



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.

F Beans (Snap and Lima)

Plant Tissue Testing

Plant tissue testing can be a valuable tool to assess crop nutrient status during the growing season to aid with in-season fertility programs or to evaluate potential deficiencies or toxicities. Critical snap bean tissue test values for most recently matured leaves up to first bloom: N 3-4%, P 0.3-0.5%, K 2.0-3.0%, Ca 0.8-1.5%, Mg 0.25-0.45% and S 0.2-0.4%. For additional nutrients and other growth stages consult with a tissue testing laboratory or this web link at the University of Florida: <http://edis.ifas.ufl.edu/ep081>.

Site selection, soil and fertilization

Well-drained friable sandy loams to clay loams are well suited for legumes. Avoid compacted soils that can flood. Slightly acid soils (pH 6-6.5) are preferred. If lime is needed, apply it several months before planting. All P and K can be applied before planting. Beans respond to N applications, especially bush types.

Planting and Harvesting Dates

Note: In PA and normally cooler areas, delay the start of planting by 10 days and stop planting 14 days sooner than indicated below. In the southern part of the region, plantings that will result in pod set at temperatures above 90°F (commonly mid July-early August) are at risk of blossom drop, split set, high cull percentage, and reduced yield.

Variety	Planting Dates	Harvesting Dates
Market Snap	April 10 - August 10	June 20 - October 20
Processing Snap	April 20 - August 10	July 1 - October 20
Fordhook Lima	May 15 - July 10 (June 20 - July 10 in the southern part of the region)	August 1 - October 20
Baby Lima	May 15 - July 20	August 1 - October 30
Pole Lima	May 15 - June 15	July 15 - October 30

Spacing

Snap Beans. Rows 30-36 inches apart, 6-10 plants/ft. Plant 50-75 lb/A of seed depending on seed size (lower rate for lighter seeds). Narrow rows increase yields but render late-season tillage difficult. Plant in rows 18-24 inches apart with 5-7 plants/ft. Plant 75-120 lb/A of seed, depending on seed size. Calibrate planter according to seed size. Sow 1-1½ inches deep in light sandy soil; shallower in heavier soil.

Lima Beans, Fordhook Type. Rows 30-36 inches apart, 2 plants/ft. Plant 85 lb/A of seed, 1½ inches deep.

Lima Beans, Baby Types. Rows 30-36 inches apart, 3-4 plants/ft. Plant 50 lb/A of seed, 1½ inches deep (deeper if soil is dry). For irrigated fields: Rows 18-30 inches apart, 4-5 inches between plants; plant 96 lb/A of seed at close spacing and 78 lb/A at wider spacing.

Lima Beans, Pole Types. Large seeded pole lima beans are often started in a cold frame or greenhouse which results in higher germination percentages and earlier crops. Plant 1 seed per cell at a depth of 1 inch in containers or plug flats with cells that are at least 1.5 inches in diameter and 2 inches deep. Use a sterile commercial greenhouse medium. Bottom heat will stimulate growth and help produce transplants quicker. Transplant to the field once plants have the first true leaves. Do not allow transplants to become completely root bound. Do not disturb roots during the transplanting process or stunting may occur. Pole lima beans are very vigorous and should not be planted too close together or excessive vine growth may reduce yields. Space plants at a distance of 3-6 ft in the row (less vigorous types closer, more vigorous types further apart) with a minimum of 5 ft between rows.

Irrigation

Snap and lima beans are grown under irrigated and dryland conditions. Bean crops respond to irrigation and highest yields are obtained when soil moisture is maintained at 50% of field capacity or higher, from the 2 trifoliate leaf stage through pod sizing. Water use during flowering and pod sizing can be over 0.25 inches/day and water deficit during this period will have the greatest negative impact on yield and pod quality. However, a balance must be struck between maintaining adequate moisture for pod growth and minimizing wetness in the canopy which promotes white mold in all beans and downy mildew and pod blight in lima beans.

Trellising Pole Lima Beans

Sturdy wooden or metal posts should be spaced every 15-20 ft in the row. Additional smaller spacer stakes may be needed in between posts. At least 5 ft, preferably 6 ft, of the posts or stakes should be above ground. Tightly stretch a 10-12 gauge wire and nail it to the tops of the stakes. Stretch a smaller wire or twine and nail it to the posts halfway up above the ground. Then tie the twine in a crisscross fashion to the top wire and to the bottom wire (or twine) on

