

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
Planting information						
Distance between rows (in)	18 - 40	36 - 48	18 - 36	36 - 48	20 - 42	36, 2-row beds
Number of rows/bed	1 - 2					
Distance between rows/bed	10 - 12					
Distance between plants (in)	2 - 4	3 - 5	3 - 6	8 - 12	2 - 6	2 - 6
Seeding depth (in)	1 - 1.5	1 - 1.5	1 - 1.5	1 - 1.5	1 - 1.5	1 - 1.5
Seed per acre (lb)	45 - 80	30 - 45	40 - 60	20 - 40	15 - 30	25 - 50
Days to maturity from seed	45 - 60	50 - 70	60 - 80	80 - 100	75 - 90	60 - 80
Plant populations	52,272 - 172,240	58,000	116,160	21,780	104,544	87,120

Cultivars

Table 11.2. Commercial legume cultivars.

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

Asian Legumes

The Asian legume group includes fruits (usually known as pods), which are eaten at the immature stage with edible immature seeds (green shell), and some young stem tips. The winged bean also has edible leaves and roots, though the latter do not appear to be cultivated commercially in the continental 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
Planting information				
Distance between rows (in)	24	20-30	9	20
Distance between plants (in)	6	2-6	2-3	4-6
Seeding depth (in)	1 - 1.5	1 - 1.5	1 - 1.5	1 - 1.5
Days to maturity from seed	90-120	80-120	90-120	90-120
Plant populations	43,560	87,120	348,480	78,409
Planting dates	Pigeon pea	Snowpea	Winged bean	Yard-long bean
North Florida	Not recommended	Jan - Mar	Not recommended	Mar - July
Central Florida	Not recommended	Nov - Feb	Not recommended	Feb - Aug
South Florida	Nov - Feb	Nov - Feb	Mar - Apr	Sept - Apr
Planting information				
Distance between rows (in)	24-36	36, 2-row beds	36	20 - 42
Distance between plants (in)	2 - 6	2 - 6	8	2 - 6
Seeding depth (in)	1 - 1.5	1 - 1.5	1 - 1.5	1 - 1.5
Days to maturity from seed	180 (early); 270-365 (late)	60 - 80	90 (day neutral varieties)	75 - 90
Plant populations	10,890	87,120	21,780	104,544

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

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

Insect or mite pest	MOA Code	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	REI (hours)	Days to Harvest	Remarks ²
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 and crop use	
	1B	*Dibrom 8E (naled)	1.0 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock feed.
	1B	Dimethoate 4EC (dimethoate)	0.5-1.0 pt	2.0 pt/year	48	0- mechanical harvesting	Do not use on field peas.
	1B	Malathion 8F (malathion)	1.0 pt	2.0 pt	12	3	Green and dried peas only. Do not graze or feed forage to livestock.
	1B	Orthene 97 (acephate)	0.50-1.0 lb	2.0 lb a.i.	24	14-dry succulent 1- lima beans succulent form	Do not apply to succulent beans for fresh market or processing. Do not feed treated vines or seeds to livestock.
	3A	*Asana XL (esfenvalerate)	5.8-9.6 fl oz	38.4 fl oz	12	3-snap 21-dry beans and peas	Do not feed or graze livestock on treated vines.
	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz: succulent 19.2 fl oz: dry	12	3-succulent 14-dry	
	3A	PyGanic 5.0 (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.
	4A	Admire Pro (imidacloprid)	soil: 7-10.5 fl oz; foliar: 1.2 fl oz	soil: 10.5 fl oz foliar: 3.6 fl oz	12 12	soil:21 foliar:7	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used.
	4A	Assail 30SG, (acetamidprid)	2.5-5.3 fl oz	16 fl oz	12	7	Edible podded legumes, succulent shelled peas and beans.
	4D	Sivanto Prime (flupyradifurone)	7.0-10.5 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days.
	23	Movento (spirotetramat)	4-5 fl oz	10 fl oz	24	1- succulent 7-dry	
		BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA pyrethrins)	0.25-2.0 qt	no limit	12	0	
		Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	OMRI-Listed ² . May be used in green- houses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		Grandevo (<i>Chromobacterium subsugae</i> strain PRAA4-1)	1-3 lb	none	4	0	OMRI-Listed ² . Succulent or dried.
		M-Pede 49% (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed ² .
		Sun Spray 98.8%, JMS Stylet Oil, Saf-T - Side, others (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed ² .
		Aza-Direct (azadirachtin)	1-2 pts	3.5 pt	4	0	OMRI-Listed ² . Anti-feedant, repellent, insect growth regulator.
		Neemix 4.5 (azadirachtin)	4-16.0 fl oz	20 gm a.i.	4	0	OMRI-Listed ² . Insect growth regulator and feeding repellent.
	Trilogy (extract of neem oil)	1.0-2.0% v/v	as needed	4	0	OMRI-Listed ² .	

Table 11.5. 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.
Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.

