RUTGERS
New Jersey Agricultural Experiment Station

This is a section from the

2020/2021 Mid-Atlantic Commercial Vegetable Production Recommendations

The recommendations are **NOT** for home gardener use.

The **full manual**, containing recommendations specific to New Jersey, can be found on the Rutgers NJAES website in the Publications section: *http://njaes.rutgers.edu/pubs/publication.asp?pid=E001*.

This manual will be revised biennially. In January 2021, a **critical update** with important updates to the 2020/2021 manual will be communicated through local Extension Agents and Vegetable Specialists.

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

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

F. Commodity Recommendations

Pesticide Use Disclaimer

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

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

For more information on Pesticide Safety and the Pesticide Label see chapter D.

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

1. Pesticides are listed by **group or code number based on chemical structure and mechanism of action**, as classified by the Weed Science Society of America (WSSA) for herbicides, the Insecticide Resistance Action Committee (IRAC) for insecticides, and the Fungicide Resistance Action Committee (FRAC) for fungicides.
   If the number is in bold font, the product may have resistance concerns.

2. For **restricted use pesticides**, the restricted active ingredients are labeled with a *****. (See section D 3.2.1 "Restricted Use Classification Statement" for more information).

3. **In addition to the pesticides listed below, other formulations or brands with the same active ingredient(s) may be available. ALWAYS CHECK THE LABEL:**
   a) to ensure a pesticide is labeled for the same use,
   b) to ensure the pesticide is labeled for the desired crop, and
   c) for additional restrictions.

4. All pesticide recommendations are made for spraying a **broadcast area of 1 acre** (43,560 square feet). **Adjust the rate for banded applications** (for more information, see section E 1.3 Calibrating Granular Applicators).

5. Check the label for the maximum amount of pesticide per application and the maximum number of applications per year.

6. **Bee Toxicity Rating (Bee TR)**: N=nontoxic; L=minimum impact on bees; M=moderately toxic, can be used if dosage, timing and method of application are correct, but should NOT be applied directly to the crop if bees are present; H=highly toxic, severe losses expected, -- = data not available.

Radishes, Rutabagas and Turnips

Radishes are a quick-growing, cool-season crop, that develops its best quality (small tops and well-shaped roots) when grown at 50-65°F in medium to short day lengths. Crop must be grown rapidly (23-28 days) with adequate soil moisture. When growth is checked, the radish becomes hot, tough, and pithy. Long days (15 hours) and warm temperatures induce seed-stalk formation.

Rutabagas and Turnips are cool-season crops that develop their best root growth at 40-60°F. They can be grown in spring or fall. Rutabagas require 90 days to mature so it is not practical to grow a spring crop in Southern New Jersey, Maryland or Virginia. Early maturing turnip varieties can be harvested in 40 days, but late maturing varieties in 75 days. As biennial plants, both rutabagas and turnips with be induced to flower after exposure to cool temperatures in spring planted crops or if fall crops are left to regrow over winter. Seed stalk formation will stop root development rendering them unsalable.

Recommended Varieties[1]

Radish (Red Globe; White Interior)	Rover[2]	Cherry Belle
	Cherriette[2]	Pink Beauty (organic)
	Crunchy Royale[2]	Champion
	Diego[2]	Crimson Giant (large globe)
	Red Satin[2]	
Daikon/Specialty Radish	Watermelon (white flesh, red interior, globe)	
	Shumkyo Semi Long (red flesh, white interior, elongated)	
	White icicle (white flesh, white interior, elongated)	
	Eastern Egg (multi-color)	
	Minowase Summer Cross #3 (Daikon)	
	Mihashige (Daikon)	
	China Rose (red flesh, white interior, elongated)	
	Chinese Winter (Daikon)	
	Black Spanish Round (dark flesh, white interior, large globe)	
	April Cross* (Daikon)	
Rutabaga	Helenor	Laurentian
Turnip White	Tokyo Cross[2]	Shogoin
	White Lady[2]	Just Right (fall and winter harvest)[2]
	Hakeuri[2]	
Turnip Purple	Purple Prince[2]	Royal Crown[2]
	Purple Top White Globe (MR[3])	

[1]Varieties within type listed earliest to latest according to vendors: Radish 18-45 days; Daikon/Specialty Radish 24-80 days; Rutabaga 90-100 days; Turnip 35-75 days. [2]F1 hybrid variety. [3]MR = mosaic resistant (vendor information).

