

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.

Beans (Snap and Lima)

Recommended Snap Beans (Bush) Varieties¹

Snap Beans (Bush)	Variety	Color ²	Length (inch)	Sieve Size ³	Use ⁴	Days	Heat Tol. ⁵	Reported Disease Resistance ⁶						
								BCMV	BCTV	Cl	Ua	Psp	Xap	Pss
Green Round Podded Types	Achiever	DG	5.5	3-4	F	53		R						
	Annihilator	DG	6.0	4	F,P	53	X	R	R					
	Barron	DG	5.5	3-4	F,P	54		R	R			R	I	R
	Bowie	MDG	5.5	3-4	F,P	56		R	R					
	Bronco	DG	5.3	3-4	F	53		R						
	Caprice	MDG	5.5	3-4	F,P	56		R		R		R	R	I
	Colter	MDG	5.5	4	F	53		R	R		R			
	Crockett	DG	5.25	2-3	F,P	58		R	R		R	R	R	R
	Dominator	DG	6.0	4	F,P	53	X	R	R					
	Hickok	MDG	5.5	3-4	F	54		R	R		R			
	Jade II	DG	6.5	4	F	60		R			I			
	Lewis	MDG	5.5	3-4	F,P	53		R	R		R	R		I
	Maxibel	MG	7.0	2.3	F	60								
	Momentum	DG	5.8	3-4	F	56		R						
	Nickel	MG	4.25	2-3	F	53						I		
	Pike	MDG	5.25	3	F	55		R	R			I	I	I
	Prevail	DG	5.5	3-4	F	54		R	I					
	Provider	MG	5.5	4-5	F	55								
	PV857	DG	5.5	4-5	F	54	X	R			I			
	Strike	MG	5.5	3-4	F	55		R						
SV1137GF	MG	5.5	3-4	F	53		R		R					
Sybaris	DG	5.8	3-4	F,P	56		R			I				
Tema	DG	5.5	3	F	53		R							
Valentino	DG	5.75	3	F	53		R			R				
Wyatt	DG	5.75	3-4	P	54		R	R			R	R	R	
Green Flat Podded Types	Furano	MG	5.5		F,P	54		R						
	Greencrop	MG	6.5		F	55								
	Navajo	MDG	5.5-6		P	55				R				
	Roma II	MG	5.5		F,P	58		R						
	Usambura	MG	5.5		P	54	X	R				I		
	Velero	MDG	6.25		P	56		R	R					
Yellow (Wax) Round Podded Types	Carson	Y	5.5	4-5	F,P	56		R		R			R	
	Eureka	Y	5.5	4-5	F	56		R					R	
	Gold Mine	Y	5.3	4-5	P	56		R			R			
	Gold Rush	MY	6.0	4	F	55		R						
	Rocdor	Y	6.0	4	F	53		R		R	R			
	SV1003GF	MY	5.2	3-4	F	56		R					I	

¹Varieties are listed alphabetically within type.

²G=Green, Y=Yellow, M=Medium and D=Dark.

³Bean diameter category for majority of beans at harvest, 2=14.5/64 to 18.5/64 inch, 3=18.5/64 to 21.0/64 inch, 4=21.0/64 to 24.0/64 inch, 5=24.0/64 to 27.0/64 inch.

⁴F=fresh, P=processing Not all processing beans that perform well in the region are listed; consult with your processor for variety recommendations.

⁵Heat Tol.=Heat Tolerance. Heat tolerant varieties produce a high yield and a high percent of marketable pods when plants are exposed to high temperatures during flowering and pod set.

⁶Disease resistance reported from source seed companies. R=resistant; I=intermediate/partial resistance; BCMV=Bean Common Mosaic Virus; BCTV=Beet Curly Top Virus; Ua=rust caused by *Uromyces appendiculatus*; Cl=Anthracnose caused by *Colletotrichum lindemuthianum*; Psp=halo blight caused by *Pseudomonas savastanoi pv.phaseolicola*; Xap=common blight caused by *Xanthomonas axonopodis pv. phaseoli*; Pss=bacterial brown spot caused by *Pseudomonas syringae pv. syringae*.