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

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Insect or mite pest	MOA Code	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	REI (hours)	Days to Harvest	Remarks ²
	11A	Javelin WG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.12-1.50 lb	as needed	4	0	OMRI-Listed ² . Treat when larvae are young. Thorough coverage is essential.
	11A	Xentari DF (<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>)	0.5-2.0 lb	as needed	4	0	OMRI-Listed ² . Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse.
	15	Rimon 0.83 EC (novaluron)	6-12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
		Intrepid 2F (methoxyfenozide)	4-16 fl oz	64 fl oz	12	7	
	22	Avaunt (indoxacarb)	3.5 oz	14 fl oz	12	7	Southern pea (dry) varieties only.
	28	Coragen (chlorantraniliprole / rynaxypyr)	3.5-7.5 fl oz	15.4 fl oz of chlorantraniliprole products per acre per year.	4	1	Foliar application only.
	28	Exirel (cyantraniliprole, cyazapyr)	10.5-20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1- succulent 7- dried	Label contains pollinator warning language.
		BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25-2.0 qt	no limit	12	0	
		Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	OMRI-Listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		Aza-Direct (azadirachtin)	1-2 pts	3.5 pts	4	0	OMRI-Listed ² . Anti-feedant, repellent, insect growth regulator.
Cucumber beetle, bean leaf beetle, Mexican bean beetle, cowpea curculio	1A	*Lannate (methomyl)	LV: 0.75-3pt SP: 0.25-1.0 lb	15 pt 5.0 lb	48	see label varies with rate & crop	
	1A	Sevin 4F (carbaryl)	0.50-1.5 qt	6.0 qt/year	12	3-fresh beans & peas 14-grazing or forage 21-dried beans peas, seed or hay.	Use on succulent shelled peas and beans prohibited.
	1B	Orthene 97 (acephate)	0.50-1.0 lb	2.0 lb a.i.	24	14-dry succulent 1- lima beans succulent form	Do not apply to succulent beans for fresh market or processing.
	1B	Dimethoate 4EC (dimethoate)	0.5-1.0 pt	2.0 pt/year	48	0-me- chanical harvesting	Do not feed treated vines. Do not use on field peas.
	1B	*Thimet 20G EZ Load (phorate)	4.9-9.4 oz/ 1000 ft row	1 application only at plant	48	60	Poison. Label pending in Fla. Do not graze livestock on treated forage. No direct contact with seed.
	3,28	*Besiege (chlorantraniliprole, lambda cyhalothrin)	5-10 fl oz	31 fl oz	24	7-edible podded succulent shelled 21-dry shelled	

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	3A	*Baythroid XL (beta-cyfluthrin)	0.8-3.2 fl oz-dry beans & peas 0.8-2.1 fl oz- southern pea	6.4 fl oz-dry beans & peas 10.5 fl oz southern peas	12	7-dry beans & peas 3-southern pea	Not for use on succulent beans or peas. Do not feed treated vines or hay to livestock.
	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3-succulent 14-dry	
	3A	Declare Insecticide (gamma-cyhalothrin)	1.02-1.54 fl oz	0.38 pt	24	7-edible podded and succulent shelled, 21-dry	For control before larvae bore into the plant stalk or pods. Do not graze livestock in treated areas or harvest vines for forage or hay.
	3A	*Mustang *Mustang Maxx (zeta-cypermethrin)	3.0-4.3 oz 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).
	3A	PyGanic 5.0 (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.
	3A	*Warrior II (lambda cyhalothrin)	0.96-1.92 fl oz	7.68 fl oz	24	7-edible podded and succulent shelled; 21-dried, shelled	
	4A	Assail 30SG , (acetamidprid)	2.5-5.3 fl oz	16 fl oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	15	Rimon 0.83 EC (novaluron)	9-12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
		Aza-Direct (azadirachtin)	1-2 pts	3.5 pts	4	0	OMRI-Listed ² . Anti-feedant, repellent, insect growth regulator.
		Neemix 4.5 (azadirachtin)	4-16 fl oz	20 gm a.i.	12	0	OMRI-Listed ² . Insect growth regulator and feeding repellent.
Fire Ants	7A	Extinguish ((S) methoprene)	1-1.5 lb broadcast	as needed	4	0	Insect growth regulator. Colonies will get reduced after three weeks and eliminated after 8-10 weeks.
	7C	Esteem Ant Bait (pyriproxyfen)	1.5-2.0 lb	0.134 lb a.i.	12	1	Insect growth regulator. Apply at first sign of ant activity.
Grasshoppers	1B	Dimethoate 4EC (dimethoate)	0.5-1.0 pt	2.0 pt/year	48	0-mechanical harvesting	Do not feed treated vines. Do not use on field peas.
	3,28	Besiege (chlorantraniliprole, lambda cyhalothrin)	5-10 fl oz	31 fl oz	24	7-edible podded succulent shelled 21-dry shelled	
	3A	*Asana XL (esfenvalerate)	5.8-9.6 fl oz	38.4 fl oz	12	3-snap 21-dry beans and peas	Do not feed or graze livestock on treated vines.
	3A	*Baythroid XL (beta-cyfluthrin)	2.4-3.2 fl oz beans & peas 1.6-2.1 fl oz southern pea	6.4 fl oz 10.5 fl oz	12	7-dry beans & peas 3-southern pea	Not for use on succulent beans or peas. Do not feed treated vines
	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3-succulent 14-dry	
	3A	Declare Insecticide (gamma-cyhalothrin)	1.02-1.54 fl oz	0.38 pt	24	7-edible podded and succulent shelled, 21-dry	For control before larvae bore into the plant stalk or pods. Do not graze livestock in treated areas or harvest vines for forage or hay.

