

# Chapter 11. Legume Production<sup>1</sup>

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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)

**Snowpea**—*Pisum sativum*

**Southernpea/Yard-long bean**—*Vigna unguiculata*

**Winged bean**—*Psophocarpus tetragonolobus*

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Table 1. Planting information for legumes.

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

## Cultivars

Table 2. Commercial legume cultivars.

Green Bush			Yellow Bush	Green Pole	Lima
Affirmed	Greencrop	PV 857	Carson	Dade	Bridgeton
BA 0958	Jackson	PV 959	Golden Rod	Macaslan	Fordhook 242
Caprice	LaSalle	Sybaris (BA 1007)	Gold Strike		Jackson Wonder
Coyote	Momentum	Valentino	SV 1003		Thorogreen
Desoto	PV 575				
Southern Pea			Snowpea		
CA Blackeye No.5	Pinkeye Purplehull	Top Pick Pinkeye	Oregon Sugarpod II		
Cream 8	Quickpick	White Acre			
Cream 12	Texas Cream 40	Zipper Cream			
Coronet Pinkeye	Top Pick Cream				
Knuckle Purplehull	Top Pick Crowder				

## 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 leaves and stem tips. For instance, the winged bean has edible leaves and roots, though the latter are rarely cultivated commercially in the continental United States. Pole bean, long (or yard long) bean (both dark- and light-green colors), broad bean, and lablab beans are commercially grown in south Florida. All the pole or indeterminate types can be grown on raised beds with or without plastic mulch using drip, overhead, or subsurface irrigation. Fenugreek

does not grow well in rocky soils, such as those found in Miami-Dade County. Pigeon peas are a semiperennial shrub in warmer areas. Many pigeon pea and winged bean varieties are short day and only flower during the fall. There are some day-neutral varieties available for both crops. Edamame varieties, especially those from seed companies in the United States, are sensitive to daytime length, so care must be taken to select varieties for one's growing area. Japanese varieties are classified as "summer" or "fall" types, indicating when they flower. Fertilizer recommendations for pole, long, or broad beans are generally applicable to

this group. All of these crops are started from seed, though winged beans require scarification prior to planting. All the indeterminate types need some kind of support, ranging from individual bamboo stakes to trellises. However, some bush-type broad beans (Indian type) do not need trellises. For pest control products, these crops are included in the legume crop chapter.

**Table 3. Planting information for Asian legumes.**

<b>Planting Dates</b>	<b>Cluster Bean/Guar</b>	<b>Edamame</b>	<b>Fenugreek</b>	<b>Hyacinth Bean</b>
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
<b>Planting Dates</b>	<b>Pigeon Pea</b>	<b>Snowpea</b>	<b>Winged Bean</b>	<b>Yard-long Bean</b>
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 4. Cultivars for Asian legumes.**

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

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

Active Ingredient lb a.i./A	Trade Name Product/A	MOA Code	Crops	Weeds Controlled/Remarks
<b>Labels change frequently. Be sure to read a current product label before applying any chemical.</b>				
*** PREEMERGENCE ***				
<b>Carfentrazone</b> 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 burndown for emerged broadleaf weeds. Use crop oil concentrate, methylated seed oil, or nonionic surfactant at recommended rates. Maximum rate of 0.096 lba.i./A per season. No pretransplant interval.
<b>EPTC</b> 2.0–4.0	(Eptam) 7E 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.
<b>Fomesafen</b> 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.
<b>Glyphosate</b>	(various formulations) consult labels	9	Bean (all), pea (all)	Emerged broadleaf and grass weeds. Consult individual labels for restrictions.
<b>Halosulfuron</b> 0.02	(Sanda) 75 DF 0.5 oz	2	Bean (black-eyed, cowpea, southern pea)	Broadleaf weeds and nutsedge. Apply after planting but before crop emergence. May cause significant, temporary stunting and delayed maturity of peas, resulting in delayed harvest.
<b>Imazethapyr</b> 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 week of planting or preemergence application within 1 day after planting. PHI 3 days.
<b>Imazethapyr</b> 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.
<b>Paraquat</b> 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.
<b>Pelargonic acid</b>	(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 herbicide.
<b>Pendimethalin</b> 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.
<b>Pyraflufen</b> 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.
<b>Saflufenacil</b> 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 within 14 days between timings. Do not apply more than 2 fl oz/A per season.
<b>S-metolachlor</b> 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.
<b>Sulfentrazone</b> 0.07–0.09	(Willowood sulfentrazone) 4 SC 2.25–3.0 fl oz	14	Bean and pea (dry shelled)	Broadleaf and grass weed control, nutsedge suppression. Do not apply on sands with less than 1% organic matter. Do not apply more than 8 fl oz/A within a 12-month period. Trial on a small area.

Active Ingredient lb a.i./A	Trade Name Product/A	MOA Code	Crops	Weeds Controlled/Remarks
<b>Sulfentrazone</b> 0.07–0.12	(Willowood sulfentrazone) 4 SC 2.25–3.75 fl oz	14	Succulent pea	Broadleaf and grass weed. Nutsedge suppression. Do not apply on sands with less than 1% organic matter. Do not apply more than 6 fl oz/A within a 12-month period. Trial on a small area.
<b>Trifluralin</b> 0.5–0.75	(Treflan, Trust) 4 EC 1.0–1.5 pt (Treflan, Trifluralin) 10 G 5.0–7.5 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>				
<b>Bentazon</b> 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 trifoliate 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.
<b>Carfentrazone</b> 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. Include crop oil concentrate or nonionic surfactant is recommended rates. PHI 0 days.
<b>Clethodim</b> 0.094–0.25 0.07–0.25	(Arrow) 2 EC 6–16 fl oz (Select Max) 1 EC 9–32 fl oz	1	Bean (succulent), pea (succulent)	Annual and perennial grass control. Consult label for bean types. PHI 21 days.
<b>EPTC</b> 3.1–4.0	(Eptam) 7 E 3.5–4.5 pt	8	Bean (green, dry)	Broadleaf and nutsedge weeds. Apply as layby treatment during the last cultivation of the season. Direct spray solution to the base of the crop. Do not exceed 9 pt/A per crop.
<b>Fluazifop</b> 0.19–0.38	(Fusilade DX) 2 EC 12–24 fl oz	1	Bean (dry)	Annual and perennial grass weeds. Do not apply to cowpea. Do not apply more than 48 fl oz/A per season. Include a COC or NIS in the spray solution. PHI 60 days.
<b>Fomesafen</b> 0.25–0.38	(Reflex) 2 EC 1.0–1.5 pt	14	Bean (dry, snap)	Annual broadleaf and grass weeds and nutsedge. Not for use in Miami-Dade County. Consult label for rate based on size of specific weed species. Do not apply more than 1.5 pt/A per year.
<b>Halosulfuron</b> 0.02–0.03	(Sandea) 75 DF 0.5–0.66 oz	2	Bean (dry)	Broadleaf weeds and nutsedge. Row middles only. Avoid contact with planted crop. Do not apply more than 1 oz/A per crop.
<b>Halosulfuron</b> 0.02–0.03	(Sandea) 75 DF 0.5–0.66 oz	2	Bean (snap, lima)	Broadleaf weeds and nutsedge. Directed sprays. Apply after the two to four trifoliate leaf stage, but before flowering.
<b>Imazethapyr</b> 0.14	(Pursuit) 2 L 3.0 oz	2	Bean (dry), bean (southern pea), pea (dry, English)	Do not apply before bean has at least one trifoliate leaf. Apply to peas at least 3 in. in height, but prior to the fifth node and before flowering. Consult label for preharvest intervals.
<b>Pelargonic acid</b>	(Scythe) 4.2 EC 3%–10% v/v	27	Bean (all), pea (all)	Emerged weeds, row middles only. Use a shielded sprayer directed to the row middles to reduce drift to the crop
<b>Quizalofop</b> 0.04–0.08	(Assure II) 6–12 fl oz	1	Bean (snap, dry), pea (succulent, dry)	Annual and perennial grass weeds. Allow 7 days between sequential applications to allow for regrowth. Include a COC or NIS in the spray solution. PHI 30 days for succulent pea and dry bean. PHI 60 days for dry pea.
<b>Sethoxydim</b> 0.19–0.47	(Poast) 1.5 EC 1.0–2.5 pt	1	Bean (dry, succulent), pea (dry, succulent)	Growing grass weeds. Do not exceed 4.0 pt/A per season. Include a COC in the spray solution. PHI 30 days for dry bean and dry pea. PHI days for succulent bean and succulent pea.

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

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
<b>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.</b>							
<b>Aphids</b>	1A	*Lannate LV; *SP (methomyl)	LV: 1.50–3 pt SP: 0.25–1.0 lb	LV: 15 pt SP: 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	<b>Mechanical harvesting: 0</b>	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	Dry succulent: 14 Lima beans succulent form: 1	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	Snap: 3 Dry beans and peas: 21	Do not feed or graze livestock on treated vines.
	3A	*Brigade 2 EC (bifenthrin)	2.1–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	Succulent: 3 Dry: 14	
	3A	PyGanic 5.0 (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . 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	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.
	4A + 15	Cormoran (novaluron + acetamiprid)	9-12 fl oz	36 fl oz	12	7	
	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	Succulent: 1 Dry: 7	
	-	Aza-Direct (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed <sup>2</sup> . Antifeedant, repellent, insect growth regulator.
	-	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.

