RUTGERS UNIVERSITY
Cooperative Extension
New Jersey Agricultural Experiment Station

This is a section from the

2026/2027
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 at: *https://njaes.rutgers.edu/pubs/publication.php?pid=e001*.

This manual will be revised biennially. **In January 2027, a Critical Update** with important updates to the 2026/2027 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 Commissioners. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.

2026/2027
Mid-Atlantic Commercial Vegetable Production Recommendations

If you are having a medical emergency after using pesticides, always call 911 immediately.

POISON Help®

1-800-222-1222

In Case of an Accident

- Remove the person from exposure
- Get away from the treated or contaminated area immediately
- Remove contaminated clothing
- Wash with soap and clean water
- Call a physician and/or the National Poison Control Center (1-800-222-1222).
  Your call will be routed to your State Poison Control Center.
- Have the pesticide label with you!
- Be prepared to give the EPA registration number to the responding center/agency

Greens (Mustard, Turnip)

Recommended Varieties
Note: For Kale and Collard Greens, see the Cole Crops section

Type	Variety[1]	Use	Hybrid	Season	Description
Asian Mustard[2]	Green Kyoto Mizuna	Cooked, Salad	No	Spring/Fall	Green, serrated leaf
	Koji Tatsoi	Cooked, Salad	Yes	Spring/Fall	Green, heavy savoy leaf
	Komatsuna	Cooked, Salad	Yes	Spring/Fall	Green, flat leaf
	Miz America	Cooked, Salad	Yes	Spring/Fall	Dark red, toothed leaf
	Purple Mizuna	Cooked, Salad	Yes	Spring/Fall	Purple serrated leaf
	Red Kingdom	Cooked, Salad	Yes	Spring/Fall	Purple, serrated leaf
	Senposai	Cooked, Salad	Yes	Spring/Fall	Green, flat leaf
	Tatsoi	Cooked, Salad	No	Spring/Fall	Green, semi savoy leaf
	Tokyo Bekana	Salad	Yes	Spring/Fall	Light-green, non-heading Chinese cabbage
Mustard	Florida Broadleaf	Cooked	No	Fall	Green, flat leaf
	Garnet Giant	Salad	No	Fall	Red, flat leaf
	Green Wave	Cooked, Salad	No	Fall	Green, curled leaf
	Red Giant	Cooked, Salad	No	Fall	Red, crinkled leaf
	Red Splendor	Cooked, Salad	No	Spring/Fall	Red, serrated leaf
	Savannah	Cooked	Yes	Spring/Fall	Green, flat leaf
	Scarlet Frills	Salad	No	Spring/Fall	Red, ruffled leaf
	Southern Giant Curled	Cooked	No	Fall	Green, curled leaf
	Tendergreen	Cooked	No	Fall	Green, flat leaf
Turnip	Alamo	Cooked, Salad	Yes	Spring/Fall	Green, flat leaf
	All Top	Cooked	Yes	Fall	Green, flat leaf
	Hakurei	Cooked, Salad	Yes	Spring/Fall	Green, serrated leaf
	Seven Top	Cooked	No	Fall	Green, serrated leaf
	Topper	Cooked	Yes	Spring/Fall	Green, serrated leaf

[1]**Listed alphabetically within type**. [2]Asian mustards recommended growing season for full size harvest without bolting. Greens may be planted throughout the year for harvest in the baby stage. For spring planting, Asian mustards should be planted after frost risk to avoid bolting.

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 the recommendations found below.

		Soil Phosphorus Level				Soil Potassium Level				
		Low	Med	High (Opt)	Very High	Low	Med	High (Opt)	Very High	
Greens[1] (Mustard, Turnip)	**N (lb/A)**	**P_2O_5 (lb/A)**				**K_2O (lb/A)**				**Nutrient Timing and Method**
	50-170	150	100	50	0	150	100	50	0	Total nutrient recommended
	50	150	100	50	0	150	100	50	0	Broadcast and disk-in
	25-60	0	0	0	0	0	0	0	0	Topdress after each cutting

[1]Apply 25-30 lb/A of sulfur (S) for most soils.