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	3A	*Mustang	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).	
		*Mustang Maxx (zeta-cypermethrin)	3.2-4.0 oz	24 fl oz	12	21-dried shelled peas or beans		
	3A	*Warrior II (lambda cyhalothrin)	1.28-1.92 fl oz	7.68 fl oz	24	7-edible podded and succulent shelled; 21-dried, shelled	Do not graze livestock in treated areas.	
		BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25-1qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.	
		BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25-2.0 qt	no limit	12	0		
		Mycotrol EOS (<i>Beauveria bassiana</i> strain GHA)	0.25-1qt	no limit	4	0		
Leafhopper	1A	*Lannate (methomyl)	LV: 0.75-3pt SP: 0.25-1.0 lb	15 pt 5.0 lb	48	see label varies with rate & crop		
	1B	*Dibrom (naled)	1.0 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock forage.	
	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.	
	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3-succulent 14-dry		
	3A	*Mustang	3.0-4.3 oz	25.8 oz	12	1-succulent;	Can also be applied at planting for control of cutworms, white grubs, and wireworms. (See label).	
		*Mustang Maxx (zeta-cypermethrin)	2.72-4.0 oz	24 oz	12	21-dried shelled peas or beans		
	3A	*Warrior II (lambda cyhalothrin)	1.28-1.92 fl oz	7.68 fl oz	24	7-edible podded and succulent shelled; 21-dried, shelled	Do not graze livestock in treated areas.	
	3A	PyGanic 5.0 (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.	
	4A	Admire Pro (imidacloprid)	soil: 7-10.5 fl oz; foliar: 1.2 fl oz	soil: 10.5 fl oz foliar: 3.6 fl oz	12 12	21- soil 7- foliar	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used.	
	4A	Assail 30SG , (acetamiprid)	2.5-5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.	
	4D	Sivanto Prime (flupyradifurone)	7.0-10.5 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days.	
	16	Courier 40 SC (buprofezin)	9.0-13.6 fl oz.	27.2 fl oz	12	14	Insect growth regulator. For succulent beans only. Good coverage essential.	
	28	Exirel (cyantraniliprole/ cyazapyr)	10.5-20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1- succulent 7- dried	Label contains pollinator protection warnings.	
			BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
			BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25-2.0 qt	no limit	12	0	

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Insect or mite pest	MOA Code	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	REI (hours)	Days to Harvest	Remarks ²
		Mycotrol EOS (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 pt	no limit	4	0	OMRI-Listed ² . May be used in green-houses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		M-Pede 49% (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed ² .
		Sun Spray 98.8% JMS Stylet Oil, Saf-T side, others (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed ² .
		Aza-Direct (azadirachtin)	1-2 pts	3.5 pt	4	0	OMRI-Listed ² . Anti-feedant, repellent, insect growth regulator.
Liriomyza leafminers	5	Entrust SC (spinosad)	1.5-2.0 fl oz	9.0 fl oz: succulent 3.75 fl oz : dry	4	3-succulent 28-dry	OMRI-Listed ² . Do not feed forage or hay to meat or dairy animals.
	5	Radiant SC (spinetoram)	5-8 fl oz	28 fl oz: succulent 12 fl oz: dry	4	3-succulent 28-dry	Time applications to small larvae.
	6	*Agri-Mek SC (abamectin)	8.0-16.0 fl oz	48.0 fl oz	12	7	Dry beans only.
	17	Trigard (cyromazine)	2.66 oz 1 packet	0.75 lb a.i./acre	12	7	Not for use on soybeans or peas.
	28	Coragen (chlorantraniliprole / rynaxypyr)	7.5 fl oz	15.4 fl oz of chlorantraniliprole products per acre per year	4	1	Foliar application only.
	28	Exirel (cyantraniliprole/ cyazypyr)	10.5-20.5 oz	no more than 0.4 lb a.i. Group 28 products	12	1-succulent 7- dried	
		Sun Spray 98.8%, JMS Stylet Oil, Saf-T - Side, others (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed ² .
		Neemix 4.5 (azadirachtin)	4-16 fl oz	20 gm a.i.	12	0	OMRI-Listed ² . Insect growth regulator and feeding repellent.
Lygus bug, stink bug, kudzu bug	1A	*Lannate (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	
	1A	Sevin 4F (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.
	1B	*Dibrom 8E (naled)	1-1.5 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock feed.
	1B	Dimethoate 4EC (dimethoate)	0.5-1.0 pt	2.0 pt/year	48	0-mechanical harvesting	Do not feed treated vines. Do not use on field peas.
	3,28	Besiege (chlorantraniliprole, lambda cyhalothrin)	5-10 fl oz	31 fl oz	24	7-edible podded succulent shelled 21-dry shelled	
	3A	*Baythroid XL (beta-cyfluthrin)	2.4-3.2 fl oz- beans & peas 1.6-2.1 fl oz- southern pea	6.4 fl oz 10.5 fl oz	12	7-dry beans & peas 3-southern pea	Not for use on succulent beans or peas. Do not feed treated vines or hay to livestock.

Table 11.5. 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. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.

