



This is a section from the

2019

Mid-Atlantic

Commercial Vegetable

Production Recommendations

The manual, which is published annually, is **NOT** for home gardener use.

The **full manual**, containing recommendations specific to New Jersey, can be found on the Rutgers NJAES website in the Publications section:

<http://njaes.rutgers.edu/pubs/publication.asp?pid=E001>.

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>

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

1. Pesticides are listed by **group or code number based on chemical structure and mode 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 the Pesticide Safety chapter 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 the Pest Management chapter, Calibrating Granular Applicators section).
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 crop if bees are present; H=highly toxic, severe losses expected, -- = data not available.

Parsley

Recommended Varieties¹

Curly Leaf		Flat Leaf
Banquet (Overwintering)	Krausa	Giant of Italy
Champion Moss	Lisette	Italian Flat Leaf
Darki	Moss Curled II	Italian Plain Leaf
Forest Green (Semi-curved)	Titan	

¹Listed alphabetically; all varieties are open pollinated.

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 the Soil and Nutrient Management chapter. Your state's soil test report recommendations and/or your farm's nutrient management plan supersede recommendations found below.

Parsley		Soil Phosphorus Level				Soil Potassium Level				Nutrient Timing and Method
		Low	Med	High (Opt)	Very High	Low	Med	High (Opt)	Very High	
	N (lb/A)	P ₂ O ₅ (lb/A)				K ₂ O (lb/A)				
	150-175	200	150	100	0	200	150	100	0	Total nutrient recommended
	50-75	200	150	100	0	200	150	100	0	Broadcast and disk-in
	25-50	0	0	0	0	0	0	0	0	Sidedress after first cutting
	25-50	0	0	0	0	0	0	0	0	Sidedress after each additional cutting

Seeding and Spacing

Seed is sown 1/3 inch deep in a well-prepared seedbed as early as ground can be worked in late February/early March through mid-May for late spring/summer harvest. Later plantings can be sown beginning in mid-July for fall harvest and through mid-August for overwintered production. Spacing between rows is 12-18 inches. Parsley seeds are drilled at a rate of 20-40 lb/A, with plants spaced 1-2 inches apart in each row. Seed is slow to germinate. If seeds are more than 1 year old, test the germination and increase the sowing rate to compensate for reduced germination.

Overwintered and the earliest spring and later fall plantings benefit from the use of floating row covers and/or low or high tunnels for protection from freezing. Floating row covers can create conditions favorable for bacterial leaf spot infections to start and spread. Removing row covers on warm or windy days to allow excess moisture to evaporate will help reduce incidence of bacterial leaf diseases.

Harvest and Post-Harvest Considerations

Parsley can be harvested by cutting a few leaves at a time from each plant, or entire plants may be cut or dug with roots attached and bunched for sale. If cut above the crown, plants will regrow for a second cutting. Parsley leaves are used most commonly for fresh market, but for dried herb markets, the characteristic flavor and green color can be retained if the leaves are dehydrated. Store fresh parsley at 32°F (0°C) and 95-100% relative humidity. Parsley can keep up to 2-2.5 months at 32°F, but high humidity is essential to prevent desiccation. Do not store with other crops that produce ethylene as parsley is very sensitive to ethylene. Packaging in perforated polyethylene bags and using top ice are beneficial for longer storage periods. Controlled atmosphere of approximately 10% oxygen and 11% carbon dioxide at moderate temperatures (41-50°F/5-10°C) can help retain green color and salability.