Seeding

Seed in early- to mid-August for fall harvest. Mustards and turnip greens planted in the spring are susceptible to bolting if exposed to cold temperatures for prolonged periods of time, and only bolt-resistant varieties such as Savanna mustard and Alamo turnip should be grown. Later spring plantings (April) have a lower risk of bolting. For all plantings, sow 3-4 lb/A of seed in rows 12-24 inches apart. A wide variety of mustards are available for incorporating into salad mixes for microgreens or baby salad mixes. These are sown in beds or trays as a broadcast or in narrow rows. They can be seeded from late winter through late fall in high tunnels for successive harvests.

Harvest and Post-Harvest Considerations

Greens for baby salad mixes are cut at ground level for a single harvest, or 1-2 inches from the ground for multiple cuts. Larger turnip, mustard, and Asian mustards may be harvested by cutting off entire plants near ground level for a single harvest, or by cutting 2-6 inches above the ground to allow for regrowth. For processing, greens are machine cut 4-6 inches from the ground when full tonnage has been achieved but before petioles and midribs have become too large. Multiple harvests may be possible.

Greens should be transported as quickly as possible to the packing area. Hydrocooling or vacuum cooling are recommended for pre-cooling. Greens should be held as close to 32°F as possible, because of their perishability. At this temperature, greens can be held for 10-14 days. Relative humidity of at least 95% is desirable to prevent wilting. Air circulation should be adequate to remove heat of respiration, but not too rapid to speed transpiration and wilting. Greens are commonly shipped with plastic package and top ice. Greens packed in polyethylene-lined crates and protected by crushed ice keep in excellent condition if kept near 32°F but deteriorate rapidly at higher temperatures.

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-3) in Chapter E Pest Management.

2. Minimize herbicide resistance development. Identify the herbicide mode 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 (*=Restricted Use)	Product Rate	Active Ingredient	Active Ingredient Rate	PHI (d)	REI (h)
3	Treflan 4EC	1 to 1.5 pt/A	**trifluralin**	0.5 to 0.75 lb/A	--	12
-**Labeled for turnip greens for processing and mustard greens**. Incorporate into 2-3 inches of soil within 8 h after application. -Primarily controls annual grasses and a few broadleaf weeds. Poor incorporation can reduce overall weed control. **Do not** use (or reduce rate) used when cold, wet soil conditions are expected, or crop injury may result. Maximum application not addressed on label.						
8	Prefar 4E	5 to 6 qt/A	**bensulide**	5 to 6 lb/A	--	--
-**Labeled for mustard greens.** -Labeled for preplant incorporated or preemergence applications; **do not** incorporate more than 2 inches deep (1 inch is optimum). -If applied preemergence, irrigate within 36 h of application with ½ inch of water; if not incorporated with irrigation or rainfall within 36 h, weed control maybe reduced. Provides control/suppression of some annual grass weeds and some broadleaves including pigweeds, purslane, and lambsquarters. -**Do not** apply more than 6 lb ai/A per season.						

