

Chapter 11. Legume Production¹

Peter J. Dittmar, Eugene J. McAvoy, Dakshina R. Seal, Shouan Zhang, Josh H. Freeman, Johan Desaegeer, and Qingren Wang²

Botany and Planting

Cluster bean/Guar—*Cyamopsis tetragonolobus*

Edamame—*Glycine max*

Fenugreek/Methi—*Trigonella foenum-gracum*

Hyacinth bean/Lablab bean—*Lablab purpureus*

Lima bean—*Phaseolus lunatus*

Pigeon pea—*Cajanus cajan*

Snapbean—*Phaseolus vulgaris*, Fabaceae (Leguminosae)

Southernpea/Yard-long bean—*Vigna unguiculata*

Snowpea—*Pisum sativum*

Winged bean—*Psophocarpus tetragonolobus*

Table 1. Planting information for legumes.

Planting Dates	Snapbean Bush	Snapbean Pole	Lima Bean Bush	Lima Bean Pole	Southern Pea	Snowpea
North Florida	Mar–Apr Aug–Sept	Mar–Apr Aug–Sept	Mar–Apr Aug	Mar–Apr Aug	Mar–July	Jan–Mar
Central Florida	Feb–Apr Aug–Sept	Feb–Apr Aug–Sept	Feb–Mar Aug–Sept	Feb–Mar Aug–Sept	Feb–Aug	Nov–Feb
South Florida	Sept–Apr	Sept–Apr	Sept–Apr	Sept–Apr	Sept–Apr	Nov–Feb
Planting Information						
Distance between rows (in)	18–40	36–48	18–36	36–48	20–42	36, 2-row beds
Number of rows/bed	1–2					
Distance between rows/bed	10–12					
Distance between plants (in)	2–4	3–5	3–6	8–12	2–6	2–6
Seeding depth (in)	1–1.5	1–1.5	1–1.5	1–1.5	1–1.5	1–1.5
Seed per acre (lb)	45–80	30–45	40–60	20–40	15–30	25–50
Days to maturity from seed	45–60	50–70	60–80	80–100	75–90	60–80
Plant populations	52,272–172,240	58,000	116,160	21,780	104,544	87,120

1. This document is HS727, one of a series of the Horticultural Sciences Department, UF/IFAS Extension. Original publication date June 1995. Revised June 2020. This is Chapter 11 of the *Vegetable Production Handbook of Florida, 2020–2021 edition*. Visit the EDIS website at <http://edis.ifas.ufl.edu>.

2. Peter J. Dittmar, assistant professor, Horticultural Sciences Department; Eugene McAvoy, Extension agent IV, UF/IFAS Extension Hendry County; Dakshina Seal, associate scientist; Shouan Zhang, associate professor, UF/IFAS Tropical Research and Education Center; Joshua H. Freeman, associate professor, UF/IFAS North Florida REC; Johan Desaegeer, assistant professor, UF/IFAS Gulf Coast REC; and Qingren Wang, Extension agent I, UF/IFAS Extension Miami-Dade County; UF/IFAS Extension, Gainesville, FL 32611.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication do not signify our approval to the exclusion of other products of suitable composition.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county's UF/IFAS Extension office. U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.

Cultivars

Table 2. Commercial legume cultivars.

Green Bush			Yellow Bush	Green Pole	Lima
Achiever	Inspiration	Thoroughbred	Carson	Dade	Bridgeton
Ambition	Momentum	Valentino	Gold Mine	Macaslan	Cypress
BA 0958	Opportune	Vision	Gold Rush		Fordhook 242
Caprice	Sybaris (BA 1007)	3230	Golden Rod		Jackson Wonder
Southern Pea			Snowpea		
CA Blackeye No.5	Knuckle Purplehull	Texas Cream 40	Oregon Sugarpod II		
Cream 8	Magnolia	White Acre			
Cream 12	Pinkeye Purplehull	Zipper Cream			

Asian Legumes

The Asian legume group includes fruits (usually known as pods), which are eaten at the immature stage with edible immature seeds (green shell), and some young stem tips. The winged bean also has edible leaves and roots, though the latter do not appear to be cultivated commercially in the continental United States. Pole bean, long bean (both dark and light green colors), and broad bean are commercially grown in south Florida. All the pole or indeterminate types can be grown on raised beds with or without plastic mulch using drip, overhead, or subsurface irrigation. Fenugreek does not grow well in rocky soils, such as those found in Miami-Dade County. Pigeon peas are a semiperennial shrub in warmer areas. Many pigeon pea and winged bean varieties are short day and only flower during the fall. There are some day-neutral varieties available of both crops.

Edamame varieties, especially those from seed companies in the United States, are sensitive to daytime length, so care must be taken to select varieties for one's growing area. Japanese varieties are classified as "summer" or "fall" types, indicating when they flower. Fertilizer recommendations for pole, long, or broad beans are generally applicable to this group. All of these crops are started from seed, though winged beans require scarification prior to planting. All the indeterminate types need some type of support, ranging from individual bamboo stakes to trellises. However, some bush-type broad beans (Indian type) do not need trellises. For pest control products, these crops are included in the legume crop chapter.

Table 3. Planting information for Asian legumes.

Planting Dates	Cluster Bean/Guar	Edamame	Fenugreek	Hyacinth Bean
North Florida	Mar–Apr; Aug	Mar–Apr; Aug	Mar–Apr; Aug	Mar–Apr; Aug
Central Florida	Feb–Mar; Aug–Sept	Feb–Mar; Aug–Sept	Feb–Mar; Aug–Sept	Feb–Mar; Aug–Sept
South Florida	Sept–Apr	Sept–Apr	Sept–Apr	Sept–Apr
Planting Information				
Distance between rows (in)	24	20–30	9	20
Distance between plants (in)	6	2–6	2–3	4–6
Seeding depth (in)	1–1.5	1–1.5	1–1.5	1–1.5
Days to maturity from seed	90–120	80–120	90–120	90–120
Plant populations	43,560	87,120	348,480	78,409
Planting Dates	Pigeon Pea	Snowpea	Winged Bean	Yard-long Bean
North Florida	Not recommended	Jan–Mar	Not recommended	Mar–July
Central Florida	Not recommended	Nov–Feb	Not recommended	Feb–Aug
South Florida	Nov–Feb	Nov–Feb	Mar–Apr	Sept–Apr
Planting Information				
Distance between rows (in)	24–36	36, 2-row beds	36	20–42
Distance between plants (in)	2–6	2–6	8	2–6
Seeding depth (in)	1–1.5	1–1.5	1–1.5	1–1.5
Days to maturity from seed	180 (early); 270–365 (late)	60–80	90 (day-neutral varieties)	75–90
Plant populations	10,890	87,120	21,780	104,544

Table 4. Cultivars for Asian legumes.

Crop	Life Cycle	Cultivars	Trellising
Broad bean	Annual		Yes
Bush-type broad bean	Annual	Indian type	No
Cluster bean, Guar	Annual		Yes
Edamame	Annual	Green Legend, Lucky Lion, Tohya, Triple Play	No
Fenugreek, Methi	Annual		No
Hyacinth bean, Lablab bean	Annual	Akahana Fugimame, Asia Purple, Asia White	No
Long bean (dark and light green color)	Annual		Yes
Pigeon pea (a short-lived perennial)	Short-lived perennial		No
Snow/snap (edible podded) pea	Annual	Oregon Sugarpod II	Yes
Winged bean, Goa bean	Annual	Winged Bean, Youdou	Yes
Yard-long bean	Annual	Bia-long, Orient Wonder, Stickless Wonder	Yes

Table 5. Herbicides approved for managing weeds in beans and peas.

