UNIVERSITY OF FLORIDA
IFAS EXTENSION

ENY-467

Insect Management for Onions, Leek, and Garlic[1]

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Sweet varieties of bulbing onions, which make bulbs under short day conditions and do not store well, are by far the most common onions grown in Florida. They are generally grown on small acreages in the winter for local and farmers markets. In Hillsborough County and in the Suwannee Valley, strawberry growers are the major producers of onions, many of which are harvested green.

Because it is grown in the winter and early spring, the onion crop in Florida suffers from relatively few insect pests, with thrips and seedcorn maggot being the most commonly found. Armyworms and cutworms can occasionally damage seedlings. Cultural controls, such as growing thrips-tolerant varieties and preparing seedbeds early, should be used and insecticides avoided as much as possible to limit the development of insecticide resistance and favor the survival of insect predators and parasites.

Several species of thrips feed on onions. In north Florida, onion thrips (*Thrips tabaci*) and tobacco thrips (*Frankliniella fusca*) are the most commonly found. Onion thrips can transmit iris yellow spot virus and tobacco thrips transmits tomato spotted wilt virus to onions. Other thrips that have been reported to attack onions include western flower thrips (*F. occidentalis*) and melon thrips (*T. palmi*). Thrips can become resistant to insecticides very quickly. Because they feed deep down at the base of emerging leaves, they can also avoid both insecticides and natural enemies, such as the insidious pirate bug. There are relatively few insecticides labeled for use on onions. The most commonly used are the pyrethroids and methomyl, a carbamate, but they may be only moderately effective. A threshold of 5-10 thrips per plant has been suggested for winter-grown sweet onions in the South.

Seedcorn maggots (*Delia platura*), which feed on many different plants, can be a problem when there are high levels of decaying organic matter in the soil and when the weather is cool and wet. Soil applications of chlorpyrifos or diazinon at planting may be useful if there is a history of seedcorn maggot problems. Early preparation of the field to allow the breakdown of organic matter before planting is essential.

1. This document is ENY-467 (IG153), one of a series of the Entomology & Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Published: August 2002. Revised: September 2005. For more publications related to horticulture/agriculture, please visit the EDIS Website at **http://edis.ifas.ufl.edu/**.

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Table 1. Selected insecticides approved for use on insects attacking onions and allies.

Chemical Name	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code[1]	Notes
Agree WG (*Bacillus thuringiensis* subspecies *aizawai*)	1.0-2.0 lb	4	0	lepidopteran larvae (caterpillar pests)	11B1	Apply when larvae are small for best control. OMRI-listed[2].
***Ambush 25 W** (permethrin)	6.4-19.2 oz	12	1	armyworms, cutworms, leafminers, onion maggot (adults), onion thrips, stink bugs	3	Dry bulb only and garlic.
***Ammo 2.5 EC** (cypermethrin)	2.0-5.0 fl oz	12	7	aphids, armyworms, cutworms, leafminers, onion maggot adults, stink bugs	3	All *Allium* spp., green and dry.
Aza-Direct (azadirachtin)	1-2 pts, up to 3.5, if needed	4	0	aphids, beetles, caterpillars, leafhoppers, leafminers, mites, stink bugs, thrips, weevils, whiteflies	26	Antifeedant, repellant, 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, repellant, insect growth regulator.
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.

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Condor (*Bacillus thuringiensis* subspecies *kurstaki*)	0.67-1.67 qts	4	0	caterpillars	11B2	Do not use in combination with any chlorothalonil-based fungicides. Use caution when mixing with other oil-based products or surfactants. Treat when larvae are young. Good coverage is essential.
Deliver (*Bacillus thuringiensis* subspecies *kurstaki*)	0.25-1.5 lb	4	0	caterpillars	11B2	Use higher rates for armyworms. OMRI-listed[2].
***Diazinon AG500, 4 EC, *50 W** (diazinon)	**foliar - AG500, 4EC:** 3-4 qts **50W:** 6-8 lb	24	14	onion thrips	1B	Bulb and green
	preplant - AG500, 4EC: 3-4 qts **50W:** 6-8 lb	24	preplant	wireworms	1B	See label.
DiPel DF (*Bacillus thuringiensis* subspecies *kurstaki*)	0.5-2.0 lb	4	0	caterpillars	11B2	Treat when larvae are young. Good coverage is essential.
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. This is the only fire ant bait that is labeled for use on cropland. May be applied by ground equipment or aerially.
Javelin WG (*Bacillus thuringiensis* subspecies *kurstaki*)	0.12-1.5 lb	4	0	most caterpillars, but not *Spodoptera* species (armyworms)	11B2	Treat when larvae are young. Thorough coverage is essential. OMRI-listed[2].

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***Lannate LV; *SP** (methomyl)	**LV:** 1.5-3.0 pt **SP:** 0.5-1.0 lb	48	7 = (dry and green)	beet armyworm, black cutworm, thrips, variegated cutworm	1A	Add a wetting agent to improve coverage.
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.
Lorsban 15 G; *4 E; 75 WG (chlorpyrifos)	See labels for rates	24	at planting	onion maggot	1B	Dry bulb only.
Malathion 5 EC; 8 F (malathion)	1-2 pt	12	3	onion maggot, thrips	1B	
M-Pede 49% EC Soap, insecticidal	1-2% V/V	12	0	aphids, leafhoppers, mites, plant bugs, thrips, whiteflies	--	
***Mustang Max** (zeta-cypermethrin)	2.24-4.0 oz	12	7	aphids, armyworms, cutworms, leafminers, onion maggot adults, onion thrip, stink bugs	3	
Neemix 4.5 EC (azadirachtin)	4-16 fl oz	12	0	aphids, armyworms, cabbage looper, cutworms, leafminers, onion maggot, thrips, whiteflies	26	OMRI-listed[2].
***Penncap-M** (methyl parathion)	2 pt	4 days - See label	15	thrips	1B	Do not apply when onions are blooming and bees are foraging.
***Pounce 3.2 EC** (permethrin) (dry only)	4-12 oz	12	1	armyworms, cutworms, leafminers, onion maggot, stink bugs, thrips	3	
Pyrellin EC (pyrethrin + rotenone)	1-2 pt	12	12 hours	aphids, leafhoppers, loopers, mites, plant bugs, stink bugs, thrips, whiteflies	3, 21	
Spod-X LC (insect virus)	1.7-3.4 fl oz	4	0	beet armyworm	--	Treat when larvae are small. OMRI-listed[2].

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Chemical Name	Rate (product/acre)	REI (hours)	Days to Harvest	Insects	MOA Code[1]	Notes
***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.
Trigard (cyromazine)	2.66 oz	12	7	leafminers	17	Do not make more than 6 applications.
Trilogy (extract of neem oil)	0.5-2.0% 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	14	aphids, armyworms, cutworms, onion maggot adults, plant bugs, stink bugs, thrips	3	For bulb crops only, not green onions. Do not apply more than 0.24 lb ai/acre per season.
Xentari DF (*Bacillus thuringiensis* subspecies *aizawai*)	0.5-2.0 lb	4	0	caterpillars	11B1	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.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
7C. 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.

*** Restricted Use Only.**