

Insect Management for Sweet Potatoes¹

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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 (Regal, for instance) of sweet potato 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.

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The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition. All chemicals should be used in accordance with directions on the manufacturer's label. Use pesticides safely. Read and follow directions on the manufacturer's label.

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.

Table 1. Selected insecticides approved for use on insects attacking sweet potatoes.

Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code ¹	Notes
Actara (thiamethoxam)	1.5-3.0 oz	12	14	aphids, flea beetles, potato leafhopper	4A	Toxic to bees. Do not use after Admire, Platinum, or Venom. One application per season.
Admire Pro (imidacloprid)	4.4-10.5 fl oz	12	125	aphids, flea beetles, leafhoppers, whiteflies	4A	
Assail 70WP Assail 30SG (acetamiprid)	0.6-1.7 oz 1.5-4.0 oz	12	7	aphids, cucumber beetles, flea beetles, leafhoppers, whiteflies	4A	Whiteflies not on label for sweet potatoes but are for other crops on label. No more than 4 applications per season.
Avant (indoxacarb)	2.5-6.0 oz	12	7	cabbage looper	22	Do not apply more than 24 oz/acre per crop.
Aza-Direct (azadirachtin)	1-2 pts, up to 3.5 pts, if needed	4	0	aphids, beetles, caterpillars, leafhoppers, leafminers, mites, stink bugs, thrips, weevils, whiteflies	un	Antifeedant, repellent, insect growth regulator. OMRI-listed ² .
Azatin XL (azadirachtin)	5-21 fl oz	4	0	aphids, beetles, caterpillars, leafhoppers, leafminers, thrips, weevils, whiteflies	un	Antifeedant, repellent, insect growth regulator.
*Baythroid XL (beta-cyfluthrin)	0.8-2.8 fl oz	12	0	cutworms, cabbage looper, flea beetles, potato leafhopper, sweetpotato weevil adults	3	No more than 16.8 oz/acre per season.
Biobit HP (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	caterpillars (will not control large armyworms)	11	Treat when larvae are young. Good coverage is essential. Can be used in the greenhouse. OMRI-listed ² .
BotaniGard 22 WP, ES (<i>Beauveria bassiana</i>)	WP: 0.5-2 lb/100 gal ES: 0.5-2 qt/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.

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*Brigade 2 EC (bifenthrin) *Capture LFR	9.6-19.2 oz at-plant (soil); 3.2-9.6 oz at lay-by (soil); 2.1-6.4 oz (foliar) See label for rates for LFR.	12	21	cucumber beetles, flea beetles, sweetpotato weevil adults (foliar), whitefringed beetle adults, white grub adults, white grubs (lay-by), wireworm adults, wireworms (at-plant and lay-by)	3	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.
Coragen (rynaxypyr)	3.5-5.0 fl oz	4	14	beet armyworm	28	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.
Crymax WDG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	caterpillars	11	Use high rate for armyworms. Treat when larvae are young.
Deliver (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.25-1.5 lb	4	0	caterpillars	11	Use higher rates for armyworms. OMRI-listed ² .
Diatect V; Diatect Multipurpose Insecticide II (diatomaceous earth + pyrethrins + piperonyl butoxide)	1-6 lb	12	0	aphids, armyworms, cabbage looper	3, --	Diatect V is OMRI-listed ² (no piperonyl butoxide)
DiPel DF (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.5-2.0 lb	4	0	caterpillars	11	Treat when larvae are young. Good coverage is essential.
Entrust (spinosad)	1-3 oz	4	7	armyworms, leafminers, <i>Liriomyza</i> , loopers, thrips	5	Do not make applications less than 7 days apart or apply more than 4 times per crop. Do not apply more than 6.5 oz/acre per crop. OMRI-listed ² .

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Trade Name (Common Name)	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code ¹	Notes
Extinguish (S)-methoprene)	1.0-1.5 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.
Fulfill (pymetrozine)	2.75-5.5 oz	12	14	buckthorn aphid, green peach aphid, melon aphid, potato aphid	9B	Allow a minimum of 7 days between applications. Do not exceed 11 oz/acre/season.
Imidan 70 W (phosmet)	1.3 lb	4 days for seedbed treatment, 5 days for foliar	7	banded cucumber beetle, sweetpotato weevil, whitefringed beetle, suppression of white grub and wireworm	1B	No more than 5 applications per season. Do not apply through irrigation system. Crop must be mechanically harvested.
Javelin WG (<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i>)	0.12-1.5 lb	4	0	most caterpillars, but not <i>Spodoptera</i> species (armyworms)	11	Treat when larvae are young. Thorough coverage is essential. OMRI-listed ² .
Lorsban 15G, 75WG, *Advanced (chlorpyrifos)	See labels for rates	24	preplant broadcast treatment, 125 days before harvest	flea beetles, sweet potato flea beetle, wireworms (<i>Conoderus</i>)	1B	See label. Must be incorporated into soil.
Malathion 8 F (malathion)	1-1.75 pt	12	3	leafhoppers, morning glory leafminer	1B	
*Mocap 15 G, *EC (ethoprop)	See labels	48	preplant see label	cucumber beetles, flea beetles, white grubs, wireworms	1B	Two to three weeks before planting.
Movento (spirotetramat)	4.0-5.0 fl oz	24	7	aphids, psyllids, whiteflies	23	Maximum of 10 fl oz/acre per season.
M-Pede 49% EC Soap, insecticidal	1-2 % V/V	12	0	aphids	-	OMRI-listed ² .