Active Ingredient lb a.i./A	Trade Name Product/A	MOA Code	Crops	Weeds Controlled/Remarks
Labels change frequently. Be sure to read a current product label before applying any chemical.				
*** PREEMERGENCE ***				
Bensulide 5.0–6.0	(Prefar) 4 E 5–6 qt	8	Dry bulb vegetables: onion, garlic, shallot	Annual broadleaf and grass control. Incorporate or irrigate 1 to 2 in. deep within 36 hr of application. Consult label for rotational restrictions.
Bromoxynil 0.25–0.38	(Buctril) 2 EC 1.0–1.5 pt (Buctril) 4 EC 0.5–0.75 pt	6	Onion (dry bulb)	Broadleaf weeds. Preemergence is restricted to muck soils containing greater than 10% organic matter. Apply at least 3 to 4 days prior to emergence. Weeds should not exceed the 4-leaf stage, 2 in. in height or 1 in. in diameter.
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl oz (Aim) 2.0 EC up to 2 fl oz	14	Onion, garlic, leek, chive, shallot	Apply as a preplant burndown for emerged broadleaf weeds. Use crop oil concentrate, methylated seed oil, or nonionic surfactant at recommended rates. Maximum rate of 0.096 lb a.i./A per season. No pretransplant interval.
DCPA 4.5–6.0	(Dacthal) 6 F 6–8 lb	3	Onion (dry bulb, green), leek, shallot	Annual grasses and certain broadleaf control. Apply at seeding or planting. Maximum rate of 10.5 lb a.i./A per season.
Flumioxazin up to 0.06	(Chateau) 51 WDG up to 2 fl oz	14	Garlic, onion (dry bulb)	Broadleaf control. Apply to transplanted onions between the 2- and 6- leaf stage. Apply to direct-seeded onions between the 3- and 6-leaf stage.
Glyphosate	(various formulations) consult label	9	Onion, garlic, leek, chive, shallot	Control of emerged broadleaf and grass weeds. Consult individual labels for restrictions.
Oxyfluorfen 2	(Goal 2XL) 2 EC 2.0 pt (GoalTender) 4 EC 1.0 pt	14	Onion (dry bulb), garlic (dry bulb)	Certain broadleaf weeds. Transplanted only. Apply within 2 days of transplanting. Necrotic lesions, twisting, or stunting of plants can occur if applications are made during cool, wet weather or prior to the full development of the true leaves.
Paraquat 0.5–1.0	(Gramoxone) 2 SL 2–4 pt	22	Onion (dry bulb)	Controls emerged weeds. Apply prior, during, or after planting, but before crop emergence. Only 2 applications a season. Use a nonionic surfactant.
Paraquat 0.63–1.0	(Gramoxone) 2 SL 2.5–4.0 pt (Firestorm) 3 SL 1.7–2.7 pt	22	Onion (seeded), garlic	Emerged broadleaf and grass weeds. Apply as a preplant burndown. A maximum of 1 lb a.i./A per season.
Pelargonic acid	(Scythe) 4.2 EC 3%–10% v/v	27	Onion, garlic, leek, chive, shallot	Emerged broadleaf and grass weeds. Apply before emergence of crop. Product is a contact, nonselective, foliar-applied herbicide. There is no residual activity.
Pendimethalin mineral 0.5–0.75 muck 1.0–2.0	(Prowl) 3.3 EC mineral 1.2–1.8 pt muck 2.4–4.8 pt (Prowl H20) 3.8 mineral 1.0–1.5 pt muck 2.0–4.0 pt	3	Onion (dry bulb), shallot (dry bulb), garlic	Mineral soils: Apply when crop has 2 to 9 true leaves. Muck soils: May be applied as sequential application: preemergence through loop stage, early postemergence (2 to 6 true leaf stage), late postemergence (6 to 9 true leaf stage). Do not exceed 5.9 lb a.i./A in a growing season. PHI 45 days.
Pyraflufen 0.001–0.003	(ET Herbicide/Defoliant) 0.5–2.0 fl oz	14	Bulb vegetables	Emerged broadleaf and grass weeds. Apply as a preplant burndown treatment.

Active Ingredient lb a.i./A	Trade Name Product/A	MOA Code	Crops	Weeds Controlled/Remarks
*** POSTEMERGENCE ***				
Bromoxynil 0.25–0.38	(Buctril) 2 EC 1.0–1.5 pt (Buctril) 4 EC 0.5–1.5 pt	6	Onion (Dry bulb)	Broadleaf weeds. Soil and onion leaves should be dry before application. Waxy coating on leaves reduces chances for injury. Varieties vary in sensitivity and use on a trial basis.
Bromoxynil 0.38–0.5	(Buctril) 2 EC 1.5–2.0 pt	6	Garlic	Broadleaf weeds. Apply after emergence but before 12 in. tall. Weeds are most susceptible up to the 4-leaf stage or 2 in. height or 1 in. wide. PHI 112 days.
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl oz (Aim) 2.0 EC up to 2 fl oz	14	Onion (dry bulb), garlic, leek, chive, shallot	Emerged broadleaf control. Post-direct hooded application to row middles for burndown of emerged weeds. Use crop oil concentrate or nonionic surfactant at recommended rates. PHI 0 days.
Clethodim 0.09–0.25 0.07–0.25	(Arrow, Select) 2 EC 6–16 fl oz (Select Max) 1 EC 9–32 fl oz	1	Onion (dry bulb), garlic, shallot (dry bulb)	Annual and perennial grass control. Some labels include green onion. Consult label for use of a crop oil concentrate or nonionic surfactant. PHI 45 days.
Clethodim 0.09–0.13	(Arrow, Select) 2 EC 6–8 fl oz (Select Max) 1 EC 12–16 fl oz	1	Chive, leek	Emerged annual and perennial grasses. Consult labels rate of COC or NIS. Do not apply more than 0.5 lb a.i./A per season. Select Max is not registered in leek. PHI 14 days.
DCPA 4.5–6.0	(Dacthal) W-75 6–8 lb (Dacthal) 6 F 6–8 pt	3	Onion (dry bulb, green), leek, shallot	Annual grasses and certain broadleaf control. Apply at layby up to 14 weeks after planting. If weeds have emerged then cultivate or hand weed. Maximum rate of 10.5 lb a.i./A per season.
Dimethanamid-p up to 1.0	(Outlook) 6 EC up to 21 fl oz	15	Onion (dry bulb), garlic, leek, shallot (dry bulb, green)	Broadleaf and grass weeds. Apply after the 2 true-leaf stage. Apply as a single application or split application. Split application of 10–14 fl oz followed by 7–10 fl oz/A, with 14 days between applications. Do not exceed 21 fl oz/A per growing season. PHI 30 days.
Fluazifop 0.188	(Fusilade DX) 12 fl oz	1	Onion (dry bulb), garlic	Annual and perennial grass weeds. Do not apply more than 48 fl oz/A per season. Include a COC or NIS. PHI 45 days.
Oxyfluorfen 0.5	(Goal 2 XL) 2 EC 0.5 pt direct seeded (GoalTender) 4 EC 0.25 pt direct seeded	14	Onion (dry bulb), garlic (dry bulb)	Certain broadleaf weeds. Direct seeded only. Apply after the crop has 2 true leaves. Multiple treatments can be applied and do not exceed 0.5 lb a.i./A. Necrotic lesions, twisting, or stunting of plants can occur if applications are made during cool, wet weather or prior to development of true leaves. PHI 60 days.
Sethoxydim 0.19–0.28	(Poast) 1.5 EC 1.0–1.5 pt	1	Onion (dry bulb, green), garlic, leek, shallot	Grass weeds. Include a surfactant. Do not apply more than 4.5 pt/A per season. PHI 30 days.
Treflan 0.35–0.5	(Treflan) 4 EC 0.75–1.0 pt (Treflan TR-10) 3.75–5.0 lb	3	Onion (dry bulb)	Broadleaf and grass weeds. Apply at layby to the soil surface between onion rows. Remove weeds that are preent. Do not apply in muck soils. PHI 60 days.