2. Soil-Applied (Preplant Incorporated or Preemergence) - continued

8	Eptam 7E	3.0 to 3.5 pt/A	EPTC	2.5 to 3.0 lb/A	--	12
<p>-Snap beans only. Preplant incorporated applications only; incorporate by disking twice into 3-4 inches of soil immediately after application. Useful for nutsedge control, annual grasses, and some broadleaf weeds.</p> <p>-Combining Eptam with Dual Magnum may improve weed control but may increase the risk of crop injury when weather conditions are adverse. Do not exceed 9 pt/A per year (3.5 pt/A on coarse-textured soils).</p>						
13	Command 3ME	6.4 to 10.7 fl oz/A	clomazone	0.15 to 0.25 lb/A	45	12
<p>-Snap beans only. Apply to control annual grasses and many broadleaf weeds including common lambsquarters, velvetleaf, spurred anoda, and jimsonweed. Command will not control yellow nutsedge, mustards, morningglory species, or pigweed species.</p> <p>-Use the lower rate on coarse-textured soils low in organic matter and higher rates on fine-textured soils and on soils with high organic matter. Some temporary crop injury (partial whitening of leaf or stem tissue) may be apparent after crop emergence; beans recover from minor early injury without affecting yield or earliness.</p> <p>-WARNINGS: Command spray or vapor drift may injure sensitive crops and other vegetation up to several hundred yards from the point of application. Do not apply adjacent to sensitive crops (see label) or vegetation, or under unfavorable wind or weather conditions. Command may limit subsequent cropping options, see the label.</p> <p>-Maximum number of applications per season: 1.</p>						
14	Reflex 2SL	1.0 to 1.5 pt/A	fomesafen	0.25 to 0.375 lb/A	30	24
<p>-Snap beans only. Controls several common broadleaf weeds. Tank-mix for control of annual grasses.</p> <p>-Maximum of 1.25-1.5 pt/A may be applied either preemergence or postemergence in one year. Maximum rates vary by state (see Regional Use Map on herbicide label for details).</p> <p>-Do not apply more than once in a 2-year period (alternate year applications). Rotational restrictions for most vegetables is 18 months.</p>						
14+14	Spartan Charge 3.5EC	3 to 3.75 fl oz/A	sulfentrazone + carfentrazone	0.082 to 0.103 lb/A	--	24
<p>-Lima beans only.</p> <p>-A Special Local Needs Label 24(c) has been approved for the use of Spartan Charge for lima beans in DE only (expires 9/12/2021). Labeled for ALS-resistant pigweed (Group 2 herbicides). Do not use Spartan Charge if temporary crop injury is not acceptable.</p> <p>-Combine with another herbicide to control annual grasses. Apply no later than 3 days after seeding, but do not apply after cracking. Expect some temporary crop injury after emergence.</p>						
15	Dual Magnum 7.62E	1.0 to 2.0 pt/A	s-metolachlor	0.95 to 1.91 lb/A	--	24
<p>-Preplant incorporated or preemergence; incorporated applications should be worked into the soil 2-3 inches deep by disking twice with blades set 4-6 inches deep. Primarily controls annual grasses and nutsedge; nutsedge control is improved with preplant incorporation. Dual will not control emerged weeds. A postemergence herbicide, may be required for adequate broadleaf weed control.</p> <p>-Do not apply more than 2 pt/A during any one crop year.</p>						

3. 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 9.0 to 16.0 fl oz/A	clethodim	0.07 to 0.125 lb/A	21	12
1	Assure II/Targa 0.88EC	6.0 to 14.0 fl oz/A	quizalofop	0.04 to 0.10 lb/A	15	12
1	Poast 1.5EC	1.0 to 2 pt/A	sethoxydim	0.2 to 0.5 lb/A	15	12
<p>-Select Max and Poast can be applied to snap beans and lima beans; Assure II/Targa labeled for snap beans only.</p> <p>-Select 2EC: use crop oil concentrate (COC) at 1% v/v (1 gal/100 gal spray solution). Select Max: use nonionic surfactant (NIS) at 0.25% v/v (1 qt/100 gal spray solution). Poast: use COC at 1% v/v. Assure II/Targa: use COC at 1% v/v.</p> <p>-The use of COC may increase the risk of crop injury under hot or humid conditions. To reduce this risk, omit additives or switch to NIS when grasses are small and soil moisture is adequate.</p> <p>-Use lower labeled rates for annual grass control and higher labeled rates for perennial grass control.</p> <p>-Addition of nitrogen is not recommended.</p> <p>-Yellow nutsedge, wild onion, wild garlic, and broadleaf weeds will not be controlled.</p> <p>-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.</p> <p>-Repeated applications may be necessary to control certain perennial grasses. If repeat applications are necessary, allow 14 days between applications</p> <p>-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.</p> <p>-Rainfastness is 1 h.</p> <p>-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 apply more than 1 application per season.</p> <p>-Do not apply Assure II/Targa within 7 days of another Assure II/Targa application. Do not make more than 2 applications per season, and do not exceed 14 fl oz/A for the season.</p> <p>-Do not apply more than 2.5 pt/A Poast in single application and do not exceed 4 pt/A for the season.</p>						

3. Postemergence - continued on next page

F Beans (Snap and Lima)