Weed Control

THE LABEL IS THE LAW - See the Pesticide Use Disclaimer on the first page of section 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 the Pest Management chapter.
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)
5	Caparol 4L	1 pt/A	prometryn	0.5 lb/A	30	12
-Apply after seeding, but before crop emergence. Follow with overhead irrigation if rainfall does not occur. Primarily controls annual broadleaf weeds. Annual grasses may only be suppressed. Additional postemergence treatments may be needed for full-season control. - Do not use on sand or loamy sand soils, or crop injury may occur. - Do not tank-mix Caparol with any other pesticide. - Do not apply more than 1 pt/A in a single application and maximum Caparol 4L application per season is 3 pt/A.						
7	Lorox 50DF	1 to 3 lb/A	linuron	0.5 to 1.5 lb/A	30	24/96
-Apply immediately after seeding. Follow with irrigation if rainfall does not occur. Primarily controls broadleaf weeds. Annual grasses may only be suppressed. - Do not apply more than 1.5 lb/A linuron per season. Do not apply to parsley through any type of irrigation system -The restricted-entry interval is extended from 24 to 96 hrs (4 days) after hand-set irrigation activity.						
8	Prefar 4E	5 to 6 qt/A	bensulide	5 to 6 lb/A	--	12
-Labeled for preplant incorporated or preemergence applications; do not incorporate more than 2 inches deep (1 inch is optimum). -24c label for NJ only allows applications up to 9 qt/A (expires 12/31/2019). -Use on mineral soils only. If applied preemergence, irrigate within 36 hr of application with ½ inch of water; if not incorporated with irrigation or rainfall within 36 hr, 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	Product Rate	Active Ingredient (* = Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
1	Select 2 EC	6 to 8 fl oz/A	clethodim	0.07 to 0.12 lb/A	14	24
	Select Max 0.97EC	9 to 16 fl oz/A				
	Poast 1.5EC	1 to 1.5 pt/A	sethoxydim	0.2 to 0.28 lb/A	15	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 : use 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. 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 repeated applications are necessary, allow 14 days between applications. Rainfastness is 1 hr. - 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 2 pt/A for the season; do not apply more than 16 fl oz of Select Max in a single application and do not exceed 4 pt/A for the season. - Do not apply more than 1.5 pt/A Poast in single application and do not exceed 3 pt/A for the season.						
5	Caparol 4L	1 pt/A	prometryn	0.5 lb/A	30	12
-Apply after the crop has developed 3 true leaves. Primarily controls seedling annual broadleaf weeds less than 2 inches tall. Annual grasses may only be suppressed. An additional treatment can be applied to regrowth after the first harvest. - Do not use on sand or loamy sand soils, or crop injury may occur. Do not apply if parsley is under stress. - Do not tank-mix Caparol with any other pesticide. Do not use spray additives such as nonionic surfactant or oil concentrate. - Do not apply more than 1.0 pt/A in a single application and maximum Caparol 4L application per season is 3 pt/A.						
3. Postharvest						
Group	Product Name	Product Rate	Active Ingredient (* = Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
22	Gramoxone SL 2.0	2.25 to 3 pt/A	paraquat*	0.56 to 0.75 lb/A	--	24
-A Supplemental Label in DE for the use of Gramoxone SL 2.0 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 minutes. A maximum of 2 applications for crop dessication are allowed.						
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	Active Ingredient (* = Restricted Use)				
14	Aim	carfentrazone				

Insect Control

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Recommended Insecticides**

Aphids

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1B	Malathion 57 EC	1.0 to 2.0 pt/A	malathion (2 applications per season, only)	7	24	H
3A + 4A	Leverage 360	3.0 fl oz/A	imidacloprid + beta-cyfluthrin*	7	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam	7	12	H
4A	Admire Pro	4.4 to 10.5 fl oz/A	imidacloprid - soil	21	12	H
4A	Admire Pro	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 to 4 fl oz/A	clothianidin - foliar	7	12	H
4A	Platinum	5 to 11 fl oz/A	thiamethoxam	30	12	H
4C	Closer SC	1.5 to 2 fl oz/A	sulfoxaflor	3	12	H
9B	Fulfill 50WDG	2.75 oz/A	pymetrozine	7	12	N
23	Movento	4 to 5 fl oz/A	spirotetramet	3	24	L
28	Harvanta 50SL	10.9 to 16.4 fl oz/A	cyclanilprole	1	4	H
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantranilprole + abamectin*	7	12	H
29	Beleaf 50SG	2.0 to 2.8 fl oz/A	flonicamid	0	12	L
UN	Azatin O, Aza-Direct, Ecozin, Neemix (OMRI)	Refer to individual labels for rates	azadirachtin (biopesticide)	0	4	L