Table 6. Insecticides approved for managing insect pests of beans and peas.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides, including materials labeled for certified organic production.							
Aphids							
1A		*Lannate LV; *SP (methomyl)	LV: 1.50–3 pt SP: 0.25–1.0 lb	15 pt 5.0 lb	48	See label: varies with rate and crop use.	
1B		*Dibrom 8E (naled)	1.0 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock feed.
1B		Dimethoate 4EC (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	0—mechanical harvesting	Do not use on field peas.
1B		Malathion 8F (malathion)	1.0 pt	2.0 pt	12	3	Green and dried peas only. Do not graze or feed forage to livestock.
1B		Orthene 97 (acephate)	0.50–1.0 lb	2.0 lb a.i.	24	14—dry succulent 1—lima beans succulent form	Do not apply to succulent beans for fresh market or processing. Do not feed treated vines or seeds to livestock.
3A		*Asana XL (esfenvalerate)	5.8–9.6 fl oz	38.4 fl oz	12	3—snap 21—dry beans and peas	Do not feed or graze livestock on treated vines.
3A		*Brigade 2 EC (bifenthrin)	2.1–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	3—succulent 14—dry	
3A		PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.
4A		Admire Pro (imidacloprid)	Soil: 7–10.5 fl oz Foliar: 1.2 fl oz	Soil: 10.5 fl oz Foliar: 3.6 fl oz	12 12	Soil: 21 Foliar: 7	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used.
4A		Assail 30SG (acetamidprid)	2.5–5.3 fl oz	16 fl oz	12	7	Edible podded legumes, succulent shelled peas and beans.
4D		Sivanto Prime (flupyradifurone)	7.0–10.5 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days.
23		Movento (spirotetramat)	4–5 fl oz	10 fl oz	24	1—succulent 7—dry	
-		BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
-		BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25–2.0 qt	no limit	12	0	
-		Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	OMRI-listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
-		Grandevo (<i>Chromobacterium subtugae</i> strain PRAA4-1)	1–3 lb	none	4	0	OMRI-listed ² . Succulent or dried.
-		M-Pede 49% (soap, insecticidal)	0.25%–4.0% v/v	7-to-10-day interval	12	0	OMRI-listed ² .
-		Sun Spray 98.8% JMS Stylet Oil, Saf-T-Side, others (oil, insecticidal)	3–6 qt/100 gal (JMS); others 1–2 gal/100gal	no limit	4	0	OMRI-listed ² .
-		Aza-Direct (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	-	Neemix 4.5 (azadirachtin)	4–16.0 fl oz	20 g a.i.	4	0	OMRI-listed ² . Insect growth regulator and feeding repellent.
	-	Trilogy (extract of neem oil)	1.0%–2.0% v/v	as needed	4	0	OMRI-listed ² .
Armyworm, corn earworm, lesser cornstalk borer, loopers, cutworm, caterpillar, grubs, root maggots, wireworms	1A	*Lannate LV; *SP (methomyl)	LV: 1.50–3 pt SP: 0.50–1.0 lb	15 pt 5.0 lb	48	see label; varies with rate and crop use	
	1A	Sevin 4F (carbaryl)	0.50–1.5 qt	6.0 qt/year	12	3—fresh beans & peas 14—grazing or forage 21—dried beans seed or hay.	Use on succulent shelled peas and beans prohibited.
	1B	*Diazinon 50W, AG 500 (diazinon)	50W: 4.8 lb AG500: 2–4 qt	1 application per year	72	broadcast at planting	Succulent beans and peas only. Soil application only.
	1B	*Dibrom 8E (naled)	1–1.5 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock forage.
	1B	Orthene 97 (acephate)	0.75–1.0 lb	2.0 lb a.i.	24	14—dry or succulent 1—lima beans, succulent form	Do not apply to succulent beans for fresh market or processing. Do not feed treated vines or seeds to livestock.
	3, 28	*Besiege (chlorantraniliprole & lambda-cyhalothrin)	5–10 fl oz	31 fl oz	24	7—edible podded succulent shelled 21—dry shelled	
	3A	*Asana XL (esfenvalerate)	5.8–9.6 fl oz	38.4 fl oz	12	3—snap 21—dry beans and peas	Do not feed or graze livestock on treated vines.
	3A	*Baythroid XL (beta-cyfluthrin)	0.8–3.2 fl oz—dry beans & peas 0.8–2.1 fl oz—southern pea	6.4 fl oz—dry beans & peas 10.5 fl oz—southern peas	12	7—dry beans & peas 3—southern pea	Not for use on succulent beans or peas. Do not feed treated vines or hay to livestock.
	3A	*Brigade 2 EC (bifenthrin)	2.1–6.4 fl oz	12.8 fl oz—succulent 19.2 fl oz—dry	12	3—succulent 14—dry	
	3A	*Capture LFR (bifenthrin)	3.4–6.8 fl oz	25.5 fl oz	12	at plant	Do not exceed allowed amounts including use of other products containing bifenthrin.
	3A	*Declare Insecticide (gamma-cyhalothrin)	1.54 fl oz	0.38 pt	24	7—edible podded and succulent shelled 21—dry beans and peas	For control before larvae bore into the plant stalk or pods. Do not graze livestock in treated areas or harvest vines for forage or hay.
3A	*Mustang *Mustang Maxx (zeta-cypermethrin)	3.0–4.3 oz 1.28–4.0 oz	25.8 oz 24 oz	12	1—succulent 21—dried shelled peas or beans	Can also be applied at planting for control of cutworms, white grubs, and wireworms. (See label).	
3A	PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0		OMRI-listed ² . Treat when insects first appear.
3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	7.68 fl oz	24	7—edible podded and succulent shelled 21—dried, shelled	Do not graze livestock in treated areas.	
5	Entrust SC (spinosad)	1.25–2.0 oz	9.0 fl oz—succulent 3.75 fl oz—dry	4	3—succulent 28—dry		OMRI-listed ² . Do not feed forage or hay to meat or dairy animals.
5	Radiant SC (spinetoram)	4–8 fl oz	28.0 fl oz—succulent 12.0 fl oz—dry	4	3—succulent 28—dry		
11A	Javelin WG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.12–1.50 lb	as needed	4	0		OMRI-listed ² . Treat when larvae are young. Thorough coverage is essential.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Cucumber beetle, bean leaf beetle, Mexican bean beetle, cowpea curculio	11A	Xentari DF (<i>Bacillus thuringiensis</i> subspecies <i> aizawai</i>)	0.5–2.0 lb	as needed	4	0	OMRI-listed ² . Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse.
	15	Rimon 0.83 EC (novaluron)	6–12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	18	Intrepid 2F (methoxyfenozide)	4–16 fl oz	64 fl oz	12	7	Southern pea (dry) varieties only.
	22	Avaunt (indoxacarb)	3.5 oz	14 fl oz	12	7	Foliar application only.
	28	Coragen (chlorantraniliprole/rynaxypyr)	3.5–7.5 fl oz	15.4 fl oz of chlorantraniliprole products per acre per year.	4	1	Label contains pollinator warning language.
	28	Exirel (cyantraniliprole, cyazapyr)	10.5–20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1—succulent 7—dried	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.
	-	BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25–2.0 qt	no limit	12	0	OMRI-listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.
	-	Aza-Direct (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.
	1A	*Lannate LV; *SP (methomyl)	LV: 0.75–3 pt SP: 0.25–1.0 lb	15 pt 5.0 lb	48	See label; varies with rate & crop	Use on succulent shelled peas and beans prohibited.
	1A	Sevin 4F (carbaryl)	0.50–1.5 qt	6.0 qt/year	12	3—fresh beans & peas 14—grazing or forage 21—dried beans, peas, seed, or hay	Do not apply to succulent beans for fresh market or processing.
	1B	Orthene 97 (acephate)	0.50–1.0 lb	2.0 lb a.i.	24	14—dry succulent 1—lima beans succulent form	Do not feed treated vines. Do not use on field peas.
	1B	Dimethoate 4EC (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	0—mechanical harvesting	Poison. Label pending in Florida. Do not graze livestock on treated forage. No direct contact with seed.
	3, 28	*Besiege (chlorantraniliprole & lambda-cyhalothrin)	5–10 fl oz	31 fl oz	24	7—edible podded succulent shelled 21—dry shelled	Not for use on succulent beans or peas. Do not feed treated vines or hay to livestock.
3A	*Baythroid XL (beta-cyfluthrin)	0.8–3.2 fl oz—dry beans & peas 0.8–2.1 fl oz—southern pea	6.4 fl oz—dry beans & peas 10.5 fl oz—southern pea	12	7—dry beans & peas 3—southern pea		
3A	*Brigade 2 EC (bifenthrin)	2.1–6.4 fl oz	12.8 fl oz—succulent 19.2 fl oz—dry	12	3—succulent 14—dry		

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²	
Fire ants	3A	*Declare Insecticide (gamma-cyhalothrin)	1.02–1.54 fl oz	0.38 pt	24	7—edible podded and succulent shelled 21—dry beans and peas	For control before larvae bore into the plant stalk or pods. Do not graze livestock in treated areas or harvest vines for forage or hay.	
	3A	*Mustang *Mustang Maxx (zeta-cypermethrin)	3.0–4.3 oz 2.72–4.0 oz	25.8 oz 24.0 oz	12	1—succulent 21—dried shelled peas or beans	Can also be applied at planting for control of cutworms, white grubs, and wireworms. (See label).	
	3A	PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.	
	3A	*Warrior II (lambda-cyhalothrin)	0.96–1.92 fl oz	7.68 fl oz	24	7—edible podded and succulent shelled 21—dried, shelled		
	4A	Assail 30SG (acetamidprid)	2.5–5.3 fl oz	16 fl oz	12	7	Edible podded legumes and succulent shelled peas and beans.	
	15	Rimon 0.83 EC (novaluron)	9–12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.	
	-	Aza-Direct (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.	
	-	Neemix 4.5 (azadirachtin)	4–16 fl oz	20 g a.i.	12	0	OMRI-listed ² . Insect growth regulator and feeding repellent.	
	7A	Extinguish (S-methoprene)	1–1.5 lb broadcast	as needed	4	0	Insect growth regulator. Colonies will get reduced after three weeks and eliminated after 8–10 weeks.	
	7C	Esteem Ant Bait (pyriproxyfen)	1.5–2.0 lb	0.134 lb a.i.	12	1	Insect growth regulator. Apply at first sign of ant activity.	
	Grasshoppers	1B	Dimethoate 4EC (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	0—mechanical harvesting	Do not feed treated vines. Do not use on field peas.
		3, 28	*Besiege (chlorantraniliprole & lambda-cyhalothrin)	5–10 fl oz	31 fl oz	24	7—edible podded succulent shelled 21—dry shelled	
		3A	*Asana XL (esfenvalerate)	5.8–9.6 fl oz	38.4 fl oz	12	3—snap 21—dry beans and peas	Do not feed or graze livestock on treated vines.
		3A	*Baythroid XL (beta-cyfluthrin)	2.4–3.2 fl oz—beans & peas 1.6–2.1 fl oz—southern pea	6.4 fl oz 10.5 fl oz	12	7—dry beans & peas 3—southern pea	Not for use on succulent beans or peas. Do not feed treated vines.
		3A	*Brigade 2 EC (bifenthrin)	2.1–6.4 fl oz	12.8 fl oz—succulent 19.2 fl oz—dry	12	3—succulent 14—dry	
3A		*Declare Insecticide (gamma-cyhalothrin)	1.02–1.54 fl oz	0.38 pt	24	7—edible podded and succulent shelled 21—dry	For control before larvae bore into the plant stalk or pods. Do not graze livestock in treated areas or harvest vines for forage or hay.	
3A		*Mustang *Mustang Maxx (zeta-cypermethrin)	3.0–4.3 oz 3.2–4.0 oz	25.8 oz 24.0 oz	12 12	1—succulent 21—dried shelled peas or beans	Can also be applied at planting for control of cutworms, white grubs, and wireworms. (See label).	
3A		*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	7.68 fl oz	24	7—edible podded and succulent shelled 21—dried, shelled	Do not graze livestock in treated areas.	