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	-	<b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	No limit	4	0	OMRI-listed <sup>2</sup> . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	<b>Grandevo</b> ( <i>Chromobacterium subtusgae</i> strain PRAA4-1)	1–3 lb	None	4	0	OMRI-listed <sup>2</sup> . Succulent or dried.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25%–4.0% v/v	No limit 7-to-10-day interval	12	0	OMRI-listed <sup>2</sup> .
	-	<b>Neemix 4.5</b> (azadirachtin)	4–16.0 fl oz	20 g a.i.	4	0	OMRI-listed <sup>2</sup> . Insect growth regulator and feeding repellent.
	-	<b>Sun Spray 98.8%</b> , <b>JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	<b>JMS:</b> 3–6 qt/100 gal <b>Others:</b> 1–2 gal/100gal	No limit	4	0	OMRI-listed <sup>2</sup> .
	-	<b>Trilogy</b> (extract of neem oil)	1.0%–2.0% v/v	No limit	4	0	OMRI-listed <sup>2</sup> .
	- + 3A	<b>BotaniGard Maxx</b> ( <i>Beauveria bassiana</i> strain GHA + pyrethrins)	0.25–2.0 qt	No limit	12	0	
<b>Armyworm, corn earworm, lesser cornstalk borer, loopers, cutworm, caterpillar, grubs, root maggots, wireworms</b>	1A	<b>*Lannate LV; *SP</b> (methomyl)	<b>LV:</b> 1.50–3 pt <b>SP:</b> 0.50–1.0 lb	<b>LV:</b> 15 pt <b>SP:</b> 5.0 lb	48	See label: varies with rate and crop use.	
	1A	<b>Sevin 4F</b> (carbaryl)	0.50–1.5 qt	6.0 qt/year	12	Fresh beans & peas: 3 Grazing or forage: 14 Dried beans seed or hay: 21	Use on succulent shelled peas and beans prohibited.
	1B	<b>*Diazinon 50W AG 500</b> (diazinon)	<b>50W:</b> 4.8 lb <b>AG500:</b> 2–4 qt	1 application per year	72	Broadcast at planting	Succulent beans and peas only. Soil application only.
	1B	<b>*Dibrom 8E</b> (naled)	1–1.5 pt	4.5 pt	48	1	Ground application only, not for cowpeas and fieldpeas intended for livestock forage.
	1B	<b>Orthene 97</b> (acephate)	0.75–1.0 lb	2.0 lb a.i.	24	Dry or succulent: 14 Lima beans, succulent form: 1	Do not apply to succulent beans for fresh market or processing. Do not feed treated vines or seeds to livestock.



Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	3A	<b>*Asana XL</b> (esfenvalerate)	5.8–9.6 fl oz	38.4 fl oz	12	Snap: 3 Dry beans and peas: 21	Do not feed or graze livestock on treated vines.
	3A	<b>*Baythroid XL</b> (beta-cyfluthrin)	Dry beans and peas: 0.8–3.2 fl oz Southern pea: 0.8–2.1 fl oz	Dry beans and peas: 6.4 fl oz Southern peas: 10.5 fl oz	12	Dry beans and peas: 7 Southern pea: 3	<b>Not for use on succulent beans or peas.</b> Do not feed treated vines or hay to livestock.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	Succulent: 3 Dry: 14	
	3A	<b>*Capture LFR</b> (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	<b>*Declare Insecticide</b> (gamma-cyhalothrin)	1.54 fl oz	0.38 pt	24	Edible podded and succulent shelled: 7 Dry beans and peas: 21	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	<b>*Mustang</b> (zeta-cypermethrin)	3.0–4.3 oz <b>Maxx:</b> 1.28–4.0 oz	25.8 oz <b>Maxx:</b> 24 oz	12	Succulent: 1 Dried shelled peas or beans: 21	Can also be applied at planting for control of cutworms, white grubs, and wireworms. See label.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	3A	<b>*Warrior II</b> (lambda-cyhalothrin)	0.96–1.92 fl oz	7.68 fl oz	24	Edible podded and succulent shelled: 7 Dried, shelled: 21	Do not graze livestock in treated areas.
	3A + 28	<b>*Besiege</b> (lambda-cyhalothrin + chlorantraniliprole)	5–10 fl oz	31 fl oz	24	Edible podded succulent shelled: 7 Dry shelled: 21	
	5	<b>Entrust SC</b> (spinosad)	1.25–2.0 oz	Succulent: 9.0 fl oz Dry: 3.75 fl oz	4	Succulent: 3 Dry: 28	OMRI-listed <sup>2</sup> . Do not feed forage or hay to meat or dairy animals.
	5	<b>Radiant SC</b> (spinetoram)	4–8 fl oz	Succulent: 28.0 fl oz Dry: 12.0 fl oz	4	Succulent: 3 Dry: 28	
	6 + 28	<b>*Minecto Pro</b> (abamectin + cyantraniliprole)	7.5–10 fl oz	20 fl oz	12	7	
	11A	<b>Javelin WG</b> ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.12–1.50 lb	No limit	4	0	OMRI-listed <sup>2</sup> . Treat when larvae are young. Thorough coverage is essential.



Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
Cucumber beetle, bean leaf beetle, Mexican bean beetle, cowpea curculio	11A	<b>Xentari DF</b> ( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> )	0.5–2.0 lb	No limit	4	0	OMRI-listed <sup>2</sup> . Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse.
	15	<b>Rimon 0.83 EC</b> (novaluron)	6–12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	18	<b>Intrepid 2F</b> (methoxyfenozide)	4–16 fl oz	64 fl oz	12	7	
	22	<b>Avaunt</b> (indoxacarb)	3.5 oz	14 fl oz	12	7	Southern pea (dry) varieties only.
	28	<b>Coragen</b> (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	<b>Exirel</b> (cyantraniliprole/cyazypyr)	10.5–20.5 oz	No more than 0.4 lb a.i. of Group 28 products	12	Succulent: 1 Dried: 7	Label contains pollinator warning language.
	-	<b>Aza-Direct</b> (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed <sup>2</sup> . Antifeedant, repellent, insect growth regulator.
	-	<b>BotaniGard ES</b> ( <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.
	-	<b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	No limit	4	0	OMRI-listed <sup>2</sup> . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	- + 3A	<b>BotaniGard Maxx</b> ( <i>Beauveria bassiana</i> strain GHA + pyrethrins)	0.25–2.0 qt	No limit	12	0	
	1A	<b>*Lannate LV; *SP</b> (methomyl)	<b>LV:</b> 0.75–3 pt <b>SP:</b> 0.25–1.0 lb	<b>LV:</b> 15 pt <b>SP:</b> 5.0 lb	48	See label; varies with rate & crop	
	1A	<b>Sevin 4F</b> (carbaryl)	0.50–1.5 qt	6.0 qt/year	12	Fresh beans and peas: 3 Grazing or forage: 14 Dried beans, peas, seed, or hay: 21	Use on succulent shelled peas and beans prohibited.
	1B	<b>Dimethoate 4EC</b> (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	<b>Mechanical harvesting:</b> 0	Do not feed treated vines. Do not use on field peas.