Armyworms

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
3A	Mustang-Max	3.2 to 4.0 fl oz/A	zeta-cypermethrin* - not for beet armyworm	1	12	H
3A	Tombstone, others	2.4 to 3.2 fl oz/A	cyfluthrin* - not for beet armyworm	0	12	H
3A + 4A	Leverage 360	3.0 fl oz/A	imidacloprid+beta-cyfluthrin* - not for beet armyworm	7	12	H
5	Entrust SC (OMRI)	6.0 to 10.0 fl oz/A	spinosad	1	4	M
5	Radiant SC	5.0 to 10.0 oz/A	spinetoram	1	4	H
6	Proclaim 5SG	2.4 to 4.8 fl oz/A	emamectin benzoate*	7	12	H
18	Intrepid 2F (early season)	4 to 8 fl oz/A	methoxyfenozide	1	4	L
18	Intrepid 2F (late season)	8 to 10 fl oz/A	methoxyfenozide	1	4	L
28	Exirel	7 to 13.5 fl oz/A	cyantranilprole - foliar	1	12	H
28	Harvanta 50SL	10.9 to 16.4 fl oz/A	cyclanilprole	1	4	H
28	Verimark	5 to 10 fl oz/A	cyantranilprole - soil	NA	4	H
28 + 6	Minecto Pro	5.5 to 10.0 fl oz/A	cyantranilprole+abamectin*	7	12	H

Carrot Weevils

Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1B	Malathion 57 EC	1.0 to 2.0 pt/A	malathion	7	24	H

Flea Beetles, Leafhoppers

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1B	Sevin XLR Plus	0.5 to 1 qt/A	carbaryl	14	12	H
3A	Baythroid XL	2.4 to 3.2 fl oz/A	beta-cyfluthrin*	0	12	H
3A	Mustang Maxx	2.24 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Permethrin 3.2EC, others	2 to 8 fl oz/A	permethrin*	1	12	H
3A	Tombstone, others	2.4 to 3.2 fl oz/A	cyfluthrin*	0	12	H

Flea Beetles, Leafhoppers - continued on next page

F Parsley

Flea Beetles, Leafhoppers - continued

Code	Product Name	Product Rate	Active Ingredient(s)	PHI (d)	REI (h)	Bee TR
3A + 4A	Leverage 360	3.0 fl oz/A	imidacloprid + beta-cyfluthrin*	7	12	H
4A	Actara 25WDG	1.5 to 3.0 oz/A	thiamethoxam	7	12	H
4A	Admire Pro	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 to 4 fl oz/A	clothianidin - foliar	7	12	H
4A	Platinum 75SG	5 to 11 fl oz/A	thiamethoxam	30	12	H
4A	Scorpion 35SL	9 to 10.5 fl oz/A	dinotofuran - soil	21	12	H
4A	Scorpion 35SL	2 to 5.2 fl oz/A	dinotofuran - foliar	7	12	H
4A	Venom 70SG	5 to 7.5 fl oz/A	dinotofuran - soil	21	12	H
4A	Venom 70SG	1 to 3 fl oz/A	dinotofuran - foliar	1	12	H
4C	Closer SC	1.5 to 2 fl oz/A	sulfoxaflor	3	12	H
28	Harvanta 50SL	10.9 to 16.4 fl oz/A	cyclaniliprole	1	4	H