Recommended Nutrients Based on Soil Tests

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

Radishes Rutabagas and Turnips[1]		**Soil Phosphorus Level**				**Soil Potassium Level**				
		Low	**Med**	**High (Opt)**	**Very High**	**Low**	**Med**	**High (Opt)**	**Very High**	
	N (lb/A)	**P_2O_5 (lb/A)**				**K_2O (lb/A)**				**Nutrient Timing and Method**
	50	150	100	50	0	150	100	50	0	Total nutrient recommended
	50	150	100	50	0	150	100	50	0	Broadcast and disk-in

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

Seed Treatment - See also Disease Control below

Purchase hot water treated seed or request hot water seed treatment, if possible (check with your seed company).

Spacing and Seeding

Radishes: Seed as early in the spring as soil can be worked, then at 8-10 day intervals through September. Seed 10-15 lb/A in rows 8-15 inches apart with 12-15 plants/ft in the row.

Rutabagas: Seed in early spring for the early summer crop and at least 90 days before the fall early freeze date. Seed 1½-2 lb/A, ¼ inch deep, in rows 30-36 inches apart. Thin plants to 4-8 inches apart in the row when plants are 2-3 inches tall.

Turnips: Seed as early in the spring as soil can be worked or at least 70 days before the fall early freeze date. Seed 1-2 lb/A, ⅛-¼ inch deep, in rows 14-18 inches apart. Plants should be 2-3 inches apart in the row. Seed can also be broadcast at the rate of 2.5 lb/A.

Harvesting and Post-Harvest Considerations

Radishes: Bunched with tops or bagged without tops are the two ways radishes are sold. Bunching is most common in this region. Plants are pulled and gathered with rubber bands or twist ties.

Shelf life is 10-14 days. Store at 32°F and 95-100% relative humidity after washing to remove any soil on roots.

Rutabagas: Pull and trim tops in the field. Bruised, damaged, or diseased rutabagas will not store well. Wash rutabagas in clean water, spray-rinse with clean water, then dry as rapidly as possible before waxing for shipping. For short term storage the fruit does not need to be waxed. Waxed rutabagas can be stored 4-6 months at 32°F and 95-100% relative humidity.

Turnips: The crop is dug mechanically or by hand and either bunched or topped. Turnips can be stored over 4-5 months at 32°F and at 95% relative humidity.

Weed Control

THE LABEL IS THE LAW-see the Pesticide Use Disclaimer on the first page of chapter F.

Recommended Herbicides

1. Identify the weeds in each field and select recommended herbicides. More information is available in the "Herbicide Effectiveness on Common Weeds in Vegetables" (Table E-2) in chapter E Pest Management.

2. Minimize herbicide resistance development. Identify the herbicide site of action group number and follow recommended good management practices; **bolded group numbers in tables below are herbicides at higher risk for selecting resistant weed populations.** Include non-chemical weed control whenever possible.

1. Soil-Applied (Preplant Incorporated or Preemergence)

Group	Product Name	Product Rate	Active Ingredient (*=Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
3	Dacthal 6F Dacthal W-75	6 to 14 pt/A 6 to 14 lb/A	**DCPA**	4.5 to 10.5 lb/A	25	12

-**For turnips only**. Turnips: apply preplant incorporated or preemergence in turnips; **do not** incorporate deeper than 2 inches
-**Do not** apply preplant incorporated for radishes. Emerged weeds should be cultivated or weeded prior to application.
-Primarily controls annual grasses and a few broadleaf weeds, including common purslane.
-Results have been most consistent when used in fields with coarse-textured soils low in organic matter, and when the application are followed by rainfall or irrigation. Maximum application not addressed on label.

2. Postemergence

Group	Product Name	Product Rate	Active Ingredient (*=Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
1	Select 2EC Select Max 0.97EC	6 to 8 fl oz/A 9 to 16 fl oz/A	**clethodim**	0.07 to 0.12 lb/A	15/ 30	24
	Poast 1.5EC	1 to 2.5 pt/A	**sethoxydim**	0.2 to 0.5 lb/A	14	12

-**Select 2EC**: use crop oil concentrate (COC) at 1% v/v (1 gal/100 gal of spray solution). **Select Max**: use nonionic surfactant (NIS) at 0.25% v/v (1 qt/100 gal of spray solution). **Poast**: Apply with COC at 1.0% v/v.
-**The use of COC may increase the risk of crop injury when hot or humid conditions prevail.** To reduce the risk of crop injury, omit additives or switch to NIS when grasses are small and soil moisture is adequate.
-Use lower labeled rates for annual grass control and higher labeled rates for perennial grass control.
-Yellow nutsedge, wild onion, wild garlic, and broadleaf weeds will not be controlled.
-Controls many annual and certain perennial grasses, including annual bluegrass, but Poast is preferred for goosegrass control.