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25–2.0 qt	no limit	12	0	
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1 qt	no limit	4	0	OMRI-listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
Leafhopper	1A	*Lannate LV; *SP (methomyl)	LV: 0.75–3 pt SP: 0.25–1.0 lb	15 pt 5.0 lb	48	See label; varies with rate & crop.	
	1B	*Dibrom 8E (naled)	1.0 pt	4.5 pt	48	1	
	1B	Dimethoate 4EC (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	0—mechanical harvesting	Ground application only; not for cowpeas and fieldpeas intended for livestock forage. Do not use on field peas.
	3A	*Brigade 2 EC (bifenthrin)	2.1–6.4 fl oz	12.8 fl oz—succulent 19.2 fl oz—dry	12	3—succulent 14—dry	
	3A	*Mustang *Mustang Maxx (zeta-cypermethrin)	3.0–4.3 oz 2.72–4.0 oz	25.8 oz 24.0 oz	12 12	1—succulent 21—dried shelled peas or beans	Can also be applied at planting for control of cutworms, white grubs, and wireworms. (See label).
	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	7.68 fl oz	24	7—edible podded and succulent shelled 21—dried, shelled	Do not graze livestock in treated areas.
	3A	PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.
	4A	Admire Pro (imidacloprid)	Soil: 7–10.5 fl oz Foliar: 1.2 fl oz	Soil: 10.5 fl oz Foliar: 3.6 fl oz	12 12	Soil: 21 Foliar: 7	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used.
	4A	Assail 30SG (acetamidprid)	2.5–5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	4D	Sivanto Prime (flupyradifurone)	7.0–10.5 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days.
	16	Courier 40 SC (buprofezin)	9.0–13.6 fl oz	27.2 fl oz	12	14	Insect growth regulator. For succulent beans only. Good coverage essential.
	28	Exirel (cyantraniliprole, cyazapyr)	10.5–20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1—succulent 7—dried	Label contains pollinator protection warnings.
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25–2.0 qt	no limit	12	0	
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	OMRI-listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	M-Pede 49% (soap, insecticidal)	0.25%–4.0% v/v	7-to-10-day interval	12	0	OMRI-listed ² .
	-	Sun Spray 98.8% JMS Stylet Oil, Saf-T-Side, others (oil, insecticidal)	3–6 qt/100 gal (JMS); others 1–2 gal/100gal	no limit	4	0	OMRI-listed ² .

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Liriomyza leafminers	-	Aza-Direct (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.
	5	Entrust SC (spinosad)	1.5–2.0 oz	9.0 fl oz—succulent 3.75 fl oz—dry	4	3—succulent 28—dry	OMRI-listed ² . Do not feed forage or hay to meat or dairy animals.
	5	Radiant SC (spinetoram)	5–8 fl oz	28 fl oz—succulent 12 fl oz—dry	4	3—succulent 28—dry	Time applications to small larvae.
	6	*Agri-Mek SC (abamectin)	8.0–16.0 fl oz	48.0 fl oz	12	7	Dry beans only.
	17	Trigard (cyromazine)	2.66 oz 1 packet	0.75 lb a.i./acre	12	7	Not for use on soybeans or peas.
	28	Coragen (chlorantraniliprole/rynaxypyr)	7.5 fl oz	15.4 fl oz of chlorantraniliprole products per acre per year.	4	1	Foliar application only.
	28	Exirel (cyantraniliprole, cyazapyr)	10.5–20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1—succulent 7—dry	
	-	Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others (oil, insecticidal)	3–6 qt/100 gal (JMS); others 1–2 gal/100gal	no limit	4	0	OMRI-listed ² .
	-	Neemix 4.5 (azadirachtin)	4–16 fl oz	20 g.a.i.	12	0	OMRI-listed ² . Insect growth regulator and feeding repellent.
	1A	*Lannate LV; *SP (methomyl)	LV: 1.50–3 pt SP: 0.50–1.0 lb	15 pt 5.0 lb	48	See label; varies with rate & crop.	
1A	Sevin 4F (carbaryl)	1.0–1.5 qt	6.0 qt/year	12	3—fresh beans & peas 14—grazing or forage 21—dried beans, peas, seed, or hay	Use on succulent shelled peas and beans prohibited.	
1B	*Dibrom 8E (naled)	1–1.5 pt	4.5 pt	48	1	Ground application only; not for cowpeas and fieldpeas intended for livestock feed.	
1B	Dimethoate 4EC (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	0—mechanical harvesting	Do not feed treated vines. Do not use on field peas.	
3, 28	*Besiege (chlorantraniliprole & lambda-cyhalothrin)	5–10 fl oz	31 fl oz	24	7—edible podded succulent shelled 21—dry shelled		
3A	*Baythroid XL (beta-cyfluthrin)	2.4–3.2 fl oz—beans & peas 1.6–2.1 fl oz—southern pea	6.4 fl oz 10.5 fl oz	12	7—dry beans & peas 3—southern pea	Not for use on succulent beans or peas. Do not feed treated vines or hay to livestock.	
3A	*Brigade 2 EC (bifenthrin)	5.12–6.4 fl oz	12.8 fl oz—succulent 19.2 fl oz—dry	12	3—succulent 14—dry		
3A	*Declare Insecticide (gamma-cyhalothrin)	1.02–1.54 fl oz	0.38 pt	24	7—edible podded and succulent shelled 21—dry beans and peas	For control before larvae bore into the plant stalk or pods. Do not graze livestock in treated areas or harvest vines for forage or hay.	
3A	*Mustang *Mustang Maxx (zeta-cypermethrin)	3.4–4.3 oz 3.2–4.0 oz	25.8 oz 24.0 oz	12	1—succulent 21—dried shelled peas or beans	Can also be applied at planting for control of cutworms, white grubs, and wireworms. (See label.)	
3A	PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.	