3. Postemergence - continued

2	Raptor 1L	4.0 fl oz/A	imazamox	0.031 lb/A	--	4
<p>-Apply to control annual broadleaf weeds when the crop has 1-2 fully expanded trifoliolate leaves but before bloom stage of bean growth</p> <p>-Add nonionic surfactant to be 0.25% of the spray solution (1.0 qt/100 gal of spray).</p> <p>-Add 0.5 to 1.0 pt/A of bentazon (Basagran) to reduce the expression of injury symptoms or use Varisto 4.18L which is a prepackaged mixture of Raptor plus Basagran; 21 fl oz of Varisto = 4 fl oz of Raptor and 21 fl oz of Basagran 4L</p> <p>-Strictly observe all plantback restrictions.</p> <p>-Raptor is an ALS inhibitor, Group 2 herbicide, and there is widespread resistance in the region to this family of herbicides.</p> <p>-Rainfastness is 1 h. Do not apply more than 4 fl oz/A per year and more than one application per growing season.</p>						
2	Sandea 75DF	0.50 to 0.66 oz/A	halosulfuron	0.023 to 0.031 lb/A	30	12
<p>-Apply with nonionic surfactant at 0.25% of the spray solution (1.0 qt/100 gal of spray solution) to control yellow nutsedge and certain annual broadleaf weeds. Use only the lower rate when treating snap beans.</p> <p>-Applications should be sprayed when the crop has 2-3 trifoliolate leaves and annual weeds are less than 2 inches tall. (Treatments applied when beans are younger increases the risk of temporary stunting, and applications after the 3 trifoliolate leaf stage increases the risk of a split set.) Occasionally, slight yellowing of the crop may be observed within a week of Sandea application. When observed, recovery is rapid with no effect on yield or maturity.</p> <p>-Sandea provides both residual and postemergence control of susceptible weed species. Provides control of yellow nutsedge and certain annual broadleaf weeds. Control of weeds taller than 3 inches may not be adequate.</p> <p>-Sandea is an ALS inhibiting herbicide and resistant weed populations are common in the region. Do not use Group 2 herbicides repeatedly in the same field.</p> <p>-Do not apply Sandea to crops treated with a soil-applied organophosphate insecticide, or use a foliar applied organophosphate insecticide within 21 days before or 7 days after a Sandea application.</p> <p>-Rainfastness is 4 h. Do not apply more than 2 applications, or more than 2 oz of product per year.</p>						
6	Basagran 4L	1.0 to 2.0 pt/A	bentazon	0.5 to 1.0 lb/A	30	48
<p>-Apply when beans have fully expanded first trifoliolate leaves. Use lower rate to control common cocklebur, mustards, and jimsonweed and the higher rate to control yellow nutsedge, common lambsquarters, common ragweed, and Canada thistle (2 applications may be needed to control nutsedge and thistle). Basagran will not control pigweed species.</p> <p>-Temporary, pronounced crop injury may be observed that can result in delayed maturity.</p> <p>-The use of oil concentrate may increase the risk and severity of crop injury. To reduce the risk of crop injury, omit additives or switch to a nonionic surfactant when weeds are small and soil moisture is adequate. Do not spray when temperatures are over 90°F (32°C).</p> <p>-Rainfastness is 4 h.</p>						
14	Reflex 2SL	Rates vary, refer to the specific label	fomesafen	0.125 to 0.375 lb/A	30	24
<p>-Snap beans only. Apply when snap beans have 1-2 fully expanded trifoliolate leaves.</p> <p>-The recommended rate is 0.5 to 0.75 pt/A based on local research. This is lower than the labeled rate to reduce the risk of crop injury.</p> <p>-Use the lower recommended rate when weeds are small or when there is good soil moisture, high humidity, and warm cloudy weather causing "soft" growing conditions. Add nonionic surfactant to be 0.25% of the spray solution (1.0 qt/100 gal of spray).</p> <p>-Tank-mix with bentazon to improve the control of common lambsquarters, smartweed, velvetleaf, cocklebur, galinsoga, and yellow nutsedge. Use of crop oil can improve weed control, but may slightly reduce crop tolerance.</p> <p>Do not use urea ammonium nitrate (UAN) or ammonium sulfate (AMS) on snap beans or severe injury may occur.</p> <p>-Lima beans and most other vegetables are sensitive to fomesafen.</p> <p>-Reflex provides both residual and postemergence control of susceptible weed species.</p> <p>-Be sure to consider rotational crops when deciding to apply fomesafen. Rainfastness is 1 h.</p> <p>-Maximum Reflex application: 1.25 to 1.5 pt/A IN ALTERNATE YEARS.</p> <p>-Maximum fomesafen application: 0.313 to 0.375 lb ai/A IN ALTERNATE YEARS.</p>						