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	1B	<b>Orthene 97</b> (acephate)	0.50–1.0 lb	2.0 lb a.i.	24	Dry succulent: 14 Lima beans succulent form: 1	Do not apply to succulent beans for fresh market or processing.
	1B	<b>*Thimet 20G EZ Load</b> (phorate)	4.9–9.4 oz/1000 ft row	1 application only at plant	48	60	<b>Poison.</b> Label pending in Florida. Do not graze livestock on treated forage. No direct contact with seed.
	3A	<b>*Baythroid XL</b> (beta-cyfluthrin)	Dry beans and peas: 0.8–3.2 fl oz Southern pea: 0.8–2.1 fl oz	Dry beans and peas: 6.4 fl oz Southern pea: 10.5 fl oz	12	Dry beans and peas: 7 Southern pea: 3	<b>Not for use on succulent beans or peas.</b> Do not feed treated vines or hay to livestock.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	Succulent: 3 Dry: 14	
	3A	<b>*Declare Insecticide</b> (gamma-cyhalothrin)	1.02–1.54 fl oz	0.38 pt	24	Edible podded and succulent shelled: 7 Dry beans and peas: 21	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	<b>*Mustang</b> <b>*Mustang Maxx</b> (zeta-cypermethrin)	3.0–4.3 oz <b>Maxx:</b> 2.72–4.0 oz	25.8 oz <b>Maxx:</b> 24.0 oz	12	Succulent: 1 Dried shelled peas or beans: 21	Can also be applied at planting for control of cutworms, white grubs, and wireworms. See label.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	3A	<b>*Warrior II</b> (lambda-cyhalothrin)	0.96–1.92 fl oz	7.68 fl oz	24	Edible podded and succulent shelled: 7 Dried, shelled: 21	
	3A + 28	<b>*Besiege</b> (lambda-cyhalothrin + chlorantraniliprole)	5–10 fl oz	31 fl oz	24	Edible podded succulent shelled: 7 Dry shelled: 21	
	4A	<b>Assail 30SG</b> (acetamiprid)	2.5–5.3 fl oz	16 fl oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	4A + 15	<b>Cormoran</b> (novaluron + acetamiprid)	9–12 fl oz	36 fl oz	12	7	
	15	<b>Rimon 0.83 EC</b> (novaluron)	9–12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	-	<b>Aza-Direct</b> (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed <sup>2</sup> . Antifeedant, repellent, insect growth regulator.
	-	<b>Neemix 4.5</b> (azadirachtin)	4–16 fl oz	20 g a.i.	12	0	OMRI-listed <sup>2</sup> . Insect growth regulator and feeding repellent.
<b>Fire ants</b>	7A	<b>Extinguish</b> (S-methoprene)	1–1.5 lb broadcast	No limit	4	0	Insect growth regulator. Colonies will get reduced after three weeks and eliminated after 8–10 weeks.
	7C	<b>Esteem Ant Bait</b> (pyriproxyfen)	1.5–2.0 lb	0.134 lb a.i.	12	1	Insect growth regulator. Apply at first sign of ant activity.
<b>Grasshoppers</b>	1B	<b>Dimethoate 4EC</b> (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	<b>Mechanical harvesting: 0</b>	Do not feed treated vines. Do not use on field peas.
	3A	<b>*Asana XL</b> (esfenvalerate)	5.8–9.6 fl oz	38.4 fl oz	12	Snap: 3 Dry beans and peas: 21	Do not feed or graze livestock on treated vines.
	3A	<b>*Baythroid XL</b> (beta-cyfluthrin)	Beans and peas: 2.4–3.2 fl oz Southern pea: 1.6–2.1 fl oz	Beans and peas: 6.4 fl oz Southern pea: 10.5 fl oz	12	Dry beans and peas: 7 Southern pea: 3	<b>Not for use on succulent beans or peas.</b> Do not feed treated vines.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	Succulent: 3 Dry: 14	
	3A	<b>*Declare Insecticide</b> (gamma-cyhalothrin)	1.02–1.54 fl oz	0.38 pt	24	Edible podded and succulent shelled: 7 Dry: 21	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	<b>*Mustang</b> <b>*Mustang Maxx</b> (zeta-cypermethrin)	3.0–4.3 oz <b>Maxx:</b> 3.2–4.0 oz	25.8 oz <b>Maxx:</b> 24.0 oz	12	Succulent: 1 Dried shelled peas or beans: 21	Can also be applied at planting for control of cutworms, white grubs, and wireworms. See label.
	3A	<b>*Warrior II</b> (lambda-cyhalothrin)	1.28–1.92 fl oz	7.68 fl oz	24	Edible podded and succulent shelled: 7 Dried, shelled: 21	Do not graze livestock in treated areas.
	3A + 28	<b>*Besiege</b> (lambda-cyhalothrin + chlorantraniliprole)	5–10 fl oz	31 fl oz	24	Edible podded succulent shelled: 7 Dry shelled: 21	
	-	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> strain GHA)	0.25–1 qt	No limit	4	0	May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
Leafhopper	-	<b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)	0.25–1 qt	No limit	4	0	OMRI-listed <sup>2</sup> . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	- + 3A	<b>BotaniGard Maxx</b> ( <i>Beauveria bassiana</i> strain GHA + pyrethrins)	0.25–2.0 qt	No limit	12	0	
	1A	<b>*Lannate LV; *SP</b> (methomyl)	<b>LV:</b> 0.75–3 pt <b>SP:</b> 0.25–1.0 lb	<b>LV:</b> 15 pt <b>SP:</b> 5.0 lb	48	See label; varies with rate & crop.	
	1B	<b>*Dibrom 8E</b> (naled)	1.0 pt	4.5 pt	48	1	Ground application only; not for cowpeas and fieldpeas intended for livestock forage.
	1B	<b>Dimethoate 4EC</b> (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	<b>Mechanical harvesting:</b> 0	Do not feed treated vines. Do not use on field peas.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	Succulent: 3 Dry: 14	
	3A	<b>*Mustang</b> <b>*Mustang Maxx</b> (zeta-cypermethrin)	3.0–4.3 oz <b>Maxx:</b> 2.72–4.0 oz	25.8 oz <b>Maxx:</b> 24.0 oz	12	Succulent: 1 Dried shelled peas or beans: 21	Can also be applied at planting for control of cutworms, white grubs, and wireworms. See label.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	3A	<b>*Warrior II</b> (lambda-cyhalothrin)	1.28–1.92 fl oz	7.68 fl oz	24	Edible podded and succulent shelled: 7 Dried, shelled: 21	Do not graze livestock in treated areas.
	4A	<b>Admire Pro</b> (imidacloprid)	<b>Soil:</b> 7–10.5 fl oz <b>Foliar:</b> 1.2 fl oz	<b>Soil:</b> 10.5 fl oz <b>Foliar:</b> 3.6 fl oz	12	<b>Soil:</b> 21 <b>Foliar:</b> 7	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used.
4A	<b>Assail 30SG</b> (acetamiprid)	2.5–5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.	
4A + 15	<b>Cormoran</b> (novaluron + acetamiprid)	9–12 fl oz	36 fl oz	12	7		
4D	<b>Sivanto Prime</b> (flupyradifurone)	7.0–10.5 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days.	
16	<b>Courier 40 SC</b> (buprofezin)	9.0–13.6 fl oz	27.2 fl oz	12	14	Insect growth regulator. For succulent beans only. Good coverage essential.	
28	<b>Exirel</b> (cyantraniliprole/cyazapyr)	10.5–20.5 oz	no more than 0.4 lb a.i. of Group 28 products	12	Succulent: 1 Dried: 7	Label contains pollinator protection warnings.	

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	-	<b>Aza-Direct</b> (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed <sup>2</sup> . Antifeedant, repellent, insect growth regulator.
	-	<b>BotaniGard ES</b> ( <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.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25%–4.0% v/v	No limit 7-to-10-day interval	12	0	OMRI-listed <sup>2</sup> .
	-	<b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	No limit	4	0	OMRI-listed <sup>2</sup> . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	<b>Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	<b>JMS:</b> 3–6 qt/100 gal <b>Others:</b> 1–2 gal/100gal	No limit	4	0	OMRI-listed <sup>2</sup> .
	- + 3A	<b>BotaniGard Maxx</b> ( <i>Beauveria bassiana</i> strain GHA + pyrethrins)	0.25–2.0 qt	No limit	12	0	
<b>Liriomyza leafminers</b>	5	<b>Entrust SC</b> (spinosad)	1.5–2.0 oz	Succulent: 9.0 fl oz Dry: 3.75 fl oz	4	Succulent: 3 Dry: 28	OMRI-listed <sup>2</sup> . Do not feed forage or hay to meat or dairy animals.
	5	<b>Radiant SC</b> (spinetoram)	5–8 fl oz	Succulent: 28 fl oz Dry: 12 fl oz	4	Succulent: 3 Dry: 28	Time applications to small larvae.
	6	<b>*Agri-Mek SC</b> (abamectin)	1.75–3.5 fl oz	10.5 fl oz	12	7	To avoid illegal residues, must be mixed with a nonionic activator-type wetting, spreading and/or penetrating spray adjuvant. Do not feed treated vines or hay to livestock.
	6 + 28	<b>*Minecto Pro</b> (abamectin + cyantraniliprole)	7.5–10 fl oz	20 fl oz	12	7	
	17	<b>Trigard</b> (cyromazine)	2.66 oz 1 packet	0.75 lb a.i./acre	12	7	Not for use on soybeans or peas.
	28	<b>Coragen</b> (chlorantraniliprole/rynaxypyr)	7.5 fl oz	15.4 fl oz of chlorantraniliprole products per acre per year.	4	1	Foliar application only.
	28	<b>Exirel</b> (cyantraniliprole/cyazapyr)	10.5–20.5 oz	No more than 0.4 lb a.i. of Group 28 products	12	Succulent: 1 Dry: 7	
	-	<b>Neemix 4.5</b> (azadirachtin)	4–16 fl oz	20 g a.i.	12	0	OMRI-listed <sup>2</sup> . Insect growth regulator and feeding repellent.

