

# Insect Management for Sweet Potatoes<sup>1</sup>

S. E. Webb<sup>2</sup>

Sweet potatoes are widely grown in Florida. In addition to the traditional moist, orange-fleshed varieties, a dry, white-fleshed type, the boniato, is extensively grown in south Florida. Both types are the same species (*Ipomoea batatas*), however, and their pest problems are similar.

Foliar pests are generally not too difficult to manage and include agromyzid leafminers, sweetpotato whitefly, (also called silverleaf whitefly), and morningglory leafminer, which is a small caterpillar. Armyworms will also feed on foliage. Natural enemies of these pests can be conserved by using pesticides specific for the pest and avoiding broad-spectrum insecticides, if at all possible.

The most serious pests are those whose immature stages feed on roots: sweetpotato weevil, wireworms, banded cucumber beetle, pale-striped and sweetpotato flea beetles, and in south Florida, Diaprepes weevil and Cuban May beetle. Other white grubs will also feed on sweet potato roots. There are very few soil insecticides available at this time. One of the few that remain, chlorpyrifos, has a 125 days-to-harvest interval which rules out its use with early-maturing varieties. Foliar insecticides aimed at the adult stage can give some control.

Sweetpotato weevil is the most serious pest of sweet potatoes (<http://edis.ifas.ufl.edu/IN154>). Sweet potatoes fed upon by weevil larvae become extremely bitter in taste so

even minor feeding renders the potato unmarketable. Some varieties of sweet potato (Regal, for instance) have some resistance to the weevil as well as other beetle pests but the most popular orange-fleshed variety, Beauregard, is highly susceptible. Of varieties currently grown in Florida, Jewel is the only one with some resistance to insects (flea beetles).

In areas of the state where weevils are not common, it is very important to use only certified slips or transplants from weevil-free areas to avoid introducing weevils. The adult weevil does not have wings, and it and the larval stage are most often moved by transporting infested plants or storage roots (potatoes). During the growing season, keeping storage roots covered with soil helps reduce damage by preventing female weevils from laying eggs directly in roots.

Cultural practices can help reduce insect problems. Ideally, soil should be turned two to three months before planting. Crop rotation is also important. Avoid growing sweet potatoes in the same field two years in a row. New fields should be at least a mile from old fields. Destroy crop residues and culls immediately after harvest and for weevils, empty and clean potato storage areas thoroughly at least a month before harvesting the new crop.

The following table lists insecticides currently registered for use on sweet potatoes.

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Table 1. Insecticides approved for managing insect pests of sweet potato.

Labels change frequently. Be sure to read a current product label before applying any chemical.  
Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient *Restricted	Rate Product/acre	REI hours	Days to Harvest	Notes <sup>2</sup>
Aphids	3A	<b>*Mustang</b> (zeta-cypermethrin)	1.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Leaves cannot be used for food or feed.
	3A, 28	<b>*Besiege</b> (lambda-cyhalothrin and chlorantraniliprole)	5-9 oz	24	14	Do not apply more than 27.0 fl. oz of product per acre per season. Supplemental label.
	4A	<b>Actara</b> (thiamethoxam)	1.5-3.0 oz	12	14	Toxic to bees. Do not use after Platinum.
	4A	<b>Admire Pro</b> (imidacloprid)	soil: 4.4-10.5 fl oz foliar: 1.2 fl oz	12	soil: 125 foliar: 7	One application to soil per season. If using as a foliar spray, no more than 3.7 fl oz per acre per season.
	4A	<b>Assail 30SG</b> (acetamiprid)	1.5-4.0 oz	12	7	Whiteflies not on label for sweet potatoes but are for other crops on label. No more than 4 applications per season.
	4A	<b>Belay Insecticide</b> (clothianidin)	in-furrow or side dress: 9-12 fl oz, foliar: 2-3 fl oz	12	foliar: 14	In-furrow or side-dress application, including chemigation up to 50% ground cover. Do not apply more than 12 fl oz per acre per year.
	4A	<b>Platinum 75SG</b> (thiamethoxam)	1.66-2.67 oz	12	Applied at planting	To manage resistance, avoid using other Group 4A insecticides in conjunction with Platinum. Highly toxic to bees. Do not allow to drift to blooming weeds or crops.
	4D	<b>Sivanto 200 SL</b> (flupyradifurone)	7-14 fl oz	4	7	Minimum interval between applications=7 days. Maximum allowed per acre per year=28 fl oz.
	9B	<b>Fulfill</b> (pymetrozine)	2.75-5.5 oz	12	14	Allow a minimum of 7 days between applications. Do not exceed 11 oz/acre per season.
	9C	<b>Beleaf 50 SG</b> (flonicamid)	2.0-2.8 oz	12	7	Do not apply more than 8.4 oz per acre per season.
23	<b>Movento</b> (spirotetramat)	4.0-5.0 fl oz	24	7	Maximum of 10 fl oz/acre per season.	