Recommended Lima Beans Varieties¹

Type	Variety	Comments and Downy Mildew Resistance ²
Lima Beans, Fordhook Types³	Concentrated Fordhook	94 days, no resistance to current races of downy mildew, variable yields
	Fordhook 242	77 days, no resistance to current races of downy mildew
Lima Beans, Baby Types³	C-elite Select	84 days, resistant to downy mildew race E
	Cypress	77 days, cold soil tolerance, resistant to downy mildew race E
	Dixie Butter Pea	75 days, no resistance to current races of downy mildew
	Jackson Wonder	85 days, no resistance to current races of downy mildew, speckled type
	Maestro	77 days, resistant to downy mildew race E
	Maffei-15	80 days, resistant to downy mildew race F
	Meadow	77 days, resistant to downy mildew race E
184-85	86 days, resistant to downy mildew race E	
Lima Beans, Pole Types	Big 6	No resistance to downy mildew
	Big Mama	No resistance to downy mildew
	Dr. Martin	No resistance to downy mildew
	King of the Garden	No resistance to downy mildew
	Locally Selected Heirlooms	No resistance to downy mildew

¹Varieties are listed alphabetically within type. ²Based on results from University of DE tests. ³Use varieties recommended by processors. Consult the University of DE Extension at: <http://extension.udel.edu/ag/vegetable-fruit-resources/vegetable-small-fruits-program/variety-trial-results/> for variety trial results.

Variety Selection and Seed Treatment

Marketability, adaptability to the area, disease resistance and consistency in production should be considered when selecting snap bean types and varieties. Snap beans varieties can be bush types (can be harvested mechanically), or pole types (usually hand harvested). Pole types yield better in long season areas. Use seeds treated with fungicides to prevent diseases; see the Disease Control section below. Rough handling of seed greatly reduces germination.

Poor Pod Set, Deformed Pods, Split Set

High night temperatures during bloom (> 75°F, > 24°C) cause diminished pollen production and result in poor pod set, deformed pods with missing seeds, and "split set". Varieties differ in their heat susceptibility; choose only heat tolerant varieties for summer flowering plantings. Consult the variety recommendations table above or your seed supplier for information on heat tolerant varieties for your area.

Recommended Nutrients Based on Soil Tests

Before 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.

Beans	N (lb/A)	Soil Phosphorus Level				Soil Potassium Level				Nutrient Timing and Method
		Low	Med	High (Opt)	Very High	Low	Med	High (Opt)	Very High	
		P ₂ O ₅ (lb/A)				K ₂ O (lb/A)				
Snap Beans Single Crop	40-80	80	60	40	0 ¹	80	60	40	0 ¹	Total nutrient recommended
	20-40	80	60	40	0 ¹	80	60	40	0 ¹	Broadcast and disk-in
	20-40	0	0	0	0	0	0	0	0	Sidedress 4 weeks after planting
Snap Beans After Peas	20-40	80	60	40	0 ¹	80	60	40	0 ¹	Total nutrient recommended
	0-20	80	60	40	0 ¹	80	60	40	0 ¹	Broadcast and disk-in
	0-20	0	0	0	0	0	0	0	0	Sidedress 4 weeks after planting
Lima Beans Single Crop	60-90	100	60	20	0 ¹	140	100	60	0 ¹	Total nutrient recommended
	30-40	100	60	20	0 ¹	140	100	60	0 ¹	Broadcast and disk-in
	20	0	0	0	0	0	0	0	0	Band place with planter
	20	0	0	0	0	0	0	0	0	Sidedress 3-5 weeks after emergence
Lima Beans After Peas	30-40	0	0	0	0	0	0	0	0	Total nutrient recommended
	20	0	0	0	0	0	0	0	0	Band place with planter
	20	0	0	0	0	0	0	0	0	Sidedress 3-5 weeks after emergence

Apply 1-2 lb/A of boron (B) every 3 yr on most soils; see also Table B-7 in chapter B Soil and Nutrient Management. **Do not** place B in starter fertilizers due to sensitivity problems. ¹In VA, crop replacement values of 20 lb/A of P₂O₅ and 40 lb/A of K₂O are recommended on soils testing Very High.