2. Postemergence

Group	Product Name (*=Restricted Use)	Product Rate	Active Ingredient	Active Ingredient Rate	PHI (d)	REI (h)
1	Shadow 3EC Select 2EC Select Max 0.97EC	4 to 5.33 fl oz/A 6 to 8 fl oz/A 9 to 16 fl oz/A	**clethodim**	0.07 to 0.125 lb/A	14	24
	Poast 1.5EC	1 to 1.5 pt/A	**sethoxydim**	0.2 to 0.3 lb/A	30	12
-**Select 2EC**: use crop oil concentrate (COC) at 1% v/v (1 gal/100 gal of spray solution). **Select Max 0.97EC**: use nonionic surfactant (NIS) at 0.25% v/v (1 qt/100 gal of spray solution). **Shadow 3EC**: use crop oil concentrate (COC) at 1% v/v (1 gal/100 gal of spray solution) for large or stressed grasses; use nonionic surfactant (NIS) at 0.25% v/v (1 qt/100 gal of spray solution) when crop safety is a concern. **Poast 1.5EC**: Apply with COC at 1.0% v/v. -**General comments:** -The use of COC may increase the risk of crop injury when hot or humid conditions prevail. To reduce the risk of crop injury, 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. For best results, treat annual grasses when they are actively growing and before tillers are present. -Yellow nutsedge, wild onion, wild garlic, and broadleaf weeds will **not** be controlled with these herbicides. -These herbicides control many annual and certain perennial grasses. Clethodim is best on annual bluegrass; while Poast is preferred for goosegrass control. -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						

2. Postemergence Shadow, Select, Select Max, Poast - continued next page

2. Postemergence Shadow, Select, Select Max, Poast *- continued*

reduce the control of grasses. **Do not** apply more than 8 fl oz/A of Select 2EC in a single application and **do not** exceed 2 pt/A for the season; **do not** apply more than 16 fl oz/A of Select Max in a single application and **do not** exceed 4 pt/A for the season. -**Do not** apply more than 5.33 fl oz/A of Shadow 3EC in a single application and **do not** exceed 21.33 fl oz/A for the season. -**Do not** apply more than 1.5 pt/A Poast in a single application and **do not** exceed 3 pt/A for the season.						
4	Stinger 3SL / Spur 3SL	4 to 8 fl oz/A	**clopyralid**	0.094 to 0.188 lb/A	30/15	12
-**Labeled for mustard greens and turnip greens.** Spray additives are not needed or required by the label, and are not recommended -Stinger controls composite and legume weeds including 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 4 fl oz/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. -Observe follow crop restrictions or injury may occur from herbicide carryover. -Rainfastness is 6 h. **Do not** harvest mustard greens within 30 days of harvest or turnip greens within 15 days of harvest. -Maximum Stinger application per year: 8 fl oz/A; maximum number of applications: 1 for turnip greens, 2 for mustard greens.						

3. Postharvest

Group	Product Name (*=Restricted Use)	Product Rate	Active Ingredient	Active Ingredient Rate	PHI (d)	REI (h)
22	Gramoxone SL 3.0*	1.5 to 2 pt/A	**paraquat**	0.56 to 0.75 lb/A	--	24
-**Supplemental Label in DE for postharvest application to desiccate the crop.** -Apply after the last harvest for bareground or plasticulture. Always include an adjuvant. Spray coverage is essential for optimum effectiveness. See the label for additional information and warnings. -Rainfastness 30 min. A maximum of 2 applications for crop desiccation are allowed. -***Restricted-use pesticide***. Only certified applicators, who successfully complete the paraquat-specific training, can mix, load, or apply paraquat. Application of paraquat "under the direct supervision" of a certified applicator is no longer allowed. Required training link (*https://campus.extension.org/enrol/index.php?id=2201*); certified applicators must repeat training every three years.						

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

Group	Product Name (*=Restricted Use)	Active Ingredient
3	Satellite Hydrocap (mustard and turnip greens)	**pendimethalin**
14	Aim (hooded or directed application only)	**carfentrazone**
15	Devrinol (Mustard greens only)	**napropamide**

Insect Control

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

Notes:

-Not all insecticides labeled for turnip greens are labeled for turnip roots.

-For **premixes**, the group number (representing the mode of action) and active ingredient that contributes the most to control is generally listed first. In some cases, only one ingredient in a premix provides control.