2. Postemergence, Select, Poast - continued on next page

2. Postemergence, Select, Poast - continued

-For best results, treat annual grasses when they are actively growing and before tillers are present. Control may be reduced if grasses are large or under hot or dry weather conditions. Repeated applications may be necessary to control certain perennial grasses. If repeat applications are necessary, allow 14 days between applications. Rainfastness is 1 h. -**Do not** tank-mix with or apply within 2 to 3 days of any other pesticide, unless labeled, as this may increase the risk of crop injury or reduce the control of grasses. -**Do not** apply more than 8 fl oz of Select 2EC in a single application and **do not** exceed 1 pt/A for the season, **do not** apply more than 16 fl oz of Select Max in a single application and **do not** exceed 32 oz/A (radish) or 64 oz/A (rutabagas, turnips) for the season. -**Do not** apply more than 2.5 pt/A Poast in single application and **do not** exceed 2.5 pt/A for the season. -**Do not** harvest radish within 15 days of application and rutabagas and turnips within 30 days of Select application.						
4	Stinger 3A	0.33 to 0.5 pt/A	**clopyralid**	0.124 to 0.188 lb/A	15/30	12
-**Turnip roots and tops only.** Other clopyralid formulations may not be labeled (read the label). -Apply in a single application to control certain annual and perennial broadleaf weeds. -Common annuals controlled include galinsoga, ragweed species, common cocklebur, groundsel, pineappleweed, clover, and vetch. Perennials controlled include Canada thistle, goldenrod species, aster species, and mugwort (wild chrysanthemum). -Stinger is very effective on small seedling annual and emerging perennial weeds less than 2-4 inches tall, but is less effective and takes longer to work when weeds are larger. -Use 0.125 to 0.25 pt/A to control annual weeds less than 2 inches tall. Increase the rate to 4 to 8 fl oz/A to control larger annual weeds. Apply the maximum rate of 8 fl oz/A to suppress or control perennial weeds. -Spray additives are not needed or required by the label, and are not recommended. -Rainfastness is 6 h. -PHI is 15 d for turnip tops and 30 d for turnip roots. Observe follow-crop restrictions, or injury may occur from herbicide carryover.						

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

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

Insect Control

THE LABEL IS THE LAW-see the Pesticide Use Disclaimer on the first page of chapter F. Recommended Insecticides

Soil Pests

Cabbage Maggots

Cabbage maggots overwinter as pupae. Overwintered adults (flies) emerge when yellow-rocket (mustard) first blooms, then begin laying eggs on roots or soil near roots. All brassica crops are affected. Eggs hatch within 3-7 days. Young plants may become severely stunted or die. Larvae or tunnels in harvest bulbs may be evident from later infestations. This pest has 3-4 generations per growing season, although the first generation is often the most economically damaging. The last larval generation is in October, particularly in warmer years. Treatments for cabbage maggot must be done preventively, as once damage is evident, loss of plants is unavoidable. Barriers, such as row covers, may be useful in excluding flies from smaller plantings. Prompt and complete destruction of crop residue is helpful. Chemical treatments should be applied pre-plant, or at planting, depending on the product used.

Apply one of the following formul`tions:

Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use) and Crop Restrictions	PHI (d)	REI (h)	Bee TR
1B	Lorsban Advanced	1.6 to 2.75 fl oz/1000 row ft - turnip 1 fl oz/1000 row ft - radish 1.6 to 3.3 fl oz/1000 row ft - rutabaga	chlorpyrifos*- **soil only (if used pre-plant, do not apply at planting or post-planting)**	30	24	H
1B	Diazinon AG500	2.0 to 4.0 qt/A	diazinon* - **rutabaga only, preplant broadcast, incorporate immediately to 4" depth**	AP	96	H

Cutworms See also section E 3.1. Soil Pests - Detection and Control.

Cutworms are moth larvae (caterpillars) that feed on roots and stems. Cutworms chew through stems at or near the soil line, causing young plants to topple over. Cutworms may also feed on the subterranean portion of bulb crops like radish, turnips and rutabagas. Larvae are typically active at night, and spend most of this stage belowground. Cutworms are favored by less disturbed soils and debris covered soil surfaces. Conventional tillage and crop debris incorporation helps reduce populations. Several species in NJ are capable of injuring young plants. There are usually two generations per season. If cutworm damage is anticipated, it is best to treat preventively with insecticide.

