UNIVERSITY OF FLORIDA
IFAS EXTENSION

ENY-465

Insect Management for Legumes (Beans, Peas)[1]

S. E. Webb[2]

Many different insects attack leguminous vegetables. Aphids damage terminals, whiteflies feed on sap and transmit bean golden mosaic virus, and caterpillars like bean leafroller and beetles feed on leaves. Flower thrips feed in blossoms and stink bugs, corn earworm, and leaffooted bugs damage seeds and pods.

Snap beans are becoming an important crop for Florida. Southern peas (a bean) are common in north Florida. Many other types of beans are grown on a small scale. Increasingly, newer pesticides are being registered for the entire crop group, including legumes such as pigeon pea, yardlong bean, swordbean, and crowder pea. Labels for individual insecticides should be consulted to see if they are labeled for all types of beans.

According to already published guidelines for snap beans (Pernezney et al., 2003) management practices should include scouting twice a week for insect pests in at least one location for every 2.5 acres. More sites should be chosen in small fields (less than 20 acres). A map of the field should be drawn so that pest counts can be connected to a particular section of the field for future reference.

A sample is a 3 section of row. Whiteflies can be estimated by turning over several leaves in the section and counting the number of adults. Terminals should be examined for the presence of aphids. For other pests, a three by threecloth is placed on the ground and the bean plants shaken over it. Insects that fall on the cloth can be identified and counted. The growth stage of the plant and an estimate of defoliation should be recorded. Snap beans can tolerate up to 20% defoliation before pod set and 10% after pod set.

A systemic insecticide (a neonicotinoid) should be applied at planting to control aphids and whiteflies. Later in the season, when the effects of the systemic wear off, an insect growth regulator for whiteflies may be applied. Because it is the pod that is sold, damage to this part of the plant is the most serious. An insecticide appropriate for the pests present should be applied at pinpod. At least one more application may be needed before harvest.

1. This document is ENY-465 (IG151), one of a series of the Entomology & Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Published: July 2002. Revised: August 2005. For more publications related to horticulture/agriculture, please visit the EDIS Website at **http://edis.ifas.ufl.edu/**. For more information about nematodes, arthropods, and other invertebrates, please visit the Entomology & Nematology Department website at **http://entnemdept.ifas.ufl.edu/**.

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For the organic grower, a number of OMRI-listed insecticides have been listed in the table (see the Notes column).

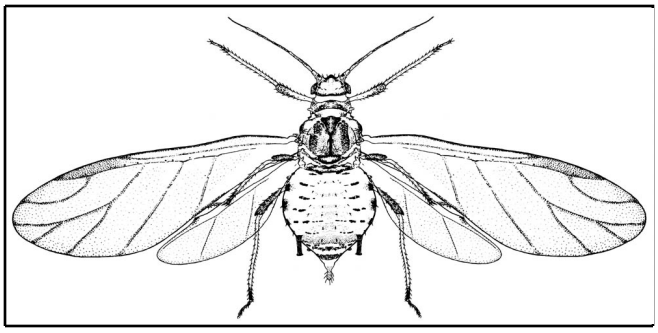

Figure 1. Cowpea aphid, *Aphis craccivora* Koch. Credits: John L. Capinera, University of Florida

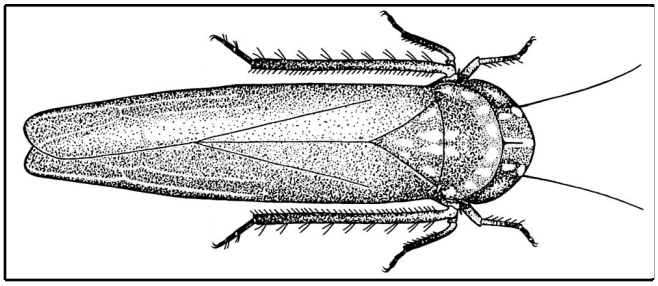

Figure 2. Potato leafhopper, *Empoasca fabae*. Credits: John L. Capinera, University of Florida

