

## Chapter 11. Legume Production

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### 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 11.1.** 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
<b>Planting information</b>						
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

### Cultivars

**Table 11.2.** 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	Golden Rod		Fordhook 242
Buffalo	3230		Gold Rush		Jackson Wonder
Caprice	Sybaris (BA 1007)				
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 U.S. 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 semi-perennial 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 U.S., 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, indicate 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 trellis. For pest control products, these crops are included in the legume crop chapter.

**Table 11.3.** 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
<b>Planting information</b>				
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
<b>Planting information</b>				
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 11.4.** 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, Stickless Wonder, Orient Wonder,	Yes

Table 11.5. Herbicides approved for managing weeds in legumes.

Labels change frequently. Be sure to read a current product label before applying any chemical.					
Active ingredient lb. a.i./A	Trade name product/A	MOA Code	Crops	Weeds controlled / remarks	
<b>*** PREEMERGENCE ***</b>					
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl. oz. (Aim) 2.0 EC up to 2 fl. oz.	14	Bean (all), pea (all)	Apply as a preplant burn down 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.	
EPTC 2.0 - 4.0	(Eptam) 7 E 2.25 - 4.5 pt.	8	Bean (green, dry)	Broadleaf and nutsedge weeds. Incorporate in the same operation to reduce volatilization. Do not exceed 9 pt./A per crop.	
Fomesafen 0.25 - 0.38	(Reflex) 2 EC 1.0 - 1.5 pt.	14	Bean (dry, snap)	Annual broadleaf and grass weeds and nutsedge. Not for use in Miami-Dade county. Do not apply more than 1.5 pt./A per year.	
Glyphosate	(various formulations) consult labels	9	Bean (all), pea (all)	Emerged broadleaf and grass weeds. Consult individual labels for restrictions.	
Halosulfuron 0.02	(Sanda) 75 DF 0.5 oz.	2	Bean (blackeyed, cowpea, southern pea)	Broadleaf weeds and nutsedge. Apply after planting but before crop emergence. May cause significant, temporary stunting and delay maturity of peas, resulting in delayed harvest.	
Imazethapyr 0.02	(Pursuit) 2 L 1.5 fl. oz.	2	Bean (snap)	Only one application a year. Preplant incorporate within 1 week of planting or preemergence application within 1 day after planting. PHI 30 days.	
Imazethapyr 0.05	(Pursuit) 2 L 3.0 fl. oz.	2	Bean (dry, lima, southern pea, cowpea), pea (dry, English), chickpea	Only one application a year. Preplant incorporate within 1 week of planting or preemergence application within 1 day after planting. Can apply up to 4 oz./A to southern pea only. Consult label for preharvest interval.	
Paraquat 0.5 - 1.0	(Gramoxone) 2 SL 2 - 4 pt. (Firestorm) 3 SL 1.3 - 2.7 pt.	22	Bean (lima, snap), pea (all)	Emerged weeds. Apply prior, during, or after planting but before crop emergence. Only three applications a season. Use a nonionic surfactant.	
Pelargonic acid	(Scythe) 4.2 EC 3 - 10% v/v	27	Bean (all), pea (all)	Emerged weeds. Apply before crop emergence. Product is a contact, nonselective, foliar-applied herbicides. There is no residual activity.	
Pendimethalin 0.5 - 0.75	(Prowl) 3.3 EC 1.2 - 1.8 pt. (Prowl H20) 3.8 1.0 - 1.5 pt.	3	Bean (dry, lima, snap, garbanzo) bean (southern pea, cowpea), chickpea	Annual broadleaf and grass weeds. Incorporate 1 - 2 in. deep within 7 days of application.	
Pyraflufen 0.0008 - 0.003	(ET Herbicide/Defoliant) 0.5 - 2.0 fl. oz.	14	Bean (all), pea (all)	Emerged broadleaf and grass weeds. Plant 1 day after application. Apply as a preplant burndown treatment.	
S-metolachlor 0.95 - 1.27	(Brawl, Dual Magnum) 7.62 EC 1.0 - 1.33 pt.	15	Bean (lima, mung, pinto, snap), bean (southern pea), pea (English)	Annual broadleaf and grass weeds and yellow nutsedge. Consult label for rate based on soil type and specific tank mix directions.	
Saflufenacil 0.027	(Sharpen) 3.42 SL 1.0 fl. oz.	14	Bean (garbanzo), bean (dry, chickpea)	Broadleaf weeds. Apply as a preplant/preemergence burndown. Sequential application can be applied with 14 days between timings. Do not apply more than 2 fl. oz./A per season.	
Sulfentrazone 0.07 - 0.09	(Willowood sulfentrazone) 4SC 2.25 - 3.0 fl. oz.	14	Bean and Pea (dry shelled)	Broadleaf and grass weed control, Nutsedge suppression. Do not apply on sands with less than 1% organic matter. Do not apply more than 8 fl. oz./A within a 12 mo. period. Should be trialed on a small area to find suitable rate for the soil type in your area.	
Sulfentrazone 0.07 - 0.12	(Willowood sulfentrazone) 4SC 2.25 - 3.75 fl. oz.	14	Succulent peas	Broadleaf and grass weed control, Nutsedge suppression. Do not apply on sands with less than 1% organic matter. Do not apply more than 6 fl. oz./A within a 12 mo. period. Should be trialed on a small area to find suitable rate for the soil type in your area.	
Trifluralin 0.5 - 0.75	(Treflan, Trust) 4 EC 1.0 - 1.5 pt. (Treflan, Trifluralin) 10 G 5 - 7.5 lb.	3	Bean (lima, mung, guar, snap), bean (southern pea), pea (dry, English)	Annual broadleaf and grass weeds. Incorporate 4 in. or less within 8 hr. Results in Florida are erratic on soils with low organic matter and clay content. Consult label for rotation restrictions.	
<b>*** POSTEMERGENCE ***</b>					
Bentazon 0.5 - 1.0	(Basagran) 4 L 1.0 - 2.0 pt.	6	Bean (dry, succulent), bean (southern pea), pea (garden, English)	Broadleaf weeds. Apply after the first trifoliolate leaf is fully expanded in bean and three pairs of leaves in pea. Yellowing, bronzing, speckling, or leaf burning may occur under certain conditions. This injury is generally outgrown without delaying pod set or maturity. PHI 30 days.	