Table 1. Insecticides approved for managing insect pests of sweet potato. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.  
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Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient *Restricted	Rate Product/acre	REI hours	Days to Harvest	Notes <sup>2</sup>
	28	Verimark (cyantraniliprole)	6.75-13.5 fl oz	4	at planting	pH of application solution should be between 4 and 6.
	un	Aza-Direct (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
	un	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	un	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	Does not kill adult insects. IGR and feeding repellent. OMRI-listed <sup>2</sup> .
	un	Trilogy (extract of neem oil)	0.5-2.0% V/V	4	0	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed <sup>2</sup> .
	--	BotaniGard ES ( <i>Beauveria bassiana</i> )	0.5-2 qt/100 gal	4	0	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
	-	Grandevo ( <i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb	4	0	OMRI-listed <sup>2</sup> .
	-	M-Pede 49% EC (soap, insecticidal)	1-2 % V/V	12	0	OMRI-listed <sup>2</sup> .
Beetles (including Cucumber beetle, Japanese beetle, Tortoise beetle, flea beetle, whitefringed beetle)	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 1.25-2.5 lb XLR, 4F: 1-2 qt	12	7	Do not apply more than 10 lb (80S) per acre per crop or 8 qt (4F, XLR). See label for preplant dip treatment.
	1B	Imidan 70 W (phosmet)	1.3 lb	4 days for seedbed treatment, 5 days for foliar	7 No	more than 5 applications per season. Do not apply through irrigation system. Crop must be mechanically harvested.
	1B	Lorsban 15G, 75WG, *Advanced (chlorpyrifos)	See labels for rates	24	preplant broadcast treatment, 125 days before harvest	See label. Must be incorporated into soil. Only one application per season.
	1B	*Mocap 15 G, *EC (ethoprop)	See labels	48	preplant, see labels	Two to three weeks before planting.
	3A	*Baythroid XL (beta-cyfluthrin)	0.8-2.8 fl oz	12	0	No more than 16.8 fl oz/acre per season.
	3A	*Brigade 2 EC (bifenthrin)	9.6-19.2 oz at-plant (soil); 3.2-9.6 oz at lay-by (soil); 2.1-6.4 oz (foliar)	12	21	No more than 2 foliar applications, at least 21 days apart. Do not apply more than 0.5 lb active ingredient per acre per season, including soil applications.
	3A	*Mustang (zeta-cypermethrin)	1.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Leaves cannot be used for food or feed.
	3A	*Warrior II (lambda-cyhalothrin)	0.96-1.92 fl oz	24	7	Do not apply more than 7.68 fl oz of product per acre per season.
	4A	Actara (thiamethoxam)	1.5-3.0 oz	12	14	Toxic to bees. Do not use after Platinum.
	3A, 28	*Besiege (lambda-cyhalothrin and chlorantraniliprole)	5-9 oz	24	14	Do not apply more than 27.0 fl. oz of product per acre per season. Supplemental label.
	3A, 4A	*Endigo ZC (lambda-cyhalothrin, thiamethoxam)	3.5-4.5 fl oz	24	14	Do not exceed a total of 10 fl oz of product per acre per growing season. Do not use with other Group 4A insecticides.
	4A	Admire Pro (imidacloprid)	soil: 4.4-10.5 fl oz foliar: 1.2 fl oz	12	soil: 125 foliar: 7	One application to soil per season. If using as a foliar spray, no more than 3.7 fl oz per acre per season. Flea beetles only
	4A	Assail 30SG (acetamiprid)	1.5-4.0 oz	12	7	Whiteflies not on label for sweet potatoes but are for other crops on label. No more than 4 applications per season.

Table 1. Insecticides approved for managing insect pests of sweet potato. (continued)

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

Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.

Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient *Restricted	Rate Product/acre	REI hours	Days to Harvest	Notes <sup>2</sup>
	4A	Belay Insecticide (clothianidin)	in-furrow or side dress: 9-12 fl oz, foliar: 2-3 fl oz	12	foliar: 14	In-furrow or side-dress application, including chemigation up to 50% ground cover. Do not apply more than 12 fl oz per acre per year. Flea beetles only
	4A	Platinum 75SG (thiamethoxam)	1.66-2.67 oz	12	Applied at planting	To manage resistance, avoid using other Group 4A insecticides in conjunction with Platinum. Highly toxic to bees. Do not allow to drift to blooming weeds or crops. Flea beetles only
	4A	Scorpion 35 SL (dinotefuran)	2.0-2.75 fl oz: foliar, 11.5-13.25 fl oz: soil	12	foliar: 7, soil: apply preplant, preemergence, or at ground crack	Do not apply more than 8 fl oz per acre per season as foliar sprays, or more than 13.25 fl oz as a soil application. Highly toxic to bees for 38 hours after application. Do not apply to crops in bloom or allow to drift to weeds or other crops in bloom. Flea beetles only
	4A, 28	Voliam Flexi (thiamethoxam and chlorantraniliprole)	4 oz	12	14	Do not exceed a total of 8 oz of product per acre per season.
	un	Aza-Direct (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
	un	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	un	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	Does not kill adult insects. IGR and feeding repellent. OMRI-listed <sup>2</sup> .
Caterpillars (including armyworm, looper, corn earworm, hornworm, webworms, saltmarsh caterpillar)	1A	Sevin 80S; XLR; 4F (carbaryl)	80S: 1.25-2.5 lb XLR, 4F: 1-2 qt	12	7	Do not apply more than 10 lb (80S) per acre per crop or 8 qt (4F, XLR). See label for preplant dip treatment.
	3A	*Baythroid XL (beta-cyfluthrin)	0.8-2.8 fl oz	12	0	No more than 16.8 fl oz/acre per season.
	3A	*Brigade 2 EC (bifenthrin)	9.6-19.2 oz at-plant (soil); 3.2-9.6 oz at lay-by (soil); 2.1-6.4 oz (foliar)	12	21	No more than 2 foliar applications, at least 21 days apart. Do not apply more than 0.5 lb active ingredient per acre per season, including soil applications.
	3A	*Mustang (zeta-cypermethrin)	1.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Leaves cannot be used for food or feed.
	3A	*Warrior II (lambda-cyhalothrin)	0.96-1.92 fl oz	24	7	Do not apply more than 7.68 fl oz of product per acre per season.
	3A, 28	*Besiege (lambda-cyhalothrin and chlorantraniliprole)	5-9 oz	24	14	Do not apply more than 27.0 fl. oz of product per acre per season. Supplemental label.
	5	Entrust SC (spinosad)	4.5-10 fl oz	4	7	Do not make applications less than 7 days apart or apply more than 4 times per crop. Do not apply more than 21 fl oz/acre per crop. OMRI-listed <sup>2</sup>
	5	Radiant SC (spinetoram)	6-8 fl oz	4	7	Do not make more than 4 applications per year.
	11A	DiPel DF ( <i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> )	0.5-2.0 lb	4	0	Treat when larvae are young. Good coverage is essential. Can be used in organic production.
	11A	Xentari DF ( <i>Bacillus thuringiensis</i> subspecies <i>aizawai</i> )	0.5-2.0 lb	4	0	Catepillars only. Treat when larvae are young. Thorough coverage is essential. May be used in the greenhouse. Can be used in organic production.
	15	Rimon 0.83 EC (novaluron)	6-12 fl oz	12	14	Do not apply more than 24 oz per acre per season. Limited to two applications for whiteflies (12-oz rate).
	18	Intrepid 2F (methoxyfenozide)	6-10 fl oz	4	7	Do not apply more than 64 fl oz of product per acre per year or apply more often than every 14 days.
	22	Avant (indoxacarb)	2.5-6.0 oz	12	7	Do not apply more than 24 oz/acre per crop.
28	Coragen (chlorantraniliprole)	3.5-5.0 fl oz	4	1	Foliar only. No more than 4 applications per crop. Do not make more than 2 successive applications in a 30-day period. Do not apply more than 15.4 fl oz per acre per crop.	