Aphids

Apply one of the following formulations:

Group	Product Name (*=Restricted Use)	Product Rate	Active Ingredient(s) and Crop Restrictions	PHI (d)	REI (h)	Bee TR
1B	Dimethoate 400EC	0.5 pt/A	dimethoate	14	48	H
1B	Malathion 57 EC	1.0 to 1.6 pt/A	malathion	7	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam - **foliar**	7	12	H
4A	Platinum 75SG	1..66 to 3.67 oz/A	thiamethoxam - **soil**	30	12	H
4A	Admire Pro 4.6SC	4.4 to 10.5 fl oz/A	imidacloprid - **soil**	21	12	H
4A	Admire Pro 4.6SC	1.3 fl oz/A	imidacloprid - **foliar**	7	12	H
4A	Assail 30SG	2.0 to 5.3 oz/A	acetamiprid	3	12	M
4A	Assail 30SC	1.7 to 4.5 fl oz/A	acetamiprid	3	12	M

Aphids - continued next page

***Aphids** - continued*

4A	Belay 2.13SC	9 to 12 fl oz/A	clothianidin - **soil**	21	12	H
4A	Belay 2.13SC	3.0 to 4.0 fl oz/A	clothianidin - **foliar**	7	12	H
4A + 3A	Leverage 360*	3.0 fl oz/A	imidacloprid + beta-cyfluthrin	7	12	H
4A+15	Cormoran	6.0 to 12.0 fl oz/A	acetamiprid + novaluron	7	12	M
4C	Transform 50WG	0.75 to 1.0 oz/A	sulfloxaflor - **turnip greens only**	7	24	H
9B	Fulfill 50WDG	2.75 oz/A	pymetrozine	7	12	L
9B	PQZ 1.87SC	2.4 to 3.2 fl oz/A	pyrifluquinazon	1	12	L
9D	Versys 0.83DC	1.5 fl oz/A	afidopyropen	0	12	L
28	Exirel 0.83SE	13.5 to 20.5 fl oz/A	cyantraniliprole	1	12	H
28	Verimark 1.67SC	6.75 to 13.5 fl oz/A	cyantraniliprole - **soil at planting**	n/a	4	H
29	Beleaf 50SG	2.0 to 2.8 oz/A	flonicamid	0	12	L

Caterpillar "Worms" Pests Including: Beet Armyworms (BAW), Cabbage Loopers (CL), Diamondback Moths (DBM), and Imported Cabbageworms (ICW)

Due to resistance development, pyrethroid insecticides are not recommended for control of BAW or DBM. Other insecticides may no longer be effective in certain areas due to DBM resistance; consult your county Extension. Rotation of insecticides with different modes of action is recommended to reduce the development of resistance.

Apply one of the following formulations.
Note: Not all materials are labeled for all crops, insects, or application methods, check labels.