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
<p>-A Special Local Needs 24(c) label has been approved in VA (expires 12/31/2022) and a Supplemental Label in DE for the use of Gramoxone SL 2.0 for postharvest application to desiccate the crop.</p> <p>-Apply after the last harvest for bareground or plasticulture. Always include an adjuvant.</p> <p>-Spray coverage is essential for optimum effectiveness. See the label for additional information and warnings.</p> <p>-Rainfastness 30 min. A maximum of 2 applications for crop desiccation are allowed.</p> <p>-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 (http://usparaquattraining.com); certified applicators must repeat training every three years.</p>						

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	Shark	carfentrazone

Insect Control

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

Soil Pests -Seed Maggots

Seed maggots are mostly a problem in soils high in organic matter, under moist conditions, and when cool springs delay seed germination. For the best control, plant seeds commercially treated with one of the following: chlorpyrifos* (Lorsban) or thiamethoxam (Cruiser 5FS) - **commercially applied seed treatment only**.

Above-ground Pests

Aphids

Treat only if aphids are well distributed throughout the field (50% or more of terminals with 5 or more aphids), when weather favors population increase, and if beneficial species are lacking.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV	1.5 to 3.0 pt/A	methomyl*	See label	48	H
1B	Dimethoate 400	0.5 to 1.0 pt/A	dimethoate*	0 ¹	48	H
4A	Neonicotinoid insecticides registered for use on Beans: see table at the end of Insect Control.					
4C	Transform WG	0.75 to 1.0 oz/A	sulfoxaflor	7	24	H
4D	Sivanto Prime or 200SL	7.0 to 14.0 fl oz/A	flupyradifurone	7	4	M
23	Movento	4.0 to 5.0 fl oz/A	spirotetramat	1	24	L
29	Beleaf 50SG	2.8 oz/A	flonicamid	7	12	L

¹Mechanical Harvest only

Bean Leaf Beetles (BLB) and Mexican Bean Beetles (MBB)

Bean leaf beetle adults, which are similar in size to spotted cucumber beetles, and Mexican bean beetle adults (copper-colored ladybeetles with black spots), and larvae (yellow with spines) chew holes in leaves, but also may cause direct injury to pods. Early control measures are recommended to reduce yield loss from defoliation, and reduce population levels later in the season. Begin spraying at 20% defoliation or 1 beetle per plant.

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 - snap beans only	3	12	H
1B	Dimethoate 400	0.5 to 1.0 pt/A	dimethoate*	0 ¹	48	H
3A	Pyrethroid insecticides registered for use on Beans: see table at the end of Insect Control.					
4A	Neonicotinoid insecticides registered for use on Beans: see table at the end of Insect Control.					

¹Mechanical Harvest only

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

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	1.00 to 1.50 qt/A	carbaryl - snap beans only	3	12	H
1B	Diazinon AG500 ¹	2.0 to 4.0 qt/A ²	diazinon*	45	72	H
3A	Pyrethroid insecticides registered for use on Beans: see table at the end of Insect Control.					
28	Coragen 1.67SC	3.5 to 7.5 fl oz/A	chlorantraniliprole - foliar	1	4	L

Broadcast just before planting and immediately incorporate into the soil.

Leafminers

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
1B	Dimethoate 400	0.5 to 1.0 pt/A	dimethoate*	0 ¹	48	H
5	Blackhawk 36WG ²	2.5 to 3.3 oz/A	spinosad	3	4	M

Leafminers - continued on next page

F Beans (Snap and Lima)

Leafminers - continued

5	Radiant SC ²	5.0 to 8.0 fl oz/A	spinetoram	3	4	M
17	Trigard 75WSP	2.66 oz/A	cyromazine	7	12	H
28 + 6	Minecto Pro	7.5 to 10.0 fl oz/A	cyantraniliprole + abamectin*	7	12	H
28	Exirel	10.0 to 20.5 fl oz/A	cyantraniliprole	1	12	H
28	Verimark	6.75 to 13.5 fl oz	cyantraniliprole	n/a	4	H

¹Mechanical Harvest only; ² Control may be improved by addition of an adjuvant

Mites

Spot-treat areas along edges of fields when white stippling along veins on the underside of leaves is first noticed. Broad-spectrum insecticides (Groups 1B, 3) will provide initial knockdown, but continued use may result in outbreaks.

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 to 1.0 pt/A	dimethoate*	0 ¹	48	H
3A	Pyrethroid insecticides registered for use on Beans: see table at the end of Insect Control.					
20B	Kanemite 15SC	31.0 fl oz/A	acequinocyl	7	12	L
20D	Acramite 50WS	1.0 to 1.5 lb/A	bifenazate	3	12	M
21A	Magister SC	32.0 to 36.0 fl oz/A	fenazaquin	7	12	H
21A	Portal XLO	2.0 pt/A	fenpyroximate - snap beans only	1	12	L

¹Mechanical Harvest only

Potato Leafhoppers (PLH)

PLH can cause hopperburn on leaves, which can reduce photosynthesis and yield. Seeds treated commercially with thiamethoxam (Cruiser 5ST) are protected from PLH for about 3 weeks post planting. Sweep netting can help determine if pest densities warrant control. Treat if the number of adults plus nymphs exceeds 100 per 20 sweeps.