Table 11.5. Herbicides approved for managing weeds in legumes. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.					
Active ingredient lb. a.i./A	Trade name product/A	MOA Code	Crops	Weeds controlled / remarks	
Carfentrazone up to 0.031	(Aim) 1.9 EW up to 2 fl. oz. (Aim) 2.0 EC up to 2 fl. oz.	14	Bean (all), pea (all)	Emerged broadleaf control. Direct application to row middles for burndown of emerged broadleaf weeds. Include crop oil concentrate or nonionic surfactant at recommended rates. PHI 0 days.	
Clethodim 0.094 - 0.25	(Arrow) 2 EC 6 - 16 fl. oz. (Select Max) 1 EC 9 - 32 fl. oz.	1	Bean (dry), pea (dry)	Annual and perennial grass control. Consult label for bean and pea types. PHI 30 days.	
Clethodim 0.094 - 0.25	(Arrow) 2 EC 6 - 16 fl. oz. (Select Max) 1 EC 9 - 32 fl. oz.	1	Bean (succulent), pea (succulent)	Annual and perennial grass control. Consult label for bean types. PHI 21 days.	
EPTC 3.1 -4.0	(Eptam) 7 E 3.5 - 4.5 pt.	8	Bean (green, dry)	Broadleaf and nutsedge weeds. Apply as layby treatment during the last cultivation of the season. Direct spray solution to the base of the crop. Do not exceed 9 pt./A per crop.	
Fluazifop 0.19 - 0.38	(Fusilade DX) 2 EC 12 - 24 fl. oz.	1	Bean (dry)	Annual and perennial grass weeds. Do not apply to cowpea. Do not apply more than 48 fl. oz./A per season. Include a COC or NIS in the spray solution. PHI 60 days.	
Fomesafen 0.25 - 0.38	(Reflex) 2 EC 1.0 - 1.5 pt.	14	Bean (dry, snap)	Annual broadleaf and grass weeds and nutsedge. Not for use in Miami-Dade County. Consult label for rate based on size of specific weed species. Some bronzing, crinkling, or spotting may occur, but the crop will outgrow these effects and develop normally. Do not apply more than 1.5 pt./A per year.	
Halosulfuron 0.02 - 0.03	(Sandea) 75 DF 0.5 - 0.66 oz.	2	Bean (dry)	Broadleaf weeds and nutsedge. Row middles only. Avoid contact with planted crop. If crop grown on plastic, keep the application off the plastic. Do not apply more than 1 oz./A per crop.	
Halosulfuron 0.02 - 0.03	(Sandea) 75 DF 0.5 - 0.66 oz.	2	Bean (snap, lima)	Broadleaf weeds and nutsedge. Directed sprays. Apply after the two to four trifoliate leaf stage but before flowering.	
Imazethapyr 0.14	(Pursuit) 2 L 3.0 oz.	2	Bean (dry), bean (southern pea), pea (dry, English)	Do not apply before bean has at least one trifoliate leaf. Apply to peas at least 3 in. in height, but prior to the fifth node and before flowering. Consult label for preharvest intervals.	
Pelargonic acid	(Scythe) 4.2 EC 3 - 10% v/v	27	Bean (all), pea (all)	Emerged weeds. Row middles only. Use a shielded sprayer directed to the row middles to reduce drift to the crop.	
Quizalofop 0.04 - 0.08	(Assure II) 6 - 12 fl. oz.	1	Bean (snap, dry), pea (succulent, dry)	Annual and perennial grass weeds. Allow 7 days between sequential applications to allow for regrowth. Include a COC or NIS in the spray solution. PHI 30 days for succulent pea and dry bean. PHI 60 days for dry pea.	
Sethoxydim 0.19 - 0.47	(Poast) 1.5 EC 1.0 - 2.5 pt.	1	Bean (dry, succulent), pea (dry, succulent)	Growing grass weeds. Decreased efficacy if weeds are under stress. Do not exceed 4.0 pt./A per season. Include a crop oil concentrate in the spray solution. PHI 30 days for dry bean and dry pea. PHI 15 days for succulent bean and succulent pea.	

Table 11.6. Insecticides labeled for management of arthropod pests of beans and peas.

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.							
Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
Aphids	1A	*Lannate LV* SP (methomyl)	LV: 1.50-3pt SP: 0.25-1.0 lb	15 pt 5.0 lb	48	see label: varies with rate & crop	Poison. Highly toxic to fish, aquatic invertebrates, mammals and bees.
	1B	*Dibrom 8E (naled)	1.0 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock feed. Toxic to fish and wildlife. Poison. Corrosive.
	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. Highly toxic to bees. See label.

**Table 11.6.** Insecticides labeled for management of arthropod pests of beans and peas. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
	1B	<b>Malathion 8F</b> (malathion)	1.0 pt	2.0 pt	12	3	Green and dried peas only. Do not graze or feed forage to livestock. Highly toxic to bees, fish and aquatic invertebrates.
	1B	<b>Orthene 97</b> (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. See label. Toxic to birds and bees. Do not feed treated vines or seeds to livestock.
	3A	<b>*Asana XL</b> (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. Toxic to fish and aquatic invertebrates. Do not apply if bees are visiting treated area.
	3A	<b>*Brigade 2 EC</b>  (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz: succulent 19.2 fl oz: dry	12	3-succulent  14-dry	Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear. Toxic to bees and aquatic organisms.
	4A	<b>Admire Pro</b> (Imidacloprid)	soil: 7-10.5 fl oz; foliar: 1.2 fl oz	soil: 10.5 fl oz foliar: 3.6 fl oz	12 12	21-soil 7-foliar	Do not apply to both soil and foliage. Do not use other 4A insecticides if imadacloprid is used. Bee hazard
	4A	<b>Assail 30SG</b> , (acetamidprid)	2.5-5.3 fl oz	16 fl oz	12	7	Edible podded legumes, succulent shelled peas and beans. Toxic to birds, bees and fish.
	4D	<b>Sivanto Prime</b> (flupyradifurone)	7.0-10.5 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days. Toxic to aquatic invertebrates.
	23	<b>Movento</b> (spirotetramat)	4-5 fl oz	10 fl oz	24	1- succulent 7- dry	Toxic to aquatic invertebrates and honey bee larvae.
	-	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.25-1.0qt	no limit	4	0	May be used in greenhouses. Contact dealer if an adjuvant must be used. Not compatible in tank mix with fungicides. May be pathogenic to bees.
	-	<b>Grandevo</b> ( <i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb	none	4	0	OMRI-Listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed <sup>2</sup> . Use with a companion insecticide.
	-	<b>Sun Spray 98.8%</b> , <b>JMS Stylet Oil</b> , <b>Saf-T-Side</b> , others (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed <sup>2</sup> . Toxic to fish.
	-	<b>Aza-Direct</b> (azadirachtin)	1-2 pts	3.5 pt	4	0	OMRI-Listed <sup>2</sup> . Anti-feedant, repellent insect growth regulator. Toxic to fish.
	-	<b>Neemix 4.5</b> (azadirachtin)	4-16.0 fl oz	20 gm a.i.	4	0	OMRI-Listed <sup>2</sup> . Insect growth regulator and feeding repellent. Does not kill adult insects.
	-	<b>Trilogy</b> (extract of neem oil)	1.0-2.0% v/v	as needed	4	0	OMRI-Listed <sup>2</sup> . Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment.

