

## Chapter 9. Legume Production

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Information regarding crop specific fertilization and irrigation recommendations can be found in chapters 2 and 3, respectively.

### 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 9.1.** 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					
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 9.2.** 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 9.3.** 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 9.4.** 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 9.5. Herbicides approved for Asian 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.
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.
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.

**Table 9.5.** Herbicides approved for Asian legumes. (continued)

<b>Labels change frequently. Be sure to read a current product label before applying any chemical.</b>				
Active ingredient lb. a.i./A	Trade name product/A	MOA code	Crops	Weeds controlled / remarks
<b>Clethodim</b> 0.094 - 0.25	<b>(Arrow) 2 EC</b> 6 - 16 fl. oz. <b>(Select Max) 1 EC</b> 9 - 32 fl. oz.	1	Bean (succulent), pea (succulent)	Annual and perennial grass control. Consult label for bean types. PHI 21 days.
<b>EPTC</b> 3.1 -4.0	<b>(Eptam) 7 E</b> 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.
<b>Fluazifop</b> 0.19 - 0.38	<b>(Fusilade DX) 2 EC</b> 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.
<b>Fomesafen</b> 0.25 - 0.38	<b>(Reflex) 2 EC</b> 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.
<b>Halosulfuron</b> 0.02 - 0.03	<b>(Sanda) 75 DF</b> 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.
<b>Halosulfuron</b> 0.02 - 0.03	<b>(Sanda) 75 DF</b> 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.
<b>Imazethapyr</b> 0.14	<b>(Pursuit) 2 L</b> 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.
<b>Pelargonic acid</b>	<b>(Scythe) 4.2 EC</b> 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.
<b>Quizalofop</b> 0.04 - 0.08	<b>(Assure II)</b> 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.
<b>Sethoxydim</b> 0.19 - 0.47	<b>(Poast) 1.5 EC</b> 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 9.6** Insecticides approved for managing insect pests of beans and peas.

<b>Labels change frequently. Be sure to read a current product label before applying any chemical.</b>							
<b>Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.</b>							
Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
<b>Aphids</b>	1A	<b>*Lannate LV, *SP</b> (methomyl)	<b>LV:</b> 0.75-3 pt <b>SP:</b> 0.25-1.0 lb	10 applications only	48	See label: varies with rate and crop use	Poison. Highly toxic to fish, aquatic invertebrates and mammals.
	1B	<b>*Dibrom 8E</b> (naled)	1-1.5 pt	4.5 pt	48	1	Ground application only, not for cowpeas and field peas intended for livestock feed. Toxic to fish and wildlife. Poison. Corrosive.
	1B	<b>Dimethoate 4EC</b> (dimethoate)	0.5-1 pt	2.0 pts/year	48	0-mechanical harvesting	Do not feed treated vines. Do not use on field peas. Highly toxic to bees. See label.
	1B	<b>Malathion 8F</b> (malathion)	1.0 pt	2 applications only	12	3	Green and dried peas only. Do not graze or feed forage to livestock. Highly toxic to bees, fish and invertebrates.
	1B	<b>Orthene 97</b> (acephate)	0.25-1.0 lb	2.0 lb a.i.	24	14 - dry, succulent 1 - lima beans, succulent form	Do not use on green beans (string, wax, snap). Do not feed treated vines or seed to livestock. Toxic to birds and bees. See label.