Group	Product Name (*=Restricted Use)	Product Rate	Active Ingredient(s) and Crop Restrictions	PHI (d)	REI (h)	Bee TR
1A	Lannate LV 2.4WSL*	1.5 to 3.0 pt/A	methomyl	10	48	H
3A[2]	Asana XL 0.66EC*	9.6 fl oz/A	esfenvalerate **- mustard greens only** **- not recommended for BAW or DBM**	7	12	H
3A[2]	Baythroid XL1EC*	1.6 to 2.4 fl oz/A	beta-cyfluthrin **- not recommended for BAW or DBM**	0	12	H
3A[2]	Brigade 2EC*	2.1 to 6.4 fl oz/A	bifenthrin **- not recommended for BAW or DBM**	7	12	H
3A[2]	Hero 1.23* Hero 1.14EW*	4.0 to 10.3 fl oz/A 4.5 to 11.2 oz/A	bifenthrin + zeta-cypermethrin **- not recommended for BAW or DBM**	7	12	H
3A[2]	Mustang Maxx 0.8*	2.24 to 4.0 fl oz/A	zeta-cypermethrin **- not recommended for BAW or DBM**	1	12	H
3A[2]	Tombstone 2*, Tombstone Helios 2*	1.6 to 2.4 fl oz/A	cyfluthrin **- not recommended for BAW or DBM**	0	12	H
5	Entrust 2SC (OMRI)	1.5 to 8.0 fl oz/A	spinosad	1-3[1]	4	H
5	Radiant 1SC	5.0 to 10.0 fl oz/A	spinetoram	1-3[1]	4	H
6	Proclaim 5SG*	2.4 to 4.8 oz/A	emamectin benzoate	14	12	H
11A	DiPel DF, others (OMRI)	0.5 to 2.0 lb/A	*Bacillus thuringiensis kurstaki*	0	4	N
11A	XenTari (OMRI)	0.5 to 2.0 lb/A	*Bacillus thuringiensis aizawai*	0	4	N
15+4A	Cormoran	6.0 to 12.0 fl oz/A	novaluron + acetamiprid	7	12	M
18	Intrepid 2F	4.0 to 8.0 fl oz/A early season; 8.0 to 10.0 fl oz/A late season	methoxyfenozide **- suppression only for DBM**	1	4	L
22	Avaunt 30WDG, Avaunt eVo 30WDG	2.5 to 3.5 oz/A	indoxacarb	3	12	H
28[2]	Coragen 1.67SC Coragen eVo SC, Vantacor	3.5 to 7.5 fl oz/A 1.2 to 2.5 fl oz/A	chlorantraniliprole	3	4	L
28[2]	Exirel 0.83SE	7.0 to 13.5 fl oz/A 10 to 17 fl oz/A for CL	cyantraniliprole	1	12	H
28[2]	Harvanta 50SL	10.9 to 16.4 fl oz/A	cyclaniliprole	1	4	H
28[2]	Verimark 1.67SC	5 to 10 fl oz/A, 10 to 13.5 fl oz/A for DBM	cyantraniliprole - **drip chemigation**	1	4	H
28[2]+3A[2]	Elevest*	5.6 to 9.6 fl oz/A	chlorantraniliprole + bifenthrin	7	12	H
30	Incipio	2.1 to 4.1 fl oz/A	isocycloseram – CL, DBM, ICW only	1	12	H

[1]PHI is 3 days for turnip greens.
[2]Resistance concerns for localized DBM and BAW populations.

Flea Beetles

Apply one of the following formulations:						
Group	**Product Name (*=Restricted Use)**	**Product Rate**	**Active Ingredient(s) and Crop Restrictions**	**PHI (d)**	**REI (h)**	**Bee TR**
1A	Sevin XLR Plus 4	0.5 to 1 qt/A	carbaryl	14	12	H
3A	Baythroid XL1EC*	2.4 to 3.2 fl oz/A	beta-cyfluthrin	0	12	H
3A	Brigade 2EC*	2.1 to 6.4 fl oz/A	bifenthrin	7	12	H
3A	Hero 1.23*	4.0 to 10.3 fl oz/A	bifenthrin + zeta-cypermethrin **- mustard greens only**	7	12	H
3A	Mustang Maxx 0.8*	2.24 to 4.0 fl oz/A	zeta-cypermethrin	1	12	H
3A	Tombstone 2*	2.4 to 3.2 fl oz/A	cyfluthrin	0	12	H
3A + 4A	Leverage 360*	3.0 fl oz/A	beta-cyfluthrin + imidacloprid	7	12	H
3A + 28	Elevest*	5.6 to 9.6 fl oz/A	bifenthrin + chlorantraniliprole	7	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam - **foliar**	7	12	H
4A	Platinum 75SG	1.66 to 3.67 oz/A	thiamethoxam - **soil**	30	12	H
4A	Admire Pro 4.6SC	1.3 fl oz/A	imidacloprid - **foliar**	7	12	H
4A	Belay 2.13SC	9 to 12 fl oz/A	clothianidin - **soil**	21	12	H
4A	Belay 2.13SC	3.0 to 4.0 fl oz/A	clothianidin - **foliar**	7	12	H
28	Exirel 0.83SE	13.5 to 20.5	cyantraniliprole	1	12	H
28	Harvanta 50SL	10.9 to 16.4 fl oz/A	cyclaniliprole	1	4	H
28	Verimark 1.67SC	6.75 to 13.5 fl oz/A	cyantraniliprole - **soil at planting**	n/a	4	H
30	Incipio	2.1 to 4.1 fl oz/A	isocycloseram	1	12	H