Table 11.6. Insecticides labeled for management of arthropod pests of beans and peas. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.  
Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
Caterpillars: Armyworm, corn earworm, lesser cornstalk borer, loopers, cutworm	1A	*Lannate (methomyl)	LV: 1.50-3.0 pt SP: 0.50-1.0 lb	15 pt 5.0 lb	48	see label: varies with rate & crop.	Poison. Highly toxic to fish, aquatic invertebrates, mammals and bees.
	1A	Sevin 4F (carbaryl)	0.50-1.5 qt	6.0 qt/yr	12	3-fresh beans & peas 14-grazing or forage 21-dried beans seed or hay.	Use on succulent shelled peas and beans prohibited. Extremely toxic to bees and aquatic invertebrates.
	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. Poison. Toxic to bees, birds, fish and wildlife.
	1B	*Dibrom (naled)	1-1.5 pt	4.5 pts	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock forage. Toxic to fish wildlife. Danger. Corrosive.
	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. See label. Toxic to birds and bees. 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. Toxic to fish & aquatic invertebrates. Do not apply if bees are visiting treated areas.
	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 and peas 10.5 fl oz : southern peas	12	7-dry beans & peas 3-southern pea	<b>Not for use on succulent beans or peas.</b> Do not feed treated vines or hay to livestock. Extremely toxic to bees, fish and aquatic invertebrates.
	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	Extremely toxic to bees, fish and aquatic invertebrates.
	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. Extremely toxic to bees, fish and aquatic invertebrates.
	3A	*Declare Insecticide (gamma-cyhalothrin)	1.54 fl oz	0.38 pt	24	7-edible and succulent shelled, 21-dry beans and peas	For control before larvae bore into plant stalk or pods. Do not graze livestock in treated areas or harvest vines for forage or hay. Extremely toxic to fish, bees, wildlife.
	3A	*Mustang *Mustang Maxx (Zeta-cypermethrin)	3.0-4.3 fl 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). Extremely toxic to bees, fish and aquatic invertebrates.
	3A	PyGanic 5.0 (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear. Toxic to bees and aquatic organisms.
	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	Toxic to aquatic organisms and wildlife. 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 <sup>2</sup> . Do not feed forage or hay to meat or dairy animals. Toxic to bees.
	5	Radiant SC (spinetoram)	4-8 fl oz	28.0 fl oz : succulent 12.0 fl oz : dry	4	3-succulent 28-dry	Time applications to small larvae. Toxic to bees and aquatic invertebrates.
11A	Javelin WG ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.12-1.50 lb	as needed	4	0	OMRI-Listed <sup>2</sup> Treat when larvae are young. Thorough coverage is essential.	

**Table 11.6.** Insecticides labeled for management of arthropod pests of beans and peas. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
Cucumber beetle, bean leaf beetle, Mexican bean beetle, Cowpea curculio	11A	<b>Xentari DF</b> ( <i>Bacillus thuringiensis</i> subspecies <i>aizwai</i> )	0.5-2.0 lb	as needed	4	0	OMRI-Listed <sup>2</sup> . Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Toxic to aquatic invertebrates.
	15	<b>Rimon 0.83 EC</b> (novaluron)	6-12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects. Toxic to aquatic invertebrates, do not spray when bees are visiting treated area.
	18	<b>Intrepid 2F</b> (methoxyfenozide)	4-16 fl oz	64 fl oz	12	7	Hazardous to aquatic invertebrates.
	22	<b>Avaunt</b> (indoxacarb)	3.5 oz	14 fl oz	12	7	<b>Southern pea (dry) varieties only.</b> Highly toxic to mammals, birds, fish and aquatic invertebrates.
	28	<b>Coragen</b> (chlorantraniliprole with rynaxypyr)	3.5-7.5 fl oz	15.4 fl oz of chlorantraniliprole products per acre per year.	4	1	Foliar application only. Toxic to aquatic organisms.
	-	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if an adjuvant must be used. Not compatible in tank mix with fungicides. May be pathogenic to bees.
	-	<b>Aza-Direct</b> (azadirachtin)	1-2 pts	3.5 pts	4	0	OMRI-Listed <sup>2</sup> . Anti-feedant, repellent insect growth regulator. Toxic to fish.
	1A	<b>*Lannate</b> (methomyl)	LV: 0.75-3pt SP: 0.25-1.0 lb	15 pt 5.0 lb	48	see label varies with rate & crop	Poison. Highly toxic to fish, aquatic invertebrates, mammals and bees.
	1A	<b>Sevin 4F</b> (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.	Use on succulent shelled peas and beans prohibited. Highly toxic to bees and aquatic invertebrates.
	1B	<b>Orthene 97</b> (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. See label. Toxic to birds and bees. Do not feed treated vines to livestock.
	1B	<b>Dimethoate 4EC</b> (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. Highly toxic to bees. See label.
	1B	<b>*Thimet 20G EZ Load</b> (phorate)	4.9-9.4 oz/ 1000 ft row	1 application only at plant	48	60	<b>Poison.</b> Label pending in Fla. Do not graze livestock on treated forage. No direct contact with seed. Highly toxic to birds, fish and mammals.
	3A	<b>*Baythroid XL</b> (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	<b>Not for use on succulent beans or peas.</b> Do not feed treated vines or hay to livestock. Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz: succulent 19.2 fl oz: dry	12	3-succulent 14-dry	Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>Declare Insecticide</b> (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. Extremely toxic to fish, bees, wildlife.
	3A	<b>*Mustang</b> <b>*Mustang Maxx</b> (zeta-cypermethrin)	3.0-4.3 oz 2.72-4.0 oz	25.8 fl oz 24.0 fl 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). Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear. Toxic to bees and aquatic organisms.

**Table 11.6.** Insecticides labeled for management of arthropod pests of beans and peas. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.  
Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
	3A	<b>*Warrior II</b> (lambda cyhalothrin)	0.96-1.92 fl oz	7.68 fl oz	24	7-edible podded and succulent shelled; 21- dried, shelled	Toxic to aquatic organisms and wildlife. Do not graze livestock in treated areas.
	4A	<b>Assail 30SG</b> , (acetamidprid)	2.5-5.3 fl oz	16 fl oz	12	7	Edible podded legumes and succulent shelled peas and beans. Toxic to birds, bees and fish.
	15	<b>Rimon 0.83 EC</b> (novaluron)	9-12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects. Toxic to aquatic invertebrates, do not spray when bees are visiting treated area.
	-	<b>Aza-Direct</b> (azadirachtin)	1-2 pts	3.5 pts	4	0	OMRI-Listed <sup>2</sup> . Anti-feedant, repellent insect growth regulator. Toxic to fish.
	-	<b>Neemix 4.5</b> (azadirachtin)	4-16 fl oz	20 gm a.i.	12	0	OMRI- Listed <sup>2</sup> . Insect Growth Regulator and feeding repellent, Does not kill adult insects.
<b>Fire Ants</b>	7A	<b>Extinguish</b> ((S) methoprene)	1-1.5 lb broadcast	as needed	4	0	Insect Growth Regulator. Colonies will ge reduced after three weeks and eliminated after 8-10 weeks.
	7C	<b>Esteem Ant Bait</b> (pyriproxyfen)	1.5-2.0 lb	0.134 lb a.i.	12	1	Insect Growth Regulator. Apply at first sign of ant activity. Toxic to fish and aquatic invertebrates.
<b>Grasshoppers</b>	1B	<b>Dimethoate 4EC</b> (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. Highly toxic to bees. See label
	3A	<b>*Asana XL</b> (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. Toxic to bees and fish .
	3A	<b>*Baythroid XL</b> (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	<b>Not for use on succulent beans or peas.</b> Do not feed treated vines or hay to livestock. Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz 19.2 fl oz	12	3-succulent 14-dry	Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>Declare Insecticide</b> (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. Extremely toxic to fish, bees, wildlife.
	3A	<b>*Mustang</b>	3.4-4.3 oz	25.8 fl oz	12	1-succulent;	Can also be applied at planting for control of cutworms, white grubs and wireworms. (See label). Extremely toxic to bees, fish and aquatic invertebrates.
		<b>*Mustang Maxx</b> (Zeta-cypermethrin)	3.2-4.0 oz	24 fl oz	12	21-dried shelled peas or beans	
	3A	<b>*Warrior II</b> (lambda cyhalothrin)	1.28-1.92 fl oz	7.68 fl oz	24	7-edible podded and succulent shelled; 21-dried, shelled.	Toxic to aquatic organisms and wildlife. Do not graze livestock in treated areas.
	-	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.25-1qt	no limit	4	0	May be used in greenhouses. Contact dealer if an adjuvant must be used. Not compatible in tank mix with fungi- cides. May be pathogenic to bees.
<b>Leafhopper</b>	1A	<b>*Lannate</b> (methomyl)	LV: 0.75-3pt SP: 0.25-1.0 lb	15 pt 5.0 lb	48	see label varies with rate & crop	Poison. Highly toxic to bees, fish, aquatic invertebrates and mammals.
	1B	<b>*Dibrom</b> (naled)	1.0 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock forage. Toxic to fish and wildlife. Danger. Corrosive.



