. 4-day PHI. RUP.
Stink bugs	Lorsban® products at the following rates: Cauliflower: Lorsban 4EC® at 1.6-2.4 fl. oz. per 1,000 linear ft. of row, or Lorsban 75WG® at 1.1-1.6 fl. oz. per 1,000 linear ft. of row. Broccoli, Brussels sprouts, cabbage, collards, and kale: Lorsban 4EC® at 1.6-2.75 fl. oz. per 1,000 linear ft. of row, or Lorsban 75WG® at 1.1-1.8 fl. oz. per 1,000 linear ft. of row.	Apply as a water-based spray directed at the base of plants immediately after setting in field. Use a minimum of 40 gallons of total spray per acre. Do not apply as a foliage application. Do not exceed one application per acre per season. 21-day PHI. RUP.
	Baythroid® at 2.4-3.2 fl. oz. per acre.	Do not exceed 12.8 fl. oz. per acre per season. 0-day PHI. RUP.
	Brigade 2EC® at 2.1-6.4 fl. oz., or Brigade WBS® at 5.3-16 oz. per acre.	Do not exceed 0.5 lb. a.i. per acre per season. 7-day PHI. RUP.
	Endosulfan 3EC® at 1-1.33 qts. per acre. Cabbage only.	Do not exceed 2.66 qts. per acre per season. 17-day PHI. Do not use after July 31, 2012.
	Malathion 5EC® or Malathion 57EC® at 1 pt. per 100 gallons water per acre. Harlequin bug on collards only.	7-day PHI.
	Mustang MAX® at 3.2-4 oz. per acre.	Do not exceed 0.3 lb. a.i. per acre per season. 1-day PHI. RUP.
	Rimon 0.83EC® at 6-12 fl. oz. per acre.	Do not exceed 24 oz. or 2 applications per acre per season. 7-day PHI.
	Sevin XLR PLUS® at the following rates: Harlequin bug: 0.5-1 qt. per acre. Other stink bugs: 1-2 qts. per acre.	Do not exceed 6 qts. per acre per season. 3-day PHI.
Warrrior II® at 1.28-1.92 fl. oz. per acre. Cole crops only.	Do not exceed 15.36 fl. oz. per acre per season. 1-day PHI. RUP.	

Cole Crops and Brassica Leafy Greens (continued)

Insect Control (continued)

Insects Controlled	Treatment	Comments
Thrips	Plant resistant varieties, such as Bantly, Bravo, Brutus, King Cole, Little Rock, Manrico, Rio Granda, Rio Verde, Ruby Perfection, Starski, Stonar, SuperKraut, Titanic 90, Zerlina, and others.	Some cabbage varieties are resistant to thrips.
	RR Actara® at 3-5.5 oz. per acre.	Do not exceed 11 oz. per acre pre season. 0-day PHI for broccoli, Brussels sprouts, cabbage and cauliflower. 7-day PHI for leafy greens.
	Admire PRO® at 4.4-10.5 fl. oz. per acre.	Do not exceed 0.38 lb. a.i. per acre per season. 21-day PHI.
	Ambush 25W® at 3.2-12.8 oz. per acre. Rate varies with crop. See label.	Do not exceed 0.8 lb. a.i. per acre per season for broccoli, cauliflower, Brussels sprouts, and collards. Do not exceed 1 lb. a.i. per acre per season for cabbage. 1-day PHI. RUP.
	RR Assail 30SG® at 4 oz. per acre.	Do not exceed 0.375 lb. a.i. per acre per season. 7-day PHI.
	Baythroid® at 0.8-1.6 fl. oz. per acre.	Do not exceed 12.8 fl. oz. per acre per season. 0-day PHI. RUP.
	Brigade 2EC® at 2.1-6.4 fl. oz. per acre, or Brigade WBS® at 5.3-16 oz. per acre.	Do not exceed 0.5 lb. a.i. per acre per season. 7-day PHI. RUP.
	RR Entrust® at 2-3 oz. per acre.	Do not exceed 9 oz. per acre per season. 1-day PHI.
	Mustang MAX® at 3.2-4.0 fl. oz. per acre.	Do not exceed 0.15 lb. a.i. per acre per season. Allow 7 days between applications. 1-day PHI. RUP.
	Pounce 25WP® at 3.2-12.8 oz. per acre. Rate varies with crop. See label.	Do not exceed 0.8 lb. a.i. per acre per season for broccoli, cauliflower, and Brussels sprouts. Do not exceed 1 lb. a.i. per acre per season for cabbage and collards. 1-day PHI. RUP.
	RR Radiant SC® at 6-10 fl. oz. per acre.	Do not exceed 34 fl. oz. per acre per season. 1-day PHI.
	Rimon 0.83EC® at 6-12 fl. oz. per acre.	Do not exceed 24 oz. or 3 applications per acre per season. 7-day PHI.
	RR SpinTor 2SC® at 4-10 fl. oz. per acre.	Do not exceed 29 fl. oz. per acre per season. 1-day PHI.
	Warrior II® at 1.28-1.92 fl. oz. per acre. Cole crops only.	Do not exceed 15.36 fl. oz. per acre per season. 1-day PHI. RUP.

RR This is a reduced-risk pesticide. See pages 23-24 for details.

 May be acceptable for use in certified organic production. Check with your certifier before use.



Avoid using broad-spectrum insecticides early in the season to preserve predators of pests like this diamondback moth larvae.