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
Mites: two-spotted, southern, red	3A	*Warrior II (lambda-cyhalothrin)	1.28–1.92 fl oz	7.68 fl oz	24	7—edible podded and succulent shelled 21—dried, shelled	
	15	Rimon 0.83 EC (novaluron)	12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25–2.0 qt	no limit	12	0	
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	OMRI-listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	M-Pede 49% (soap, insecticidal)	0.25%–4.0% v/v	7-to-10-day interval	12	0	OMRI-listed ² .
	-	Aza-Direct (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.
	3A	*Brigade 2 EC (bifenthrin)	5.12–6.4 fl oz	12.8 fl oz—succulent 19.2 fl oz—dry	12	3—succulent 14—dry	
	3A	PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.
	20B	Kanemite 15 SC (acequinocyl)	31 fl oz	62 fl oz	12	7	Succulent beans, including succulent soybean vegetable only.
	20D	Acramite-50WS (bifenthrin)	1.0–1.5 lb	3.0 lb	12	3	Succulent beans, peas and soybean.
	21A	Portal (fenpyroximate)	2.0 pt	4.0 pt	12	1	Snap bean only. Allow 14 days between applications.
	-	Grandevo (<i>Chromobacterium subtsugae</i> strain PRAA4-1)	1–3 lb	no limit	4	0	OMRI-listed ² . Succulent or dried.
	-	M-Pede 49% (soap, insecticidal)	0.25%–4.0% v/v	7-to-10-day interval	12	0	OMRI-listed ² .
	-	Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others (oil, insecticidal)	3–6 qt/100 gal (JMS); others 1–2 gal/100gal	no limit	4	0	OMRI-listed ² .
-	Aza-Direct (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.	
-	Trilogy (extract of neem oil)	1.0%–2.0% v/v	as needed	4	0	OMRI-listed ² .	
Thrips	3A	PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed ² .
	4A	Assail 305G (acetamidiprid)	4.5–5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	5	Entrust SC (spinosad)	1.5–2.0 fl oz	9.0 fl oz—succulent 3.75 fl oz—dry	4	3—succulent 28—dry	OMRI-listed ² . Do not feed forage or hay to meat or dairy animals.
	5	Radiant SC (spinetoram)	5–8 fl oz	28 fl oz—succulent 12 fl oz—dry	4	3—succulent 28—dry	
	15	Rimon 0.83 EC (novaluron)	12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	23	Movento (spirotetramat)	4–5 fl oz	10.0 fl oz	24	1—succulent 7—dry	
	28	Exirel (cyantraniliprole, cyazapyr)	10.5–20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1—succulent 7—dried	Label contains pollinator protection warnings.
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GH4)	0.25–1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	BotaniGard Maxx (<i>Beauveria bassiana</i> strain GH4, pyrethrins)	0.25–2.0 qt	no limit	12	0	
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GH4)	0.25–1.0 qt	no limit	4	0	OMRI-listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	Grandevo (<i>Chromobacterium subtsugae</i> strain PRAA4-1)	1–3 lb	no limit	4	0	OMRI-listed ² . Succulent or dried.
	-	M-Pede 49% (soap, insecticidal)	0.25%–4.0% v/v	7-to-10-day interval	12	0	OMRI-listed ² .
	-	Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others (oil, insecticidal)	3–6 qt/100 gal (JMS); others 1–2 gal/100gal	no limit	4	0	OMRI-listed ² .
	-	Aza-Direct (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed ² . Antifeedant, repellent, insect growth regulator.
	-	Trilogy (extract of neem oil)	1.0%–2.0% v/v	as needed	4	0	OMRI-listed ² . Apply morning or evening to reduce potential for leaf burn.
Whiteflies	3A	*Brigade 2 EC (bifenthrin)	2.1–6.4 fl oz	12.8 fl oz—succulent 19.2 fl oz—dry	12	3—succulent 14—dry	
	3A	*Mustang *Mustang Maxx (zeta-cypermethrin)	3.4–4.3 oz 3.2–4.0 oz	25.8 oz 24.0 oz	12	1—succulent 21—dried shelled peas or beans	Can also be applied at planting for control of cutworms, white grubs, and wireworms. (See label.)
	3A	PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.
	4A	Admire Pro (imidacloprid)	Soil: 7–10.5 fl oz Foliar: 1.2 fl oz	Soil: 10.5 fl oz Foliar: 3.6 fl oz	12 12	Soil: 21 Foliar: 7	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used.
	4A	Assail 30SG (acetamidprid)	4.0–5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	4D	Sivanto Prime (flupyradifurone)	10.5–14 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days
	7C	Knack IGR (pyriproxyfen)	8–10 fl oz	20 fl oz	12	7	
	15	Rimon 0.83 EC (novaluron)	12 fl oz	24 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	16	Courier 40 SC (buprofezin)	9.0–13.6 fl oz	27.2 fl oz	12	14	For succulent beans only. Allow 14 days between applications.
	23	Movento (spirotetramat)	4–5 fl oz	10.0 fl oz	24	1—succulent 7—dry	
	28	Exirel (cyantraniliprole, cyazapyr)	10.5–20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1—succulent 7—dried	

Insect or Mite Pest	MOA Code ¹	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks ²
	-	BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25–2.0 qt	no limit	12	0	
	-	Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	no limit	4	0	OMRI-listed ² . May be used in houses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	Grandevo (<i>Chromobacterium subtugae</i> strain PRAA4-1)	1–3 lb	none	4	0	OMRI-listed ² . Succulent or dried. Do not apply if bees are visiting treatment area.
	-	M-Pede 49% (soap, insecticidal)	0.25%–4.0% v/v	7-to-10-day interval	12	0	OMRI-listed ² . Use with a companion insecticide.
	-	Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others (oil, insecticidal)	3–6 qt/100 gal (JMS); others 1–2 gal/100gal	no limit	4	0	OMRI-listed ² .
	-	Neemix 4.5 (azadirachtin)	4–16 fl oz	20 g a.i.	4	0	OMRI-listed ² .
	-	Trilogy (extract of neem oil)	1.0%–2.0% v/v	as needed	4	0	OMRI-listed ² . Apply morning or evening to reduce potential for leaf burn.

¹ Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v.7.3, February 2014. Number codes (1 through 28) are used to distinguish the main insecticide mode of action groups, with additional letters for certain subgroups within each main group. All insecticides within the same group (with same number) indicate same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions. Un—unknown, or a mode of action that has not been classified yet.

² Information provided in the table applies only to Florida. Be sure to read a current product label before applying any product. The use of brand names and any mention or listing of commercial products or services in the publication does not imply endorsement by UF/IFAS Extension nor discrimination against similar products or services not mentioned. OMRI-listed: Listed by Organic Materials Review Institute for use in organic production.

* Restricted use insecticide

Table 7. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ²
			Appl.	Season	Harvest	Reentry	
Anthraxnose	M1	(copper compounds) Many brands available: Cueva, Kentan DF, Nordox, Nordox 75 WG	SEE INDIVIDUAL LABELS		Varies	Varies from 4 hr to 2 days	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Echo 720, Echo 90 DF, Echo ZN, Equus –DF Fungicide, Equus 720 SST, Initiate 720	SEE INDIVIDUAL LABELS		7 or 14	0.5	Do not use on crops for livestock.
	M1 & M1	Badge SC Badge X2 (copper hydroxide; copper oxchloride)	2 pt		0	1 (greenhouse) 2 (field)	
	M1 & M1	C-O-C-S WDG (basic copper sulfate; copper oxchloride)	1.5 lb		9.2 lb	2	

Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides, including materials labeled for certified organic production.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to			Remarks ²
			Appl.	Season	Harvest	Reentry		
Ascochyta blight	1	(thiophanate-methyl) Many brands available: 3336 EG, 3336 F, 3336 WP, Helena-Methyl 4.5 AG, Incognito 4.5F, Incognito 85 WDG, Nufarm T-Methyl 4.5F, Topsin 4.5FL Fungicide, Topsin M WSB Fungicide	SEE INDIVIDUAL LABELS	14 to 28 (see label)	0.5 (3336 fungicides) 1 (succulent beans) 3 (dry beans)	Apply once at 50%–70% bloom or twice (max=1 ½ lb/appl.) with first at 10%–30% bloom and second at peak bloom.		
	3	Propiconazole 3.6EC Tilt (propiconazole)	4 fl oz	12 fl oz	7	0.5	Supplemental label: For control of web blight caused by <i>Rhizoctonia solani</i> . Not labeled for cowpea used for livestock feed.	
	3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/100 lb seed			0.5	For suppressing seedborne anthracnose of dry bean.	
	7	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide.	
	11	Headline (pyraclostrobin)	9 fl oz 9 fl oz	18 fl oz 18 fl oz	7 or 21 7	4 hr 0.5	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.	
	11	Aframe, Azoxystar, Azoxyzone, Equaton SC, Mazolin, Quadris, Satori Fungicide, Tetraban, Trevo, Willowood Azoxy 25C (azoxystrobin)	15.5 fl oz	92.3 fl oz	14 (dry) 0 (succulent)	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.	
	11	Azteroid FC (azoxystrobin)	19.5 fl oz	116 fl oz	14 (dry) 0 (succulent)	4 hr		
	7 & M3	Vitaflor-280 (carboxin; thiram)	4.0 fl oz per 100 lb seed			1		
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.	
	11 & 3	Avaris 2XS, Cover XL, Quilt Xcel, Quilt Fungicide, Willowood Azoxyprop Xtra (azoxystrobin; propiconazole)	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	0.5	Supplemental label: Do not use on cowpea cultivars intended for livestock.	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Echo 720, Echo 90 DF, Echo ZN, Equus -DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	SEE INDIVIDUAL LABELS		7 or 14	0.5	Do not use on crops for livestock.	
	1	Thiabendazole 4L ST (thiabendazole)	1.72 fl oz/100 lb seed			0.5		
	3	Propiconazole 3.6EC Tilt (propiconazole)	4 fl oz	12 fl oz	7	0.5	Supplemental label: For control of web blight caused by <i>Rhizoctonia solani</i> . Not labeled for cowpea used for livestock feed.	
	3	Proline 480SC (prothioconazole)	5.7 fl oz	17.1 fl oz	7	0.5	Only labeled for chickpea, lentils, and dry-edible peas and beans.	
	7	Endura (boscalid)	11 oz	22 oz	21 (dry) 7 (succulent)	0.5	Limit 2 appl./crop, and alternate chemistry.	