**Table 11.6.** Insecticides labeled for management of arthropod pests of beans and peas. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
	1B	<b>Dimethoate 4EC</b> (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. Highly toxic to bees. See label.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz 19.2 fl oz	12	3-succulent 14-dry	Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>*Mustang</b> <b>*Mustang Maxx</b> (Zeta-cypermethrin)	3.0-4.3 oz 2.72-4.0 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). Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>*Warrior II</b> (lambda cyhalothrin)	1.28-1.92 fl oz	7.68 fl oz	24	7-edible podded and succulent shelled; 21-dried, shelled	Toxic to aquatic organisms and wildlife. Do not graze livestock in treated areas.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> Treat when insects first appear. Toxic to bees and aquatic organisms.
	4A	<b>Admire Pro</b> (Imidacloprid)	soil: 7-10.5 fl oz; foliar: 1.2 fl oz	soil: 10.5 fl oz foliar: 3.6 fl oz	12 12	21- soil 7- foliar	Do not apply to both soil and foliage. Do not use other 4A insecticides if imadacloprid is used. Bee hazard
	4A	<b>Assail 30SG</b> , (acetamidprid)	2.5-5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans. Toxic to birds, bees and fish.
	4D	<b>Sivanto Prime</b> (flupyradifurone)	7.0-10.5 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days. Toxic to aquatic invertebrates.
	16	<b>Courier 40 SC</b> (buprofezin)	9.0-13.6 fl oz.	27.2 fl oz	12	14	Insect growth regulator. For succulent beans only. Good coverage essential.
	-	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if an adjuvant must be used. Not compatible in tank mix with fungi- cides. May be pathogenic to bees.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed <sup>2</sup> . Use with a companion insecticide.
	-	<b>Sun Spray 98.8%</b> <b>JMS Stylet Oil,</b> <b>Saf-T-Side, others</b> (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed <sup>2</sup> Toxic to fish.
	-	<b>Aza-Direct</b> (azadirachtin)	1-2 pts	3.5 pt	4	0	OMRI-Listed <sup>2</sup> . Anti-feedant, repellent insect growth regulator. Toxic to fish.
<b>Liromyza</b>	5	<b>Entrust SC</b> (spinosad)	1.5-2.0 fl oz	9.0 fl oz: succulent 3.75 fl oz : dry	4	3-succulent 28-dry	OMRI-Listed <sup>2</sup> . Do not feed forage or hay to meat or dairy animals. Toxic to bees.
<b>leafminers</b>	5	<b>Radiant SC</b> (spinetoram)	5-8 fl oz	28 fl oz: succulent 12 fl oz: dry	4	3-succulent 28-dry	Time applications to small larvae. Toxic to bees and aquatic invertebrates.
	6	<b>*Agri-Mek SC</b> (abamectin)	8.0-16.0 fl oz	48.0 fl oz	12	7	<b>Dry beans only.</b> Toxic to fish and wildlife.
	17	<b>Trigard</b> (cyromazine)	2.66 oz 1 packet	0.75 lb a.i./acre	12	7	Not for use on soybeans or peas.
	28	<b>Coragen</b> (chlorantraniliprole with rynaxypyr)	7.5 fl oz	15.4 fl oz of chlorantraniliprole products per acre per year.	4	1	Foliar application only. Toxic to aquatic organisms.
	-	<b>Sun Spray 98.8%,</b> <b>JMS Stylet Oil,</b> <b>Saf-T-Side, others</b> (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed <sup>2</sup> Toxic to fish.

Table 11.6. Insecticides labeled for management of arthropod pests of beans and peas. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
Lygus bug, stink bug, kudzu bug	-	<b>Neemix 4.5</b> (azadirachtin)	4-16 fl oz	20 gm a.i.	12	0	OMRI- Listed <sup>2</sup> Insect Growth Regulator and feeding repellent. Does not kill adult insects.
	1A	<b>*Lannate</b> (methomyl)	LV: 1.5-3.0 pt SP: 0.50-1.0 lb	15 pt 5.0 lb	48	see label varies with rate & crop	Poison. Highly toxic to bees, fish, aquatic invertebrates and mammals.
	1A	<b>Sevin 4F</b> (carbaryl)	1.0-1.5 qt	6.0 qt/yr	12	3-fresh beans & peas 14-grazing or forage 21-dried beans peas, seed or hay.	Use on succulent shelled peas and beans prohibited. Highly toxic to bees and aquatic invertebrates.
	1B	<b>*Dibrom 8E</b> (naled)	1-1.5 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock feed. Toxic to fish and wildlife. Poison. Corrosive.
	1B	<b>Dimethoate 4EC</b> (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. Highly toxic to bees. See label.
	3A	<b>*Baythroid XL</b> (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	<b>Not for use on succulent beans or peas.</b> Do not feed treated vines or hay to livestock. Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	5.12-6.4 fl oz	12.8 fl oz 19.2 fl oz	12	3-succulent 14-dry	Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>Declare Insecticide</b> (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. Extremely toxic to fish, bees, wildlife.
	1B	<b>*Mustang</b> <b>*Mustang Maxx</b> (zeta -cypermethrin)	3.4-4.3 fl oz 3.2-4.0 fl oz	25.8 fl oz 24.0 fl 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). Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> Treat when insects first appear. Toxic to bees and aquatic organisms.
	3A	<b>*Warrior II</b> (lambda cyhalothrin)	1.28-1.92 fl oz	7.68 fl oz	24	7-edible podded and succulent shelled; 21- dried, shelled	Toxic to aquatic organisms and wildlife. Do not graze livestock in treated areas.
	15	<b>Rimon 0.83 EC</b> (novaluron)	12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects. Toxic to aquatic invertebrates, do not spray when bees are visiting treated area.
	-	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if an adjuvant must be used. Not compatible in tank mix with fungicides. May be pathogenic to bees.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed <sup>2</sup> . Use with a companion insecticide.
	-	<b>Aza-Direct</b> (azadirachtin)	1-2 pts	3.5 pt	4	0	OMRI-Listed <sup>2</sup> . Anti-feedant, repellent insect growth regulator. Toxic to fish.
Mites: two spotted, southern, red	3A	<b>*Brigade 2 EC</b> (bifenthrin)	5.12-6.4 fl oz	12.8 fl oz 19.2 fl oz	12	3-succulent 14-dry	Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> Treat when insects first appear. Toxic to bees and aquatic organisms.
	6	<b>*Agri-Mek SC</b> (abamectin)	8-16 fl oz	48 fl oz	12	7	<b>Dry beans only.</b> Toxic to fish and wildlife.