**Table 9.6** Insecticides approved for managing insect 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 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
	3A	<b>*Asana XL</b> (esfenvalerate)	5.8-9.6 fl oz	0.2 lb a.i. 4 applications at highest rate	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	<b>*Brigade 2 EC</b> (bifenthrin)	1.6-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3 – succulent; 14 – dry	Toxic to bees and fish.
	3A	<b>Pyganic 5.0</b> (pyrethrins)	0.26-18 fl oz/ 1000 cu ft	no limit	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	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	21-soil 7 - foliar	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used. Bee hazard.
	4A	<b>Assail 30SG</b> (acetamiprid)	2.5-5.3 oz	16 oz	12	7	Edible podded legumes, succulent shelled peas and beans. Toxic to birds, and aquatic invertebrates.
	4D	<b>Sivanto 200 SL</b> (flupyradifurone)	7.0-14 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days. Toxic to aquatic invertebrates
	23	<b>Movento (spirotetramat)</b>	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> )	0.5-2 qt/100 gal	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		4	0	OMRI-listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.
	--	<b>M-Pede 49% EC</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 qt/100 gal (JMS); 1-2 gal/100 gal (others)	no limit	4	0	OMRI-listed <sup>2</sup> . Toxic to fish.
	un	<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.
	un	<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.
	un	<b>Trilogy</b> (extract of neem oil)	1.0-2.0% v/v		4	0	OMRI-listed <sup>2</sup> . Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment.
<b>Armyworm, corn earworm, lesser cornstalk borer, loopers, cutworm, caterpillar, grubs, root maggots, wireworms</b>	1A	<b>*Lannate LV, *SP</b> (methomyl)	LV: 0.75-3 ptSP: 0.25-1.0 lb	10 applications only	48	See label: varies with rate and crop use	Poison. Highly toxic to fish, aquatic invertebrates and mammals.
	1A	<b>Sevin 4 F</b> (carbaryl)	4F: 0.5-1.5 qt	4 applications/year	12	13-fresh beans & peas, 14-grazing or forage, 21-dried beans, seed, or hay	Use on succulent shelled peas and beans prohibited. Highly toxic to bees and aquatic invertebrates.
	1B	<b>*Diazinon 50W, AG500</b> (diazinon)	50W: 4-8 lbAG500: 2-4 qt	one application/year	72	broadcast at planting	Succulent beans and peas only. Soil application only. Poison. Toxic to bees, birds, fish and wildlife.
	1B	<b>*Dibrom 8E</b> (naled)	1-1.5 pt	4.5 pt	48	1	Ground application only, not for cowpeas and field peas intended for livestock forage. Toxic to fish and wildlife. Danger. Corrosive.
	1B	<b>Orthene 97</b> (acephate)	0.25-1.0 lb	2.0 lb a.i.	24	14 -dry or succulent 1 - lima beans, succulent form	Do not use on green beans (string, wax, snap). Do not feed treated vines or seed to livestock. Toxic to birds and bees. See label.

**Table 9.6** Insecticides approved for managing insect 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 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
	3A	<b>*Asana XL</b> (esfenvalerate)	5.8-9.6 fl oz	0.2 lb a.i.4 applications at highest rate	12	3 – snap 21-dry beans & 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	<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. Toxic to fish & aquatic invertebrates.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	1.6-6.4 fl oz	12.8 fl oz succulent19.2 fl oz dry	12	3 – succulent; 14 – dry	Toxic to bees and fish.
	3A	<b>*Capture LFR</b> (bifenthrin)	3.4-6.8 fl oz	0.1 lb a.i. at plant0.2 lb a.i. peas 0.3 lb a.i. beans	12		Do not exceed allowed amounts including use of other products containing bifenthrin applied at plant or foliar. Toxic to aquatic organisms and bees.
	3A	<b>*Declare Insecticide</b> (gamma-cyhalothrin)	0.77-1.54 fl oz	0.06 lb a.i. or 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 and wildlife.
	3A	<b>*Mustang</b> (zeta-cypermethrin)	1.28-4.0 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>Pyganic 5.0</b> (pyrethrins)	0.26-18 fl oz/1000 cu ft	no limit	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	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.
	5	<b>Entrust SC</b> (spinosad)	3-6 fl oz	12 fl oz	4	28	OMRI-listed <sup>2</sup> . Do not feed forage or hay to dairy or meat cattle.
	5	<b>Radiant SC</b> (spinetoram)	3-8 fl oz	succulent-39 fl oz/acre/ yearsoybean- 14 fl oz/year	4	3 – succulent; 28 – dry	Time applications to small larvae.
	11A	<b>Javelin WG</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.12-1.50 lb		4	0	Treat when larvae are young. Thorough coverage is essential. OMRI-listed <sup>2</sup> .
	11A	<b>Xentari DF</b> ( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> )	0.5-2.0 lb		4	0	Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Can be used in organic production.
	15	<b>Rimon 0.83EC</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	64.0 fl oz/year	4	7	
	22	<b>Avaunt</b> (indoxacarb)	3.5 oz	14.0 oz	12	7	Southern pea (dry) varieties only. Highly toxic to mammals, birds, fish and aquatic invertebrates
	28	<b>Belt SC</b> (flubendiamide)	2-3 fl oz	6 fl oz	12	1 – edible podded and succulent shelled; 14 – dry; 3 – forage	Toxic to aquatic invertebrates
	28	<b>Coragen</b> (chlorantraniliprole with rynaxypyr)	3.5-7.5 fl oz	15.4 fl oz or 0.2 lb a.i of chlorantraniliprole products per acre per year.	4	1	Foliar application only. Toxic to aquatic organisms.