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ²
			Appl.	Season	Harvest	Reentry	
	7	Fontelis (penthioopyrad)	30 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide. Vertisan only labeled for dry edible beans.
	11	Approach (picoxystrobin)	12 fl oz	24 fl oz	14 (seed)	0.5	Do not tank mix with an adjuvant or crop oil when spraying dry beans or peas.
	11	Headline SC (pyraclostrobin)	9 fl oz	18 fl oz	7 or 21	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz	21 (dry) 7 (succulent)	0.5	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	Aframe, Azoxystar, Azoxzone, Mazolin, Quadris, Satori Fungicide, Tetraban, Trevo, Willowood Azoxy 25C (azoxystrobin)	15.5 fl oz	92.3 fl oz	14 (dry) 0 (succulent)	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	Azteroid FC (azoxystrobin)	19.5 fl oz	116 fl oz	14 (dry) 0 (succulent)	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11 & M5	Quadris Opti (azoxystrobin; chlorothalonil)	2.4 pt	9.6 pt	14 (dry)	0.5	Only labeled for dry edible beans. Limit 4 appl./crop. No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	3 & 9	Inspire Super (difenoconazole; cyprodinil)	20 fl oz	80 fl oz	14 (dry)	0.5	
	7 & 3	Approvia Top (benzovindiflupyr; difenoconazole)	11 fl oz	22 fl oz	14 (dry)	0.5	Apply on a 14-day schedule.
	7 & 3	Propulse (fluopyram; prothioconazole)	10.3 fl oz	20.5 fl oz	14	2	For dry-edible beans and peas. Do not use on crops for livestock.
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.
	11 & 3	Aframe Plus, Avaris 2XS, Cover XL, Quilt Xcel, Quilt Fungicide, Willowood Azoxyprop Xtra (azoxystrobin; propiconazole)	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	0.5	Supplemental label: Do not use on cowpea cultivars intended for livestock.
	4 & 7 & 3	EverGol Energy (metalaxyl; penflufen; prothioconazole)	1.0 fl oz/100 lb seed				Disease suppression
	7 & 3 & 11	Miravis Neo (pydiflumetofen; propiconazole; azoxystrobin)	13.7 fl oz	27.4 fl oz	14 (dry)	0.5	

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ²
			Appl.	Season	Harvest	Reentry	
Bacterial brown spot Bacterial blight Common blight Halo blight	M1	(copper compounds) Many brands available: Americop 40 DF, Basic Copper 53, Champ DP Dry Prill, Champ Formula 2 Flowable, Champ WG, Champion++, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Kop-Hydroxide, MasterCop, Nordox, Nordox 75 WG, Nu-Cop 50 WP, Nu-Cop 3 L, Nu-Cop 50 DF, Nu-Cop HB, Previsto	SEE INDIVIDUAL LABELS	Varies	Varies from 4 hr to 2 days		
	M1 & M1	Badge SC Badge X2 (copper hydroxide; copper oxychloride)	2 pt 16.6 pt 16.9 pt	0	1 (greenhouse) 2 (field)		
	M1 & M1	C-O-C-S WDG (basic copper sulfate; copper oxychloride)	1.5 lb 9.2 lb	0	2		
	M1 & M2	Top Cop with Sulfur (basic copper sulfate; sulfur)	2 pt	0	1	Do not use in aluminum tanks.	
	M1 & M2	Top Cop with Sulfur (basic copper sulfate; sulfur)	4 pt	0	1	Do not use in aluminum tanks.	
	M2	(sulfur) Many brands available: Micro Sulf, Microfine Sulfur, Microthiol Disperss, Sulfur 90W, That Flowable Sulfur, Thiolut, Yellow Jacket Dusting Sulfur, Yellow Jacket Wettable Sulfur	SEE INDIVIDUAL LABELS		1	Do not apply during periods of warm weather to avoid phytotoxicity.	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Echo 720, Echo 90 DF, Echo ZN, Equus -DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	SEE INDIVIDUAL LABELS		0.5	Do not use on crops for livestock.	
	M2 & 3	Unicorn DF (sulfur; tebuconazole)	3.75 lb 15 lb (fresh) 7.5 lb (dry)	14	0.5	Do not mix with other DMI fungicides.	
	3	Rally 40WSP Fungicide (myclobutanil)	5 oz 1.25 lb	0	1	30-day plantback interval	
	3	Monsoon, Onset 3.6L, Orius 3.6F, Tebu-Crop 3.6F, Tebustar 3.6L, Toledo (tebuconazole)	6 fl oz 24 fl oz (fresh) 12 fl oz (dry)	7 (fresh) 14 (dry)	0.5		
	3	Willowood Teb 3.65C (tebuconazole)	6 fl oz 12 fl oz	7 (fresh) 14 (dry)	0.5	DMI fungicide	
3	Propiconazole 3.6EC Tilt (propiconazole)	4 fl oz 12 fl oz	7	0.5			
3	Proline 4805C (prothioconazole)	5.7 fl oz 17.1 fl oz	7	0.5	Only labeled for chickpea, lentils and dry-edible peas and beans.		
7	Fontelis Vertisan (penthiopyrad)	30 fl oz 20 fl oz	0 (Fontelis) 21 (Vertisan)	0.5	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide. Vertisan only labeled for dry edible beans.		
11	Approach (picoxystrobin)	12 fl oz 24 fl oz	14 (seed)	0.5	Do not tank mix with an adjuvant or crop oil when spraying dry beans or peas.		

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to			Remarks ²
			Appl.	Season	Harvest	Reentry		
	11	Headline Willowood SC (pyraclostrobin)	9 fl oz	18 fl oz	7 (succulent) 21 (dry)	0.5	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.	
	11	Aframe, Azoxystar, Azoxystar, Mazolin, Quadris, Satori Fungicide, Tetraban, Trevo, Willowood Azoxy 25C (azoxystrobin)	6 fl oz	92.3 fl oz	14 (dry beans) 0 (succulent)	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.	
	11	Azteroid FC (azoxystrobin)	7.6 fl oz	116 fl oz	14 (dry) 0 (succulent)	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.	
	11 & M5	Quadris Opti (azoxystrobin; chlorothalonil)	2.4 pt	9.6 pt	14 (dry)	0.5	Only labeled for dry edible beans. Limit 4 appl./crop. No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.	
	3 & 7	Miravis Top (difenoconazole; pydiflumetofen)	13.7 fl oz	54.8 fl oz	14	0.5		
	11 & 3	Aframe Plus, Avaris 2XS, Cover XL, Quilt Xcel, Quilt Fungicide, Willowood Azoxyprop Xtra (azoxystrobin; propiconazole)	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	0.5	Supplemental label: Do not use on cowpea cultivars intended for livestock.	
	7 & 3	Luna Experience (fluopyram; tebuconazole)	12.8 fl oz	25.6 fl oz	14	0.5	Do not make more than 2 sequential applications of Luna Experience or any Group 7 – or Group 3 – containing fungicide before rotating with a fungicide of a different Group.	
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.	
	7 & 3 & 11	Miravis Neo (pydiflumetofen; propiconazole; azoxystrobin)	13.7 fl oz	27.4 fl oz	14 (dry)	0.5		
	M1	Cueva (copper octanoate)	2 gal		0	4 hr		
	M5	Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Echo 720, Echo 90 DF, Echo ZN, Equus -DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	SEE INDIVIDUAL LABELS			7 or 14	0.5	Do not use on crops for livestock.
1	3336 EG, 3336 F, 3336 WP, Topsin 4.5 FL Fungicide, Topsin M WSB Fungicide (thiophanate-methyl)	SEE INDIVIDUAL LABELS			14 to 28 (see label)	0.5 (3336 fungicides) 1 (succulent) 3 (dry)	Apply once at 50%–70% bloom or twice (max=1 ½ lb/appl.) with first at 10%–30% bloom and second at peak bloom.	
3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/100 lb seed			0.5		For protection against seedborne Botrytis.	
7	Endura (boscalid)	11 oz	22 oz	7 (succulent)	0.5		Limit 2 appl./crop. and alternate chemistry.	
7	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0	0.5			