Insect or mite pest	MOA Code	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	REI (hours)	Days to Harvest	Remarks ²
	3A	*Brigade 2 EC (bifenthrin)	5.12-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3-succulent 14-dry	
	3A	Declare Insecticide (gamma-cyhalothrin)	1.02-1.54 fl oz	0.38 pt	24	7-edible podded and succulent shelled, 21-dry beans and peas	For control before larvae bore into the plant stalk or pods. Do not graze livestock in treated areas or harvest vines for forage or hay.
	3A	*Mustang *Mustang Maxx (zeta cypermethrin)	3.4-4.3 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).
	3A	PyGanic 5.0 (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.
	3A	*Warrior II (lambda cyhalothrin)	1.28-1.92 fl oz	7.68 fl oz	24	7-edible podded and succulent shelled; 21-dried, shelled	
	15	Rimon 0.83 EC (novaluron)	12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
		BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA, pyrethrins)	0.25-2.0 qt	no limit	12	0	
		Mycotrol (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	OMRI-Listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		M-Pede 49% (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed ² .
		Aza-Direct (azadirachtin)	1-2 pts	3.5 pt	4	0	OMRI-Listed ² . Anti-feedant, repellent, insect growth regulator.
Mites: two spotted, southern, red	3A	*Brigade 2 EC (bifenthrin)	5.12-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3-succulent 14-dry	
	3A	PyGanic 5.0 (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.
	6	*Agri-Mek SC (abamectin)	8-16 fl oz	48 fl oz	12	7	Dry beans only.
	20B	Kanemite 15 SC (acequinocyl)	31 fl oz	62 fl oz	12	7	Succulent beans, including succulent soybean vegetable only.
	20D	Acramite-50WS (bifenthrin)	1.0-1.5 lb	3.0 lb	12	3	Succulent beans, peas and soybean.
	21A	Portal (fenpyroximate)	2.0 pt	4.0 pt	12	1	Snap bean only. Allow 14 days between applications.
		Grandevo (<i>Chromobacterium subsugae</i> strain PRAA4-1)	1-3 lb	no limit	4	0	OMRI-Listed ² . Succulent or dried.
		M-Pede 49% (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed ² .

Table 11.5. 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.
Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.

Insect or mite pest	MOA Code	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	REI (hours)	Days to Harvest	Remarks ²
		Sun Spray 98.8%, JMS Stylet Oil, Saf-T - Side, others (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed ² .
		Aza-Direct (azadirachtin)	1-2 pts	3.5 pts	4	0	OMRI-Listed ² . Anti-feedant, repellent, insect growth regulator.
		Trilogy (extract of Neem oil)	1.0-2.0 % v/v	as needed	4	0	OMRI-Listed ² .
Thrips	3A	Pyganic 5.0 (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-Listed ² .
	4A	Assail 30SG , (acetamidprid)	4.5-5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	5	Entrust SC (spinosad)	1.5-2.0 fl oz	9.0 fl oz :succulent 3.75 fl oz : dry	4	3-succulent 28-dry	OMRI-Listed ² . Do not feed forage or hay to meat or dairy animals.
	5	Radiant SC (spinetoram)	5-8 fl oz	28 fl oz: succulent 12 fl oz: dry	4	3-succulent 28-dry	
	15	Rimon 0.83 EC (novaluron)	12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	23	Movento (spirotetramat)	4-5 fl oz	10.0 fl oz	24	1-succulent 7-dry	
	28	Exirel (cyantraniliprole / cyazapyr)	10.5-20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1- succulent 7- dried	Label contains pollinator protection warnings.
		BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA pyrethrins)	0.25-2.0 qt	no limit	12	0	
		Mycotrol (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	OMRI-Listed ² . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		Grandevo (<i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb	no limit	4	0	OMRI-Listed ² . Succulent or dried.
		M-Pede 49% (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed ² .
		Sun Spray 98.8%, JMS Stylet Oil, Saf-T - Side, others (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed ² .
		Aza-Direct (azadirachtin)	1-2 pt	3.5 pt	4	0	OMRI-Listed ² . Anti-feedant, repellent, insect growth regulator.
		Trilogy (extract of Neem oil)	1.0-2.0 % v/v	as needed	4	0	OMRI-Listed ² . Apply morning or evening to reduce potential for leaf burn.
Whiteflies	3A	*Brigade 2 EC (bifenthrin)	2.1-6.4 fl oz	12.8 fl oz succulent 19.2 fl oz dry	12	3-succulent 14-dry	
	3A	*Mustang *Mustang Maxx (zeta-cypermethrin)	3.4-4.3 oz 3.2-4.0 oz	25.8 oz 24 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).
	3A	PyGanic 5.0 (pyrethrins)	4.5-17 fl oz	10 applications	12	0	OMRI-listed ² . Treat when insects first appear.

Table 11.5. 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. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.