**Table 9.6** Insecticides approved for managing insect 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 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
	--	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.5-2 qt/100 gal		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.
	un	<b>Aza-Direct</b> (azadirachtin)	1-3.5 pt		4	0	OMRI-listed <sup>2</sup> . Anti-feedant, repellent, insect growth regulator. Toxic to fish and aquatic invertebrates.
<b>Cucumber beetle, bean leaf beetle, Mexican bean beetle, Cowpea curculio</b>	1A	<b>*Lannate LV, *SP</b> (methomyl)	LV: 0.75-3 ptSP: 0.25-1.0 lb	10 applications only	48	See label: varies with rate and crop use	Poison. Highly toxic to fish, aquatic invertebrates and mammals.
	1A	<b>Sevin 80S, 4 F</b> (carbaryl)	<b>4F:</b> 0.5-1.5 qt		12	13-fresh beans & peas, 14-grazing or forage, 21-dried beans, seed, or hay	Repeat, as needed, up to 4 times. Applications should be at least 7 days apart. Highly toxic to bees.
	1B	<b>Orthene 97</b> (acephate)	0.25-1.0 lb	2.0 lb a.i.	24	14 -dry or succulent 1 - lima beans, succulent form	Do not use on green beans (string, wax, snap). Do not feed treated vines or seed to livestock. Toxic to birds and bees. See label.
	1B	<b>Dimethoate 4EC</b> (dimethoate)	0.5-1 pt	2.0 pts/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 20 G</b> (phorate)	4.5-7.0 oz/1000 ft row. No more than 7.6 lb a.i./acre	one application	48	60	Poison. Label pending in Fla. Do not graze livestock on treated forage. No direct contact with seed. At plant only.
	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. Toxic to fish & aquatic invertebrates.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	1.6-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3 – succulent; 14 – dry	Toxic to bees and fish.
	3A	<b>*Declare Insecticide</b> (gamma-cyhalothrin)	0.77-1.54 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. Toxic to bees, fish and wildlife
	3A	<b>*Mustang</b> (zeta-cypermethrin)	1.28-4.0 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>Pyganic 5.0</b> (pyrethrins)	0.26-18 fl oz/1000 cu ft	no limit	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	3A	<b>*Warrior II</b> (lambda-cyhalothrin)	0.96-1.92	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> (acetamiprid)	2.5-5.3 oz	3 applications	12	7	Edible podded legumes and succulent shelled peas and beans. Toxic to birds, bees and fish.
	15	<b>Rimon 0.83EC</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.
		un	<b>Aza-Direct</b> (azadirachtin)	1-3.5 pt		4	0

**Table 9.6** Insecticides approved for managing insect 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 18.2 for biopesticide and other alternative products labeled for disease management.**