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ²
			Appl.	Season	Harvest	Reentry	
Cercospora leaf spot	7 & M3	Vitafo-280 (carboxin; thiram)	4 fl oz/100 lb seed			1	For protection against seedborne Botrytis.
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.
	4 & 7 & 3	EverGol Energy (metalaxyl; penflufen; prothioconazole) (copper compounds)	1.0 fl oz/100 lb seed				Disease suppression
	M1	Many brands available: Kentan DF, Nordox, Nordox 75 WG, Previsto	SEE INDIVIDUAL LABELS		Varies	Varies from 4 hr to 2 days	
	M5	(chlorothalonil) Many brands available: Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus – DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	SEE INDIVIDUAL LABELS		7 or 14	0.5	Do not use on crops for livestock.
	7	Fontelis (penthiothopyrad)	30 fl oz	72 fl oz	0	0.5	
	11	Aproach (picoxystrobin)	12 fl oz	24 fl oz	14	0.5	
	11	Headline Headline SC Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz	7 (succulent) 21 (dry)	0.5	Limit 2 appl./crop, and alternate chemistry.
	M1 & M1	Badge SC Badge X2 (copper hydroxide; copper oxychloride)	2 pt	16.6 pt 16.9 pt	0	1 (greenhouse) 2 (field)	
	M1 & M1	C-O-C-S WDG (basic copper sulfate; copper oxychloride)	1.5 lb	9.2 lb		2	
3 & 7	Miravis Top (difenoconazole; pydiflumetofen)	13.7 fl oz	54.8 fl oz	14	0.5		
7 & 3	Aprovia Top (benzovindiflupyr; difenoconazole)	11 fl oz	22 fl oz	14 (dry)	0.5	Apply on a 14-day schedule.	
7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.	
Downy mildew	M1	(copper compounds) Many brands available: Basic Copper 53, Champ Formula 2 Flowable, Champion++, Cueva, Cuprofix Ultra 40 Dispers, Cuproxat, Kentan DF, Kocide 2000 Fungicide, Kocide 3000, Nordox, Nordox 75 WG, Nu-Cop 30 HB, Previsto	SEE INDIVIDUAL LABELS			4 hr to 2 days (see label)	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus –DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	SEE INDIVIDUAL LABELS		7 or 14	0.5	Do not use on crops for livestock.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre			Min. Days to		Remarks ²
			Appl.	Season	Harvest	Reentry		
Fusarium seedling blight, Fusarium root rot	M1 & M1	Badge SC Badge X2 (copper hydroxide; copper oxychloride)	2 pt	16.6 pt 16.9 pt	0	1 (greenhouse) 2 (field)		
	M1 & M1	C-O-C-SWDG (basic copper sulfate; copper oxychloride)	1.5 lb	9.2 lb		2		
	M1 & M2	Top Cop with Sulfur (basic copper sulfate; sulfur)	4 pt		0	1	Do not use in aluminum tanks.	
	M1 & 4	Ridomil Gold/Copper (copper hydroxide; mefenoxam)	2 lb	8 lb	3	2	Limit 4 appl./crop.	
	1	St-Methyl 540 FS (thiophanate-methyl)	0.28 fl oz/100 lb seed			0.5		
	4	Ridomil Gold SL (mefenoxam)	0.2 pt	0.8 pt	3	2	Must be tank mixed with other effective fungicides.	
	4	Ultra Flourish (mefenoxam)	0.4 pt	2.0 pt (soil) 1.6 pt (foliar)	3	2	Must be tank mixed with other effective fungicides.	
	11	Approach (picoxystrobin)	12 fl oz	24 fl oz	14	0.5		
	11	Headline Headline SC Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz	7	0.5	Limit 2 appl./crop, and alternate chemistry.	
	21	Ranman 400SC Fungicide (cyazofamid)	2.75 fl oz	16.5 fl oz	0	0.5	Not labeled for cowpea used for livestock feed. Limit 6 appl./crop. No more than three sequential appl. before rotating chemistry.	
	40	Revus (mandipropamid)	8 fl oz	32 fl oz	1	4 hr		
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.	
1	Mertect 340-F (thiabendazole)	0.68 fl oz/100 lb seed			0.5			
1	Thiabendazole 4L ST (thiabendazole)	1.72 fl oz/100 lb seed			0.5			
1	T-Methyl 4.5L ST (thiophanate-methyl)	0.28 fl oz/100 lb seed			0.5			
3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/100 lb seed			0.5			
3	Redigo 480 (prothioconazole)	0.32 fl oz/100 lb seed			0.5			
7	Systiva XS Xemium (fluxapyroxad)	0.47 fl oz/100 lb seed						
11	Stamina (pyraclostrobin)	1.5 fl oz/100 lb seed						
12	Dyna-Shield, Fludioxonil, Fludioxonil 4L ST, Maxim 4F S, Spirato 480 FS, StartUp FLUDI (fludioxonil)	0.16 fl oz/100 lb seed			0.5			
3 & 4	Rancona Summit (ipconazole; metalaxyl)	4.0 fl oz/100 lb seed			1			

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ²
			Appl.	Season	Harvest	Reentry	
Phytophthora	7 & 3	Rancona V 100 Pro FS (carboxin; ipconazole)	1.5 fl oz/100 lb seed			0.5	
	4 & 11	Trilex 2000 (metalaxyl; trifloxystrobin)	1.0 fl oz/100 lb seed			1	
	4 & 12	Apron Maxx RFC (mefenoxam; fludioxonil)	1.5 fl oz/100 lb seed			2	
	4 & 12	Apron Maxx RTA (mefenoxam; fludioxonil)	5.0 fl oz/100 lb seed			2	
	7 & M3	Vitaflo-280 (carboxin; thiram)	4.0 fl oz/100 lb seed			1	Seed treatment
	4 & 7 & 3	EverGol Energy (metalaxyl; penflufen; prothioconazole)	1.0 fl oz/100 lb seed			1	
	4 & 7 & 12	Vibrance Maxx (mefenoxam; sedaxane; fludioxonil)	1.54 fl oz/100 lb seed			2	
	11 & 12 & 4 & 4A (insecticide)	Seed Shield Beans (azoxystrobin; fludioxonil; mefenoxam; thiamethoxam)	3.0 fl oz/100 lb seed			2	
	4	Acquire, Allegiance FL, Dyna-Shield metalaxyl 318 FS, Metalaxyl 4.0 ST, Sebring 318 FS, Sebring 480 FS (metalaxyl)	0.75 fl oz/100 lb seed except for Metalaxyl 4.0 ST at 0.5 fl oz/100 lb seed			1	Seed treatment
	4	Apron XL (mefenoxam)	0.32 fl oz/100 lb of seed			2	Seed treatment only
	Powdery mildew	21	Ranman 400SC Fungicide (cyazofamid)	2.75 fl oz	16.5 fl oz	0	0.5
4 & 12		Apron Maxx RTA (mefenoxam; fludioxonil)	5 fl oz/100 lb seed			2	Seed treatment only
11 & 12 & 4 & 4A		Seed Shield Beans (azoxystrobin; fludioxonil; mefenoxam; thiamethoxam)	3.0 fl oz/100 lb seed			2	Seed treatment only
M1		Cueva (copper ocanoate)	2 gal		0	4 hr	OMRI-listed
M2		Many brands available: Cosavet-DF Edge, Micro Sulf, Microfine Sulfur, Microthiol Dispers, Sufifa, Sulfur 6 L, Sulfur 90W, THAT Flowable Sulfur, Thiolux, Wettable Sulfur, TriTek	SEE INDIVIDUAL LABELS			1	Do not apply during periods of warm weather, to avoid phytotoxicity.
M1 & M2		Top Cop with Sulfur (basic copper sulfate; sulfur)	2 qt		0	1	Do not use in aluminum tanks.
7		Fontelis (penthioopyrad)	30 fl oz	72 fl oz	0	0.5	
7		Vertisan (penthioopyrad)	20 fl oz	41 fl oz	21 (seed) 0 (hay)	0.5	
11		Approach (picoxystrobin)	12 fl oz	24 fl oz	14	0.5	
11		Headline SC Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz	7	0.5	Limit 2 appl./crop, and alternate chemistry.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to			Remarks ²
			Appl.	Season	Harvest	Reentry		
Pythium damping-off & root rot	7 & 3	Luna Experience (fluopyram; tebuconazole)	12.8 fl oz	25.6 fl oz	14	0.5	Do not make more than 2 sequential applications of Luna Experience or any Group 7 – or Group 3 – containing fungicide before rotating with a fungicide of a different group.	
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 (succulent) 21 (dry)	0.5	Do not make more than 2 applications per season.	
	4	Acquire, Allegiance FL, Dyna-Shield metalaxyl 318 FS, Metalaxyl 265 ST, Metalaxyl 4.0 ST, Sebring 318 FS, Sebring 480 FS (metalaxyl)	0.75 fl oz/100 lb seed			1	Seed treatment	
	4	MetaStar 2E (metalaxyl)	4 pt				Preplant incorporated at planting or soil surface after planting. Do not use in greenhouse or field-grown bedding plants.	
	4	Apron XL (mefenoxam)	0.64 fl oz/100 lb seed			2	Seed treatment only	
	4	Ridomil Gold SL (mefenoxam)	0.2 pt	0.8 pt	3	2	Must be tank mixed with other effective fungicides.	
	4	Ultra Flourish (mefenoxam)	2 pt			2	Apply as a broadcast soil application at preplant or as a surface application at planting.	
	3 & 4	Rancona Summit (ipconazole; metalaxyl)	4.0 fl oz/100 lb seed			1		
	4 & 11	Trilex 2000 (metalaxyl; trifloxystrobin)	1.0 fl oz/100 lb seed			1		
	4 & 11	Uniform (mefenoxam; azoxystrobin)	0.34 fl oz/1000 ft row			0		
	4 & 12	Apron Maxx RFC (metalaxyl; fludioxonil)	1.5 fl oz/100 lb seed			2		
	4 & 12	Apron Maxx RTA (metalaxyl; fludioxonil)	5.0 fl oz/100 lb seed			2		
	4 & 12	Spirao M 185 FS (metalaxyl; fludioxonil)	1.5 fl oz/100 lb seed			2		
	7 & M3	VitaFlo-280 (carboxin; thiram)	4 fl oz/100 lb seed			1		
Rhizoctonia diseases	1	St-Methyl 540 FS T-Methyl 4.5L ST (thiophanate-methyl)	0.28 fl oz/100 lb seed			0.5		
	3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/100 lb seed			0.5	Seed treatment for protection against <i>Rhizoctonia solani</i> .	
	3	Propiconazole 3.6 EC (propiconazole)	4 fl oz	12 fl oz	7	0.5	For web blight (<i>Rhizoctonia solani</i>)	
	7	Systiva XS Xemium (fluxapyroxad)	0.47 fl oz/100 lb seed			0		
	11	Aframe (azoxystrobin)	0.8 fl oz/1000 row ft			4 hr		
	11	AzoxyStar (azoxystrobin)	3.75 fl oz/100 lb seed			4 hr	Seed treatment	