Harlequin Bugs

These orange, black and white stinkbugs can be quite destructive, particularly on leafy cole crops like collards. Egg masses consist of numerous white and black barrel-shaped eggs in neat rows. Nymphs remain clustered near the eggs until molting. Infestations can be quite heavy. Feeding results in pale blotches with scalloped edges on foliage.

Apply one of the following formulations:						
Group	**Product Name (*=Restricted Use)**	**Product Rate**	**Active Ingredient(s) and Crop Restrictions**	**PHI (d)**	**REI (h)**	**Bee TR**
3A	Baythroid XL1EC*	2.4 to 3.2 fl oz/A	beta-cyfluthrin	0	12	H
3A	Brigade 2EC*	2.1 to 6.4 fl oz/A	bifenthrin	7	12	H
3A	Hero 1.23*	4.0 to 10.3 fl oz/A	bifenthrin + zeta-cypermethrin **- mustard greens only**	7	12	H
3A	Mustang Maxx 0.8*	3.2 to 4.0 fl oz/A	zeta-cypermethrin	1	12	H
3A	Tombstone 2*	2.4 to 3.2 fl oz/A	cyfluthrin	0	12	H
3A + 4A	Leverage 360*	3.0 fl oz/A	beta-cyfluthrin + imidacloprid	7	12	H
3A + 28	Elevest*	7.0 to 9.6 fl oz/A	bifenthrin + chlorantraniliprole	7	12	H
4A	Assail 30SG	4.0 to 5.3 oz/A	acetamiprid	3	12	M
4A	Assail 30SC	3.4 to 4.5 fl oz/A	acetamiprid	3	12	M
4A	Belay 2.13SC	9 to 12 fl oz/A	clothianidin - **soil**	21	12	H
4A	Belay 2.13SC	3.0 to 4.0 fl oz/A	clothianidin - **foliar**	7	12	H
30	Incipio	3.1 to 4.1 fl oz/A	isocycloseram	1	12	H

Leafhoppers

Apply one of the following formulations:						
Group	**Product Name (*=Restricted Use)**	**Product Rate**	**Active Ingredient(s) and Crop Restrictions**	**PHI (d)**	**REI (h)**	**Bee TR**
1A	Sevin XLR Plus 4	0.5 to 1 qt/A	carbaryl	14	12	H
1B	Dimethoate 400EC	0.5 pt/A	dimethoate	14	48	H
3A	Baythroid XL1.0EC*	0.8 to 1.6 fl oz/A	beta-cyfluthrin	0	12	H
3A	Brigade 2EC*	2.1 to 6.4 fl oz/A	bifenthrin	7	12	H
3A	Hero 1.23*	4.0 to 10.3 fl oz/A	bifenthrin + zeta-cypermethrin **- mustard greens only**	7	12	H
3A	Mustang Maxx 0.8*	2.24 to 4.0 fl oz/A	zeta-cypermethrin	1	12	H
3A	Tombstone 2* Tombstone Helios 2*	0.8 to 1.6 fl oz/A	cyfluthrin	0	12	H
3A + 4A	Leverage 360*	3.0 fl oz/A	beta-cyfluthrin + imidacloprid	7	12	H