Table 1. Insecticides approved for managing insect pests of sweet potato. (continued)

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Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient *Restricted	Rate Product/acre	REI hours	Days to Harvest	Notes <sup>2</sup>
	28	Verimark (cyantraniliprole)	6.75-13.5 fl oz	4	at planting	pH of application solution should be between 4 and 6.
	un	Aza-Direct (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
	un	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	un	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	Does not kill adult insects. IGR and feeding repellent. OMRI-listed <sup>2</sup> .
	-	Grandevo ( <i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb	4	0	OMRI-listed <sup>2</sup> .
Fire ants	1B	*Mocap 15 G, *EC (ethoprop)	See labels	48	preplant, see labels	Two to three weeks before planting.
	7A	Extinguish ((S)-methoprene)	1.0-1.5 lb	4	0	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.
	7D	Esteem Ant Bait (pyriproxyfen)	1.5-2.0 lb	12	1	Do not exceed a total of 0.109 lb pyriproxyfen per acre (all formulations, i.e., Knack IGR). Ant Bait contains 0.5% ai, or 0.10 lb at 2-lb rate.
Leafhoppers	1B	Malathion 5 EC (malathion)	5EC: 1.5-2.5 pt 8F: 1-1.5 pt	12	5EC: 0 8F: 3	Maximum of two applications per year.
	3A	*Baythroid XL (beta-cyfluthrin)	0.8-2.8 fl oz	12	0	No more than 16.8 fl oz/acre per season.
	3A	*Warrior II (lambda-cyhalothrin)	0.96-1.92 fl oz	24	7	Do not apply more than 7.68 fl oz of product per acre per season.
	3A	*Mustang (zeta-cypermethrin)	1.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Leaves cannot be used for food or feed.
	3A, 28	*Besiege (lambda-cyhalothrin and chlorantraniliprole)	5-9 oz	24	14	Do not apply more than 27.0 fl. oz of product per acre per season. Supplemental label.
	3A, 4A	*Endigo ZC (lambda-cyhalothrin, thiamethoxam)	3.5-4.5 fl oz	24	14	Do not exceed a total of 10 fl oz of product per acre per growing season. Do not use with other Group 4A insecticides.
	4A	Admire Pro (imidacloprid)	soil: 4.4-10.5 fl oz foliar: 1.2 fl oz	12	soil: 125 foliar: 7	One application to soil per season. If using as a foliar spray, no more than 3.7 fl oz per acre per season.
	4A	Assail 30SG (acetamiprid)	1.5-4.0 oz	12	7	Whiteflies not on label for sweet potatoes but are for other crops on label. No more than 4 applications per season.
	4A	Platinum 75SG (thiamethoxam)	1.66-2.67 oz	12	Applied at planting	To manage resistance, avoid using other Group 4A insecticides in conjunction with Platinum. Highly toxic to bees. Do not allow to drift to blooming weeds or crops.
	4A	Scorpion 35 SL (dinotefuran)	2.0-2.75 fl oz: foliar, 11.5-13.25 fl oz: soil	12	foliar: 7, soil: apply preplant, preemer- gence, or at ground crack	Do not apply more than 8 fl oz per acre per season as foliar sprays, or more than 13.25 fl oz as a soil application. Highly toxic to bees for 38 hours after application. Do not apply to crops in bloom or allow to drift to weeds or other crops in bloom.
	4A, 28	Voliam Flexi (thiamethoxam and chlorantraniliprole)	4 oz	12	14	Do not exceed a total of 8 oz of product per acre per season.
	4C	Transform WG (sulfoxaflor)	0.75-2.25 oz	24	7	Do not make more than 2 consecutive or 4 total applications per year.
	4D	Sivanto 200 SL (flupyradifurone)	7-14 fl oz	4	7	Minimum interval between applications=7 days. Maximum allowed per acre per year=28 fl oz.
	23	Movento (spirotetramat)	4.0-5.0 fl oz	24	7	Maximum of 10 fl oz/acre per season.
	un	Aza-Direct (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .