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks ²
			Appl.	Season	Harvest	Reentry	
	11	Azoxystrobin 100 ST (azoxystrobin)	0.8 fl oz/1000 row ft			0	
	11	Azoxystrobin (azoxystrobin)	1.0 fl oz/1000 row feet			4 hr	For Rhizoctonia root rot (<i>Rhizoctonia solani</i>)
	11	Azteroid FC (azoxystrobin)	19.5 fl oz	116 fl oz	14 (dry) 0 (succulent)	4 hr	For web blight (<i>Rhizoctonia solani</i>)
	11	Dynasty (azoxystrobin)	0.765 fl oz/100 lb seed			4 hr	Seed treatment
	11	Mazolin (azoxystrobin)	0.8 fl oz/1000 row ft				Avoid application directly to seed since delayed emergence may occur
	11	Quadrif (azoxystrobin)	15.5 fl oz	92.3 fl oz	14 (dry) 0 (succulent)	4 hr	For web blight (<i>Rhizoctonia solani</i>)
	11	Satori Fungicide Tetran Trevo Willowood Azoxy 25C (azoxystrobin)	0.8 fl oz/1000 row ft				
	11	Stamina (pyraclostrobin)	1.5 fl oz/100 lb seed			0.5	Seed treatment
	11	Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz	1	0.5	
	12	Dyna-Shield Fludioxonil Fludioxonil 4L ST Maxim 4FS Spirato 480FS StartUp FLUDI (fludioxonil)	0.16 fl oz/100 lb seed			0.5	Seed treatment only.
	14	Blocker 4F (PCNB)	3.3 fl oz/1000 row ft			0.5	Avoid application directly to seed because delayed emergence may occur.
	14	Rizolex (tolclofos-methyl)	0.3 fl oz/100 lb seed	200 lb		0.5	Only applied on the "true seed," not on other propagation parts.
	7 & M3	VitaFlo-280 (carboxin; thiram)	4 fl oz per 100 lb seed			1	Seed treatment
	3 & 4	Rancona Summit (ipconazole; metalaxyl)	4 fl oz per 100 lb seed			1	
	4 & 11	Trilex 2000 (metalaxyl; trifloxystrobin)	1.0 fl oz/100 lb seed			1	
	4 & 11	Uniform (mefenoxam; azoxystrobin)	0.34 fl oz/1000 ft row			0	Make only one application per season
	4 & 12	Apron Maxx RFC (mefenoxam; fludioxonil)	1.5 fl oz/100 lb seed			2	Seed treatment only.
	4 & 12	Apron Maxx RTA (mefenoxam; fludioxonil)	5 fl oz/100 lb seed			2	Seed treatment only.
	11 & 3	Aframe Plus, Avaris 2XS, Cover XL, Quilt Xcel, Willowood AzoxyProp Xtra (azoxystrobin; propiconazole)	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	0.5	For web blight (<i>Rhizoctonia solani</i>)

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to			Remarks ²
			Appl.	Season	Harvest	Reentry		
White mold	1	(thiophanate-methyl) Many brands available: 3336 EG, 3336 F, 3336 WP, Helena-Methyl 4.5 AG, Incognito 4.5F, Nufarm T-Methyl 4.5F, Topsin 4.5FL Fungicide, Topsin M WSB Fungicide	SEE INDIVIDUAL LABELS	Season	14 to 28 (see label)	0.5 (3336 fungicides) 1 (succulent) 3 (dry)	Apply once at 50%–70% bloom or twice (max=1 ½ lb/appl.) with first at 10%–30% bloom and second at peak bloom.	
	M1	Cueva (copper ocanoate)	2 gal		0	4 hr	OMRI-listed.	
	2	Iprodione 4L AG Fungicide Meteor Nevado 4F Rovral 4 Flowable (iprodione)	2 pt	4 pt	0	1	Limit 2 applications per season. Not for use as livestock feed.	
	7	Endura (boscalid)	11 oz	22 oz	7 (succulent)	0.5	Limit 2 appl./crop, and alternate chemistry.	
	7	Fontelis (penthioopyrad)	30 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide.	
	7	Vertisan (penthioopyrad)	20 fl oz	41 fl oz	21	0.5	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide. Vertisan only labeled for dry edible beans.	
	12	Cannonball WG Cannonball WP (fludioxonil)	7 oz	28 oz	7	0.5	After 2 applications of Cannonball WP, alternate with another fungicide with a different mode of action for 2 applications.	
	14	Blocker 4F Fungicide (PCNB)	2 pt		0	0.5	Avoid tank-mixing with highly acidic pesticides as this may reduce efficacy. Apply to seed furrow and covering soil. Do not spray seed directly.	
	14	Botran 5F (DCNA dicloran)	1.6 qt	3.2 qt	2	0.5	Do not feed treated plants to livestock.	
	29	Omega 500F (fluazinam)	0.85 pt	1.75 pt	14 (edible—poddled and succulent beans)	2		
	7 & 3	Propulse (fluopyram; prothioconazole)	10.3 fl oz	20.5 fl oz	14	2	For dry-edible beans and peas. Do not use on crops for livestock.	
7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.		
9 & 12	Switch 62.5 WG (cyprodinil; fludioxonil)	14 oz	56 oz	7	0.5			
1 & 3 & 11	Trevo Packed (thiophanate-methyl; tebuconazole; azoxystrobin)	30 fl oz		14 (fresh) 28 (dry)	1			

¹ FRAC code (fungicide group): Number (1 through 46) and letters (U and P) are used to distinguish the fungicide mode of action groups. All fungicides within the same group (with same number or letter) indicate same active ingredient or similar mode of action. This information must be considered for the fungicide resistance management decisions. U = unknown, or a mode of action that has not been classified yet and is typically associated with another number; P = host plant defense inducers. Source: FRAC Code List 2019; <http://www.frac.info/> (FRAC = Fungicide Resistance Action Committee).

² Information provided in this table applies only to Florida. Be sure to read a current product label before applying any chemical. The use of brand names and any mention or listing of commercial products or services in the publication does not imply endorsement by UF/IFAS Extension nor discrimination against similar products or services not mentioned.

Table 8. Nonfumigant nematicides for legume crops in Florida.

Product	Application Directions
Mocap 15G (a.i. ethoprop)	Apply 13 pounds per acre (36-inch row spacing) or 0.9 pounds per 1,000 linear feet of row in a band of 15 inches wide on the row at-planting. Mix with the top 2 to 4 inches of soil with mechanical equipment right after application. If broadcast, apply 34 lb/acre from 1 week before planting to at planting time and mix with 2–4 inches of soil. DO NOT use as a seed furrow treatment or allow granules to contact the seed. Only 1 application per season.