Cutworms - continued on next page

Cutworms - continued

Apply one of the following formulations:						
Group	**Product Name**	**Product Rate**	**Active Ingredient(s) (*=Restricted Use) and Crop Restrictions**	**PHI (d)**	**REI (h)**	**Bee TR**
1A	Sevin XLR Plus	1.0 to 2.0 qt/A	carbaryl	7	12	H
3A	Baythroid XL	1.6 to 2.8 fl oz/A	beta-cyfluthrin* - **radish only**	0	12	H
3A	Tombstone, others	1.6 to 2.8 fl oz/A	cyfluthrin* **- radish only**	0	12	H
3A + 4A	Leverage 360	2.4 to 2.8 fl oz/A	imidacloprid + beta-cyfluthrin* - **radish only**	7	12	H

Above-ground Pests

Aphids To prevent flare-ups, avoid overuse of synthetic pyrethroid (3A) insecticides for control of other pests.

Apply one of the following formulations:						
Group	**Product Name**	**Product Rate**	**Active Ingredient(s) (*=Restricted Use) and Crop Restrictions**	**PHI (d)**	**REI (h)**	**Bee TR**
1B	Malathion 57 EC	1.0 to 1.6 pt/A - radish, rutabaga 1.0 to 2.0 pt/A - turnip	malathion	7 1	12	H
3A+4A	Leverage 360	2.4 to 2.8 fl oz/A	imidacloprid + beta-cyfluthrin* - **radish only**	7	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam	7	12	H
4A	Platinum 75SG	1.70 to 2.17 oz/A- radish 1.70 to 4.01 oz/A- rutabaga, turnip	thiamethoxam	AP	12	H
4A	Admire Pro	4.4 to 10.5 fl oz/A	imidacloprid - **soil**	21	12	H
4A	Admire Pro	1.2 fl oz/A	imidacloprid - **foliar**	7	12	H
4D	Sivanto Prime or 200SL	10.5 to 14.0 fl oz/A	flupyradifurone - **foliar**	7	4	M
28	Exirel	13.5 to 20.5 fl oz/A	cyantraniliprole - **turnip only**	1	12	H

Caterpillar "Worm" Pests Including Cabbage Loopers, Diamondback Moths, Imported Cabbageworms, Cross-striped Cabbageworms, Cabbage Webworms, and Armyworms

Due to resistance development, pyrethroid insecticides are not recommended for control of Diamondback Moth or Beet Armyworm. Other insecticides may no longer be effective in certain areas due to Diamondback Moth resistance; consult your Extension Office. Rotation of insecticides with different modes of action is recommended to reduce resistance development. Under-leaf spray coverage is essential for effective control particularly with *Bacillus thuringiensis* and contact materials. With boom-type rigs, apply spray with at least 3 nozzles per row, one directed downward and one directed toward each side. Evaluate effectiveness when considering further treatment.

Apply one of the following formulations: **Note: not all materials are labeled for all crops, insects or application methods, check the label for directions!**						
Group	**Product Name**	**Product Rate**	**Active Ingredient(s) (*=Restricted Use) and Crop Restrictions**	**PHI (d)**	**REI (h)**	**Bee TR**
3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate* - **turnip: imported cabbageworm and beet armyworm only; radish: beet armyworm only; not labeled for rutabaga**	7	12	H
5	Entrust SC (OMRI)	3.0 to 6.0 fl oz/A	spinosad	3	4	M
5	Radiant SC	6.0 to 8.0 fl oz/A	spinetoram	3	4	M
11A	XenTari (OMRI)	0.5 to 2.0 lb/A	*Bacillus thuringiensis aizawai*	0	4	N
18	Intrepid 2F	4.0 to 10.0 fl oz/A	methoxyfenozide	1	4	L
28	Coragen 1.67SC	3.5 to 7.5 fl oz/A	chlorantraniliprole - **soil**	1	4	L
28	Coragen 1.67SC	3.5 to 7.5 fl oz/A	chlorantraniliprole **- foliar**	1	4	L
28	Verimark	5.0 to 10.0 fl oz/A	cyantraniliprole - **turnip only**	AP	4	H

Flea Beetles

Crop rotation, management of wild hosts (wild mustard, rocket etc.) and prompt destruction of crop residue are helpful in population suppression. Sequential plantings of host crops can result in population build-up.