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
	un	<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 be reduced after three weeks and eliminated after 8 to 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.
Grasshoppers	1B	<b>Dimethoate 4EC</b> (dimethoate)	0.5-1 pt			48	0: mechanical harvesting Do not feed treated vines. Highly toxic to bees.
	3A	<b>*Asana XL</b> (esfenvalerate)	5.8-9.6 fl oz	0.2 lb a.i./acre. 4 applications at highest rate	12	3 - snap21-dry beans and peas	Do not feed or graze livestock on treated vines. Toxic to bees & fish.
	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	Not for use on succulent beans or peas. Do not feed treated vines or hay to livestock. Toxic to fish & aquatic invertebrates.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	1.6-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3 – succulent; 14 – dry	Toxic to bees and fish.
	3A	<b>*Declare Insecticide</b> (gamma-cyhalothrin)	0.77-1.54 fl oz	0.06 lb a.i. or 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 and wildlife.
	3A	<b>*Mustang</b> (zeta-cypermethrin)	1.28-4.0 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)	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.
	--	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.5-2 qt/100 gal	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>Leafhopper</b>	1A	<b>*Lannate LV, *SP</b> (methomyl)	LV: 0.75-3 pt SP: 0.25-1.0 lb	10 applications only	48	See label: varies with rate and crop use	Poison. Highly toxic to fish, aquatic invertebrates and mammals.
	1B	<b>*Dibrom 8E</b> (naled)	1-1.5 pt	4.5 pt/acre	48	1	Ground application only, not for cowpeas and field peas intended for livestock feed. Toxic to fish and wildlife. Poison. Corrosive.
	1B	<b>Dimethoate 4EC</b> (dimethoate)	0.5-1 pt	2.0 pts/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)	1.6-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3 – succulent; 14 – dry	Toxic to bees and fish.
	3A	<b>*Mustang</b> (zeta-cypermethrin)	1.28-4.0 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)	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.
	3A	<b>Pyganic 5.0</b> (pyrethrins)	0.26-18 fl oz/1000 cu ft	no limit	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.



**Table 9.6** Insecticides approved for managing insect 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 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
	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	21-soil 7 - foliar	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used. Bee hazard.
	4A	<b>Assail 30SG</b> (acetamiprid)	2.5-5.3 oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans. Toxic to birds, and aquatic invertebrates.
	4D	<b>Sivanto 200 SL</b> (flupyradifurone)	7-14 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days. Toxic to aquatic invertebrates
	16	<b>Courier 40SC</b> (buprofezin)	9.0-13.6 fl oz.	27.2 fl oz	12	14	For succulent beans only. Allow 14 days between applications.
	--	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.5-2 qt/100 gal	no limit	4	0	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides. May be pathogenic to bees.
	--	<b>M-Pede 49% EC</b> (soap, insecticidal)	0.25-4.0 % v/v	7-10 day intervals	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 qt/100 gal (JMS); 1-2 gal/100 gal (others)		4	0	OMRI-listed <sup>2</sup> . Toxic to fish.
	un	<b>Aza-Direct</b> (azadirachtin)	1-3.5 pt		4	0	OMRI-listed <sup>2</sup> . Anti-feedant, repellent, insect growth regulator. Toxic to fish and aquatic invertebrates.
<b>Liriomyza leafminers</b>	5	<b>Entrust SC</b> (spinosad)	3-6 fl oz	12 fl oz	4	28 days	OMRI-listed <sup>2</sup> . Do not feed forage or hay to dairy or meat cattle.
	5	<b>Radiant SC</b> (spinetoram)	3-8 fl oz	succulent-39 fl oz/acre/year soybean- 14 fl oz/year	4	3 – succulent; 28 – dry	Time applications to small larvae.
	6	<b>*Agri-Mek SC</b> (abamectin)	1.75-3.5 fl oz	3.5 oz	12	7	<b>Dry beans only.</b> Must be mixed with a non-ionic activator type wetting, spreading and/or penetrating adjuvant. Do not use binder or sticker type adjuvants. Toxic to fish and wildlife.
	17	<b>Trigard</b> (cyromazine)	2.66 oz	0.75 lb a.i.	12	7	Not for use on soybeans or peas.
	28	<b>Coragen</b> (rynaxypyr)	3.5-7.5 fl oz	15.4 fl oz or 0.2 lb a.i of chlorantraniliprole products per acre per year.	4	1	Foliar application only. Toxic to aquatic organisms.
	--	<b>Sun Spray 98.8%, JMS Stylet-Oil, Saf-T-Side, others</b> (oil, insecticidal)	3-6 qt/100 gal (JMS); 1-2 gal/100 gal (others)	no limit	4	0	Organic Stylet -Oil and Saf-T-Side are OMRI-listed <sup>2</sup> . Toxic to fish.
	un	<b>Neemix 4.5</b> (azadirachtin)	4-16 fl oz		12	0	Acts as IGR and feeding repellent. Does not kill adult insects. OMRI-listed <sup>2</sup> .
	<b>Lygus bug, stink bug, kudzu bug, plant bug</b>	1A	<b>*Lannate LV, *SP</b> (methomyl)	<b>LV:</b> 0.75-3 ptSP: 0.25-1.0 lb	10 applications only	48	See label: varies with rate and crop use
1A		<b>Sevin 80S, 4 F</b> (carbaryl)	<b>4F:</b> 0.5-1.5 qt	4 applications/year	12	13-fresh beans & peas, 14-grazing or forage, 21-dried beans, 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		48	1	Ground application only. Do not use on cowpeas and field peas for livestock feeding.
1B		<b>Dimethoate 4EC</b> (dimethoate)	0.5-1 pt	2.0 pts/year	48	0: mechanical harvesting	Do not feed treated vines. Do not use on field peas. Highly toxic to bees. See label.