Tarnished Plant Bugs

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
1B	Sevin XLR Plus	1 to 2 qt/A	carbaryl	14	12	H
3A	Baythroid XL	2.4 to 3.2 fl oz/A	beta-cyfluthrin*	0	12	H
3A	Mustang Maxx	3.2 to 4.0 fl oz/A	zeta-cypermethrin*	1	12	H
3A	Tombstone, others	2.4 to 3.2 fl oz/A	cyfluthrin*	0	12	H
3A + 4A	Leverage 360	3.0 fl oz/A	imidacloprid + beta-cyfluthrin*	7	12	H
29	Beleaf 50SG	2.0 to 2.8 fl oz/A	flonicamid	0	12	L

Disease Control

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Recommended Fungicides

Nematode Control

Nematode control is essential for satisfactory parsley production; see the Nematodes and Soil Fumigation sections in the Pest Management chapter. Before planting, soil should be fumigated with metam-sodium (Busan or Vapam HL) according to directions in the Soil Fumigation section in the Pest Management chapter.

Seed Treatment

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
For Pythium and Phytophthora Control:						
4	Apron XL LS ¹	0.085 to 0.64 fl oz/100 lb seed	mefenoxam	n/a	n/a	N
For Control of Other Root Rots:						
12	Maxim 4FS ¹	0.08 to 0.16 fl oz/100 lb seed	fludioxonil	n/a	n/a	L

¹Apron XL LS and Maxim 4FS can be combined.

Damping-off caused *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	Ridomil Gold 4SL	0.5 to 1.0 pt/A	mefenoxam	NA	48	N
4	MetaStar 2E AG	2.0 to 4.0 pt/A	metalaxyl	NA	48	N
For Rhizoctonia root rot control, apply as in-furrow application:						
11	azoxystrobin 2.08F	0.40 to 0.80 fl oz/A		NA	4	N
For Pythium and Rhizoctonia root rot control apply as banded spray:						
11 + 4	Uniform 3.66SC	0.34 fl oz/1000 ft row	azoxystrobin + mefenoxam	NA	0	N

Bacterial Leaf Blight and Septoria Leaf Spot

To help reduce disease pressure from bacterial and fungal diseases, rotate with non-related crops for at least 2 years. Space successive plantings in the same year as far apart as possible. Heavy winds and rain may damage leaves and predispose leaves to bacterial infections.

Bacterial leaf blight: Prevention is key. Avoid working in the fields while the foliage is wet to help reduce spread. Scout fields on a regular basis for early symptoms, apply fixed copper at labeled rates with regular maintenance applications for leaf spot diseases and repeat every 7 days. Some copper-based products are OMRI-approved and can be used in organic production systems for the suppression of bacterial and some fungal diseases.

Septoria leaf spot: The disease causes serious problems in fields where parsley has been grown extensively. Grow parsley in fields without a history of the disease. Plant blocks as far apart as possible. **Early detection and prevention are key.** Scout daily and apply fungicides preventatively before first leaf spots appear. Early season infections (*i.e.*, prior to first cutting) will severely reduce subsequent harvests.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Rotate the following every 7 days prior to the onset of the disease:						
3	Rhyme 2.08SC	5.0 to 7.0 fl oz/A	flutriafol	7	12	--
3 + 11	Topguard EQ	6.0 to 8.0 fl oz/A	flutriafol + azoxystrobin	7	12	--
7	Fontelis 1.67SC ¹	14.0 to 24.0 fl oz/A	penthiopyrad	3	12	L
7 + 11	Merivon 2.09SC ¹	4.0 to 11.0 fl oz/A	fluxapyroxad + pyraclostrobin	1	12	N
or with a FRAC code 11 fungicide where resistance is not present:²						
11	azoxystrobin 2.08F ¹	6.0 to 15.5 fl oz/A	azoxystrobin	0	4	N
11	Cabrio 20EG ¹	12.0 to 16.0 oz/A	pyraclostrobin	0	12	N

(*) See labels for specific crop use.

¹ Tank-mixing the above with a fixed copper may also help suppress bacterial infections.

² Poor control has been noted in areas of southern NJ where FRAC code 11 fungicides have been used extensively to control Septoria leaf spot.

**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 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.