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 qt/A	carbaryl - snap beans only	3	12	H
1A	Lannate LV	0.75 to 3.0 pt/A	methomyl*	see label	48	H
1B	Dimethoate 400	0.5 to 1.0 pt/A	dimethoate*	0 ¹	48	H
3A	Pyrethroid insecticides registered for use on Beans: see table at the end of Insect Control.					
4A	Neonicotinoid insecticides registered for use on Beans: see table at the end of Insect Control.					
4D	Sivanto Prime or 200SL	7.0 to 14.0 fl oz/A	flupyradifurone	7	4	M

¹Mechanical Harvest only

Stink Bugs

Sweep netting can be useful to detect stink bugs. Treatment is recommended if adults and nymphs exceed 7 per 50 sweeps during pod development.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
3A	Pyrethroid insecticides registered for use on Beans: see table at the end of Insect Control.					

Tarnished Plant Bugs (TPB)

Treat only if the number of adults and/or nymphs exceeds 15 per 50 sweeps from the pin pod stage until harvest.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV	1.5 to 3 pt/A	methomyl*	see label	48	H
1B	Dimethoate 400	0.5 to 1.0 pt/A	dimethoate*	0 ¹	48	H
3A	Pyrethroid insecticides registered for use on Beans: see table at the end of Insect Control.					
4C	Transform WG	1.5 to 2.25 oz/A	sulfoxaflor	7	24	H
29	Beleaf 50SG	2.8 oz/A	flonicamid	7	12	L

¹Mechanical Harvest only

Thrips

Treatments should be applied if thrips are present from cotyledon stage to when the first true leaves are established and/or when first blossoms form.

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
1A	Lannate LV	1.5 to 3 pt/A	methomyl*	see label	48	H
3A	Pyrethroid insecticides registered for use on Beans: see table at the end of Insect Control.					
4A	Neonicotinoid insecticides registered for use on Beans: see table at the end of Insect Control.					
5	Radiant SC ¹	5.0 to 8.0 fl oz/A	spinetoram	3	4	M
5	Blackhawk 36WG ¹	2.5 to 3.3 oz/A	spinosad	3	4	M

¹Control may be improved by addition of an adjuvant

Whiteflies

Apply one of the following formulations:						
Group	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
4A	Neonicotinoid insecticides registered for use on Beans: see table at the end of Insect Control.					
4D	Sivanto Prime or 200SL	10.5 to 14.0 fl oz/A	flupyradifurone	7	4	M
21A	Portal XLO	2.0 pt/A	fenpyroximate - snap beans only	1	12	L
23	Movento	4.0 to 5.0 fl oz/A	spirotetramat	1	24	L
28	Exirel	10.0 to 20.5 fl oz/A	cyantraniliprole	1	12	H
28	Verimark	6.75 to 13.5 fl oz	cyantraniliprole	n/a	4	H

"Worm" Pests, Including: Corn Earworms (CEW), Beet Armyworms (BAW), European Corn Borers (ECB), Cutworms, Yellow-Striped Armyworms, and Loopers

There are several species of lepidopteran "worm" pests that can attack beans. These pests feed on leaves and also attack pods. An action threshold of 30 larvae per 3 ft of row or about 20% defoliation is often used pre-pod. Once bean pods form, control measures are often needed weekly to protect the crop from direct damage or infestation of the pods. In processing snap beans, treat every 5-7 days if CEW catches in local blacklight traps average 20 or more per night and most corn in the area is mature. For lima beans, treat when CEW populations exceed 1 per 6 ft of row. **Please note that some localized CEW, BAW and soybean looper populations have developed resistance to pyrethroids (Group 3A), and that these insecticides should be used with caution and rotated to other insecticide classes within a season**

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	Lannate LV	1.5 to 3 pt/A	methomyl* - except cutworms	see label	48	H
3A	Pyrethroid insecticides registered for use on Beans: see table at the end of Insect Control.					
5	Blackhawk 36WG	2.2 to 3.3 oz/A	spinosad	3	4	M
5	Radiant SC	4.0 to 8.0 fl oz/A	spinetoram - except yellow striped armyworm	3	4	M
11A	XenTari (OMRI)	0.5 to 1.5 lb/A	<i>Bacillus thuringiensis aizawai</i>	0	4	N
11A	Dipel DF, others (OMRI)	0.5 to 2.0 lb/A	<i>Bacillus thuringiensis kurstaki</i>	0	4	N
18	Intrepid 2F	4.0 to 16.0 fl oz/A 10.0 to 16.0 fl oz/A (CEW)	methoxyfenozide	7	4	L
22	Avaunt eVo	3.5 to 6.0 oz/A	indoxacarb (CEW, ECB only)	3	12	H
28	Coragen 1.67SC	5.0 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	Exirel	10.0 to 20.5 fl oz/A	cyantraniliprole (CEW, ECB only)	1	12	H