Insect or mite pest	MOA Code	Trade Name (Active Ingredient) *Restricted	Rate (Product/acre)	Max rate product per season	REI (hours)	Days to Harvest	Remarks ²
	4A	Admire Pro (imidacloprid)	soil: 7-10.5 fl oz; foliar: 1.2 fl oz	soil: 10.5 fl oz foliar: 3.6 fl oz	12 12	21- soil 7- foliar	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used.
	4A	Assail 30SG , (acetamidprid)	4.0-5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	4D	Sivanto Prime (flupyradifurone)	10.5-14 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days.
	7C	Knack IGR (pyriproxifen)	8-10 fl oz	20 fl oz	12	7	
	15	Rimon 0.83 EC (novaluron)	12 fl oz	24 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	16	Courier 40 SC (buprofezin)	9.0-13.6 fl oz.	27.2 fl oz	12	14	For succulent beans only. Allow 14 days between applications.
	23	Movento (spirotetramat)	4-5 fl oz	10.0 fl oz	24	1-succulent 7-dry	
	28	Exirel (chlorantraniliprole with cyazapyr)	10.5-20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	1- succulent 7- dried	
		BotaniGard ES (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		BotaniGard Maxx (<i>Beauveria bassiana</i> strain GHA pyrethrins)	0.25-2.0 qt	no limit	12	0	
		Mycotrol ESO (<i>Beauveria bassiana</i> strain GHA)	0.25-1.0 qt	no limit	4	0	OMRI-Listed ² . May be used in houses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
		Grandevo (<i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb	none	4	0	OMRI-Listed ² . Succulent or dried. Do not apply if bees are visiting treatment area.
		M-Pede 49% (soap, insecticidal)	0.25-4.0% v/v	7-10 day interval	12	0	OMRI-Listed ² . Use with a companion insecticide.
		Sun Spray 98.8%, JMS Stylet Oil, Saf-T - Side, others (oil, insecticidal)	3-6 qts/100 gal (JMS); others 1-2 gal/100gal	no limit	4	0	OMRI-Listed ² .
		Neemix 4.5 (azadirachtin)	4-16 fl oz	20 gm a.i.	4	0	OMRI-Listed ² .
		Trilogy (extract of Neem oil)	1.0-2.0 % v/v	as needed	4	0	OMRI-Listed ² . Apply morning or evening to reduce potential for leaf burn.

¹ Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v.7.3, February 2014. Number codes (1 through 28) are used to distinguish the main insecticide mode of action groups, with additional letters for certain 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.

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

* Restricted use insecticide

Table 11.6. Bean, pea, and other legume fungicides ordered by disease and then FRAC group according to their mode of action.

Pertinent Diseases or Pathogens	Fungicide Group ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.							
Anthracnose	M1	(copper compounds) Many brands available: Cueva, Kentan DF, Nordox, Nordox 75 WG	SEE INDIVIDUAL LABELS		Varies	Varies from 4 hr to 2 days	
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Echo 720, Echo 90 DF, Echo ZN, Equus –DF Fungicide, Equus 720 SST, Initiate 720	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock
	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	0	1 (greenhouse) 2 (field)	
	1	(thiophanate-methyl) Many brands available: 3336 EG, 3336 F, 3336 WP, Helena-Methyl 4.5 AG, Incognito 4.5F, Incognito 85 WDG, Nufarm T-Methyl 4.5F, Topsin 4.5FL Fungicide, Topsin M WSB Fungicide	SEE INDIVIDUAL LABELS		14 to 28 (see label)	12 hr (3336 fungicides) 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	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 seedborne anthracnose of dry bean.
	7	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0 (Fontelis)	12 hr	No more than 2 sequential appl. Before alternating to a non-FRAC 7 fungicide.
	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	Aframe Azoxystar Azoxystrobin Equation SC Mazolin Quadris Satori Fungicide Tetraban Trevor Willowood Azoxy 2SC Azteroid FC (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.
	7 & M3	Vitaflor-280 (carboxin; thiram)	4.0 fl oz per 100 lb seed			1	
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	12 hr	Limit 2 appl/season. Crop can not be used for livestock until 14 days after last application.
	11 & 3	Avaris 2XS Cover XL Quilt Xcel Quilt Fungicide Willowood Azoxyprop Xtra (azoxystrobin; propiconazole)	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	12 hr	Supplemental label: Do not use on cowpea cultivars intended for livestock.

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.							
Ascochyta blight	M5	(chlorothalonil)	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock
		Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus –DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz					
	1	Thiabendazole 4L ST (thiabendazole)	1.72 fl oz/100 lb seed			12 hr	
	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 (penthioopyrad)	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.
	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	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.
		Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz	7 (succulent) 21 (dry)	12 hr	
	11	Aframe Azoxystar Azoxyzone Mazolin Quadris Satori Fungicide Tetraban Trevo 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.
	3 & 9	Inspire Super (difenoconazole; cyprodinil)	20 fl oz	80 fl oz	14 (dry)	12 hr	
	7 & 3	Aprovia Top (benzovindiflupyr; difenoconazole)	11 fl oz	22 fl oz	14 (dry)	12 hr	Apply on a 14-day schedule
	7 & 3	Propulse (fluopyram; prothioconazole)	10.3 fl oz	20.5 fl oz	14	2	For dry-edible beans and peas. Do not use on crops for livestock.
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin) (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 & 3	Aframe Plus Avaris 2XS Cover XL Quilt Xcel Quilt Fungicide Willowood Azoxyprop Xtra (azoxystrobin; propiconazole)	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	12 hr	Supplemental label: Do not use on cowpea cultivars intended for livestock.