Table 1. Insecticides approved for managing insect pests of sweet potato. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.  
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Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient *Restricted	Rate Product/acre	REI hours	Days to Harvest	Notes <sup>2</sup>
	un	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	un	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	Does not kill adult insects. IGR and feeding repellent. OMRI-listed <sup>2</sup> .
	-	Grandevo ( <i>Chromobacterium subtsugae</i> strain PRAA4-1)	1-3 lb	4	0	OMRI-listed <sup>2</sup> .
<i>Liriomyza</i> Leafminers	1B	Malathion 5 EC (malathion)	5EC: 1.5-2.5 pt 8F: 1-1.5 pt	12	5EC: 0 8F: 3	Maximum of two applications per year.
	4A	Actara (thiamethoxam)	1.5-3.0 oz	12	14	Toxic to bees. Do not use after Platinum.
	5	Entrust SC (spinosad)	4.5-10 fl oz	4	7	Do not make applications less than 7 days apart or apply more than 4 times per crop. Do not apply more than 21 fl oz/acre per crop. OMRI-listed <sup>2</sup>
	5	Radiant SC (spinetoram)	6-8 fl oz	4	7	Do not make more than 4 applications per year.
	6	*Agri-Mek SC (abamectin)	1.75-3.5 fl oz	12	14	Must be used with a non-ionic activator type wetting, spreading and/or penetrating adjuvant., not a binder sticker type adjuvant.
	15	Rimon 0.83 EC (novaluron)	6-12 fl oz	12	14	Do not apply more than 24 oz per acre per season. Limited to two applications for whiteflies (12-oz rate).
	un	Aza-Direct (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
	un	Azatin XL (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	un	Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	Does not kill adult insects. IGR and feeding repellent. OMRI-listed <sup>2</sup> .
	--	Oil, insecticidal	1-2 gal/100 gal	12	Up to day of harvest	
Mites	6	*Agri-Mek SC (abamectin)	1.75-3.5 fl oz	12	14	Must be used with a non-ionic activator type wetting, spreading and/or penetrating adjuvant., not a binder sticker type adjuvant.
	23	Oberon 2SC (spiromesifen)	8-16 fl oz	12	7	Maximum amount per crop: 32 oz/acre. No more than 2 applications.
	un	Aza-Direct (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
	un	Trilogy (extract of neem oil)	0.5-2.0% V/V	4	0	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed <sup>2</sup> .
	--	Oil, insecticidal	1-2 gal/100 gal	12	Up to day of harvest	
Stinkbugs, plant bugs	3A	*Mustang (zeta-cypermethrin)	1.4-4.3 oz	12	1	A maximum of 0.3 lb ai/acre per season may be applied. Leaves cannot be used for food or feed.
	3A	*Warrior II (lambda-cyhalothrin)	0.96-1.92 fl oz	24	7	Do not apply more than 7.68 fl oz of product per acre per season.
	3A, 28	*Besiege (lambda-cyhalothrin and chlorantraniliprole)	5-9 oz	24	14	Do not apply more than 27.0 fl. oz of product per acre per season. Supplemental label.
	3A, 4A	*Endigo ZC (lambda-cyhalothrin, thiamethoxam)	3.5-4.5 fl oz	24	14	Do not exceed a total of 10 fl oz of product per acre per growing season. Do not use with other Group 4A insecticides.
	9C	Beleaf 50 SG (flonicamid)	2.0-2.8 oz	12	7	Do not apply more than 8.4 oz per acre per season.
	un	Aza-Direct (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
Thrips (check label for species controlled)	5	Entrust SC (spinosad)	4.5-10 fl oz	4	7	Do not make applications less than 7 days apart or apply more than 4 times per crop. Do not apply more than 21 fl oz/acre per crop. OMRI-listed <sup>2</sup>
	5	Radiant SC (spinetoram)	6-8 fl oz	4	7	Do not make more than 4 applications per year.