Apply one of the following formulations:						
Group	**Product Name**	**Product Rate**	**Active Ingredient(s) (*=Restricted Use)and Crop Restrictions**	**PHI (d)**	**REI (h)**	**Bee TR**
1A	Sevin XLR Plus	0.5 to 1.0 qt/A	carbaryl	7	12	H
3A	Asana XL	5.8 to 9.6 fl oz/A	esfenvalerate* - **radish and turnip only**	7	12	H
3A	Baythroid XL	1.6 to 2.8 fl oz/A	beta-cyfluthrin*	0	12	H

Flea Beetles - continued on next page

Flea Beetles - continued

3A	Tombstone, others	1.6 to 2.8 fl oz/A	cyfluthrin*	0	12	H
3A + 4A	Leverage 360	2.4 to 2.8 fl oz/A	imidacloprid + beta-cyfluthrin* - **radish only**	7	12	H
4A	Admire Pro	4.4 to 10.5 fl oz/A	imidacloprid - **soil**	21	12	H
4A	Admire Pro	1.2 fl oz/A	imidacloprid - **foliar**	7	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam	7	12	H
4A	Platinum 75SG	1.7 to 2.17 oz/A 1.7 to 4.01 oz/A	thiamethoxam - **radish** thiamethoxam - **rutabaga, turnip**	AP	12	H
5	Entrust SC (OMRI)	3 to 6 fl oz/A	spinosad	3	4	M

Leafminers

Apply one of the following formulations:						
Group	**Product Name**	**Product Rate**	**Active Ingredient(s) (*=Restricted Use) and Crop Restrictions**	**PHI (d)**	**REI (h)**	**Bee TR**
1B	Dimethoate 400	0.5 pt/A	dimethoate* - **turnip only**	14	48	H
5	Entrust SC (OMRI)	3 to 6 fl oz/A	spinosad	3	4	M
5	Radiant SC	6.0 to 8.0 fl oz/A	spinetoram	3	4	M
28	Exirel	13.5 to 20.5 fl oz/A	cyantraniliprole - **turnip only**	1	12	H
28	Verimark	6.57 to 13.5 fl oz/A	cyantraniliprole - **turnip only**	AP	4	H

Disease Control

THE LABEL IS THE LAW-see the Pesticide Use Disclaimer on the first page of chapter F.

Recommended Fungicides

Seed Treatment Options

Heat treatment is a non-chemical alternative to conventional chlorine treatments that only kill pathogens on the surface of the seed coat. Heat treatment has the additional benefit of killing pathogens within the seed coat and is particularly useful for crops that are prone to seed-borne bacterial infections. Seed heat treatment follows a strict time and temperature protocol and is best done with thermostatically controlled water baths. Two baths are required; one for pre-heating, and a second for the effective (pathogen killing) temperature. The initial pre-heating is at 100ºF (37ºC) for 10 minutes. In the second bath, soak radish seed at 122°F (50°C) for 15 minutes. Immediately after removal from the second bath, rinse seeds with cool water. Dry seeds on a screen or paper. Pelleted seed is not recommended for heat treatment. Only treat seed that will be used during the current production season.

An alternative to hot water is to use 1 part Alcide (sodium chlorite), 1 part lactic acid, and 18 parts water as a seed soak. Treat seed for 1-2 minutes with constant agitation and rinse for 5 minutes in running water. Following either treatment above, dust dried seed with Captan 50WP or Thiram 480DP at 1 level tsp/lb of seed (3 oz/100 lb).

Seed Treatment Prior to Seeding

Code	**Product Name**	**Product Rate**	**Active Ingredient(s) (*=Restricted Use)**	**PHI (d)**	**REI (h)**	**Bee TR**
For Pythium and Phytophthora root rot control use a seed treatment such as:						
4	Apron XL LS	0.085 to 0.64 fl oz/100 lb seed	mefenoxam	--	--	N
For control of other root rots apply:						
12	Maxim 4FS	0.08 to 0.16 fl oz/100 lb seed	fludioxonil	--	--	L
Note: Apron XL LS and Maxim 4FS can be combined.						