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*Mustang (zeta-cypermethrin)	1.4-4.3 oz	12	1	cabbage looper, cucumber beetles, cutworms, flea beetles, grasshoppers, leathoppers, tarnished plant bug, vegetable weevil, whitefringed beetle (adult), yellowstriped armyworm; aids in control of aphids and beet armyworm	3	A maximum of 0.3 lb ai/acre per season may be applied. Leaves cannot be used for food or feed.
Neemix 4.5 (azadirachtin)	4-16 fl oz	12	0	aphids, beetles, caterpillars, grasshoppers, leathoppers, leafminers, thrips, weevils, whiteflies	un	Does not kill adult insects. IGR and feeding repellent. OMRI-listed ² .
Oberon 2SC (spiromesifen)	8-16 fl oz	12	7	twospotted spider mite, whiteflies	23	Maximum amount per crop: 32 oz/acre. No more than 2 applications.
Oil, insecticidal	1-2 gal/100 gal	12	Up to day of harvest	leafminers, mites, whiteflies	--	
Platinum	5-8 fl oz	12	Applied at planting	aphids, Colorado potato beetles, flea beetles, potato leathoppers	4A	For most crops that are not on the label, a 120-day plant-back interval must be observed. To manage resistance, avoid using Actara or Provado in conjunction with Platinum.
Platinum 75SG (thiamethoxam)	1.66-2.67 oz	12		aphids, flea beetles, leathoppers, whiteflies	4A	Limited to 3 applications.
Provado 1.6F (imidacloprid)	3.5 oz	12	7	aphids, cabbage looper, leathoppers, mites, plant bugs, thrips	3, 21	
Pyrellin EC (pyrethrin + rotenone)	1-2 pt	12	12 hours	armyworm, Colorado potato beetle, dipterous leafminer, loopers, thrips	5	Do not make more than 4 applications per year.
Radiant (spinetoram)	6-8 fl oz	4	7	armyworms, loopers, other foliage feeding caterpillars, whiteflies (suppression)	15	Do not apply more than 24 oz per acre per season. Limited to two applications.
Rimon 0.83 EC (novaluron)	9-12 fl oz	12	14			

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Sevin 80S; XLR; 4F (carbaryl)	80S: 1.25-2.5 lb XLR, 4F: 1-2 qt	12	7	corn earworm, cucumber beetles, flea beetles, sweetpotato hornworm, sweetpotato weevil (preplant dip), tortoise beetle, whitefringed beetle, yellowstriped armyworm	1A	Do not apply more than 10 lb (80S) per acre per crop or 8 qt (4F, XLR). See label for preplant dip treatment.
SpinTor 2 SC (spinosad)	3.2-9.6 fl oz	4	7	armyworms, leafminers (<i>Liriomyza</i> spp.), loopers, thrips	5	Do not apply more than a total of 21 fl oz per acre per crop.
*Telone C-35 (dichloropropene + chloropicrin)	See label	5 days- See label	preplant	symphylans, wireworms	--	See supplemental label for use restrictions in south and central Florida.
*Telone II (dichloropropene)						
*Thionex 3 EC (endosulfan)	0.66-1.33 qt	72	1	sweetpotato flea beetle, sweetpotato weevil, whiteflies	2	Do not make more than 2 applications per year or exceed 2.0 lb active ingredient per acre per year.
Trilogy (extract of neem oil)	0.5-2.0% V/V	4	0	aphids, mites, suppression of thrips and whiteflies	un	Apply morning or evening to reduce potential for leaf burn. Toxic to bees exposed to direct treatment. OMRI-listed ² .
Xentari DF (<i>Bacillus thuringiensis</i> subspecies <i>aizawai</i>)	0.5-2.0 lb	4	0	caterpillars	11	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.

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¹ Mode of Action codes for vegetable pest insecticides from the Insecticide Resistance Action Committee (IRAC) Mode of Action Classification v. 6.1 August 2008.						
1A. Acetyl cholinesterase inhibitors, Carbamates (nerve action)						
1B. Acetyl cholinesterase inhibitors, Organophosphates (nerve action)						
2A. GABA-gated chloride channel antagonists (nerve action)						
3. Sodium channel modulators (nerve action)						
4A. Nicotinic acetylcholine receptor agonists (nerve action)						
5. Nicotinic acetylcholine receptor allosteric activators (nerve action)						
6. Chloride channel activators (nerve and muscle action)						
7A. Juvenile hormone mimics (growth regulation)						
7C. Juvenile hormone mimics (growth regulation)						
9B and 9C. Selective homopteran feeding blockers						
10. Mite growth inhibitors (growth regulation)						
11. Microbial disruptors of insect midgut membranes						
12B. Inhibitors of mitochondrial ATP synthase (energy metabolism)						
15. Inhibitors of chitin biosynthesis, type 0, lepidopteran (growth regulation)						
16. Inhibitors of chitin biosynthesis, type 1, homopteran (growth regulation)						
17. Molting disruptor, dipteran (growth regulation)						
18. Ecdysone receptor agonists (growth regulation)						
22. Voltage-dependent sodium channel blockers (nerve action)						
23. Inhibitors of acetyl Cocarboxylase (lipid synthesis, growth regulation)						
28. Ryanodine receptor modulators (nerve and muscle action)						
un. Compounds of unknown or uncertain mode of action						
² OMRI-listed: Listed by the Organic Materials Review Institute for use in organic production.						
* Restricted Use Only.						