**Table 11.6.** Insecticides labeled for management of arthropod pests of beans and peas. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.  
Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
Thrips check label for species controlled	20B	<b>Kanemite 15 SC</b> (acequinocyl)	31 fl oz	62 fl oz	12	7	Succulent beans, including succulent soybean vegetable only.
	21A	<b>Portal</b> (fenpyroximate)	2.0 pt	4.0 pt	12	1	Snap bean only. Allow 14 days between applications. Highly toxic to fish and aquatic invertebrates.
	-	<b>Grandevo</b> (Chromobacterium subtsugae strain PRAA4-1)	1-3 lb	as needed	4	0	OMRI-Listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed <sup>2</sup> . Use with a companion insecticide.
	-	<b>Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed <sup>2</sup> . Toxic to fish.
	-	<b>Acramite-50WS</b> (bifentate)	1.0-1.5 lb	3.0 lb	12	3	Succulent beans, peas and soybean. Toxic to birds and aquatic invertebrates.
	-	<b>Aza-Direct</b> (azadirachtin)	1-2 pts	3.5 pts	4	0	OMRI-Listed <sup>2</sup> . Anti-feedant, repellent insect growth regulator. Toxic to fish.
	-	<b>Trilogy</b> (extract of Neem oil)	1.0-2.0 % v/v	as needed	4	0	OMRI-Listed <sup>2</sup> . Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear. Toxic to bees and aquatic organisms.
	4A	<b>Assail 30SG</b> , (acetamidprid)	4.5-5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans. Toxic to birds and aquatic invertebrates.
	5	<b>Entrust SC</b> (spinosad)	1.5-2.0 fl oz	9.0 fl oz :succulent 3.75 fl oz : dry	4	3-succulent 28-dry	OMRI-Listed <sup>2</sup> . Do not feed forage or hay to meat or dairy animals. Toxic to bees.
	5	<b>Radiant SC</b> (spinetoram)	5-8 fl oz	28 fl oz: succulent 12 fl oz: dry	4	3-succulent 28-dry	Time applications to small larvae. Toxic to bees and aquatic invertebrates.
	15	<b>Rimon 0.83 EC</b> (novaluron)	12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects. Toxic to aquatic invertebrates, do not spray when bees are visiting treated area.
	23	<b>Movento</b> (spirotetramat)	4-5 fl oz	10.0 fl oz	24	1-succulent 7-dry	Toxic to aquatic invertebrates and honey bee larvae.
	-	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if an adjuvant must be used. Not compatible in tank mix with fungi- cides. May be pathogenic to bees.
-	<b>Grandevo</b> (Chromobacterium subtsugae strain PRAA4-1)	1-3 lb	no limit	4	0	OMRI-Listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.	
-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed <sup>2</sup> . Use with a companion insecticide.	
-	<b>Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed <sup>2</sup> . Toxic to fish.	
-	<b>Aza-Direct</b> (azadirachtin)	1-2 pt	3.5 pt	4	0	OMRI-Listed <sup>2</sup> . Anti-feedant, repellent insect growth regulator. Toxic to fish.	

**Table 11.6.** Insecticides labeled for management of arthropod pests of beans and peas. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical. Also refer to Table 19.2 for biopesticide and other alternative products labeled for disease management.

Insect or mite pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	Days to Harvest	REI (hours)	Remarks <sup>2</sup>
Whiteflies	-	<b>Trilogy</b> (extract of Neem oil)	1.0-2.0 % v/v	as needed	4	0	OMRI-Listed <sup>2</sup> . Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz 19.2 fl oz	12	3-succulent 14-dry	Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>*Mustang</b> <b>*Mustang Maxx</b> (Zeta-cypermethrin)	3.4-4.3 oz 3.2-4.0 oz	25.8 oz 24 oz	12	1-succulent; 21-dried shelled beans or peas.	Can also be applied at planting for control of cutworms, white grubs and wireworms. (See label). Extremely toxic to bees, fish and aquatic invertebrates.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear. Toxic to bees and aquatic organisms.
	4A	<b>Admire Pro</b> (Imidacloprid)	soil: 7-10.5 fl oz; foliar: 1.2 fl oz	soil: 10.5 fl oz foliar: 3.6 fl oz	12 12	21- soil 7- foliar	Do not apply to both soil and foliage. Do not use other 4A insecticides if imadacloprid is used. Bee hazard
	4A	<b>Assail 30SG,</b> (acetamidprid)	4.0-5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans. Toxic to birds, bees and fish.
	4D	<b>Sivanto Prime</b> (flupyradifurone)	10.5-14 fl oz	28.0 fl oz/year	4	7	minimum interval between applications: 10 days. Toxic to aquatic invertebrates.
	7C	<b>Knack IGR</b> (pyriproxyfen)	8-10 fl oz	20 fl oz	12	7	Toxic to fish and aquatic invertebrates.
	15	<b>Rimon 0.83 EC</b> (novaluron)	12 fl oz	24 oz	12	1	Rimon disrupts molting and has no effect on adult insects. Toxic to aquatic invertebrates, do not spray when bees are visiting treated area.
	16	<b>Courier 40 SC</b> (buprofezin)	9.0-13.6 fl oz.	27.2 fl oz	12	14	For succulent beans only. Allow 14 days between applications.
	23	<b>Movento</b> (spirotetramat)	4-5 fl oz	10.0 fl oz	24	1-succulent 7-dry	Toxic to aquatic invertebrates and honey bee larvae.
	-	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if an adjuvant must be used. Not compatible in tank mix with fungicides. May be pathogenic to bees.
	-	<b>Grandevo</b> ( <i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb	none	4	0	OMRI-Listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed <sup>2</sup> . Use with a companion insecticide.
	-	<b>Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed <sup>2</sup> . Toxic to fish.
-	<b>Neemix 4.5</b> (azadirachtin)	4-16 fl oz	20 gm a.i.	4	0	OMRI- Listed <sup>2</sup> . Insect Growth Regulator and feeding repellent, Does not kill adult insects.	
-	<b>Trilogy</b> (extract of Neem oil)	1.0-2.0 % v/v	as needed	4	0	OMRI-Listed <sup>2</sup> . Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment.	

<sup>1</sup> Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 8.2 March 2017. Number codes (1 through 29) are used to distinguish the main insecticide mode of action groups, with additional letters for certain sub-groups 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. - = unknown, or a mode of action that has not been classified yet.

<sup>2</sup> 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 the University of Florida Cooperative Extension against similar products or services not mentioned.

\* Restricted use insecticide

**Table 11.7.** 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 <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>	
			Applic.	Season	Harvest	Reentry		
Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.								
Anthracnose	M1	(copper compounds) <b>Many brands available:</b> Cueva, Kentan DF, Nordox, Nordox 75 WG	SEE INDIVIDUAL LABELS		Varies		Varies from 4 hr to 2 days	
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 500 ZN-Fungicide, Equus –DF Fungicide, Equus 720 SST, Initiate 720	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock	
	M1	Badge SC Badge X2 (copper hydroxide; copper oxychloride) C-O-C-S WDG (basic copper sulfate; copper oxychloride)	2 pt	16.6 pt 16.9 pt	0		1 (greenhouse) 2 (field)	
	M1	C-O-C-S WDG (basic copper sulfate; copper oxychloride)	1.5 lb	9.2 lb			2	
	1	(thiophanate-methyl) <b>Many brands available:</b> 3336 EG, 3336 F, 3336 WP, Cercobin, Helena-Methyl 4.5 AG, Incognito 4.5F, Incognito 85 WDG, Nufarm T-Methyl 4.5F, Thiophanate Methyl 85-WDG, Topsin 4.5FL Fungicide, Topsin M WSB Fungicide	SEE INDIVIDUAL LABELS		14 to 28 (see label)		Varies from 12 hr to 3 days (see label)	Apply once at 50-70% bloom or twice (max.=1 ½ lbs/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		12 hr	Supplemental label: For control of web blight caused by Rhizoctonia solani. Not labeled for cowpea used for livestock feed.
	3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/100 l seed				12 hr	For suppressing seed borne anthracnose of dry bean.
	7	Fontelis Vertisan (penthiopyrad)	30 fl oz 20 fl oz	72 fl oz 41 fl oz	0 (Fontelis) 21 (Vertisan)		12 hr	No more than 2 sequential appl. Before alternating to a non-FRAC 7 fungicide. Vertisan only labeled for dry edible beans.
	7 & M3	Vitaflo-280 (carboxin; thiram)	4.0 fl oz per 100 lb seed				1	Seed treatment. Not effective in control of anthracnose if seed is highly infected.
	7 & 11	Priaxor (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21		12 hr	Limit 2 appl/season. Crop can not be used for livestock until 14 days after last application.
	11	Headline Headline SC (pyraclostrobin)	9 fl oz 9 fl oz	18 fl oz 18 fl oz	7 or 21 7		4 hr 12 hr	No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	11	(azoxystrobin) <b>Many brands available:</b> Aframe, Azoxystar, Equation SC, Quadris, Satori Fungicide, Willowood Azoxy 2SC	15.5 fl oz	92.3 fl oz	14 (dry) 0 (succulent)		4 hr	No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.