Table 1. Insecticides approved for managing insect pests of sweet potato. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.  
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Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient *Restricted	Rate Product/acre	REI hours	Days to Harvest	Notes <sup>2</sup>
	un	<b>Aza-Direct</b> (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
	un	<b>Azatin XL</b> (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	un	<b>Trilogy</b> (extract of neem oil)	0.5-2.0% V/V	4	0	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed <sup>2</sup> .
	--	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.5-2 qt/100 gal	4	0	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides.
Sweetpotato weevil	1B	<b>Imidan 70 W</b> (phosmet)	1.3 lb	4 days for seedbed treatment, 5 days for foliar	7	No more than 5 applications per season. Do not apply through irrigation system. Crop must be mechanically harvested.
	3A	<b>*Baythroid XL</b> (beta-cyfluthrin)	0.8-2.8 fl oz	12	0	No more than 16.8 fl oz/acre per season. Adults only
	4A	<b>Belay Insecticide</b> (clothianidin)	9-12 fl oz			In furrow or side dressing
	un	<b>Aza-Direct</b> (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
	un	<b>Azatin XL</b> (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	un	<b>Neemix 4.5</b> (azadirachtin)	4-16 fl oz	12	0	Does not kill adult insects. IGR and feeding repellent. OMRI-listed <sup>2</sup> .
Whitefly	1B	<b>Malathion 5 EC</b> (malathion)	5EC: 1.5-2.5 pt 8F: 1-1.5 pt	12	5EC: 0 8F: 3	Maximum of two applications per year. Tank mix with pyrethroid for best control
	3A	<b>*Brigade 2 EC</b> (bifenthrin)	<del>9.6-19.2 oz at plant</del> (soil): 3.2-9.6 oz at lay by (soil); 2.1-6.4 oz (foliar)	12	21	Foliar only. No more than 2 foliar applications, at least 21 days apart. Do not apply more than 0.5 lb active ingredient per acre per season, including soil applications. Tanksmix with Malathion for best control.
	3A	<b>*Warrior II</b> (lambda-cyhalothrin)	0.96-1.92 fl oz	24	7	Do not apply more than 7.68 fl oz of product per acre per season. Tanksmix with Malathion for best control.
	3A, 4A	<b>*Endigo ZC</b> (lambda-cyhalothrin, thiamethoxam)	3.5-4.5 fl oz	24	14	Do not exceed a total of 10 fl oz of product per acre per growing season. Do not use with other Group 4A insecticides.
	4A	<b>Admire Pro</b> (imidacloprid)	soil: 4.4-10.5 fl oz foliar: 1.2 fl oz	12	soil: 125 foliar: 7	One application to soil per season. If using as a foliar spray, no more than 3.7 fl oz per acre per season.
	4A	<b>Assail 30SG</b> (acetamiprid)	1.5-4.0 oz	12	7	Whiteflies not on label for sweet potatoes but are for other crops on label. No more than 4 applications per season.
	4D	<b>Sivanto 200 SL</b> (flupyradifurone)	7-14 fl oz	4	7	Minimum interval between applications=7 days. Maximum allowed per acre per year=28 fl oz.
	15	<b>Rimon 0.83 EC</b> (novaluron)	6-12 fl oz	12	14	Do not apply more than 24 oz per acre per season. Limited to two applications for whiteflies (12-oz rate).
	23	<b>Movento</b> (spirotetramat)	4.0-5.0 fl oz	24	7	Maximum of 10 fl oz/acre per season.
	23	<b>Oberon 2SC</b> (spiromesifen)	8-16 fl oz	12	7	Maximum amount per crop: 32 oz/acre. No more than 2 applications.
	un	<b>Aza-Direct</b> (azadirachtin)	1-2 pt, up to 3.5 pt, if needed	4	0	Antifeedant, repellent, insect growth regulator. OMRI-listed <sup>2</sup> .
	un	<b>Azatin XL</b> (azadirachtin)	5-21 fl oz	4	0	Antifeedant, repellent, insect growth regulator.
	un	<b>Neemix 4.5</b> (azadirachtin)	4-16 fl oz	12	0	Does not kill adult insects. IGR and feeding repellent. OMRI-listed <sup>2</sup> .
	un	<b>Trilogy</b> (extract of neem oil)	0.5-2.0% V/V	4	0	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed <sup>2</sup> .

Table 1. Insecticides approved for managing insect pests of sweet potato. (continued)

Labels change frequently. Be sure to read a current product label before applying any chemical.  
Also refer to Table 18.2 for biopesticide and other alternative products labeled for disease management.



Insects	MOA Code <sup>1</sup>	Trade Name Active Ingredient *Restricted	Rate Product/acre	REI hours	Days to Harvest	Notes <sup>2</sup>
	--	<b>BotaniGard ES</b> ( <i>Beauveria bassiana</i> )	0.5-2 qt/100 gal	4	0	May be used in greenhouses. Contact dealer for recommendations if an adjuvant must be used. Not compatible in tank mix with fungicides. OMRI-listed <sup>2</sup> .
	-	<b>Grandevo</b> ( <i>Chromobacterium</i> <i>subtsugae</i> strain PRAA4-1)	1-3 lb	4	0	
	--	<b>Oil, insecticidal</b>	1-2 gal/100 gal	12	Up to day of harvest	

<sup>1</sup> Mode of Action (MOA) codes for plant pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 7.3, February 2014. Number codes (1 through 28) are used to distinguish the main insecticide mode of action groups, with additional letters for certain sub-groups within each main group. All insecticides within the same group (with same number) indicate same active ingredient or similar mode of action. This information must be considered for the insecticide resistance management decisions. un = unknown, or a mode of action that has not been classified yet.

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

\* Restricted use insecticide.