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.							
Bacterial brown spot, Bacterial blight, Common blight, Halo blight	4 & 7 & 3	EverGol Energy (metalaxyli; penflufen; prothioconazole)	1.0 fl oz/100 lb seed				Disease suppression
	7 & 3 & 11	Miravis Neo (pydiflumetofen; propiconazole; azoxystrobin)	13.7 fl oz	27.4 fl oz	14 (dry)	12 hr	
	M1	(copper compounds) Many brands available: Americop 40 DF, Basic Copper 53, Champ DP Dry Prill, Champ Formula 2 Flowable, Champ WG, Champion++, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Kop-Hydroxide, MasterCop, Nordox, Nordox 75 WG, Nu Cop 50 WP, Nu-Cop 3 L, Nu-Cop 50 DF, Nu-Cop HB, Previsto	SEE INDIVIDUAL LABELS		Varies	Varies from 4 hr to 2 days	
	M1 & M1	Badge SC Badge X2 (copper hydroxide; copper oxychloride) C-O-C-S WDG (basic copper sulfate; copper oxychloride)	2 pt 1.5 lb	16.6 pt 9.2 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
	M1 & M2	Top Cop with Sulfur (basic copper sulfate; sulfur)	4 pt		0	1	Do not use in aluminum tanks
	M2	(sulfur) Many brands available: Micro Sulf, Microfine Sulfur, Microthiol Disperss, Sulfur 90W, That Flowable Sulfur, Thiolux, Yellow Jacket Dusting Sulfur, Yellow Jacket Wettable Sulfur	SEE INDIVIDUAL LABELS			1	Do not apply during periods of warm weather to avoid phytotoxicity
	M5	(chlorothalonil) Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus –DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock
	M2 & 3	Unicorn DF (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 (myclobutanil)	5 oz	1.25 lb	0	1	30-day plantback interval
3	Monsoon Onset 3.6L Orius 3.6F Tebu-Crop 3.6F Tebustar 3.6L Teledo Willowood Teb 3.6SC (tebuconazole)	6 fl oz	24 fl oz (fresh) 12 fl oz (dry)	7 (fresh) 14 (dry)	12 hr	DMI fungicide	
3	Propiconazole 3.6 EC Tilt	4 fl oz 4 fl oz	12 fl oz 12 fl oz	7 7	12 hr 12 hr		

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.							
	3	(propiconazole) 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	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.
	11	Headline Headline SC Willowood Pyrac 2EC (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 Azoxyzone Mazolin Quadris Satori Fungicide Tetraban Trevio Willowood Azoxy 2SC Azteroid FC (azoxystrobin)	6 fl oz 7.6 fl oz	92.3 fl oz 116 fl oz	14 (dry beans) 0 (succulent) 14 (dry) 0 (succulent)	4 hr 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.
	3 & 7	Miravis Top (difenoconazole; pydiflumetofen)	13.7 fl oz	54.8 fl oz	14	12 hr	
	11 & 3	Avaris 2XS Aframe Plus 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.
	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.
	7 & 11	Priaxor Xemium (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.
	7 & 3 & 11	Miravis Neo (pydiflumetofen; propiconazole; azoxystrobin)	13.7 fl oz	27.4 fl oz	14 (dry)	12 hr	
Botrytis or Gray mold	M1	Cueva (copper octanoate)	2 gal		0	4 hr	
	M5	(chlorothalonil)	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock
		Many brands available: Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720, Echo 90 DF, Echo ZN, Equus – DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz					

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.							
	1	3336 EG, 3336 F, 3336 WP, Topsin 4.5 FL Fungicide, Topsin M WSB Fungicide (thiophanate-methyl)	SEE INDIVIDUAL LABELS		14 to 28 (see label)	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.
	3	Rancona 3.8 FS (ipconazole)	0.085 fl oz/ 100 lb seed			12 hr	For protection against seedborne <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 & M3	Vitaflor-280 (carboxin; thiram)	4 fl oz/100 lb seed			1	For protection against seedborne <i>Botrytis</i> .
	7 & 11	Priaxor Xemium (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.
	4 & 7 & 3	EverGol Energy (metalaxyl; penflufen; prothioconazole)	1.0 fl oz/100 lb seed				Disease suppression
Cercospora leaf spot	M1	(copper compounds) Many brands available: Kentan DF, Nordox, Nordox 75 WG, Previsto	SEE INDIVIDUAL LABELS		Varies	Varies from 4 hr to 2 days	
	M5	(chlorothalonil) Many brands available: Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus – DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock
	7	Fontelis (penthiopyrad)	30 fl oz	72 fl oz	0	12 hr	
	11	Aproach (picoxystrobin)	12 fl oz	24 fl oz	14	12 hr	
	11	Headline Headline SC Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz	7 (succulent) 21 (dry)	12 hr	Limit 2 appl/crop & alternate chemistry
	M1 & M1	Badge SC Badge X2 (copper hydroxide; copper oxychloride) C-O-C-S WDG (basic copper sulfate; copper oxychloride)	2 pt 1.5 lb	16.6 pt 9.2 lb	0	1 (greenhouse) 2 (field)	
	3 & 7	Miravis Top (difenoconazole; pydiflumetofen)	13.7 fl oz	54.8 fl oz	14	12 hr	
	7 & 3	Aprovia Top (benzovindiflupyr; difenoconazole)	11 fl oz	22 fl oz	14 (dry)	12 hr	Apply on a 14-day schedule
	7 & 11	Priaxor Xemium (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.
	Downy mildew	M1	(copper compounds) Many brands available: 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, Nu-Cop 30 HB, Previsto	SEE INDIVIDUAL LABELS			4 hr to 2 days (see label)
M5		(chlorothalonil) Many brands available:	SEE INDIVIDUAL LABELS		7 or 14	12 hr	Do not use on crops for livestock