F Beans (Snap and Lima)

Group 3A Pyrethroid Insecticides Registered for Use on Beans					
Apply one of the following formulations (check if the product label lists the insect you intend to spray; the label is the law):					
Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Asana XL ¹	2.9 to 9.6 fl oz/A ¹	esfenvalerate* - snap beans only	3	12	H
Bifenthrin 2EC, others	1.6 to 6.4 fl oz/A	bifenthrin*	3	12	H
Hero EC	4.0 to 10.3 fl oz/A	zeta-cypermethrin* + bifenthrin*	3	12	H
Lambda-Cy IEC, others ¹	1.92 to 3.84 fl oz/A ¹	lambda-cyhalothrin*	7	24	H
Mustang Maxx ¹	1.28 to 4.0 fl oz/A ¹	zeta-cypermethrin*	1	12	H
Warrior II ¹	0.96 to 1.92 fl oz/A ¹	lambda-cyhalothrin*	7	24	H
Combo products containing a pyrethroid					
Besiege ¹	5.0 to 10.0 fl oz/A ¹	lambda-cyhalothrin* + chlorantraniliprole (Group 28)	7	12	H
Brigadier	3.8 to 5.6 fl oz/A	bifenthrin* + imidacloprid (Group 4A) - foliar only	7	12	H
Ethos XB	6.8 to 8.5 fl oz/A	bifenthrin* + <i>Bacillus amyloliquefaciens</i> - soil	3	12	H
Ethos XB	2.1 to 8.5 fl oz/A	bifenthrin* + <i>Bacillus amyloliquefaciens</i> - foliar	3	12	H

¹Not recommended for BAW or soybean looper due to resistance issues.

Group 4A Neonicotinoid Insecticides Registered for Use on Beans					
Apply one of the following formulations (check if the product label lists the insect you intend to spray; the label is the law):					
Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Admire Pro	7.0 to 10.5 fl oz/A	imidacloprid - soil	21	12	H
Admire Pro	1.2 fl oz/A	imidacloprid - foliar	7	12	H
Assail 30SG	2.5 to 5.3 oz/A	acetamiprid	7	12	M
Combo products containing a neonicotinoid					
Brigadier	3.8 to 5.6 fl oz/A	imidacloprid + bifenthrin* (Group 3A) - foliar only	7	12	H

Disease Control

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

Nematodes - See also sections E 1.5 Soil Fumigation and E 1.6 Nematode Control in chapter E Pest Management. Use fumigants listed in the Pest Management chapter or Mocap 15G at 13 to 20 lb/A (0.9 to 1.4 lb/1000 linear feet of row) in a 12-in. band over the row. Do not use as an in-furrow treatment. A Special Local Needs Label 24(c) is available for use of Mocap EC (2.0 to 3.9 fl oz/1000 linear feet of row or 1.33 to 2.75 qt/A broadcast) on lima and snap beans in DE and MD.

Taking soil samples in the fall for soybean cyst nematode (SCN) and root knot nematode determinations from fields to be planted the following season is highly recommended. Growers who rotate snap beans with soybeans should be alert for problems caused by SCN in infested fields. Snap beans are susceptible, where baby lima beans are resistant to SCN. Snap beans and lima beans are very susceptible to root knot nematode.

Seed Treatment

Use treated seed and avoid rough handling of seed as it greatly reduces germination.

IMPORTANT: Do not use treated seed for food or feed!						
Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI(d)	REI(h)	Bee TR
For Rhizoctonia and Fusarium:						
12	Maxim 4FS	0.08 to 0.16 fl oz/100 lb seed	fludioxonil	AP	12	L
For Rhizoctonia:						
11	Dynasty	0.15 to 0.76 fl oz/100 lb seed	azoxystrobin	AP	4	N
For Pythium/Phytophthora:						
4	Apron XL LS	0.16 to 0.64 fl oz/100 lb seed	mefenoxam	AP	48	N

Damping Off caused by *Phytophthora*, *Pythium*, and *Rhizoctonia*

Damping off and root rots are caused by a complex of soilborne fungi including *Rhizoctonia*, *Pythium*, *Phytophthora*, and *Fusarium* spp. In the mid-Atlantic region, the primary cause of root rot in bean are *Pythium* spp., which often cause extensive damage during periods of warm, wet, humid weather in July and August. On snap beans, *Pythium* spp. can also cause extensive pod rot.