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 trifoliolate 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

which the beans will climb. An individual stake or line should be placed at each plant for initial climbing to the trellis. Bean supports should be put up before the bean plants begin producing "runners" and falling over. A ground wire may also be used and then twine is woven in a V fashion over the top wire and under the bottom wire. An alternative system would use 6 ft plastic netting attached to the posts and a top and bottom wire. Trellises have to be sturdy enough to support the heavy lima bean vines.

No-Till / Conservation Tillage

Snap and lima beans have been successfully grown in no-till and conservation tillage systems, though lima bean yields are often lower and residues can make harvest more difficult. In no-till systems, bean seeds are usually drilled into the stubble/plant residue of a small grain crop. Consider bean variety, date of planting, soil fertility practices, insect control, planting equipment, mulch, residue at harvest, and weed species in the field. For more information on this production method, see section A6 Conservation Tillage Crop Production.

Harvest and Post Harvest Considerations

Processing snap beans are usually harvested when 50% of the beans are sieve size 4 or smaller, but this percentage will depend on processor needs and variety. Yield of processing snap beans ranges from 4 to 6 ton/A. Processing should occur soon after harvest and transport times should be minimized. Washing and precooling shelled beans is recommended for distance transport.

Fresh market snap beans are either hand harvested multiple times at the desired size or machine harvested when the highest percentage of marketable beans can be obtained. Yield of fresh market snap beans ranges from 150 to 250 bushel/A. Beans for fresh market shipping should meet US No. 1 standards or higher.

Baby lima beans for mechanical picking are harvested when the highest percentage of full pods can be obtained and when plants have approximately 10% dry pods. Hand-picked lima beans are picked at the full green seed stage.

Fordhook lima beans are harvested when the highest percentage of full pods can be obtained but before any pods have dried.

Grading and Packing

A grading line will typically have offloading and conveying belts, a gravity separator to remove soil, rocks, and heavy field trash, an air blast trash remover for leaves, stems, and other light field trash, a rotating drum tumbler to remove pin beans and immature pods through slots, a broken bean eliminator, vibrating tables where good pods are further segregated from field trash, a sizer for processing beans, vibrating washers where pods are rinsed with water to remove soil particles and to remove some of the field heat, grading tables where pods are manually inspected to remove overmature, blemished, decayed, or other defective pods, and for fresh market beans, a box filler. Beans are moved by vibration into wire bound crates or waxed cartons, which are weighed and unloaded onto a box closing machine after which boxes go to a cold storage area. In smaller operations, many of these tasks will be done by hand at a sorting table. Field packing is practical mainly for direct market and local sales. Beans may also be harvested directly by consumers or local wholesalers as U-pick.

Cooling and Storage

Fresh market snap beans are highly perishable and should be cooled rapidly after harvest, preferably to 40-43°F (4-6°C). Vacuum or forced-air cooling can be effective, but the preferred method is hydrocooling as the cold water cools beans rapidly and the free moisture helps prevent wilting or shriveling. Use chlorinated water with a 55-70 ppm free chlorine concentration and pH of 6.5-7 (neutral) for washing and hydrocooling.

Beans should be stored at 39-45°F (4-7°C) and 95% relative humidity. Under these conditions, beans will maintain quality for 7-10 days. Temperatures of 38°F (3°C) and lower may cause significant chilling injury. Beans lose moisture rapidly if not properly protected by packaging or by a relative humidity of 95% or above. When the relative humidity approaches saturation, as in consumer packages, temperatures above 45°F (7°C) must be avoided to prevent serious decay within a few days. Beans should not be stored or shipped with ethylene generating fruits and vegetables.