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chloronil 720, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus –DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz							
M1 & M1	Badge SC		2 pt	16.6 pt	0	1 (greenhouse)	
	Badge X2 (copper hydroxide; copper oxychloride)			16.9 pt		2 (field)	
	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
M1 & 4	Ridomil Gold /Copper (copper hydroxide; mefenoxam)		2 lb	8 lb	3	2	Limit 4 appl./crop
1	St-Methyl 540 FS (thiophanate-methyl)		0.28 fl oz/100 lb seed			12 hr	
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	
11	Approach (picoxystrobin)		12 fl oz	24 fl oz	14	12 hr	
11	Headline, Headline SC, Willowood Pyrac 2EC (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	
7 & 11	Priaxor Xemium (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.
Fusarium seeding blight, Fusarium root rot	1	Mertect 340-F	0.68 fl oz/100 lb seed			12 hr	
		Thiabendazole 4L ST (thiabendazole)	1.72 fl oz/100 lb seed			12 hr	
	1	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	
	3	Redigo 480 (prothioconazole)	0.32 fl oz/100 lb seed			12 hr	
	7	Systiva XS Xemium (fluxapyroxad)	0.47 fl oz/100 lb seed				
	11	Stamina (pyraclostrobin)	1.5 fl oz/100 lb seed				
	12	Dyna-Shield Fludioxonil 4L ST, Maxim 4F S, Spirato 480 FS, STartUp FLUDI (fludioxonil)	0.16 fl oz/100 lb seed			12 hr	
	3 & 4	Rancona Summit (ipconazole; metalaxyl)	4.0 fl oz/100 lb seed			1	
	7 & 3	Rancona V 100 Pro FS (carboxin; ipconazole)	1.5 fl oz/100 lb seed			12 hr	

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²	
			Applic.	Season	Harvest	Reentry		
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.								
	4 & 11	Trilex 2000 (metalaxyl; trifloxystrobin)	1.0 fl oz/100 lb seed			1		
	4 & 12	Apron Maxx RFC	1.5 fl oz/100 lb seed			2		
		Apron Maxx RTA (mefenoxam; fludioxonil)	5.0 fl oz/100 lb seed			2		
	7 & M3	Vitafla-280 (carboxin; thiram)	4.0 fl oz/100 lb seed			1	Seed treatment	
	4 & 7 & 3	EverGol Energy (metalaxyl; penflufen; prothioconazole)	1.0 fl oz/100 lb seed			1		
	4 & 7 & 12	Vibrance Maxx (mefenoxam; sedaxane; fludioxonil)	1.54 fl oz/100 lb seed			2		
	11 & 12 & 4 & 4A (insecti- cide)	Seed Shield Beans (azoxystrobin; fludioxonil; mefenoxam; thiamethoxam)	3.0 fl oz/100 lb seed			2		
Phytophthora	4	Acquire Allegiance FL Dyna-Shield metalaxyl 318 FS Metalaxyl 4.0 ST Sebring 318 FS Sebring 480 FS (metalaxyl)	0.75 fl oz/ 100 lb seed except for Metalaxyl 4.0 ST at 0.5 fl oz/100 lb seed			1	Seed treatment	
	4	Apron XL (mefenoxam)	0.32 fl oz/100 lb of seed			2	Seed treatment only	
	21	Ranman 400SC Fungicide (cyazofamid)	2.75 fl oz	16.5 fl oz	0	12 hr		
		Apron Maxx RTA (mefenoxam; fludioxonil)	5 fl oz/100 lb seed			2	Seed treatment only	
	11 & 12 & 4 & 4A	Seed Shield Beans (azoxystrobin; fludioxonil; mefenoxam; thiamethoxam)	3 fl oz/100 lb seed			2	Seed treatment only	
		M1	Cueva (copper ocanoate)	2 gal			0	4 hr OMRI listed
		M2	(sulfur) Many brands available: Cosavet-DF Edge, Micro Sulf, Microfine Sulfur, Microthiol Disperss, Suffa, Sulfur 6 L, Sulfur 90W, THAT Flowable Sulfur, Thiolux, Wettable Sulfur, TriTek	SEE INDIVIDUAL LABELS			1	Do not apply during periods of warm weather to avoid phytotoxicity
	M1 & M2	Top Cop with Sulfur (basic copper sulfate; sulfur)	2 qt			0	1 Do not use in aluminum tanks	
	7	Fontelis Vertisan (penthiopyrad)	30 fl oz 20 fl oz	72 f oz 41 fl oz		0 21 (seed) 0 (hay)	12 hr 12 hr	
	11	Aproach (picoxystrobin)	12 fl oz	24 fl oz		14	12 hr	
	11	Headline Headline SC Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz		7	12 hr Limit 2 appl/crop & alternate chemistry	
	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.	