Rotate beans with non-legume crops. Avoid fields with low lying areas, poorly drained soils, and minimize soil compaction. Plow under previous crop residue rather than disking. Select cultivars that set pods high in the plant, are more upright in architecture and use a close row spacing to help avoid pod contact with the soil surface.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following at-planting (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 3.66SE	0.34 fl oz/1000 ft row ¹	mefenoxam + azoxystrobin	AP	0	N
Rhizoctonia root rot						
7	Fontelis 1.67SC	1.2 to 1.6 fl oz/1000 ft row	penthiopyrad	AP	12	L
11	azoxystrobin 2.08F	0.40 to 0.80 fl oz/1000 ft row	azoxystrobin	AP	4	N

¹Avoid direct seed contact, which may cause delayed emergence.

Bacterial and Fungal Diseases

Anthracnose (*Colletotrichum* sp.) and Web Blight (*Rhizoctonia* sp.)

Use western-grown, certified seed and rotate to allow 2 years between bean plantings.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following formulations on a 7 to 14-day schedule and rotate between different fungicides:						
3 + 11	Quilt Xcel 2.2SE	10.5 to 14.0 fl oz/A	propiconazole + azoxystrobin	7	12	N
11	azoxystrobin 2.08F	6.2 to 15.5 fl oz/A	azoxystrobin	14	4	N
11	Headline 2.1EC	6.0 to 9.0 fl oz/A	pyraclostrobin	7/21	12	N
7 + 11	Priaxor 4.17SC	4.0 to 8.0 fl oz/A	fluxapyroxad + pyraclostrobin	7/21	12	N

Bacterial Blight

Use western-grown, certified seed. Apply copper as a preventative prior to the onset of disease and on a weekly basis under favorable conditions for disease development to help mitigate the spread of the pathogen. Avoid harvesting during wet conditions.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
When incidence is low, apply the following on a 7 to 10-day schedule:						
M01	copper (OMRI) ¹	at labeled rates	copper	0	48	N

¹There are several copper-based products with OMRI labels. See labels for specifics. Copper applications for bacterial disease management may also help suppress some fungal pathogens in organic production systems.

Bacterial Brown Spot

Use certified pathogen free seed. Bacterial brown spot occurs primarily on lima beans and is more troublesome in irrigated fields and during wet seasons. Apply copper as a preventative prior to the onset of disease and on a weekly basis under favorable conditions for disease development to help mitigate the spread of the pathogen. Avoid harvesting during wet conditions.

Code	Product Name	Product Rate	Active Ingredient(s) (*=Restricted Use)	PHI (d)	REI (h)	Bee TR
When incidence is low, apply the following on a 7 to 10-day schedule:						
M01	copper (OMRI)	at labeled rates	copper	0	48	N

¹There are several copper-based products with OMRI labels. See labels for specifics. Copper applications for bacterial disease control may help suppress some fungal pathogens in organic production systems.

Common Bean Rust (*Uromyces appendiculatus*) on Snap Bean

Rust is often a problem during late summer and early fall. Plant resistant cultivars whenever possible. For susceptible cultivars, start fungicide applications when the disease symptoms first appear.

F Beans (Snap and Lima)

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following formulations on a 7 to 14-day schedule and rotate between fungicides with different modes of action:						
M05	chlorothalonil 6F	2.0 to 4.0 pt/A	chlorothalonil	14	12	N
3	Rally 40WSP	4.0 to 5.0 oz/A	myclobutanil	0	24	N
3	tebuconazole 3.6F	4.0 to 6.0 fl oz/A	tebuconazole	7	12	N
3 + 11	Quilt Xcel 2.2SE	10.5 to 14.0 fl oz/A	propiconazole + azoxystrobin	7	12	N
7	Fontelis 1.67SC	14.0 to 30.0 fl oz/A	penthiopyrad	0	12	L
11	Headline 2.1EC	6.0 to 9.0 fl oz/A	pyraclostrobin	7/21	12	N
11	azoxystrobin 2.08F	6.2 to 15.5 fl oz/A	azoxystrobin	0	4	N

Lima Bean Downy Mildew (*Phytophthora phaseoli*)

Races B, D, E, and F of the pathogen have been found in the mid-Atlantic area over the past 15 years. **Race F has been the only race detected in Delaware since 2006.** Plant resistant varieties when possible (see varieties table above). Avoid excessive irrigation and poorly drained soils.

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
When weather conditions are favorable for disease development, apply and rotate between the following fungicides with different modes of action:						
4 + M01	Ridomil Gold Copper 65WP	2.0 lb/A	mefenoxam + copper	3	48	N
11	Headline 2.1EC	6.0 to 9.0 fl oz/A	pyraclostrobin	7/21	12	N
21	Ranman 400SC	2.75 fl oz /A	cyazofamid	0	12	L
29	Omega 500F	0.5-0.85 pt/A	fluazinam	14/30	12	N
40	Forum 4.17SC (seed only)	6.0 fl oz/A	dimethomorph	0	12	N
If lima bean downy mildew is observed in the field, apply one of the following:						
4 + M01	Ridomil Gold Copper 65WP	2.0 lb/A	mefenoxam + copper	3	48	N
P07	Phosphite	4.0-6.0 pt/A	phosphite	0	4	N

Lima Bean Pod Blight (*Phytophthora capsici*)

P. capsici has a very broad host range and can survive in the soil for several years. Avoid heavy irrigation and irrigating at night, especially after pod set. Avoid planting on poorly drained or compacted soils and in fields with rotations of cucurbits and peppers that are also hosts.