Table 11.7. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Pertinent Diseases or Pathogens	Fun-gicide Group <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Applic.	Season	Harvest	Reentry	
<b>Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.</b>							
Ascochyta blight	11 & M5	Quadris Opti (azoxystrobin; chlorothalonil)	2.4 pt	9.6 pt	14 (dry)	12 hr	Only labeled for dry edible beans. Limit 4 appl/crop. No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	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)	12 hr	Supplemental label: Do not use on cowpea cultivars intended for livestock.
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Echo ZN, Equus 500 ZN-Fungicide, Equus -DF Fungicide, Equus 720 SST, Initiate 720	<b>SEE INDIVIDUAL LABELS</b>		7 or 14	12 hr	Do not use on crops for livestock
	3	Propiconazole 3.6 EC Tilt (propiconazole)	4 fl oz	12 oz	7	12 hr	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	12 hr	Only labeled for chickpea, lentils and dry-edible peas and beans.
	7	Endura (boscalid)	11 oz	22 oz	21 (dry) 7 (succulent)	12 hr	Limit 2 appl/crop & alternate chemistry
	7	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0	12 hr	No more than 2 sequential appl. Before alternating to a non-FRAC 7 fungicide. Vertisan only labeled for dry edible beans.
	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 (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	12 hr	Limit 2 appl/season. Crop can not be used for livestock until 14 days after last application.
	11	Approach (picoxystrobin)	12 fl oz	24 fl oz	14 (seed)	12 hr	Do not tank mix with an adjuvant or crop oil when spraying dry beans or peas.
	11	Headline Headline SC (pyraclostrobin)	9 fl oz	18 fl oz	7 or 21	4 hr	No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	11	<b>(azoxystrobin)</b> <b>Many brands available:</b> Aframe, Azoxystar, Equation SC, Quadris, Satori Fungicide, Willowood Azoxy 2SC	15.5 fl oz	92.3 fl oz	14 (dry) 0 (succulent)	4 hr	No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	11 & M5	Quadris Opti (azoxystrobin; chlorothalonil)	2.4 pt	9.6 pt	14 (dry)	12 hr	Only labeled for dry edible beans. Limit 4 appl/crop. No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	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)	12 hr	Supplemental label: Do not use on cowpea cultivars intended for livestock.

Table 11.7. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>	
			Applic.	Season	Harvest	Reentry		
Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.								
Bacterial brown spot, Bacterial blight, Common blight, Halo blight	M1	(copper compounds) <b>Many brands available:</b> Americop 40 DF, Basic Copper 53, Champ DP Dry Prill, Champ Formula 2 Flowable, Champ WG, Champion++, Copper-Count-N, 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) C-O-C-S WDG (basic copper sulfate; copper oxychloride)	2 pt 16.6 pt 16.9 pt 1.5 lb		0	1 (greenhouse) 2 (field) 2		
	M1 & M2	Top Cop with Sulfur (basic copper sulfate; sulfur)	2 pt		0	1	Do not use in aluminum tanks	
	Botrytis or Gray mold	M1	Cueva (copper octanoate)	2 gal		0	4 hr	
		M5	(chlorothalonil) <b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 90 DF, Echo ZN, Equus 500 ZN-Fungicide, Equus -DF Fungicide, Equus 720 SST, Initiate 720, Praiz	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock
		1	(thiophanate-methyl) <b>Many brands available:</b> 3336 EG, 3336 F, 3336 WP, Cercobin, Helena T-Methyl 4.5 AG, Incogniti 4.5 F, Nufarm T-Methyl 4.5 F, Thiophanate Methyl 85-WDG, Topsin 4.5 FL Fungicide, Topsin M WSB Fungicide	SEE INDIVIDUAL LABELS		14 to 28 (see label)	12 hr (3336 fungicides) 1 (succulent) 3 (dry)	Apply once at 50-70% bloom or twice (max.=1 ½ lbs/appl.) with first at 10-30% bloom and second at peak bloom.
		2	(iprodione) <b>Many brands available:</b> Iprodione 4L AG Fungicide, Meteor, Nevado 4F, Rovral 4 Flowable	2 pts	4 pt	14	1	Do not make more than 2 applications per season; The product should be last applied no later than peak bloom; This product must not be used on cowpeas
		3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/ 100 lb seed			12 hr	For protection against seed borne <i>Botrytis</i> .
		7	Endura (boscalid)	11 oz	22 oz	7 (succulent)	12 hr	Limit 2 appl/crop & alternate chemistry
		7	Luna Privilege (fluopyram)	6.84 fl oz	13.7 fl oz	14	12 hr	Do not make more than 2 sequential applications of LUNA PRIVILEGE or any Group 7-containing fungicide before rotating with a fungicide of a different Group.

Table 11.7. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Pertinent Diseases or Pathogens	Fun-gicide Group <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Applic.	Season	Harvest	Reentry	
<b>Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.</b>							
	7	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0	12 hr	
	29	Omega 500F (fluazinam)	0.85 pt	1.75 pt	14 (succulent) 30 (dry)	12 hr	
	7 & 11	Priaxor (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7	12 hr	Limit 2 appl/season. Crop can not be used for livestock until 14 days after last application.
	7 & M3	Vitaflo-280 (carboxin; thiram)	4 fl oz/100 lb seed			1	For protection against seed borne <i>Botrytis</i> .
	9 & 12	Switch 62.5WG (cyprodinil; fludioxonil)	14 oz	56 oz	7	12 hr	Alternate with another fungicide with a different mode of action for 2 applications after 2 applications of Switch 62.5WG.
<b>Cercospora leaf spot</b>	M1	(copper compounds) <b>Many brands available:</b> Kentan DF, Kocide DF, Nordox, Nordox 75 WG, Previsto	<b>SEE INDIVIDUAL LABELS</b>		Varies	Varies from 4 hr to 2 days	
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720 SC, Echo 720, Echo 90 DF, Equus –DF Fungicide, Equus 720 SST, Initiate 720	<b>SEE INDIVIDUAL LABELS</b>		7 or 14	12 hr	Do not use on crops for livestock
	7	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0	12 hr	
	7 & 11	Priaxor (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	12 hr	Limit 2 appl/season. Crop can not be used for livestock until 14 days after last application.
	11	Headline, Headline SC (pyraclostrobin)	9 fl oz	18 fl oz	7	12 hr	Limit 2 appl/crop & alternate chemistry
	M1	Badge SC Badge X2 (copper hydroxide; copper oxychloride)	2 pt	16.6 pt 16.9 pt	0	1 (greenhouse) 2 (field)	
<b>Downy mildew</b>	M1	C-O-C-S WDG (basic copper sulfate; copper oxychloride)	1.5 lb	9.2 lb		2	
	M1	(copper compounds) <b>Many brands available:</b> Basic Copper 53, Champ Formula 2 Flowable, Champion++, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, Kentan DF, Kocide 2000 Funicide, Kocide 3000, Nordox, Nordox 75 WG, Nu-Cop 30 HB, Previsto	<b>SEE INDIVIDUAL LABELS</b>			4 hr to 2 days (see label)	
	M1	Badge SC Badge X2 (copper hydroxide; copper oxychloride)	2 pt	16.6 pt 16.9 pt	0	1 (greenhouse) 2 (field)	
	M1	C-O-C-S WDG (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