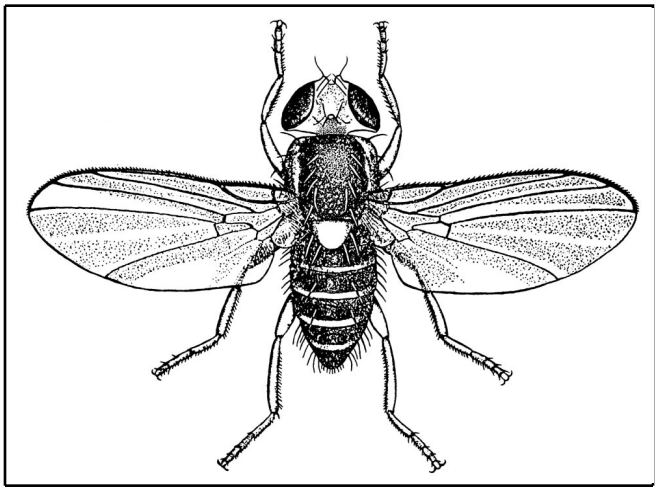

Figure 3. American serpentine leafminer, *Liriomyza trifolii* (Burgess) Credits: John L. Capinera, University of Florida

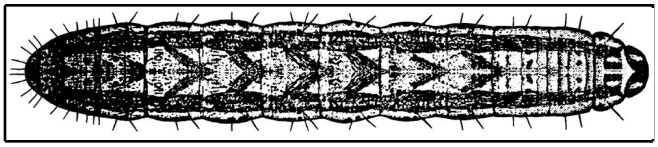

Figure 4. Granulate cutworm larva, *Feltia subterranea* (F.). Credits: USDA

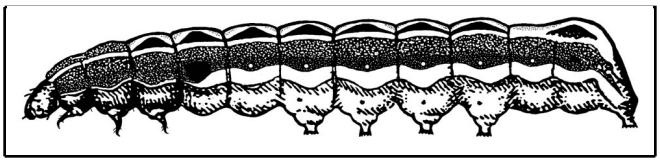

Figure 5. Southern armyworm larva, *Spodoptera eridania* (Cramer) Credits: John L. Capinera, University of Florida

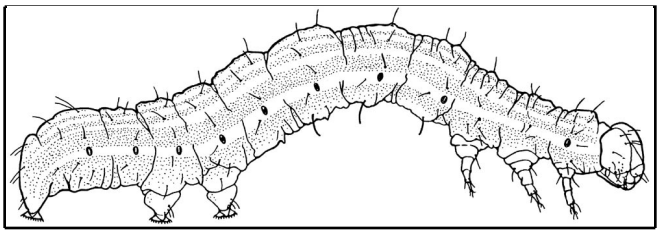

Figure 6. Cabbage looper larva.

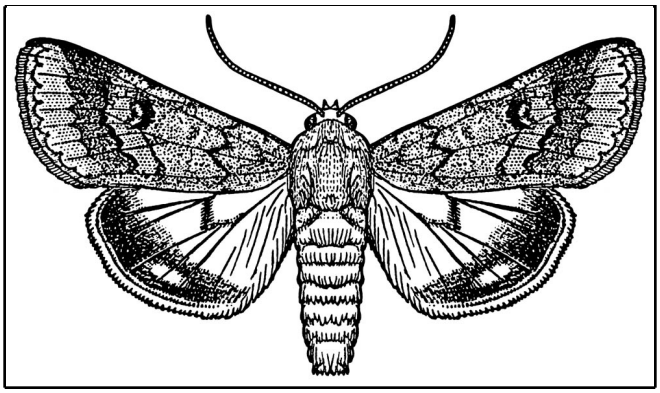

Figure 7. Corn earworm adult, *Helicoverpa zea* (Boddie). Credits: John L. Capinera, University of Florida

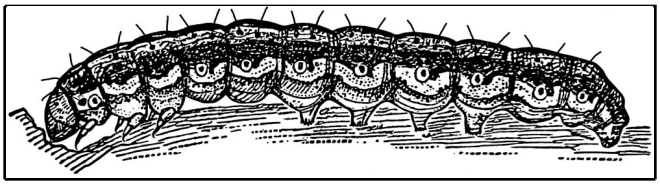

Figure 8. Corn earworm larva, *Helicoverpa zea* (Boddie). Credits: USDA

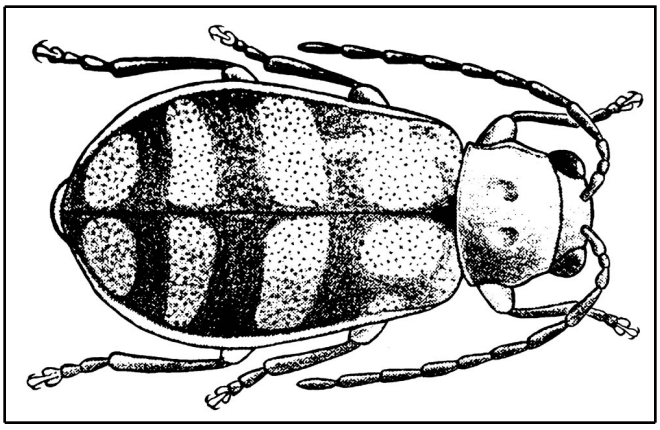

Figure 9. Banded cucumber beetle, *Diabrotica balteata* Leconte. Credits: John L. Capinera, University of Florida