Leafhoppers - continued next page

***Leafhoppers** - continued*

3A + 28	Elevest*	5.6 to 9.6 fl oz/A	bifenthrin + chlorantraniliprole	7	12	H
4A	Admire Pro 4.6SC	4.4 to 10.5 fl oz/A	imidacloprid - **soil**	21	12	H
4A	Admire Pro 4.6SC	1.3 fl oz/A	imidacloprid - **foliar**	7	12	H
4A	Belay 2.13SC	9 to 12 fl oz/A	clothianidin - **soil**	21	12	H
4A	Belay 2.13SC	3.0 to 4.0 fl oz/A	clothianidin - **foliar**	7	12	H

Leafminers

Apply one of the following formulations:						
Group	**Product Name (*=Restricted Use)**	**Product Rate**	**Active Ingredient(s)**	**PHI (d)**	**REI (h)**	**Bee TR**
1B	Dimethoate 400EC	0.5 pt/A	dimethoate	14	48	H
5	Entrust 2SC (OMRI)	6.0 to 10.0 fl oz/A	spinosad	1-3[1]	4	H
5	Radiant 1SC	6.0 to 10.0 fl oz/A	spinetoram	1-3[1]	4	H
15 + 4A	Cormoran	6.0 to 12.0 fl oz/A	novaluron + acetamiprid	7	12	M
17	Trigard 75WSP	2.66 oz/A	cyromazine	7	12	H
28	Exirel 0.83SE	13.5 to 20.5 fl oz/A	cyantraniliprole	1	12	H
28	Harvanta 50SL	10.9 to 16.4 fl oz/A	cyclaniliprole	1	4	H
28	Verimark 1.67SC	6.75 to 13.5 fl oz/A 6.75 to 10.0 fl oz/A	cyantraniliprole - **soil at planting** cyantraniliprole - **drip chemigation**	n/a 1	4	H

[1]PHI is 3 days for turnip greens.

Thrips

Apply one of the following formulations:						
Group	**Product Name (*=Restricted Use)**	**Product Rate**	**Active Ingredient(s)**	**PHI (d)**	**REI (h)**	**Bee TR**
3A + 4A	Leverage 360*	3.0 fl oz/A	beta-cyfluthrin + imidacloprid	7	12	H
4A[1]	Actara 25WDG	3.0 to 5.5 oz/A	thiamethoxam - **foliar**	7	12	H
4A[1]	Platinum 75SG	1.66 to 3.67 oz/A	thiamethoxam - **soil**	30	12	H
4A[1]	Assail 30SG	4.0 to 5.3 oz/A	acetamiprid	3	12	M
4A[1]	Assail 30SC	3.4 to 4.5 fl oz/A	acetamiprid	3	12	M
4A + 15	Cormoran	12.0 fl oz/A	acetamiprid + novaluron[3]	7	12	M
5	Entrust 2SC (OMRI)	6.0 to 10.0 fl oz/A	spinosad	1-3[2]	4	H
5	Radiant 1SC	6.0 to 10.0 fl oz/A	spinetoram	1-3[2]	4	H
28	Exirel 0.83SE	13.5 to 20.5 fl oz/A	cyantraniliprole	1	12	H
28	Harvanta 50SL	10.9 to 16.4 fl oz/A	cyclaniliprole	1	4	H
28	Verimark 1.67SC	10 to 13.5 fl oz/A	cyantraniliprole - **soil at planting**	n/a	4	H

[1]**Resistance concerns with tobacco thrips.** [2]PHI is 3 days for turnip greens. [3]Novaluron is effective on thrips larvae.