Table 11.7. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Applic.	Season	Harvest	Reentry	
<b>Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.</b>							
	M1 & 4	Ridomil Gold /Copper (copper hydroxide; mefenoxam)	2 lb	8 lb	3	2	Limit 4 appl./crop
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Weather Stik, Bravo ZN, Chloronil 720, Echo 720, Echo 90 DF, Echo ZN, Equus 500 ZN-Fungicide, Equus -DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN	<b>SEE INDIVIDUAL LABELS</b>		7 or 14	12 hr	Do not use on crops for livestock
	4	Ridomil Gold SL Ultra Flourish (mefenoxam)	0.2 pt 0.4 pt	0.8 pt 2.0 pt (soil) 1.6 pt (foliar)	3 3	2 2	Must be tank mixed with other effective fungicides.
	7 & 11	Priaxor (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	12 hr	Limit 2 appl/season. Crop can not be used for livestock until 14 days after last application.
	11	Headline, Headline SC (pyraclostrobin)	9 fl oz	18 fl oz	7	12 hr	Limit 2 appl/crop & alternate chemistry
	21	Ranman 400SC Fungicide (cyazofamid)	2.75 fl oz	16.5 fl oz	0	12 hr	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	
	40	Forum Fungicide (dimethomorph)	6 fl oz	30 fl oz		12 hr	Labeled for lima beans intended for harvest as succulent seed only. Limit 5 appl./season. Do not add spreading/penetrating adjuvant.
Phytophthora	4	(metalaxyl) <b>Many brands available:</b> Acquire, Allegiance FL, Dyna-Shield Metalaxyl 318 FS, Metalaxyl 4.0 ST, Sebring 318 FS, Sebring 480 FS	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
	12 & 4	Apron Maxx RFC Apron Maxx RTA (mefenoxam; fludioxonil)	1.5 fl oz/ 100 lb seed 5 fl oz/ 100 lb seed			2 2	Seed treatment only Seed treatment only
	11 & 12 & 4 & 4A	Seed Shield Beans (azoxystrobin; fludioxonil; mefenoxam; thiamethoxam)	3 fl oz/100 lb seed			2	Seed treatment only
Pod tip rot	3	Rally 40WSP Fungicide (myclobutanil)	5 oz	1.25 lb	0	1	30-day plantback interval
Powdery mildew	M1	Cueva (copper ocanoate)	2 gal		0	4 hr	OMRI listed

**Table 11.7.** Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Pertinent Diseases or Pathogens	Fun-gicide Group <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Applic.	Season	Harvest	Reentry	
<b>Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.</b>							
	M2	(sulfur) <b>Many brands available:</b> Crusade DF, Kumulus DF Fungicide-Acaricide, Micro Sulf, Microfine Sulfur, Microthiol Disperss, Sulfur 90W, Sulfur-DF, Wettable Sulfur, Yellow Jacket Dusting Sulfur, Yellow Jacket Wettable Sulfur	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	Luna Privilege (fluopyram)	6.84 fl oz	13.7 fl oz	14	12 hr	Do not make more than 2 sequential applications of Luna Privilege or any Group 7 containing fungicide before rotating with a fungicide of a different group.
	7	Fontelis	30 fl oz	72 f oz	0	12 hr	
		Vertisan (penthioopyrad)	20 fl oz	41 fl oz	21 (seed) 0 (hay)	12 hr	
	11	Approach (picoxystrobin)	12 fl oz	24 fl oz	14	12 hr	
	11	Headline, Headline SC (pyraclostrobin)	9 fl oz	18 fl oz	7	12 hr	Limit 2 appl/crop & alternate chemistry
	7 & 3	Lunar Experience (fluopyram; tebuconazole)	12.8 fl oz	25.6 fl oz	14	12 hr	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 (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 (succulent) 21 (dry)	12 hr	Do not make more than 2 applications per season
<b>Pythium damping-off &amp; root rot</b>	4	(metalaxyl) <b>Many brands available:</b> Acquire, Allegiance FL, Dyna-Shield Metalaxyl 318 FS, Metalaxyl 4.0 ST, Sebring 318 FS, Sebring 480 FS	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	Metastar 2E (metalaxyl)	4 pt			2	Preplant incorporated at planting or soil surface after planting. Do not use in greenhouse or field- grown bedding plants.
	4	Apron XL	0.64 fl oz/ 100 lb seed			2	Seed treatment only
		Ridomil Gold SL	0.2 pt	0.8 pt	3	2	Must be tank mixed with other effective fungicides.
		Ultra Flourish (mefenoxam)	2 pt			2	Apply as a broadcast soil application at preplant or as a surface application at planting
	11 & 4	Uniform Fungicide (azoxystrobin; mefenoxam)	0.34 fl oz/ 1000 row ft			0	Make only one application per season
<b>Rhizoctonia diseases (root &amp; stem rot)</b>	7 & M3	HM-1345 Vitaflo-280 (carboxin; thiram)	4 fl oz per 100 lb seed			1	Seed treatment
	3 & 4	Rancona Summit (Ipconazole; Metalaxyl)	4 fl oz/ 100 lb seed			1	
	4 & 12	Apron Maxx RFC (mefenoxam; fludioxonil)	1.5 fl oz/100 lbs seed			2	Seed treatment only