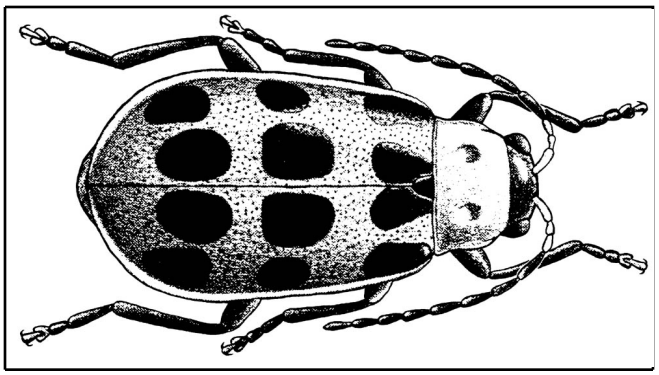

Figure 10. Spotted cucumber beetle, *D. undecimpunctata howardi* Barber. Credits: John L. Capinera, University of Florida

References

Pernezny, Ken, Gregg Nuessly, and William Stall. 2003. Integrated pest management for Florida snap beans. University of Florida, IFAS Extension. PPP37. 8 p. http://edis.ifas.ufl.edu/PP117.

Table 1. Selected insecticides approved for use on insects attacking legumes.

Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code[1]	Notes
Admire 2F (imidacloprid)	16-24 oz	12	21	aphids, leafhoppers, thrips (foliar feeding), whiteflies	4A	Do not apply more than 24 oz product per acre per season.
Admire Pro (imidacloprid)	7-10.5 fl oz			aphids, leafhoppers, thrips, whiteflies		Do not apply more than 10.5 fl oz per acre per season.
Agree WG (*Bacillus thuringiensis* subspecies *aizawai*)	0.5-2.0 lb	4	0	lepidopteran larvae (caterpillar pests)	11B1	Apply when larvae are small for best control. OMRI-listed[2].
***Asana XL 0.66 EC** (esfenvalerate)	2.9-9.6 fl oz	12	3 = snap 21 = dry	beet armyworm (aids in control), cabbage looper, corn earworm, corn rootworm (adults), cowpea curculio, cucumber beetles, cutworms, European corn borer, flea beetles, grasshoppers, green cloverworm, leafhoppers, Mexican bean beetle, painted lady butterfly (larvae), pea aphid, saltmarsh caterpillar, velvetbean caterpillar	3	Do not feed or graze livestock on treated vines. Do not apply more than 0.2 lb ai/acre per season (4 applications at highest rate).
Aza-Direct (azadirachtin)	1-2 pts (max 3.5 pts)	4	0	aphids, beetles, caterpillars, leafhoppers, leafminers, mites, stink bugs, thrips, weevils, whiteflies	26	Antifeedant, repellent, insect growth regulator. OMRI-listed[2].
Azatin XL (azadirachtin)	5-21 fl oz	4	0	aphids, beetles, caterpillars, leafhoppers, leafminers, mites, stink bugs, thrips, weevils, whiteflies	26	Antifeedant, repellent, insect growth regulator.
***Baythroid 2** (cyfluthrin)	0.8-2.1 fl oz - dry beans & peas	12	7 - dry beans & peas 3 - southern pea	beet armyworm (1st & 2nd instar), corn earworm, cowpea curculio, cutworms, fall armyworm (1st & 2nd instar), grasshoppers, plant bugs, potato leafhopper, southern armyworm (1st & 2nd instar), stink bugs, yellowstriped armyworm	3	Maximum applications for dry peas = 2. Maximum for southern peas = 5. Not for use on succulent beans or peas or dry beans.
	0.8-2.1 fl oz - southern pea					