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
When weather conditions are favorable for disease development, apply and rotate between the following fungicides with different modes of action:						
4 + M01	Ridomil Gold Copper 65WP	2.0 lb/A	mefenoxam + copper	3	48	N
7	Endura 70W	8.0 to 11.0 oz/A	boscalid	7	12	--
21	Ranman 400SC	2.75 fl oz/A	cyazofamid	0	12	L
29	Omega 500F ^{1,2}	8.0 fl oz/A	fluazinam	14/30	12	N
40	Forum 4.17SC	6.0 fl. oz/A	dimethomorph	0	12	N
P07	Phosphite	4.0 to 6.0 pt/A	phosphite	0	4	N

¹Applied for downy mildew management may also control *P. capsici*. ²Not labeled for aerial applications.

Pythium blight (Cottony leak)

Cottony leak can be a serious problem during prolonged periods of hot, humid, wet weather. Select cultivars with good plant architecture that keep the pods off the soil surface. Pods in contact with the soil surface are more prone to infection. Using a narrower row spacing may help keep plants more erect and pods from contacting the soil. Select fields with good drainage and avoid planting in low-lying areas. Avoid overhead watering.

Code	Product Name	Product Rate	Active Ingredient(s) (* = Restricted Use)	PHI (d)	REI (h)	Bee TR
Apply one of the following formulations at disease onset and rotate between different modes of action:						
4 + M01	Ridomil Gold Copper 65WP	2.5-5.0 lb/A	mefenoxam + copper	3	48	N
21	Ranman 400SC	2.75 fl oz/A	cyazofamid	0	12	L
P07	Phosphite	4.0 to 6.0 pt/A	phosphite	0	4	N

Southern Blight (*Sclerotium rolfsii*)

Southern blight can be a serious disease of snap and lima beans in the southern most areas of the region. The pathogen may survive in the soil for many years so avoid planting in fields with a known history of the pathogen. Disease development is favored by high temperatures and wet weather conditions. Rotations will not eliminate the pathogen, but rotations with corn, sorghum, small grains or grasses may help reduce disease severity. Avoid overhead irrigation. Apply the following in a preventative manner, especially in fields with a history of the disease.

Code	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
11	azoxystrobin 2.08F	15.5 fl oz/A	azoxystrobin	0	4	N

White Mold (*Sclerotinia*) and Gray Mold (*Botrytis*)

White mold is caused by *Sclerotinia* which has a broad host range and can persist in the soil for over 5 yr. Avoid poorly drained soils and excessive overhead irrigation, especially preceding and during flowering. Rotation to non-hosts (such as corn or small grains) for at least 3 yr may help reduce disease levels but will not completely eliminate the pathogen. Always harvest infested fields **after** non-infested fields to help minimize potential spread.

Code	Product Name	Product Rate	Active Ingredient(s) (*= Restricted Use)	PHI (d)	REI (h)	Bee TR
Preplant: For white mold only. Apply 3-4 months prior to disease onset to allow the active agent to reduce levels of sclerotia in the soil. Incorporate 1-2 in. deep but do not plow before seeding to avoid spreading of untreated sclerotia from lower to upper soil layers.						
44	Contans 5.3WG (OMRI)	2.0 to 4.0 lb/A	<i>Coniothyrium miticans</i>	--	--	N
Post seeding: Close spacing of snap beans may increase the potential for white mold. Fungicide sprays are needed only when the soil has been wet for 6-10 days before or during bloom. This causes sclerotia to germinate and eject spores. For snap beans, a fungicide should be applied at 10-20% bloom. A second spray should be made 7-10 days after the first spray if the soil remains wet and blossoms are still present. Check labels for details on fungicide timing. For lima beans, later fungicide applications have been beneficial if favorable environmental conditions persist.						
Apply one of the following:						
1	thiophanate-methyl 70WP	1.5 to 2.0 lb/A	thiophanate-methyl	14	24	N
2	iprodione 4F	1.5 to 2.0 pt/A	iprodione	See label	24	N
7	Endura 70W	8.0 to 11.0 oz/A	boscalid	7	12	--
7	Fontelis 1.67SC	16.0 to 30.0 fl oz/A	penthiopyrad	0	12	L
7 + 11	Priaxor 4.17SC	4.0 to 8.0 fl oz/A	fluxapyroxad + pyraclostrobin	7	12	N
9 + 12	Switch 62.5WG	11.0 to 14.0 oz/A	cyprodinil + fludioxonil	7	12	L
29	Omega 500F	8.0 fl oz /A	fluazinam	14/30	12	N

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.