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	-	<b>Sun Spray 98.8%</b> , <b>JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	<b>JMS:</b> 3–6 qt/100 gal <b>Others:</b> 1–2 gal/100gal	No limit	4	0	OMRI-listed <sup>2</sup> .
<b>Lygus bug, stink bug, kudzu bug</b>	1A	<b>*Lannate LV; *SP</b> (methomyl)	<b>LV:</b> 1.50–3 pt <b>SP:</b> 0.50–1.0 lb	<b>LV:</b> 15 pt <b>SP:</b> 5.0 lb	48	See label; varies with rate & crop.	
	1A	<b>Sevin 4F</b> (carbaryl)	1.0–1.5 qt	6.0 qt/year	12	Fresh beans and peas: 3 Grazing or forage: 14 Dried beans, peas, seed, or hay: 21	Use on succulent shelled peas and beans prohibited.
	1B	<b>*Dibrom 8E</b> (naled)	1–1.5 pt	4.5 pt	48	1	Ground application only; not for cowpeas and fieldpeas intended for livestock feed.
	1B	<b>Dimethoate 4EC</b> (dimethoate)	0.5–1.0 pt	2.0 pt/year	48	<b>Mechanical harvesting:</b> 0	Do not feed treated vines. Do not use on field peas.
	3A	<b>*Baythroid XL</b> (beta-cyfluthrin)	Beans and peas: 2.4–3.2 fl oz Southern pea: 1.6–2.1 fl oz	Beans and peas: 6.4 fl oz Southern pea: 10.5 fl oz	12	Dry beans and peas: 7 Southern pea: 3	<b>Not for use on succulent beans or peas.</b> Do not feed treated vines or hay to livestock.
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	5.12–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	Succulent: 3 Dry: 14	
	3A	<b>*Declare Insecticide</b> (gamma-cyhalothrin)	1.02–1.54 fl oz	0.38 pt	24	Edible podded and succulent shelled: 7 Dry beans and peas: 21	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	<b>*Mustang</b> <b>*Mustang Maxx</b> (zeta-cypermethrin)	3.4–4.3 oz <b>Maxx:</b> 3.2–4.0 oz	25.8 oz <b>Maxx:</b> 24.0 oz	12	Succulent: 1 Dried shelled peas or beans: 21	Can also be applied at planting for control of cutworms, white grubs, and wireworms. See label.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	3A	<b>*Warrior II</b> (lambda-cyhalothrin)	1.28–1.92 fl oz	7.68 fl oz	24	Edible podded and succulent shelled: 7 Dried, shelled: 21	

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	3A + 28	<b>*Besiege</b> (lambda-cyhalothrin + chlorantraniliprole)	5–10 fl oz	31 fl oz	24	Edible podded succulent shelled: 7 Dry shelled: 21	
	4A + 15	<b>Cormoran</b> (novaluron + acetamiprid)	12 fl oz	36 fl oz	12	7	
	15	<b>Rimon 0.83 EC</b> (novaluron)	12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	-	<b>Aza-Direct</b> (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed <sup>2</sup> . Antifeedant, repellent, insect growth regulator.
	-	<b>BotaniGard ES</b> ( <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.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25%–4.0% v/v	No limit	12	0	OMRI-listed <sup>2</sup> .
	-	<b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	No limit	4	0	OMRI-listed <sup>2</sup> . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	- + 3A	<b>BotaniGard Maxx</b> ( <i>Beauveria bassiana</i> strain GHA + pyrethrins)	0.25–2.0 qt	No limit	12	0	
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	5.12–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	Succulent: 3 Dry: 14	
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	6	<b>*Agri-Mek SC</b> (abamectin)	1.75–3.5 fl oz	10.5 fl oz	12	7	To avoid illegal residues, must be mixed with a nonionic activator-type wetting, spreading and/or penetrating spray adjuvant. Do not feed treated vines or hay to livestock.
	6 + 28	<b>*Minecto Pro</b> (abamectin + cyantraniliprole)	7.5–10 fl oz	20 fl oz	12	7	
	20B	<b>Kanemite 15 SC</b> (acequinocyl)	31 fl oz	62 fl oz	12	7	Succulent beans, including succulent soybean vegetable only.
	20D	<b>Acramite-50WS</b> (bifenazate)	1.0–1.5 lb	3.0 lb	12	3	Succulent beans, peas and soybean.
	21A	<b>Portal</b> (fenpyroximate)	2.0 pt	4.0 pt	12	1	Snap bean only. Allow 14 days between applications.



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Thrips	-	<b>Aza-Direct</b> (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed <sup>2</sup> . Antifeedant, repellent, insect growth regulator.
	-	<b>Grandevo</b> ( <i>Chromobacterium subtsugae</i> strain PRAA4-1)	1–3 lb	No limit	4	0	OMRI-listed <sup>2</sup> . Succulent or dried.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25%–4.0% v/v	No limit 7-to-10-day interval	12	0	OMRI-listed <sup>2</sup> .
	-	<b>Sun Spray 98.8%</b> , <b>JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	<b>JMS:</b> 3–6 qt/100 gal <b>Others:</b> 1–2 gal/100gal	No limit	4	0	OMRI-listed <sup>2</sup> .
	-	<b>Trilogy</b> (extract of neem oil)	1.0%–2.0% v/v	No limit	4	0	OMRI-listed <sup>2</sup> .
	1A	<b>*Lannate LV; *SP</b> (methomyl)	<b>LV:</b> 1.50–3 pt <b>SP:</b> 0.50–1.0 lb	<b>LV:</b> 15 pt <b>SP:</b> 5.0 lb	48	See label: varies with rate and crop use	
	3A	<b>*Hero</b> (zeta-cypermethrin + bifenthrin)	10.3 oz	27.39 oz	12	Succulent: 3 Dry: 21	
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> .
	3A+ 28	<b>*Besiege</b> (lambda-cyhalothrin + chlorantraniliprole)	6–10 fl oz	31 fl oz	24	Edible podded succulent shelled: 7 Dry shelled: 21	Does not include Western Flower Thrips.
	4A	<b>Admire Pro</b> (imidacloprid)	7–10.5 fl oz	10.5 fl oz	12	21	Only soil applied is labeled and only for foliar feeding thrips.
	4A	<b>Assail 30SG</b> (acetamiprid)	4.5–5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	4A + 15	<b>Cormoran</b> (novaluron + acetamiprid)	12 fl oz	36 fl oz (see remarks)	12	7	Do not apply more than two applications against thrips per season.
	5	<b>Entrust SC</b> (spinosad)	1.5–2.0 fl oz	Succulent: 9.0 fl oz Dry: 3.75 fl oz	4	Succulent: 3 Dry: 28	OMRI-listed <sup>2</sup> . Do not feed forage or hay to meat or dairy animals.
5	<b>Radiant SC</b> (spinetoram)	5–8 fl oz	Succulent: 28 fl oz Dry: 12 fl oz	4	Succulent: 3 Dry: 28		
6 + 28	<b>*Minecto Pro</b> (abamectin + cyantraniliprole)	10 fl oz	20 fl oz	12	7	Suppression of foliage-feeding only.	

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	15	<b>Rimon 0.83 EC</b> (novaluron)	12 fl oz	36.0 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	23	<b>Movento</b> (spirotetramat)	4–5 fl oz	10.0 fl oz	24	Succulent: 1 Dry: 7	
	28	<b>Exirel</b> (cyantraniliprole/cyazapyr)	10.5–20.5 oz	No more than 0.4 lb a.i. of Group 28 products	12	Succulent: 1 Dried: 7	Label contains pollinator protection warnings.
	-	<b>Aza-Direct</b> (azadirachtin)	1–2 pt	3.5 pt	4	0	OMRI-listed <sup>2</sup> . Antifeedant, repellent, insect growth regulator.
	-	<b>BotaniGard ES</b> ( <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.
	-	<b>Grandevo</b> ( <i>Chromobacterium subtusugae</i> strain PRAA4-1)	1–3 lb	No limit	4	0	OMRI-listed <sup>2</sup> . Succulent or dried.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25%–4.0% v/v	No limit	12	0	OMRI-listed <sup>2</sup> .
	-	<b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	No limit	4	0	OMRI-listed <sup>2</sup> . May be used in greenhouses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	<b>Sun Spray 98.8%</b> , <b>JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	<b>JMS:</b> 3–6 qt/100 gal <b>Others:</b> 1–2 gal/100gal	no limit	4	0	OMRI-listed <sup>2</sup> .
	-	<b>Trilogy</b> (extract of neem oil)	1.0%–2.0% v/v	no limit	4	0	OMRI-listed <sup>2</sup> . Apply morning or evening to reduce potential for leaf burn.
	- + 3A	<b>BotaniGard Maxx</b> ( <i>Beauveria bassiana</i> strain GHA + pyrethrins)	0.25–2.0 qt	No limit	12	0	
<b>Whiteflies</b>	3A	<b>*Brigade 2 EC</b> (bifenthrin)	2.1–6.4 fl oz	Succulent: 12.8 fl oz Dry: 19.2 fl oz	12	Succulent: 3 Dry: 14	
	3A	<b>*Mustang Maxx</b> (zeta-cypermethrin)	3.4–4.3 oz <b>Maxx:</b> 3.2–4.0 oz	25.8 oz <b>Maxx:</b> 24.0 oz	12	Succulent: 1 Dried shelled peas or beans: 21	Can also be applied at planting for control of cutworms, white grubs, and wireworms. See label.
	3A	<b>PyGanic 5.0</b> (pyrethrins)	4.5–17 fl oz	10 applications	12	0	OMRI-listed <sup>2</sup> . Treat when insects first appear.
	4A	<b>Admire Pro</b> (imidacloprid)	<b>Soil:</b> 7–10.5 fl oz <b>Foliar:</b> 1.2 fl oz	<b>Soil:</b> 10.5 fl oz <b>Foliar:</b> 3.6 fl oz	12	<b>Soil:</b> 21 <b>Foliar:</b> 7	Do not apply to both soil and foliage. Do not use other 4A insecticides if imidacloprid is used.