**Table 9.6** Insecticides approved for managing insect 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 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
	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. Toxic to fish & aquatic invertebrates.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	1.6-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3 – succulent; 14 – dry	Toxic to bees and fish.
	3A	<b>*Declare Insecticide</b> (gamma-cyhalothrin)	0.77-1.54 fl oz	0.06 lb a.i. or 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 and wildlife.
	3A	<b>*Mustang</b> (zeta-cypermethrin)	1.28-4.0 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>Pyganic 5.0</b> (pyrethrins)	1.0-18 oz	no limit	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	3A	<b>*Warrior II</b> (lambda-cyhalothrin)	0.96-1.92 fl oz	7.68 fl oz	24	7 - edible podded & succulent shelled; 21 - dried, shelled	Toxic to aquatic organisms and wildlife. Do not graze livestock in treated areas.
	15	<b>Rimon 0.83EC</b> (novaluron)	6-12 fl oz		12	1	See label for rates for specific pests. Do not apply more than 36 fl oz per acre per season. Do not apply more often than every 7 days. Rimon disrupts molting and has no effect on adult insects.
	--	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.5-2 qt/100 gal		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% EC</b> (soap, insecticidal)	0.25-4.0 % v/v	7-10 day intervals	12	0	OMRI-listed <sup>2</sup> . Use with a companion insecticide.
	un	<b>Aza-Direct</b> (azadirachtin)	1-2 pt (max 3.5 pt)		4	0	Anti-feedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> . Toxic to fish.
<b>Mites: two spotted, southern red</b>	3A	<b>*Brigade 2 EC</b> (bifenthrin)	1.6-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3 – succulent; 14 – dry	Toxic to bees and fish.
	3A	<b>Pyganic 5.0</b> (pyrethrins)	0.26-18 fl oz/ 1000 cu ft	no limit	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	6	<b>*Agri-Mek SC</b> (abamectin)	1.75-3.5 fl oz	3.5 oz	12	7	<b>Dry beans only.</b> Must be mixed with a non-ionic activator type wetting, spreading and/or penetrating adjuvant. Do not use binder or sticker type adjuvants. Toxic to fish and wildlife.
	20B	<b>Kanemite 15 SC</b> (acequinocyl)	31 fl oz		12	7	Do not make more than two applications per year. <b>Succulent beans, including succulent soybean vegetable, only.</b>
	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> ( <i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb		4	0	OMRI-listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.
	--	<b>M-Pede 49% EC</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day intervals	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 qt/100 gal (JMS); 1-2 gal/100 gal (others)	no limit	4	0	OMRI-listed <sup>2</sup> . Toxic to fish.