Damping-off caused by *Pythium* and *Rhizoctonia*

Code	**Product Name**	**Product Rate**	**Active Ingredient(s) (*=Restricted Use)**	**PHI (d)**	**REI (h)**	**Bee TR**
For Pythium root rot control apply as banded spray:						
4	MetaStar 2E AG[1]	2.0 to 4.0 pt/A	metalaxyl	AP	48	N
4	Ridomil Gold 4SL[1]	0.5 to 1.0 pt/A	mefenoxam	AP	48	N
43	Presidio 4SC[1]	3.0 to 4.0 fl oz/A	fluopicolide	AP	48	--
For Rhizoctonia root rot control apply as in-furrow application:						
11	azoxystrobin 2.08F	0.40 to 0.80 fl oz/A (see label)	azoxystrobin	0	4	N
For Pythium and Rhizoctonia root rot control apply as banded spray:						
4 + 11	Uniform 3.66SE[1]	0.34 fl oz/1000 ft. row[2]	mefenoxam + azoxystrobin	AP	0	N

[1]Applications at seeding will also help control Downy mildew. [2] See label for restrictions

Bacterial and Fungal Diseases

Alternaria, Blackleg and Black Rot

Alternaria, Blackleg and Black Rot can survive on infested debris and seed. Purchase certified or treated seed. Use hot water seed treatment to help reduce seed-borne infections (see above). Thoroughly disc or plow under plant debris after harvest. Eliminate cruciferous weeds which can act as hosts and rotate with non-cruciferous crops.

Clubroot

Radishes are susceptible, whereas turnips are resistant. Use of irrigation water containing fungus spores is the principal way of spreading the pathogen. If clubroot occurs, clean and disinfest any equipment to be used in other fields. Adjust soil pH with hydrated lime to as close to 7.0 as possible. Improve drainage and use raised beds.

Downy Mildew

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply the following when weather conditions favor disease development and/or disease is first noticed:[1,2]						
M01	copper (OMRI)[1]	at labeled rates	copper	0	48	N
21	Ranman 400SC	2.75 fl oz/A (turnip greens only)	cyazofamid	0	12	L

[1]Some copper based products are OMRI-approved for organic production and may help suppress some fungal pathogens in these crops.
[2]Uniform, Presidio, mefenoxam, or metalaxyl applications for root rot control at seeding will also help control downy mildew.

Leaf Spots (caused by *Cercospora* or *Alternaria)* and Powdery Mildew

Long periods of wet weather and driving rains which promote soil splashing are conducive for development. Thoroughly disc or plow under plant debris after harvest. Eliminate cruciferous weeds which can act as hosts and rotate with non-cruciferous crops.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply and rotate the following preventatively and/or when conditions favor development:						
3	Tilt 3.6EC[1]	3.0 to 4.0 fl oz/A	propiconazole	14	12	N
7 + 9	Luna Tranquility 4.16SC	8.0 to 11.2 fl oz/A	fluopyram + pyrimethanil	7	12	--
7 + 11	Merivon 2.09SC	4.0 to 5.5 fl oz/A	fluxapyroxad + pyraclostrobin	0	12	N
7 + 12	Miravis Prime 3.34SC 2.09SC[2]	6.8 fl oz/A	pydiflumetofen + fludioxonil	7	12	--
Rotate with one of the following FRAC code 11 fungicides:						
11	azoxystrobin 2.08F	6.0 to 15.5 fl oz/A plus fixed copper at labeled rates	azoxystrobin	0	4	N
11	Cabrio 20EG	8.0 to 12.0 oz/A plus fixed copper at labeled rates	pyraclostrobin	0	12	N

[1] For Cercospora leaf spot only. [2] Supplemental label; must be in possession of applicator

Scab

Scab is more severe under dry soil conditions, high soil pH, and low level of Mg. Heavy irrigation in the first two weeks after emergence and the application of S to reduce soil pH will assist in disease control.

White Rust

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
When weather conditions favor disease development or at the first sign of disease in field, apply:						
4 + M01	Ridomil Gold Copper 65WP[1]	2.0 lb/A every 7 days (not for use in rutabagas and turnip)	mefenoxam + copper	7	48	N
Alternate with one of the following FRAC code 11 fungicides:						
11	azoxystrobin 2.08F	6.0 to 15.5 fl oz/A	azoxystrobin	0	4	N
11	Cabrio 20EG	8.0 to 16.0 oz/A	pyraclostrobin	0	12	N

[1]Ridomil Gold Copper applications will also help control downy mildew (see labels for restrictions).

For Immediate Medical Attention

Call 911

For a Pesticide Exposure Poisoning Emergency Call

For All States

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

For Pesticide Spills

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