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	4A	<b>Assail 30SG</b> (acetamiprid)	4.0–5.3 fl oz	16 oz	12	7	Edible podded legumes and succulent shelled peas and beans.
	4A + 15	<b>Cormoran</b> (novaluron + acetamiprid)	12 fl oz	36 fl oz (see remarks)	12	7	Do not apply more than two applications against whiteflies per season.
	4D	<b>Sivanto Prime</b> (flupyradifurone)	10.5–14 fl oz	28.0 fl oz/year	4	7	Minimum interval between applications: 10 days
	6 + 28	<b>*Minecto Pro</b> (abamectin + cyantraniliprole)	10 fl oz	20 fl oz	12	7	
	7C	<b>Knack IGR</b> (pyriproxyfen)	8–10 fl oz	20 fl oz	12	7	
	15	<b>Rimon 0.83 EC</b> (novaluron)	12 fl oz	24 fl oz	12	1	Rimon disrupts molting and has no effect on adult insects.
	16	<b>Courier 40 SC</b> (buprofezin)	9.0–13.6 fl oz	27.2 fl oz	12	14	For succulent beans only. Allow 14 days between applications.
	23	<b>Movento</b> (spirotetramat)	4–5 fl oz	10.0 fl oz	24	Succulent: 1 Dry: 7	
	28	<b>Exirel</b> (cyantraniliprole/cyazapyr)	10.5–20.5 oz	No more than 0.4 lb a.i. of Group 28 products	12	Succulent: 1 Dried: 7	
	-	<b>BotaniGard ES</b> ( <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.
	-	<b>Grandevo</b> ( <i>Chromobacterium subtsugae</i> strain PRAA4-1)	1–3 lb	No limit	4	0	OMRI-listed <sup>2</sup> . Succulent or dried. Do not apply if bees are visiting treatment area.
	-	<b>M-Pede 49%</b> (soap, insecticidal)	0.25%–4.0% v/v	No limit 7-to-10-day interval	12	0	OMRI-listed <sup>2</sup> . Use with a companion insecticide.
	-	<b>Mycotrol ESO</b> ( <i>Beauveria bassiana</i> strain GHA)	0.25–1.0 qt	No limit	4	0	OMRI-listed <sup>2</sup> . May be used in houses. Contact dealer if adjuvant must be used. Compatible in tank mix with some fungicides.
	-	<b>Neemix 4.5</b> (azadirachtin)	4–16 fl oz	20 g a.i.	4	0	OMRI-listed <sup>2</sup> .
	-	<b>Sun Spray 98.8%, JMS Stylet Oil, Saf-T-Side, others</b> (oil, insecticidal)	<b>JMS:</b> 3–6 qt/100 gal <b>Others:</b> 1–2 gal/100gal	no limit	4	0	OMRI-listed <sup>2</sup> .

Insect or Mite Pest	MOA Code <sup>1</sup>	Trade Name (Active Ingredient) *Restricted	Rate (Product/Acre)	Max Rate Product per Season	REI (Hours)	Days to Harvest	Remarks <sup>2</sup>
	-	<b>Trilogy</b> (extract of neem oil)	1.0%–2.0% v/v	no limit	4	0	OMRI-listed <sup>2</sup> . Apply morning or evening to reduce potential for leaf burn.
	- + 3A	<b>BotaniGard Maxx</b> ( <i>Beauveria bassiana</i> strain GHA + pyrethrins)	0.25–2.0 qt	No limit	12	0	

<sup>1</sup> Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v.9.4, March 2020. Number codes (1 through 28) are used to distinguish the main insecticide mode of action groups, with additional letters for certain subgroups within each main group. All insecticides within the same group (with same number) indicate same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions. Un— unknown, or a mode of action that has not been classified yet.

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

\* **Restricted use insecticide**

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

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	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) <b>Many brands available:</b> Cueva, Kentan DF, Nordox, Nordox 75 WG	SEE INDIVIDUAL LABEL		Varies	Varies from 4 hr to 2 days	
	M1 + M1	<b>Badge SC</b> <b>Badge X2</b> (copper hydroxide + copper oxychloride)	2 pt	<b>SC:</b> 16.6 pt <b>X2:</b> 16.9 pt	0	<b>Greenhouse:</b> 1 <b>Field:</b> 2	
	M1 + M1	<b>C-O-C-S WDG</b> (basic copper sulfate + copper oxychloride)	1.5 lb	9.2 lb		2	
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus-DF Fungicide, Equus 720 SST, Initiate 720	SEE INDIVIDUAL LABEL		7 or 14	0.5	Do not use on crops for livestock.
	1	(thiophanate-methyl) <b>Many brands available:</b> 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 LABEL		14 to 28 (see label)	<b>3336 fungicides:</b> 0.5 Succulent beans: 1 Dry beans: 3	Apply once at 50%–70% bloom or twice (max=1.5 lb/appl.) with first at 10%–30% bloom and second at peak bloom.
3	<b>Propiconazole 3.6EC Tilt</b> (propiconazole)	4 fl oz	12 fl oz	7	0.5	Supplemental label: For control of web blight caused by <i>Rhizoctonia solani</i> . Not labeled for cowpea used for livestock feed.	
3	<b>Rancona 3.8 FS</b> (ipconazole)	0.085 fl oz/100 lb seed			0.5	For suppressing seedborne anthracnose of dry bean.	
7	<b>Fontelis</b> (penthiopyrad)	30 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide.	
7 + M3	<b>Vitaflo-280</b> (carboxin + thiram)	4.0 fl oz per 100 lb seed			1		
7 + 11	<b>Priaxor Xemium</b>	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.	

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
Ascochyta blight	11	<b>Aframe, Azoxystar, Azoxyzone, Mazolin, Quadris, Satori Fungicide, Tetraban, Trevo, Willowood Azoxy 25C</b> (azoxystrobin)	15.5 fl oz	92.3 fl oz	Dry: 14 Succulent: 0	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	<b>Azteroid FC</b> (azoxystrobin)	19.5 fl oz	116 fl oz	Dry: 14 Succulent: 0	4 hr	
	11	<b>Headline Headline SC</b> (pyraclostrobin)	9 fl oz	18 fl oz	7 or 21 <b>SC: 7</b>	4 hr <b>SC: 0.5</b>	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11 + 3	<b>Avaris 2XS, Cover XL, Quilt Fungicide, Quilt Xcel, Willowood Azoxyprop Xtra</b> (azoxystrobin + propiconazole)	14 fl oz	42 fl oz	Dry: 14 Succulent: 7	0.5	Supplemental label: Do not use on cowpea cultivars intended for livestock.
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Echo 720, Echo 90 DF, Echo ZN, Equus-DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	<b>SEE INDIVIDUAL LABEL</b>		7 or 14	0.5	Do not use on crops for livestock.
	3	<b>Propiconazole 3.6EC Tilt</b> (propiconazole)	4 fl oz	12 fl oz	7	0.5	Supplemental label: For control of web blight caused by <i>Rhizoctonia solani</i> . Not labeled for cowpea used for livestock feed.
	3	<b>Proyysol</b> (mefentrifluconazole)	5 fl oz	15 fl oz	21	0.5	Only labeled for chickpea, lentils, and dry-edible peas and beans. Disease suppression
	4 + 7 + 3	<b>EverGol Energy</b> (metalaxyl + penflufen + prothioconazole)	1.0 fl oz/100 lb seed				
	7	<b>Endura</b> (boscalid)	11 oz	22 oz	Dry: 21 Succulent: 7	0.5	Limit 2 appl./crop, and alternate chemistry.
	7	<b>Fontelis</b> (penthiopyrad)	30 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide.
	7 + 3 + 11	<b>Miravis Neo</b> (pydiflumetofen + propiconazole + azoxystrobin)	13.7 fl oz	27.4 fl oz	Dry: 14	0.5	
7 + 11	<b>Priaxor Xemium</b> (fluxapyroxad + pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.	

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
	11	<b>Approach</b> (picoxystrobin)	12 fl oz	24 fl oz	<b>Seed:</b> 14	0.5	Do not tank mix with an adjuvant or crop oil when spraying dry beans or peas.
	11	<b>Headline</b> <b>Headline SC</b> (pyraclostrobin)	9 fl oz	18 fl oz	7 or 21	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	<b>Willowood Pyrac 2EC</b> (pyraclostrobin)	9 fl oz	18 fl oz	Dry: 21 Succulent: 7	0.5	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	<b>Aframe, Azoxystar, Azoxyzone, Mazolin, Quadris, Satori Fungicide, Tetraban, Trevo, Willowood Azoxy 2SC</b> (azoxystrobin)	15.5 fl oz	92.3 fl oz	Dry: 14 Succulent: 0	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	<b>Azteroid FC</b> (azoxystrobin)	19.5 fl oz	116 fl oz	Dry: 14 Succulent: 0	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11 + 3	<b>Aframe Plus, Avaris 2XS, Cover XL, Quilt Fungicide, Quilt Xcel, Willowood Azoxyprop Xtra</b> (azoxystrobin + propiconazole)	14 fl oz	42 fl oz	Dry: 14 Succulent: 7	0.5	Supplemental label: Do not use on cowpea cultivars intended for livestock.
<b>Bacterial brown spot,</b> <b>Bacterial blight,</b> <b>Common blight,</b> <b>Halo blight</b>	M1	(copper compounds) <b>Many brands available:</b> Americop 40 DF, Basic Copper 53, Champ DP Dry Prilli, Champ Formula 2 Flowable, Champion++, Champ WG, Cueva, Cuprofix Ultra 40 Disperss, Cuproxat, Kentan DF, Kocide 2000, Kocide 3000, Kocide DF, Kop-Hydroxide, MasterCop, Nordox, Nordox 75 WG, Nu-Cop 3 L, Nu-Cop 50 DF, Nu-Cop 50 WP, Nu-Cop HB, Previsto	<b>SEE INDIVIDUAL LABEL</b>		Varies	Varies from 4 hr to 2 days	
	M1 + M1	<b>Badge SC</b> <b>Badge X2</b> (copper hydroxide + copper oxychloride)	2 pt	<b>SC:</b> 16.6 pt <b>X2:</b> 16.9 pt	0	<b>Greenhouse:</b> 1 <b>Field:</b> 2	
	M1 + M1	<b>C-O-C-S WDG</b> (basic copper sulfate + copper oxychloride)	1.5 lb	9.2 lb		2	
	M1 + M2	<b>Top Cop with Sulfur</b> (basic copper sulfate + sulfur)	2 qt		0	1	Do not use in aluminum tanks.



Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
Bean Rust ( <i>Uromyces appendiculatus</i> )	M1 + M2	<b>Top Cop with Sulfur</b> (basic copper sulfate + sulfur)	2qt		0	1	Do not use in aluminum tanks.
	M2	(sulfur) <b>Many brands available:</b> Microfine Sulfur, Micro Sulf, Microthiol Disperss, Sulfur 90W, THAT Flowable Sulfur, Thiolux, Yellow Jacket Dusting Sulfur, Yellow Jacket Wetttable Sulfur	<b>SEE INDIVIDUAL LABEL</b>			1	Do not apply during periods of warm weather to avoid phytotoxicity.
	M2 + 3	<b>Unicorn DF</b> (sulfur + tebuconazole)	3.75 lb	Fresh: 15 lb Dry: 7.5 lb	14	0.5	Do not mix with other DMI fungicides.
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus-DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	<b>SEE INDIVIDUAL LABEL</b>		7 or 14	0.5	Do not use on crops for livestock.
	3	<b>Monsoon</b> <b>Onset 3.6L</b> <b>Orius 3.6F</b> <b>Tebu-Crop 3.6F</b> <b>Tebustar 3.6L</b> (tebuconazole)	6 fl oz	Fresh: 24 fl oz Dry: 12 fl oz	Fresh: 7 Dry: 14	0.5	
	3	<b>Propiconazole 3.6EC</b> <b>Tilt</b> (propiconazole)	4 fl oz	12 fl oz	7	0.5	
	3	<b>Rally 40WSP Fungicide</b> (myclobutanil)	5 oz	1.25 lb	0	1	30-day plantback interval
	3	<b>Willowood Teb 3.6SC</b> (tebuconazole)	6 fl oz	12 fl oz	Fresh: 7 Dry: 14	0.5	DMI fungicide
	7	<b>Fontelis</b> (penthiopyrad)	30 fl oz	72 fl oz	0	0.5	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide.
	7 + 3	<b>Luna Experience</b> (fluopyram + tebuconazole)	12.8 fl oz	25.6 fl oz	14	0.5	Do not make more than 2 sequential applications of Luna Experience or any Group 7- or Group 3-containing fungicide before rotating with a fungicide of a different Group.
7 + 3 + 11	<b>Miravis Neo</b> (pydiflumetofen + propiconazole + azoxystrobin)	13.7 fl oz	27.4 fl oz	Dry: 14	0.5		

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
	7 + 11	<b>Priaxor Xemium</b> (fluxapyroxad + pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.
	11	<b>Aframe, Azoxystar, Azoxyzone, Mazolin, Quadris, Satori Fungicide, Tetraban, Trevo, Willowood Azoxy 2SC</b> (azoxystrobin)	6 fl oz	92.3 fl oz	Dry beans: 14 Succulent: 0	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	<b>Approach</b> (picoxystrobin)	12 fl oz	24 fl oz	<b>Seed:</b> 14	0.5	Do not tank mix with an adjuvant or crop oil when spraying dry beans or peas.
	11	<b>Azteroid FC</b> (azoxystrobin)	7.6 fl oz	116 fl oz	Dry: 14 Succulent: 0	4 hr	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11	<b>Headline Headline SC Willowood Pyrac 2EC</b> (pyraclostrobin)	9 fl oz	18 fl oz	Succulent: 7 Dry: 21	0.5	No more than 2 sequential applications before alternating to a non-FRAC 11 fungicide.
	11 + 3	<b>Aframe Plus, Avaris 2XS, Cover XL, Quilt Fungicide, Quilt Xcel, Willowood Azoxyprop Xtra</b> (azoxystrobin + propiconazole)	14 fl oz	42 fl oz	Dry: 14 Succulent: 7	0.5	Supplemental label: Do not use on cowpea cultivars intended for livestock.
<b>Botrytis or Gray mold</b>	M1	<b>Cueva</b> (copper octanoate)	2 gal		0	4 hr	
	M5	<b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus-DF Fungicide, Equus 720 SST, Initiate 720, Initiate ZN, Praiz	<b>SEE INDIVIDUAL LABEL</b>		7 or 14	0.5	Do not use on crops for livestock.
	1	<b>3336 EG, 3336 F, 3336 WP, Topsin 4.5 FL Fungicide, Topsin MWSB Fungicide</b> (thiophanate-methyl)	<b>SEE INDIVIDUAL LABEL</b>		14 to 28 (see label)	<b>3336 fungicides:</b> 0.5 Succulent: 1 Dry: 3	Apply once at 50%–70% bloom or twice (max=1.5 lb/appl.) with first at 10%–30% bloom and second at peak bloom.
	3	<b>Rancona 3.8 FS</b> (ipconazole)	0.085 fl oz/100 lb seed			0.5	For protection against seedborne <i>Botrytis</i> .
	7	<b>Endura</b> (boscalid)	11 oz	22 oz	Succulent: 7	0.5	Limit 2 appl./crop, and alternate chemistry.
	7	<b>Fontelis</b> (penthiopyrad)	30 fl oz	72 fl oz	0	0.5	

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
Cercospora leaf spot	7 + M3	<b>Vitaflo-280</b> (carboxin + thiram)	4 fl oz/100 lb seed			1	For protection against seedborne <i>Botrytis</i> .
	7 + 11	<b>Priaxor Xemium</b> (fluxapyroxad + pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.
	29	<b>Omega 500F</b> (fluzinam)	13.6 fl oz	27.2 fl oz	14	0.5	
	M1	(copper compounds) <b>Many brands available:</b> Kentan DF, Nordox, Nordox 75 WG, Previsto	<b>SEE INDIVIDUAL LABEL</b>		Varies	Varies from 4 hr to 2 days	
	M1 + M1	<b>Badge SC</b> <b>Badge X2</b> (copper hydroxide + copper oxychloride)	2 pt	<b>SC:</b> 16.6 pt <b>X2:</b> 16.9 pt	0	<b>Greenhouse:</b> 1 <b>Field:</b> 2	
	M1 + M1	<b>C-O-C-S WDG</b> (basic copper sulfate + copper oxychloride)	1.5 lb	9.2 lb		2	
	M5	(chlorothalonil) <b>Many brands available:</b> 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	<b>SEE INDIVIDUAL LABEL</b>		7 or 14	0.5	Do not use on crops for livestock.
	7	<b>Fontelis</b> (penthiopyrad)	30 fl oz	72 fl oz	0	0.5	
	7 + 3	<b>Aprovia Top</b> (benzovindiflupyr + difenoconazole)	11 fl oz	22 fl oz	Dry: 14	0.5	Apply on a 14-day schedule.
	7 + 11	<b>Priaxor Xemium</b> (fluxapyroxad + pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.
	11	<b>Approach</b> (picoxystrobin)	12 fl oz	24 fl oz	14	0.5	
11	<b>Headline</b> <b>Headline SC</b> <b>Willowood Pyrac 2EC</b> (pyraclostrobin)	9 fl oz	18 fl oz	Succulent: 7 Dry: 21	0.5	Limit 2 appl./crop, and alternate chemistry.	

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
Downy mildew	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, Nu-Cop 30 HB, Previsto	SEE INDIVIDUAL LABEL			4 hr to 2 days (see label)	
	M1 + M1	<b>Badge SC</b> <b>Badge X2</b> (copper hydroxide + copper oxychloride)	2 pt	<b>SC:</b> 16.6 pt <b>X2:</b> 16.9 pt	0	<b>Greenhouse:</b> 1 <b>Field:</b> 2	
	M1 + M1	<b>C-O-C-S WDG</b> (basic copper sulfate + copper oxychloride)	1.5 lb	9.2 lb		2	
	M1 + M2	<b>Top Cop with Sulfur</b> (basic copper sulfate + sulfur)	2qt		0	1	Do not use in aluminum tanks.
	M1 + 4	<b>Ridomil Gold/Copper</b> (copper hydroxide + mefenoxam)	2 lb	8 lb	3	2	Limit 4 appl./crop.
	M5	(chlorothalonil) <b>Many brands available:</b> Bravo Ultrex, Bravo Weather Stik, Bravo ZN, Chlorothalonil 720, Echo 720, Echo 90 DF, Echo ZN, Equus 720 SST, Equus-DF Fungicide, Initiate 720, Initiate ZN, Praiz	SEE INDIVIDUAL LABEL		7 or 14	0.5	Do not use on crops for livestock.
	4	<b>Ridomil Gold SL</b> (mefenoxam)	0.2 pt	0.8 pt	3	2	Must be tank mixed with other effective fungicides.
	4	<b>Ultra Flourish</b> (mefenoxam)	0.4 pt	<b>Soil:</b> 2.0 pt <b>Foliar:</b> 1.6 pt	3	2	Must be tank mixed with other effective fungicides.
	7 + 11	<b>Priaxor Xemium</b> (fluxapyroxad + pyraclostrobin)	8 fl oz	16 fl oz	7 or 21	0.5	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.
	11	<b>Approach</b> (picoxystrobin)	12 fl oz	24 fl oz	14	0.5	
	11	<b>Headline</b> <b>Headline SC</b> <b>Willowood Pyrac 2EC</b> (pyraclostrobin)	9 fl oz	18 fl oz	7	0.5	Limit 2 appl./crop, and alternate chemistry.