**Table 9.6** Insecticides approved for managing insect 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 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
	un	<b>Acramite-50 WS</b> (bifenazate)	1.0-1.5 lb		12	3	<b>Succulent beans and peas and succulent shelled soybeans.</b>
	un	<b>Aza-Direct</b> (azadirachtin)	1-3.5 pt		4	0	OMRI-listed <sup>2</sup> . Anti-feedant, repellent, insect growth regulator. Toxic to fish and aquatic invertebrates.
	un	<b>Trilogy</b> (extract of neem oil)	1.0-2.0% v/v		4	0	OMRI-listed <sup>2</sup> . Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment.
<b>Thrips</b>	3A	<b>Pyganic 5.0</b> (pyrethrins)	0.26-18 fl oz/1000 cu ft	no limit	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	4A	<b>Assail 30SG</b> (acetamiprid)	2.5-5.3 oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans. Limited to 3 applications per season. Toxic to birds, and aquatic invertebrates.
	5	<b>Entrust SC</b> (spinosad)	3-6 fl oz	12 fl oz	4	OMRI-listed <sup>2</sup> . Do not feed forage or hay to dairy or meat cattle.	OMRI-listed <sup>2</sup> . Do not feed forage or hay to dairy or meat cattle.
	5	<b>Radiant SC</b> (spinetoram)	3-8 fl oz	succulent-39 fl oz/acre/year soybean- 14 fl oz/year	4	3 – succulent; 28 – dry	Time applications to small larvae.
	15	<b>Rimon 0.83EC</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.
	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> )	0.5-2 qt/100 gal	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		4	0	OMRI-listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.
	--	<b>M-Pede 49% EC</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day intervals	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 qt/100 gal (JMS); 1-2 gal/100 gal (others)	no limit	4	0	OMRI-listed <sup>2</sup> . Toxic to fish.
	un	<b>Aza-Direct</b> (azadirachtin)	1-3.5 p)		4	0	OMRI-listed <sup>2</sup> . Anti-feedant, repellent, insect growth regulator. Toxic to fish and aquatic invertebrates.
	un	<b>Trilogy</b> (extract of neem oil)	0.5-2% V/V		4	0	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed <sup>2</sup> .
<b>Whiteflies</b>	3A	<b>*Brigade 2 EC</b> (bifenthrin)	1.6-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3 – succulent; 14 – dry	Toxic to bees and fish. Tank mix with 1B product for better control.
	3A	<b>*Mustang</b> (zeta-cypermethrin)	1.4-4.3 oz	0.3 lba.i./acre	12	1 - succulent; 21 - dried shelled peas or beans	Do not make applications less than 5 days apart. Not for soybeans. Do not apply more than 0.3 lb ai/acre per season. Can also be applied at planting for control of cutworms, white grubs and wireworms (see label). Tank mix with 1b Product of better control.

**Table 9.6** Insecticides approved for managing insect 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 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient	Rate Product/acre	Maximum rate/acre per season	REI hours	Days to Harvest	Remarks <sup>2</sup>
	3A	<b>Pyganic 5.0</b> (pyrethrins)	0.26-18 fl oz/1000 cu ft	no limit	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	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	21-soil 7 - foliar	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used. Bee hazard.
	4A	<b>Assail 30SG</b> (acetamiprid)	2.5-5.3 oz	3 applications	12	7	Edible podded legumes and succulent shelled peas and beans. Toxic to birds, bees and fish.
	4D	<b>Sivanto 200 SL</b> (flupyradifurone)	7-14 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		12	7	Do not make more than 2 applications per season.
	15	<b>Rimon 0.83EC</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.
	16	<b>Courier 40SC</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> )	0.5-2 qt/100 gal		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</i> <i>subtsugae</i> strain PRAA4-1)	1-3 lb		4	0	OMRI-listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.
	--	<b>M-Pede 49% EC</b> (soap, insecticidal)	0.25-4.0% v/v	7-10 day intervals	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 qt/100 gal (JMS); 1-2 gal/100 gal (others)	no limit	4	0	OMRI-listed <sup>2</sup> . Toxic to fish.
	un	<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.
	un	<b>Trilogy</b> (extract of neem oil)	1.0-2.0% v/v		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. 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 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. un = unknown, or a mode of action that has not been classified yet.