Table 11.7. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Pertinent Diseases or Pathogens	Fun-gicide Group <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Applic.	Season	Harvest	Reentry	
<b>Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.</b>							
	4 & 12	Apron Maxx RTA (mefenoxam; fludioxonil)	5 fl oz/100 lbs seed			2	Seed treatment only
	4 & 14	Ridomil Gold PC GR (mefenoxam; PCNB)	12 oz / 1000 row feet			2	Do not use on crops for livestock. Apply directly soil surrounding seed at planting.
	11 & 4	Uniform Fungicide (azoxystrobin; mefenoxam)	0.34 fl oz/ 1000 row ft			0	Make only one application per season
	1	St-Methyl 540 FS T-Methyl 4.5L ST (thiophanate-methyl)	0.28 fl oz/ 100 lb seed			12 hr	
	3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/ 100 lb seed			12 hr	Seed treatment for protection against <i>Rhizoctonia solani</i> .
	7	Systiva XS (fluxapyroxad)	0.47 fl oz/ 100 lb seed				
	11	(azoxystrobin) <b>Many brands available:</b> Aframe, Azoxystar, Dynasty, Equation SC, Quadris, Satori Fungicide, Trevo, Willowood Azoxy 2SC	<b>SEE INDIVIDUAL LABELS</b>		14 (dry) 0 (succulent)	0 to 4 hr (see label)	See label for seed treatment rates.
	11	Stamina (pyraclostrobin)	1.5 fl oz/100 lb seed			12 hr	Seed treatment
	11	Trilex Flowable (trifloxystrobin)	0.32 fl oz/ 100 lbs seed			12 hr	Seed treatment only
	12	Dyna-Shield Fludioxonil Maxim 4FS Spirato 480FS (fludioxonil)	0.16 fl oz/ 100 lbs seed			12 hr	Seed treatment only
	14	Blocker 4F (PCNB)	3.3 fl oz/ 1000 row ft			12 hr	Avoid application directly to seed since delayed emergence may occur
	14	Rizolex (tolclofos-methyl)	0.3 fl oz/100 lb seed	200 lb		12 hr	Only applied on the "true seed", not on other propagation parts.
<b>Rust</b>	M1 & M2	Top Cop with Sulfur (basic copper sulfate; sulfur)	4 pt		0	1	Do not use in aluminum tanks
	M2	(sulfur) <b>Many brands available:</b> Micro Sulf, Microfine Sulfur, Microthiol Disperss, Sulfur 90W, Yellow Jacket Dusting Sulfur, Yellow Jacket Wettable Sulfur	<b>SEE INDIVIDUAL LABELS</b>			1	Do not apply during periods of warm weather to avoid phytotoxicity
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Echo 720, Echo 90 DF, Echo ZN, Equus 500 ZN-Fungicide, Equus -DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	<b>SEE INDIVIDUAL LABELS</b>		7 or 14	12 hr	Do not use on crops for livestock
	M2 & 3	Unicorn (sulfur; tebuconazole)	3.75 lb	15 lb (fresh) 7.5 lb (dry)	14	12 hr	Do not mix with other DMI fungicides.
	3	Rally 40WSP Fungicide Sonoma 40 WSP (myclobutanil)	5 oz	1.25 lb	0	1	30-day plantback interval

**Table 11.7.** Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Pertinent Diseases or Pathogens	Fun-gicide Group <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Applic.	Season	Harvest	Reentry	
<b>Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.</b>							
	3	Monsoon Onset 3.6L Orius 3.6F Tebu-Crop 3.6F Tebustar 3.6L Teledo (tebuconazole)	6 fl oz	24 fl oz (fresh) 12 fl oz (dry)	7 (fresh) 14 (dry)	12 hr	
	3	Propiconazole 3.6 EC Tilt (propiconazole)	4 fl oz 4 fl oz	12 fl oz 12 fl oz	7 7	12 hr 12 hr	
	3	Proline 480SC (prothioconazole)	5.7 fl oz	17.1 fl oz	7	12 hr	Only labeled for chickpea, lentils and dry-edible peas and beans.
	3	Willowood Teb 3.6SC (tebuconazole)	6 fl oz	12 fl oz	7 (fresh) 14 (dry)	12 hr	DMI fungicide
	7	Fontelis Vertisan (penthiopyrad)	30 fl oz 20 fl oz	72 fl oz 41 fl oz	0 (Fontelis) 21 (Vertisan)	12 hr	No more than 2 sequential appl. Before alternating to a non-FRAC 7 fungicide. Vertisan only labeled for dry edible beans.
	7 & 11	Priaxor (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	12 hr	Limit 2 appl/season. Crop can not be used for livestock until 14 days after last application.
	11	Approach (picoxystrobin)	12 fl oz	24 fl oz	14 (seed)	12 hr	Do not tank mix with an adjuvant or crop oil when spraying dry beans or peas.
	11	Headline Headline SC (pyraclostrobin)	9 fl oz	18 fl oz	7 (succulent) 21 (dry)	12 hr	No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	11	<b>(azoxystrobin)</b> <b>Many brands available:</b> Aframe, Azoxystar, Equation SC, Quadris, Satori Fungicide, Willowood Azoxy 2SC	15.5 fl oz	92.3 fl oz	14 (dry) 0 (succulent)	4 hr	No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	11 & M5	Quadris Opti (azoxystrobin; chlorothalonil)	2.4 pt	9.6 pt	14 (dry)	12 hr	Only labeled for dry edible beans. Limit 4 appl/crop. No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	11 & 3	Avaris 2XS Quilt Xcel Quilt-Fungicide Willowood Azoxyprop Xtra (azoxystrobin; propiconazole)	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	12 hr	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	12 hr	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.
<b>White mold</b>	1	(thiophanate-methyl) <b>Many brands available:</b> 3336 EG, 3336 F, 3336 WP, Cercobin, Helena T-Methyl 4.5 AG, Incognito 4.5F, Nufarm T-methyl 4.5F, Thiophanate-methyl 85-WDG, Topsin 4.5FL Fungicide, Topsin M WSB Fungicide	<b>SEE INDIVIDUAL LABELS</b>		14 to 28 (see label)	12 hr (3336 fungicides) 1 (succulent) 3 (dry)	Apply once at 50-70% bloom or twice (max.=1 ½ lbs/appl.) with first at 10-30% bloom and second at peak bloom.
	M1	Cueva (copper octanoate)	2 gal		0	4 hr	OMRI-listed

**Table 11.7.** Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Pertinent Diseases or Pathogens	Fun-gicide Group <sup>1</sup>	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Applic.	Season	Harvest	Reentry	
<b>Labels change frequently. Be sure to read a current product label before applying any chemical. Refer to Table 19.1 for biopesticide and other alternative products labeled for disease management.</b>							
	2	(iprodione) <b>Many brands available:</b> Iprodione 4L AG Fungicide, Meteor, Nevado 4F, Rovral 4 Flowable	2 pt	4 pt	14 to 45 (see label)	1	Do not make more than 2 applications per season; The product should be last applied no later than peak bloom; This product must not be used on cowpeas
	3	Proline 480SC (prothioconazole)	5.7 fl oz	17.1 fl oz	7	12 hr	Only labeled for chickpea, lentils and dry-edible peas and beans.
	7	Endura (boscalid)	11 oz	22 oz	7 (succulent)	12 hr	Limit 2 appl/crop & alternate chemistry
	7	Luna Privilege (fluopyram)	6.84 fl oz	13.7 fl oz	14	12 hr	No more than 2 sequential appl. before alternating to a non-FRAC 7 fungicide.
	7	Fontelis Vertisan (penthioopyrad)	30 fl oz 20 fl oz	72 fl oz 41 fl oz	0 (Fontelis) 21 (Vertisan)	12 hr	No more than 2 sequential appl. 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)	12 hr	Do not tank mix with an adjuvant or crop oil when spraying dry beans or peas.
	12	Cannonball WG Cannonball WP (fludioxonil)	7 oz	28 oz	7	12 hr	After 2 applications of Cannonball WP, alternate with another fungicide with a different mode of action for 2 applications.
	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 (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	12 hr	Limit 2 appl/season. Crop can not be used for livestock until 14 days after last application.
	9 & 12	Switch 62.5 WG (cyprodinil; fludioxonil)	14 oz	56 oz	7	12 hr	
	14	Blocker 4F Fungicide (PCNB)	2 pt		0	12 hr	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	12 hr	Do not feed treated plants to livestock
	29	Omega 500F (fluazinam)	0.85 pt	1.75 pt	14 (edible-podded and succulent beans)	2	

<sup>1</sup> 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 2017; <http://www.frac.info/> (FRAC = Fungicide Resistance Action Committee).

<sup>2</sup> 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 the University of Florida Cooperative Extension Service nor discrimination against similar products or services not mentioned.