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
	21	<b>Ranman 400SC Fungicide</b> (cyazofamid)	2.75 fl oz	16.5 fl oz	0	0.5	Not labeled for cowpea used for livestock feed. Limit 6 appl./crop. No more than three sequential appl. before rotating chemistry.
	40	<b>Revus</b> (mandipropamid)	8 fl oz	32 fl oz	1	4 hr	
<b>Fusarium seedling blight, Fusarium root rot</b>	1	<b>Thiabendazole 4L ST</b> (thiabendazole)	1.72 fl oz/100 lb seed			0.5	
	1	<b>T-Methyl 4.5L ST</b> (thiophanate-methyl)	0.28 fl oz/100 lb seed			0.5	
	3	<b>Rancona 3.8 FS</b> (ipconazole)	0.085 fl oz/100 lb seed			0.5	
	3 + 4	<b>Rancona Summit</b> (ipconazole + metalaxyl)	4.0 fl oz/100 lb seed			1	
	4 + 11	<b>Trilex 2000</b> (metalaxyl + trifloxystrobin)	1.0 fl oz/100 lb seed			1	
	4 + 12	<b>Apron Maxx RFC</b> (mefenoxam + fludioxonil)	1.5 fl oz/100lb seed			2	
	4 + 12	<b>Apron Maxx RTA</b> (mefenoxam + fludioxonil)	5.0 fl oz/100lb seed			2	
	7	<b>Systiva XS Xemium</b> (fluxapyroxad)	0.47 fl oz/100 lb seed				
	7 + M3	<b>Vitaflo-280</b> (carboxin + thiram)	4.0 fl oz/100lb seed			1	Seed treatment
	7 + 3	<b>Rancona V 100 Pro FS</b> (carboxin + ipconazole)	1.5 fl oz/100 lb seed			0.5	
	11	<b>Stamina</b> (pyraclostrobin)	1.5 fl oz/100 lb seed				
	11 + 12 + 4 + 4A (insecticide)	<b>Seed Shield Beans</b> (azoxystrobin + fludioxonil + mefenoxam + thiamethoxam)	3.0 fl oz/100 lb seed			2	
12	<b>Dyna-Shield, Fludioxonil, Fludioxonil 4L ST, Maxxim 4F S, Spirato 480 FS, STartUp FLUDI</b> (fludioxonil)	0.16 fl oz/100 lb seed			0.5		
<b>Phytophthora</b>	4	<b>Acquire, Allegiance FL, Dyna-Shield Metalaxyl 318 FS, Metalaxyl 4.0 ST</b> (metalaxyl)	0.75 fl oz/100 lb seed <b>Metalaxyl 4.0 ST:</b> 0.5 fl oz/100lb seed			1	Seed treatment

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
Powdery mildew	4	<b>Apron XL</b> (mefenoxam)	0.32 fl oz/100 lb of seed			2	Seed treatment only
	4 + 12	<b>Apron Maxx RTA</b> (mefenoxam + fludioxonil)	5 fl oz/100 lb seed			2	Seed treatment only
	11 + 12 + 4 + 4A (insecticide)	<b>Seed Shield Beans</b> (azoxystrobin + fludioxonil + mefenoxam + thiamethoxam)	3.0 fl oz/100 lb seed			2	Seed treatment only
	21	<b>Ranman 400SC Fungicide</b> (cyazofamid)	2.75 fl oz	16.5 fl oz	0	0.5	
	43	<b>Presidio</b> (flupicolide)	4 fl oz		0	0.5	
	M1	<b>Cueva</b> (copper ocanoate)	2 gal		0	4 hr	OMRI-listed
	M1 + M2	<b>Top Cop with Sulfur</b> (basic copper sulfate + sulfur)	2 qt		0	1	Do not use in aluminum tanks.
	M2	<b>Many brands available:</b> Cosavet-DF Edge, Microfine Sulfur, Micro Sulf, Microthiol Dispers, Suffa, Sulfur 6 L, Sulfur 90W, THAT Flowable Sulfur, Thiolut, TriTek, Wettable Sulfur	<b>SEE INDIVIDUAL LABEL</b>			1	Do not apply during periods of warm weather to avoid phytotoxicity.
	3 + 11	<b>Veltyma</b> (pyraclostrobin + mefentrifluconazole)	10 fl oz	20 fl oz	21	0.5	
	7	<b>Fontelis</b> (penthioopyrad)	30 fl oz	72 fl oz	0	0.5	
	7 + 3	<b>Luna Experience</b> (fluopyram + tebuconazole)	12.8 fl oz	25.6 fl oz	14	0.5	Do not make more than 2 sequential applications of Luna Experience or any Group 7- or Group 3-containing fungicide before rotating with a fungicide of a different group.
7 + 3 + 11	<b>Miravis Neo</b> (pydiflumetofen + propiconazole + azoxystrobin)	13.7 fl oz	27.4 fl oz	14	0.5		
7 + 11	<b>Priaxor Xemium</b> (fluxapyroxad + pyraclostrobin)	8 fl oz	16 fl oz	Succulent: 7 Dry: 21	0.5	Do not make more than 2 applications per season.	
11	<b>Approach</b> (picoxystrobin)	12 fl oz	24 fl oz	14	0.5		
11	<b>Headline</b> <b>Headline SC</b> <b>Willowood Pyrac 2EC</b> (pyraclostrobin)	9 fl oz	18 fl oz	7	0.5	Limit 2 appl./crop, and alternate chemistry.	

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
Pythium damping-off & root rot	3 + 4	<b>Rancona Summit</b> (ipconazole + metalaxyl)	4.0 fl oz/100 lb seed			1	
	4	<b>Acquire, Allegiance FL, Dyna-Shield Metalaxyl 318 FS, Metalaxyl 265 ST, Metalaxyl 4.0 ST</b> (metalaxyl)	0.75 fl oz/100 lb seed			1	Seed treatment
	4	<b>Apron XL</b> (mefenoxam)	0.64 fl oz/100 lb seed			2	Seed treatment only
	4	<b>MetaStar 2E</b> (metalaxyl)	4 pt			2	Preplant incorporated at planting or soil surface after planting. Do not use in greenhouse or field-grown bedding plants.
	4	<b>Ridomil Gold SL</b> (mefenoxam)	0.2 pt	0.8 pt	3	2	Must be tank mixed with other effective fungicides.
	4	<b>Ultra Flourish</b> (mefenoxam)	2 pt			2	Apply as a broadcast soil application at preplant or as a surface application at planting.
	4 + 11	<b>Trilex 2000</b> (metalaxyl + trifloxystrobin)	1.0 fl oz/100 lb seed			1	
	4 + 11	<b>Uniform</b> (mefenoxam + azoxystrobin)	0.34 fl oz/1000 ft row			0	
	4 + 12	<b>Apron Maxx RFC</b> (metalaxyl + fludioxonil)	1.5 fl oz/100 lb seed			2	
	4 + 12	<b>Apron Maxx RTA</b> (metalaxyl + fludioxonil)	5.0 fl oz/100 lb seed			2	
Rhizoctonia diseases	7 + M3	<b>Vitalo-280</b> (carboxin + thiram)	4 fl oz/100 lb seed			1	
	1	<b>St-Methyl 540 FS T-Methyl 4.5L ST</b> (thiophanate-methyl)	0.28 fl oz/100 lb seed			0.5	
	3	<b>Propiconazole 3.6 EC</b> (propiconazole)	4 fl oz	12 fl oz	7	0.5	For web blight ( <i>Rhizoctonia solani</i> )
	3	<b>Rancona 3.8 FS</b> (ipconazole)	0.085 fl oz/100 lb seed			0.5	Seed treatment for protection against <i>Rhizoctonia solani</i> .
	3 + 7 + 11	<b>Miravis Neo</b> (pydiflumetofen + propiconazole + azoxystrobin)	13.7 fl oz	27.4 fl oz	14	0.5	
	4 + 11	<b>Trilex 2000</b> (metalaxyl + trifloxystrobin)	1.0 fl oz/100 lb seed			1	



Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
	4 + 11	<b>Uniform</b> (mefenoxam + azoxystrobin)	0.34 fl oz/1000 ft row			0	Make only one application per season
	4 + 12	<b>Apron Maxx RFC</b> (mefenoxam + fludioxonil)	1.5 fl oz/100 lb seed			2	Seed treatment only.
	4 + 12	<b>Apron Maxx RTA</b> (mefenoxam + fludioxonil)	5 fl oz/100 lb seed			2	Seed treatment only.
	7	<b>Systiva XS Xemium</b> (fluxapyroxad)	0.47 fl oz/100 lb seed			0	
	7	<b>Vibrance</b> (sedaxane)	0.16 fl oz/100 lb seed				
	7 + M3	<b>Vitaflo-280</b> (carboxin + thiram)	4 fl oz/100 lb seed			1	Seed treatment
	11	<b>Aframe</b> (azoxystrobin)	0.8 fl oz/1000 row ft			4 hr	
	11	<b>Azoxystar</b> (azoxystrobin)	3.75 fl oz/100 lb seed			4 hr	Seed treatment
	11	<b>Azoxystrobin 100 ST</b> (azoxystrobin)	0.8 fl oz/1000 row ft			0	
	11	<b>Azoxyzone</b> (azoxystrobin)	1.0 fl oz/1000 row feet			4 hr	For Rhizoctonia root rot ( <i>Rhizoctonia solani</i> )
	11	<b>Azteroid FC</b> (azoxystrobin)	19.5 fl oz	116 fl oz	Dry: 14 Succulent: 0	4 hr	For web blight ( <i>Rhizoctonia solani</i> )
	11	<b>Dynasty</b> (azoxystrobin)	0.765 floz/100 lb seed			4 hr	Seed treatment
	11	<b>Mazolin</b> (azoxystrobin)	0.8 fl oz/1000 row ft				Avoid application directly to seed because delayed emergence may occur.
	11	<b>Quadris</b> (azoxystrobin)	15.5 fl oz	92.3 fl oz	Dry: 14 Succulent: 0	4 hr	For web blight ( <i>Rhizoctonia solani</i> )
	11	<b>Satori Fungicide, Tetraban, Trevo, Willowood Azoxy 2SC</b> (azoxystrobin)	0.8 fl oz/1000 row ft				
	11	<b>Stamina</b> (pyraclostrobin)	1.5 fl oz/100 lb seed			0.5	Seed treatment
	11	<b>Willowood Pyrac 2EC</b> (pyraclostrobin)	9 fl oz	18 fl oz	1	0.5	
	11 + 3	<b>Aframe Plus, Avaris 2XS, Cover XL, Quilt Xcel, Willowood AzoxyProp Xtra</b> (azoxystrobin + propiconazole)	14 fl oz	42 fl oz	Dry: 14 Succulent: 7	0.5	For web blight ( <i>Rhizoctonia solani</i> )

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
	12	<b>Dyna-Shield Fludioxonil, Fludioxonil 4L ST, Maxim 4FS, Spirato 480FS, StartUp FLUDI</b> (fludioxonil)	0.16 fl oz/100 lb seed			0.5	Seed treatment only.
	14	<b>Blocker 4F</b> (PCNB)	3.3 fl oz/1000 row ft			0.5	Avoid application directly to seed because delayed emergence may occur.
	14	<b>Rizolex</b> (tolclofos-methyl)	0.3 fl oz/100 lb seed	200 lb		0.5	Only applied on the "true seed," not on other propagation parts.
<b>White mold</b>	M1	<b>Cueva</b> (copper ocanoate)	2 gal		0	4 hr	OMRI-listed.
	1	(thiophanate-methyl) <b>Many brands available:</b> 3336 EG, 3336 F, 3336 WP, Incognito 4.5F, Topsin 4.5FL Fungicide, Topsin M WSB Fungicide	<b>SEE INDIVIDUAL LABEL</b>		14 to 28 (see label)	<b>3336 fungicides:</b> 0.5 Succulent: 1 Dry: 3	Apply once at 50%–70% bloom or twice (max=1.5 lb/appl.) with first at 10%–30% bloom and second at peak bloom.
	1 + 3 + 11	<b>Trevo Packed</b> (thiophanate-methyl + tebuconazole + azoxystrobin)	30 fl oz		Fresh: 14 Dry: 28	1	
	2	<b>Meteor Nevado 4F Rovral 4 Flowable</b> (iprodione)	2 pt	4 pt		0	Limit 2 applications per season. Not for use as livestock feed.
	7	<b>Endura</b> (boscalid)	11 oz	22 oz		Succulent: 7	Limit 2 appl./crop, and alternate chemistry.
	7	<b>Fontelis</b> (penthiopyrad)	30 fl oz	72 fl oz		0	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide.
	7	<b>Vertisan</b> (penthiopyrad)	20 fl oz	41 fl oz		21	No more than 2 sequential applications before alternating to a non-FRAC 7 fungicide. Vertisan only labeled for dry edible beans.
	7 + 11	<b>Priaxor Xemium</b> (fluxapyroxad + pyraclostrobin)	8 fl oz	16 fl oz		7 or 21	Limit 2 appl./season. Crop cannot be used for livestock until 14 days after last application.
	9 + 12	<b>Switch 62.5 WG</b> (cyprodinil + fludioxonil)	14 oz	56 oz		7	
	14	<b>Blocker 4F Fungicide</b> (PCNB)	2 pt			0	Avoid tank-mixing with highly acidic pesticides as this may reduce efficacy. Apply to seed furrow and covering soil. Do not spray seed directly.

Pertinent Diseases or Pathogens	Fungicide Group <sup>1</sup>	Chemical (Active Ingredients)	Max Rate/Acre		Min. Days to		Remarks <sup>2</sup>
			Appl.	Season	Harvest	Reentry	
	14	<b>Botran 5F</b> (DCNA dicloran)	1.6 qt	3.2 qt	2	0.5	Do not feed treated plants to livestock.
	29	<b>Omega 500F</b> (fluazinam)	0.85 pt	1.75 pt	Edible— podded and succulent beans: 14	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 2021; <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 UF/IFAS Extension nor discrimination against similar products or services not mentioned.

Table 8. Nonfumigant nematicides for legume crops in Florida.

Product	Application Directions
Mocap 15G (a.i. ethoprop)	Apply 13 pounds per acre (36-inch row spacing) or 0.9 pounds per 1,000 linear feet of row in a band of 15 inches wide on the row at-planting. Mix with the top 2 to 4 inches of soil with mechanical equipment right after application. If broadcast, apply 34 lb/acre from 1 week before planting to at planting time and mix with 2–4 inches of soil. DO NOT use as a seed furrow treatment or allow granules to contact the seed. Only 1 application per season.
Velum (a.i. fluopyram)	Apply 4.0–5.0 fl oz/acre in seed furrow and cover with soil, or chemigation into root-zone through low-pressure drip or trickle irrigation. Do not apply more than 13.7 fl oz of Velum (0.446 lb fluopyram) per acre per year, regardless of formulation or method of application (soil or foliar). Do not apply within 14 days of harvest.

Table 9. Fumigant nematicides for legume crops in Florida.

Nematicide	Broadcast Application <sup>1</sup>		In-the-Row Applications
	Gallons or lb per Acre	fl oz/1000 ft/ chisel-spaced 12" apart	
Telone II <sup>2,3</sup>	9 to 12 gal	26 to 35	For any row spacing, application rates given may be concentrated in the row but shall never exceed the labeled maximum for broadcast applications. Consult the product label for additional detail.
Telone C-17 <sup>2,3</sup>	10.8 to 17.1 gal	31.8 to 50.2	For any row spacing, application rates given may be concentrated in the row but shall never exceed the labeled maximum for broadcast applications. Consult the product label for additional detail.
Telone C-35 <sup>2,3</sup>	13 to 20.5 gal	38 to 60	For any row spacing, application rates given may be concentrated in the row but shall never exceed labeled maximum for broadcast applications. Consult the product label for additional detail.
Pic-Clor 60	19 to 31.5 gal	57 to 90	For any row spacing, application rates should never exceed the labeled maximum for broadcast applications. Consult the product label for additional detail.
Vapam HL	75 gal	-	For drip or in-row chisel fumigation, consult product label for proportionately reduced overall rates, drip concentration, and flow-modifying directions and procedures.
KPam HL	60 gal	-	For drip or in-row chisel fumigation, consult product label for proportionately reduced overall rates, drip concentration, and flow-modifying directions.
Allyl Isothiocyanate (AITC) Dominus	40 gal	-	For drip or in-row fumigation and crop termination, consult product label for overall rates, drip concentration, and other flow-modifying directions.

<sup>1</sup>Gallons/acre and fl oz/1000 feet provided only for mineral soils. Higher rates may be possible for heavier-textured (loam, silt, clay) or highly organic soils.

<sup>2</sup>All of the fumigants mentioned are for retail sale and use only by state-certified applicators or persons under their direct supervision. New supplemental labeling for the Telone products must be in the hands of the user at the time of application. See new label details for additional use restrictions based on soil characteristics, buffer zones, requirements for Fumigant Management Plans (FMP) and personal protective equipment (PPE), mandatory good agricultural practices (GAPs), product and applicator training certification, and other rate-modifying recommendations with use of highly retentive mulch films.

<sup>3</sup>Higher application rates are possible in the presence of cyst-forming nematodes.

Rates are believed to be correct for products named, and similar products of other brand names, when applied to mineral soils. Higher rates are required for muck (organic) soils. However, the grower has the final responsibility to see that each product is used legally; read the label of the product to be sure that you are using it properly.