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Biobit HP (*Bacillus thuringiensis* subspecies *kurstaki*)	0.5-2.0 lb	4	0	caterpillars (will not control large armyworms)	11B2	Treat when larvae are young. Good coverage is essential. Can be used in the greenhouse. OMRI-listed[2].
BotaniGard 22 WP, ES (*Beauveria bassiana*)	**WP:** 0.5-2 lb/100 gal **ES:** 0.5-2 qts/100 gal	4	0	aphids, thrips, whiteflies	--	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
***Capture 2 EC** (bifenthrin)	1.6-6.4 fl oz	12	3	aphids, armyworms, bean leaf beetle, cloverworm, corn earworm, corn rootworm adults, cucumber beetles, loopers, *Lygus* spp., mites, pea leaf weevil, pea weevil, plant bugs, sap beetles, stink bugs, thrips, webworms, whiteflies	3	Do not apply more than 12.8 ounces of product per acre per season. Succulent beans and peas only.
Courier 70 WP, 40SC (buprofezin)	**70WP:** 9 oz **40SC:** 9-13.6 fl oz.	12	14	whitefly nymphs	16	For snap beans only. Allow 14 days between applications. Do not exceed 0.76 lb ai/acre per crop (2 applications at high rate).
Crymax WDG (*Bacillus thuringiensis* subspecies *kurstaki*)	0.5-2 lb	4	0	caterpillars	11B2	Use high rate for armyworms. Treat when larvae are young.
Deliver (*Bacillus thuringiensis* subspecies *kurstaki*)	0.25-1.5 lb	4	0	caterpillars	11B2	Use higher rates for armyworms. OMRI-listed[2].
Dibrom 8E (naled)	1-1.5 pt	48	1	aphids, leafhoppers, loopers, *Lygus* bugs, spider mites	1B	Ground application only.
Dicofol 4E (dicofol)	1-3 pt	12	21 - dry, green, lima	twospotted mites	20	No more than 2 applications per season.

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Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code[1]	Notes
Dimethoate 4EC, 2.67 (dimethoate)	**4EC:** 0.5-1 pt **2.67:** 0.75-1.5 pt	48	2 - 4 EC 0 - 2.67	aphids, bean leaf beetle, grasshoppers, leafhoppers, leafminers, *Lygus* bug, Mexican bean beetle, mites	1B	Do not feed treated vines. Highly toxic to bees.
DiPel DF (*Bacillus thuringiensis* subspecies *kurstaki*)	0.5-2 lb	4	0	caterpillars	11B2	Treat when larvae are young. Good coverage is essential. OMRI-listed[2].
***Di-Syston 8EC;** ***15 G** (disulfoton)	**8EC:** 1-2 pt **15G:** 6.7 lb	48	planting time only-green/ 60-dry	aphids, Mexican bean beetle, mites, thrips	1B	See label for information on possible phytotoxicity problems.
Endosulfan 3 EC (endosulfan)	0.66-1.33 qts	24	3	aphids, armyworms, bean leaf skeletonizer, cowpea curculio, cucumber beetles, cutworms, flea beetles, leafhoppers, Mexican bean beetle, stink bugs, whiteflies	2	Do not use on lima beans. Do not make more than 3 applications per year.
Entrust (spinosad)	1-2 oz	4	3 28 - dry	armyworms, corn earworm, leafminers, loopers, thrips	5	**Succulent -** Do not apply more than 9 oz/acre per crop. **Dry -** Do not apply more than 3.75 oz/acre per crop.
Esteem Ant Bait (pyriproxyfen)	1.5-2.0 lb	12	1	red imported fire ant	7D	
Extinguish ((S)-methoprene)	1-1.5 lb	4	0	fire ants	7A	Slow-acting IGR (insect growth regulator). Best applied early spring and fall where crop will be grown. Colonies will be reduced after three weeks and eliminated after 8 to 10 weeks. May be applied by ground equipment or aerially.
Intrepid 2F (methoxyfenozide)	4-16 fl oz	4	7	armyworms, corn earworm (suppression), loopers	18	Do not apply more than 64 fl oz per acre per season or make more than 4 applications per season.