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Labels change frequently. Be sure to read a current product label before applying any chemical.							
Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.							
	7 & 11	Priaxor Xemium (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 FL Dyna-Shield metalaxyl 318 FS Metalaxyl 265 ST Metalaxyl 4.0 ST Sebring 318 FS Sebring 480 FS (metalaxyl)	0.75 fl oz/ 100 lb seed			1	Seed treatment
	4	MetaStar 2E (metalaxyl)	4 pt			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
	3 & 4	Rancona Summit (ipconazole; metalaxyl)	4.0 fl oz/100 lb seed			1	
	4 & 11	Trilex 2000 (metalaxyl; trifloxystrobin)	1.0 fl oz/100 lb seed			1	
	4 & 11	Uniform (mefenoxam; azoxystrobin)	0.34 fl oz/ 1000 ft row			0	
	4 & 12	Apron Maxx RFC Apron Maxx RTA Spirao M 185 FS (metalaxyl; fludioxonil)	1.5 fl oz/ 100 lb seed 5.0 fl oz/ 100 lb seed 1.5 fl oz/ 100 lb seed			2 2 2	
	7 & M3	Vitaflo-280	4 fl oz/ 100 lb seed			1	
Rhizoctonia diseases	1	St-Methyl 540 FS T-Methyl 4.5L ST (thiophanate-methyl)	0.28 fl oz/ 100 lb seed			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> .
	3	Propiconazole 3.6 EC (propiconazole)	4 fl oz	12 fl oz	7	12 hr	Web blight (<i>Rhizoctonia solani</i>)
	7	Systiva XS Xemium (fluxapyroxad)	0.47 fl oz/ 100 lb seed				
	11	Aframe AzoxyStar Azoxystrobin 100 ST Azoxyzone Azteroid FC	0.8 fl oz/ 1000 row ft 3.75 fl oz/ 100 lb seed 0.8 fl oz/ 1000 row ft 1.0 fl oz/ 1000 row feet			0 4 hr 4 hr 0 4 hr	Seed treatment For <i>Rhizoctonia</i> root rot (<i>Rhizoctonia solani</i>)
			19.5 fl oz	116 fl oz	14 (dry) 0 (succulent)	4 hr	For web blight (<i>Rhizoctonia solani</i>)
		Dynasty	0.765 fl oz/100 lb seed			4 hr	Seed treatment

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.							
		Mazolin	0.8 fl oz/ 1000 row ft				Avoid application directly to seed since delayed emergence may occur
		Quadris	15.5 fl oz	92.3 fl oz	14 (dry) 0 (succulent)	4 hr	web blight (<i>Rhizoctonia solani</i>)
		Satori Fungicide	0.8 fl				
		Tetraban	oz/1000				
		Trevo	row ft				
		Willowood Azoxy 2SC (azoxystrobin)					
	11	Stamina (pyraclostrobin)	1.5 fl oz/100 lb seed			12 hr	Seed treatment
	11	Willowood Pyrac 2EC (pyraclostrobin)	9 fl oz	18 fl oz	1	12 hr	
	12	Dyna-Shield Fludioxonil	0.16 fl			12 hr	Seed treatment only
		Fludioxonil 4L ST	oz/100 lbs				
		Maxim 4FS	seed				
		Spirato 480FS					
		STartUp FLUDI (fludioxonil)					
	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.
	7 & M3	Vitaflor-280 (carboxin; thiram)	4 fl oz per 100 lb seed			1	Seed treatment
	3 & 4	Rancona Summit (Iaconazole; Metalaxyl)	4 fl oz/100 lb seed			1	
	4 & 11	Trilex 2000 (metalaxyl; trifloxystrobin)	1.0 fl oz/100 lb seed			1	
	4 & 11	Uniform (mefenoxam; azoxystrobin)	0.34 fl oz/ 1000 ft row			0	
	4 & 12	Apron Maxx RFC (mefenoxam; fludioxonil)	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
	11 & 4	Uniform Fungicide (azoxystrobin; mefenoxam)	0.34 fl oz/ 1000 row ft			0	Make only one application per season
	11 & 3	Aframe Plus	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	12 hr	For web blight (<i>Rhizoctonia solani</i>)
		Avaris 2XS	14 fl oz	42 fl oz	14 (dry) 7 (succulent)	12 hr	For web blight (<i>Rhizoctonia solani</i>)
		Cover XL	14 fl oz	42 fl oz	14 (dry)	12 hr	For web blight (<i>Rhizoctonia solani</i>)
		Quilt Xcel			7 (succulent)		
		Willowood AzoxyProp Xtra (azoxystrobin; propiconazole)					
White mold	1	(thiophanate-methyl) Many brands available: 3336 EG, 3336 F, 3336 WP, Helena T-Methyl 4.5 AG, Incognito 4.5F, Nufarm T-methyl 4.5F, Topsin 4.5FL 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.
	M1	Cueva (copper octanoate)	2 gal		0	4 hr	OMRI-listed
	2	Iprodione 4L AG Fungicide Meteor Nevado 4F Rovral 4 Flowable (iprodione)	2 pt	4 pt	0	1	Limit 2 applications per season. Not for use as livestock feed

Table 11.6. 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 ¹	Chemical (active ingredients)	Max. Rate/Acre		Min. Days to		Remarks ²
			Applic.	Season	Harvest	Reentry	
Labels change frequently. Be sure to read a current product label before applying any chemical. Please refer to Chapter 19 for information on biopesticides including materials labeled for certified organic production.							
	7	Endura (boscalid)	11 oz	22 oz	7 (succulent)	12 hr	Limit 2 appl/crop & alternate chemistry
	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)		
	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.
	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	
	7 & 3	Propulse (fluopyram; prothioconazole)	10.3 fl oz	20.5 fl oz	14	2	For dry-edible beans and peas. Do not use on crops for livestock.
	7 & 11	Priaxor Xemium (fluxapyroxad; pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	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	
	1 & 3 & 11	Trevo Packed (thiophanate-methyl; tebuconazole; azoxystrobin)	30 fl oz		14 (fresh) 28 (dry)	1	

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

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

Table 11.7. Non-fumigant nematicides for legume crops in Florida.

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