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. Non-selective or Burndown						
Group	Product Name	Product Rate	Active Ingredient (* = Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
9	Roundup PowerMax 4.5L "Generic" glyphosate 3L	16 to 32 fl oz/A 24 to 48 fl oz/A	glyphosate	0.75 to 1.13 lb acid equivalent/A	--	24
-Apply preplant or preemergence. -Some glyphosate formulations may require an adjuvant, refer to label. Tank-mix with appropriate herbicides for residual weed control. -Glyphosate controls many perennial weeds as well as annuals if applied when the weed is actively growing and has reached the stage of growth listed on the label. -Repeat applications are allowed, with maximum application of 5.3 qt/A per year.						
22	Gramoxone SL 2.0	2.4 to 4.0 pt/A	paraquat*	0.6 to 1.0 lb/A	--	12
-Apply preplant or preemergence. Always include an adjuvant (nonionic surfactant or crop oil concentrate). Tank-mix with appropriate herbicides for residual weed control. -Paraquat may not control established grasses. Spray coverage is essential for optimum control. -Rainfastness 30 min. A maximum of 3 applications per year 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 (http://usparaquattraining.com); certified applicators must repeat training every three years.						

2. Soil-Applied (Preplant Incorporated or Preemergence)						
Group	Product Name	Product Rate	Active Ingredient (* = Restricted Use)	Active Ingredient Rate	PHI (d)	REI (h)
2	Pursuit 2L	1.5 to 2.0 fl oz/A	imazethapyr	0.024 to 0.031 lb/A	30	4
- Lima beans; labeled for snap bean in NJ only. -Apply as preplant incorporated or to the soil surface, but shallow, thorough incorporation improves consistency of performance when dry weather follows application. Primarily controls broadleaf weeds. Combine with another herbicide to control annual grasses. -Pursuit residues persist in the soil after harvest and may affect following crops. Follow label instructions. -Pursuit is an ALS inhibitor, Group 2 herbicide, and there is widespread resistance in the region to this family of herbicides. -Maximum Pursuit application at planting: 2 fl oz/A for lima beans and 1.5 fl oz for snap beans. -Maximum number of applications per year: 1.						
2	Sandea 75DF	0.5 to 1.0 oz/A	halosulfuron	0.024 to 0.047 lb/A	30	12
-Apply after seeding but before cracking. Controls or suppresses yellow nutsedge and many annual broadleaf weeds. Results have been most consistent when the application was followed by rainfall or irrigation. -Use the lower rate on coarse-textured (sandy) soils low in organic matter, and the higher rate on fine -textured (silt and clay) soils. -Heavy rainfalls before crop emergence can result in crop stunting. - 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. -Sandea is an ALS inhibitor, Group 2 herbicide, and there is widespread resistance in the region to this family of herbicides. -Maximum Sandea application per season: 1 oz/A.						
3	Prowl H2O 3.8CS	1.0 pt/A	pendimethalin	0.48 lb/A	--	24
-Labeled only for preplant incorporated application; apply before planting and incorporate thoroughly within the top 2-3 inches of soil. -Primarily controls annual grasses and certain broadleaf weeds. - Do not use when soils are cold and/or wet soil conditions are anticipated during emergence, or crop injury may result. - Do not apply more than once per cropping season. Not recommended in NJ.						
3	Treflan 4E	1.0 to 1.5 pt/A	trifluralin	0.5 to 0.75 lb/A	--	12
-Labeled for preplant incorporation only; incorporate into 2-3 inches of soil within 8 hr after application. -Primarily controls annual grasses and a few broadleaf weeds (weak on ragweed). Poor incorporation can reduce overall weed control. -Treflan may be applied up to 4 weeks prior to planting. - Do not use or reduce the rate used when cold, wet soil conditions are expected, or crop injury may result. -Maximum application not addressed on label.						

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

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 to14-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.