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Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code[1]	Notes
Javelin WG (*Bacillus thuringiensis* subspecies *kurstaki*)	0.12-1.50 lbs	4	0	most caterpillars, but not *Spodoptera* species (armyworms)	11B2	Treat when larvae are young. Thorough coverage is essential. OMRI-listed[2].
Kelthane MF 4 (dicofol)	1-3 pt	12	21 dry, green, lima	mites	20	No more than 2 applications per season.
Knack IGR (pyriproxyfen)	8-10 fl oz	12	7	silverleaf whitefly, sweetpotato whitefly	7D	Do not make more than 2 applications per season.
***Lannate LV, *SP** (methomyl)	**LV:** 0.75-3 pts **SP:** 0.25-1.0 lb	48	See label: varies with rate and crop use	aphids, beet armyworm, corn earworm, cucumber beetles, European corn borer, fall armyworms, leafhoppers, loopers, lygus bugs, Mexican bean beetle, saltmarsh caterpillar, thrips, variegated cutworm, yellowstriped armyworm	1A	
Lepinox WDG (*Bacillus thuringiensis* subspecies *kurstaki*)	1.0-2.0 lb	12	0	for most caterpillars, including beet armyworm (see label)	11B2	Treat when larvae are small. Thorough coverage is essential.
Malathion 5EC; 8F (malathion)	1.5 pt	12	1	aphids, cucumber beetles, *Lygus* bugs, mites, Mexican bean beetle, potato leafhopper	1B	Field & greenhouse. Do not graze or feed forage to livestock.
***MSR Spray Concentrate** (oxydemeton-methyl)	2 pt	48	21	leafhoppers, mites	1B	Lima beans only.
Mocap 10G; *15G (ethoprop)	See label for rates	48	at planting	symphylans	1B	Snap and lima beans. Do not allow granules to contact seed.
M-Pede 49% EC Soap, insecticidal	1-2% V/V	12	0	aphids, leafhoppers, mites, plant bugs, thrips, whiteflies	--	OMRI-listed[2].

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Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code[1]	Notes
***Mustang Max** (zeta-cypermethrin)	1.28-4.0 oz	12	1 - succulent 21 - dried shelled peas or beans	corn earworm, cowpea curculio, cutworms, fall armyworm, flea beetles, grasshoppers, leafhoppers, lesser cornstalk borer (aides in control), Mexican bean beetle, plant bugs, saltmarsh caterpillar, southern armyworm, stink bugs, true armyworm, velvetbean caterpillar, yellowstriped armyworm	3	Do not make applications less than 5 days apart.
Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	aphids, armyworms, bean leaf beetle, cabbage looper, corn earworm, cutworms, garden webworm, leafminers, loopers, soybean looper, webworms, whiteflies	26	Acts as IGR and feeding repellent. Does not kill adult insects. OMRI-listed[2].
Orthene 75S (acephate)	**75S:** 0.33-1.33 lb **97:** 0.25-1.0 lb	24	14 = snapbeans or dry beans 0 = lima beans, succulent form	aphids (excluding black bean aphid), armyworms (excluding beet armyworm), bean leaf beetle, bean leafroller, cabbage looper, corn earworm, cutworms, European corn borer, fleahoppers, grasshoppers, green cloverworm, leafhoppers, Mexican bean beetle, plant bugs (Lygus), soybean looper, thrips, whiteflies (except silverleaf or sweetpotato whiteflies)	1B	Do not apply more than 2 lb active ingredient per acre per season.
***Penncap-M** (methyl parathion)	2-4 pts	4 days (see label)	15	aphids, cowpea curculio, cucumber beetles, European corn borer, leafhoppers, lygus bugs, Mexican bean beetle, stink bugs	1B	For dry beans (southern peas) Begin applications when blooms are first observed.

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Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code[1]	Notes
Phaser 3EC (endosulfan)	1.92-3.84 fl oz	24	3	aphids, armyworms, bean leaf skeletonizer, cowpea curculio, cucumber beetles, cutworms, flea beetles, leafhoppers, Mexican bean beetle, stink bugs, whiteflies	3	(1) Suppression only (2) First and second instars only. (3) For control before larvae bore into the plant stalk or pods. Do not apply more than 1.92 pints per acre per season.
Provado 1.6F (imidacloprid)	3.5 oz	12	7	aphids, leafhoppers, whiteflies	4A	Not recommended following a soil application of Admire (succulent & edible podded only).
Pyrellin EC (pyrethrins + rotenone)	1-2 pt	12	12 hours	aphids, bean leaf beetle, cucumber beetles, European corn borer, flea beetles, fleahoppers, leafhoppers, leafminers, loopers, lygus bugs, mites, plant bugs, stink bugs, thrips, whiteflies	3, 21	
Sevin 80S, 4F (carbaryl)	**80S:** 0.63-1.88 lb **4F:** 0.5-1.5 qt	12	14 days for grazing or harvest for forage, or within 3 days of harvest of fresh beans or peas, or within 21 days of harvest of dried beans or peas, seed or hay.	armyworms, bean leaf beetle, blister beetles, corn earworm, cowpea curculio, cucumber beetles, cutworms, fall armyworm, flea beetles, garden webworm, green cloverworm, leafhoppers, Mexican bean beetle, plant bugs, stink bugs, tarnished plant bug, three-cornered alfalfa hopper, thrips, velvetbean caterpillar, webworms	1A	Repeat, as needed, up to 4 times. Applications should be at least 7 days apart.
SpinTor 2 SC (spinosad)	3-6 fl oz	4	3 - succulent 28 - dry	armyworms, corn earworm, European corn borer (eggs and larvae), leafminers, loopers, thrips	5	