Disease Control

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

Recommended Fungicides

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

Code	**Product Name (*=Restricted Use)**	**Product Rate**	**Active Ingredient(s)**	**PHI (d)**	**REI (h)**	**Bee TR**
Apply one of the following at seeding (see label for application methods and restrictions):						
Pythium root rot						
4	Ridomil Gold 4SL	0.5 to 1.0 pt/A	mefenoxam	AP	48	N
Pythium and Rhizoctonia root rot						
4 + 11	Uniform 3.72SC	0.34 fl oz/1000 ft row. Avoid direct seed contact, which may cause delayed emergence	mefenoxam + azoxystrobin	AP	0	N
Rhizoctonia root rot						
11	azoxystrobin 2.08F	0.40 to 0.80 fl oz/1000 ft row	azoxystrobin	AP	4	N

Bacterial and Fungal Diseases

Downy Mildew

The pathogen has a wide host range including broccoli, Brussels sprouts, cauliflower, cabbage, kale, Chinese cabbage, Chinese broccoli, Chinese mustard, radish, etc. and related weeds in the brassica family. Plant certified seed since the pathogen can be seed-borne. Use hot water seed treatment (See Cole Crops, Disease Control section). Avoid overhead watering in the morning when spores are released.

Code	Product Name (*=Restricted Use)	Product Rate	Active Ingredient(s)	PHI (d)	REI (h)	Bee TR
Scout regularly. Rotate the following fungicides with different modes of action during periods of high moisture and moderate temperatures and continue as long as weather conditions favor disease development:						
21	Ranman 400SC	2.75 fl oz/A	cyazofamid	0	12	L
40	Forum 4.17SC/A *plus* fixed copper	6.0 fl oz	dimethomorph	0	12	N
40	Revus 2.08F	8.0 fl oz/A	mandipropamid	1	4	--
40 + 45	Zampro 525SC	14.0 fl oz/A	dimethomorph + ametoctradin	0	12	--
40 + 49	Orondis Ultra 2.33SC	5.5 to 8.0 fl oz/A	mandipropamid + oxathiapiprolin	1	4	--
43	Presidio 4SC	4.0 fl oz/A	fluopicolide	2	12	L
P07	Aliette 80WDG (for mustard greens only)	3.0 lb/A	fosetyl-Al	3	12/24	N

Leaf Spots caused by Alternaria, Cercospora, Anthracnose, and White spot

The fungal pathogens that cause leaf spot overwinter in the soil. Rotate away from fields for as long as possible.

Code	Product Name (*=Restricted Use)	Product Rate	Active Ingredient(s)	PHI (d)	REI (h)	Bee TR
M01	copper (OMRI)[1]	at labeled rates	copper	0		N
When conditions favor disease development, apply one of the following fungicides every 7 to 10 days for as long as conditions are favorable for disease development. Rotate between fungicides with different modes of actions:						
3	tebuconazole 3.6F	3.0 to 4.0 fl oz/A	tebuconazole	7	12	N
3	Rhyme 2.08SC	5.0 to 7.0 fl oz/A	flutriafol	7	12	--
3 + 9	Inspire Super 2.82EW	16.0 to 20.0 fl oz/A	difenoconazole + cyprodinil	7	12	--
3 + 11	Quadris Top 1.67SC	12.0 to 14.0 fl oz/A	difenoconazole + azoxystrobin	1	12	--
3 + 11	Topguard EQ 4.29SC	4.0 to 8.0 fl oz/A	flutriafol + azoxystrobin	0	12	--
7	Endura 70WG	14.0 oz/A	boscalid	0	12	--
7	Fontelis 1.67SC	14.0 to 30.0 fl oz/A	penthiopyrad	0	12	L
7 + 3	Luna Experience 3.34SC	6.0 to 8.6 fl oz/A	fluopyram + tebuconazole	7	12	--
7 + 11	Priaxor 4.17SC	6.0 to 8.2 fl oz/A	fluxapyroxad + pyraclostrobin	3	12	N
7 + 12	Miravis Prime	9.2 to 13.4 fl oz/A	pydiflumetofen + fludioxonil	0	12	--
9 + 12	Switch 62.5WG	11.0 to 14.0 oz/A	cyprodinil + fludioxonil	7	12	L
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]There are several OMRI listed copper-based products; see labels for specifics. Copper applications may help suppress some fungal pathogens in organic production systems.