<sup>2</sup> Information provided in this 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 Service nor discrimination against similar products or services not mentioned. OMRI listed: Listed by the Organic Materials Review Institute for use in organic production.

\* Restricted use insecticide.

Table 9.7. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action.

Labels change frequently. Be sure to read a current product label before applying any chemical.  
Refer to Table 18.1 for biopesticide and other alternative products labeled for disease management.

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	
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 & M1	Badge SC	2 pt	16.6 pt	0	1	
		Badge X2 (copper hydroxide; copper oxychloride)			16.9 pt		(greenhouse) 2 (field)
		C-O-C-S WDG 9 (basic copper sulfate; copper oxychloride)	1.5 lb	9.2 lb		2	
	1	(thiophanate-methyl) <b>Many brands available:</b> Cercobin, 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)	1 (succulent beans) 3 (dry beans)	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	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	Rancona 3.8 FS (ipconazole)	0.085 fl oz/ 100 l seed			12 hr	For suppressing seed borne anthracnose of dry bean.
	7	Fontelis	30 fl oz	72 fl oz	0 (Fontelis)	12 hr	No more than 2 sequential appl. Before alternating to a non-FRAC 7 fungicide. Vertisan only labeled for dry edible beans.
		Vertisan (penthiopyrad)	20 fl oz	41 fl oz	21 (Vertisan)		
	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	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.
		Headline SC (pyraclostrobin)	9 fl oz	18 fl oz	7	12 hr	
	11	Aframe					No more than 2 sequential appl. before alternating to a non-FRAC 11 fungicide.
	Equation SC						
	Quadris	15.5 fl oz	92.3 fl oz	14 (dry)	4 hr		
	Satori Fungicide Willowood Azoxy 2SC (azoxystrobin)			0 (succulent)			
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.	

**Table 9.7.** Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.

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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	
	11 & 3	Quilt Xcel Quilt Fungicide Willowood Azoxypop Xtra (azoxystrobin + propiconazole)	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	7 12 hr	Supplemental label: Do not use on cowpea cultivars intended for livestock.
Ascochyta blight	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	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 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 & 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 (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	Aframe Azoxystar Equation SC Quadris Satori Fungicide Willowood Azoxy 2SC (azoxystrobin)	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	Quilt Xcel Quilt Fungicide Willowood Azoxypop 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 9.7. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

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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	
Bacterial brown spot, Bacterial blight, Common blight, Halo blight	M1	(copper compounds) <b>Many brands available:</b> 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, NuCop 50 DF, Nu-Cop HB	SEE INDIVIDUAL LABELS		Varies	Varies from 4 hr to 2 days	
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	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock
	1	Topsin 4.5 FL Fungicide, Topsin M WSB Fungicide (thiophanate-methyl)	SEE INDIVIDUAL LABELS		14 to 28 (see label)	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.
	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	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0	12 hr	
	7	Vertisan (penthiopyrad)	20 fl oz	41 fl oz	21	12 hr	Only labeled for dried shelled beans and peas.
	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	Vitaflor-280 (carboxin + thiram)	4 fl oz/100 lb seed			1	For protection against seed borne <i>Botrytis</i> .	
Cercospora leaf spot	M1	(copper compounds) <b>Many brands available:</b> Kentan DF, Kocide DF, Nordox, Nordox 75 WG	SEE INDIVIDUAL LABELS		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	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock
	7	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0	12 hr	