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Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code[1]	Notes
Sun Spray 98.8% **JMS Stylet-Oil** **others** Oil, insecticidal	3-6 qts/100 gal (JMS) 1-2 gal/100 gal (others)	4	0	aphids, leafhoppers, leafminers, mites, thrips, whiteflies	--	Organic Stylet -Oil is OMRI-listed[2].
***Temik 15G** (aldicarb)	3.5-7.0 lb	48	at planting, 90	aphids, leafhoppers, Mexican bean beetle, mites	1A	Dry beans only. One application. Do not feed green forage hay, or straw to livestock. Do not use green pods as food for humans.
***Thimet 20 G** (phorate)	No more than 7.6 lb	48	60	aphids, leafhoppers, *Lygus* bugs, Mexican bean beetle, seedcorn maggots, thrips	1B	At planting only. Avoid direct contact with seed.
Trigard (cyromazine)	2.66 oz	12	7	leafminers	17	Dry beans (including southern pea), except cowpea, also succulent lima beans. Limited to 6 applications.
Trilogy (extract of neem oil)	0.5-2% V/V	4	0	aphids, mites, suppression of thrips and whiteflies	26	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed[2].
Warrior (lambda-cyhalothrin)	1.92-3.84 fl oz	24	7 - edible podded and succulent shelled 21 - dried, shelled	aphids, bean leaf beetle, beet armyworm (suppression only), corn earworm, cutworms, cucumber beetle adults, green clover worm, fall armyworm (1st & 2nd instar), flea beetles, grasshoppers, leafhoppers, leafminers, lesser cornstalk borer, loopers, Mexican bean beetle, plant bugs, spider mites, stink bugs, thrips[(1)], whiteflies, yellowstriped armyworm (1st & 2nd instar)	3	[(1)] Does not include western flower thrips.

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Xentari DF (*Bacillus thuringiensis* subspecies *aizawai*)	0.5-2.0 lb	4	0	caterpillars		Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Can be used in organic production.

The pesticide information presented in this table was current with federal and state regulations at the time of revision. The user is responsible for determining the intended use is consistent with the label of the product being used. Use pesticides safely. Read and follow label instructions.

[1] Mode of Action codes for vegetable pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v.3.3 October 2003.

1A. Acetylcholine esterase inhibitors, Carbamates
1B. Acetylcholine esterase inhibitors, Organophosphates
2A. GABA-gated chloride channel antagonists
3. Sodium channel modulators
4A. Nicotinic Acetylcholine receptor agonists/antagonists, Neonicotinoids
5. Nicotinic Acetylcholine receptor agonists (not group 4)
6. Chloride channel activators
7A. Juvenile hormone mimics, Juvenile hormone analogues
7D. Juvenile hormone mimics, Pyriproxifen
9A. Compounds of unknown or non-specific mode of action (selective feeding blockers), Cryolite
9B. Compounds of unknown or non-specific mode of action (selective feeding blockers), Pymetrozine
11B1. Microbial disruptors of insect midgut membranes, *B.t.* var *aizawai*
11B2. Microbial disruptors of insect midgut membranes, *B.t.* var *kurstaki*
12B. Inhibitors of oxidative phosphorylation, disruptors of ATP formation, Organotin miticide
15. Inhibitors of chitin biosynthesis, type 0, Lepidopteran
16. Inhibitors of chitin biosynthesis, type 1, Homopteran
17. Inhibitors of chitin biosynthesis, type 2, Dipteran
18. Ecdysone agonist/disruptor
20. Site II electron transport inhibitors
21. Site I electron transport inhibitors
22. Voltage-dependent sodium channel blocker
23. Inhibitors of lipid biosynthesis
25. Neuroactive (unknown mode of action)
26. Unknown mode of action, Azadirachtin

[2] OMRI-listed: Listed by the Organic Materials Review Institute for use in organic production.