**Table 9.7.** Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action. (continued)

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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	
	7	Vertisan (penthiopyrad)	20 fl oz	41 fl oz	21	12 hr	Only labeled for dried shelled beans and peas.
	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	12 hr	Limit 2 appl/crop & alternate chemistry
<b>Downy mildew</b>	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 Fungicide, Kocide 3000, Nordox, Nordox 75 WG	SEE INDIVIDUAL LABELS			4 hr to 2 days (see label)	
	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
	M5	(chlorothalonil) <b>Many brands available:</b> 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
	4	Ridomil Gold SL	0.2 pt	0.8 pt	3	2	Must be tank mixed with other effective fungicides.
		Ultra Flourish (mefenoxam)	0.4 pt	2.0 pt (soil) 1.6 pt (foliar)	3	2	
	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.
<b>Phytophthora</b>	4	Acquire Allegiance Dry Allegiance LS Allegiance FL Dyna-Shield metalaxyl 318 FS Metastar ST Seed Treatment Sebring 318 FS Sebring 480 FS (metalaxyl)	1.2 fl oz/ 100 lb seed (Al- legiance LS); 0.75 fl oz (others)			1	Seed treatment



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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	
	4	Apron XL (mefenoxam)	0.64 fl oz/ 100 lbs of seed			2	Seed treatment only
	12 & 4	Apron Maxx RFC	1.5 fl oz/100 lbs seed			2	Seed treatment only
		Apron Maxx RTA (mefenoxam; fludioxonil)	5 fl oz/100 lbs seed			2	Seed treatment only
Pod tip rot	3	Rally 40WSP Fungicide Sonoma 40 WSP (myclobutanil)	4-5 oz	1.25 lb	0	1	30-day plantback interval
Powdery mildew	M2	(sulfur) <b>Many brands available:</b> Crusade DF, Kumulus DF Fungicide- Acaricide, Micro Sulf, Microfine Sulfur, Microthiol Disperss, Sulfur 90W, Sulfur-DF, Wetttable Sulfur, Yellow Jacket Dusting Sulfur, Yellow Jacket Wetttable 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	Fontelis	30 fl oz	72 f oz	0	12 hr	
		Vertisan (penthiopyrad)	20 fl oz	41 fl oz	21 (seed) 0 (hay)	12 hr	
	11	Headline, Headline SC (pyraclostrobin)	9 fl oz	18 fl oz	7	12 hr	Limit 2 appl/crop & alternate chemistry
	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
Pythium damping-off & root rot	4	Acquire Allegiance Dry Allegiance LS Allegiance FL Dyna-Shield metalaxyl 318 FS Metastar ST Seed Treatment Sebring 318 FS Sebring 480 FS (metalaxyl)	1.2 fl oz/ 100 lb seed (Al- legiance LS); 0.75 fl oz (others)			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 (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
	11 & 4	Uniform Fungicide (azoxystrobin; mefenoxam)	0.34 fl oz/ 1000 row ft			0	Make only one application per season

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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	
Rhizoctonia diseases (root & stem rot)	7 & M3	HM-1345 Vitaflo-280 (carboxin; thiram)	4 fl oz per 100 lb seed			1	Seed treatment
	4 & 12	Apron Maxx RFC (mefenoxam; fludioxonil)	1.5 fl oz/ 100 lbs seed			2	Seed treatment only
	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.
	3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/ 100 lb seed			12 hr	Seed treatment for protection against <i>Rhizoctonia solani</i> .
	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
Rust	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	SEE INDIVIDUAL LABELS			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, 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
	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
	3	Monsoon Onset 3.6L Orius 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	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.

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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	
	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	Aproach (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	Aframe Azoxystar Quadris Satori Fungicide Willowood Azoxy 2SC (azoxystrobin)	6 fl oz	92.3 fl oz	14 (dry beans) 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	Quilt Xcel Quilt Fungicide Willowood Azoxypop 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.
<b>White mold</b>	1	(thiophanate-methyl) <b>Many brands available:</b> Cercobin, 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)	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 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
	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	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.
	11	Aproach (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.
	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.

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			Applic.	Season	Harvest	Reentry	
	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 (fluzinam)	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 2013; <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.