

INSECTICIDE RECOMMENDATIONS FOR TOBACCO BEDS AND FIELDS- 2009 ENT-15

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These recommendations were prepared as a guide and are not intended to replace the manufacturer's label. Read the entire label carefully before buying and using any insecticide. Pay special attention to the sections of the label that contain directions for mixing, application, and worker protection. Products in *bold italics* are *Restricted Use* insecticides.

Products containing endosulfan (Thiodan, Phaser, etc.) are no longer recommended for use on burley because of concerns about the residues of this insecticide on tobacco grown for export. Many products containing other active ingredients are available and provide excellent pest control.

Insecticides for Float Plant Pests (Outdoor or Greenhouse)

Orthene 97 SP (3/4 tablespoon) can be used in 3 gallons of water per 1,000 sq ft of float tray area to control **aphids, cutworms, and flea beetles**. Sprays also should provide some control of adult **fungus gnats and shore flies**, small black gnats that can be found crawling over plants and growth media in the trays. Apply to ensure even coverage. Use of higher than labeled rates may burn the foliage. NOTE: Float bed water should be disposed of in the transplanted field through the transplant water or as a foliar spray.

Deadline M-P slug bait (metaldehyde) can be used in greenhouses where tobacco transplants are grown to reduce **slug** infestations. This bait is most effective when slugs do not have access to water so it may be less effective in greenhouses.

Conventional Beds

Post-seeding Treatments (Rates for 100' of 9'-wide or 12'-wide beds) Acephate 75 SP, Orthene 75 S
 Orthene 97 can be used at the rate of 1 Tbs/ gal/ 1,000 sq ft of bed 3/4 Tbs per gal to control aphids, cutworms, or flea beetles.

Deadline M-P (metaldehyde) bait may be used for **slug** control. Damage is most likely on beds adjacent to clover or alfalfa fields. Follow label instructions on rates. Apply in the evening after watering and every 3 to 4 weeks as necessary. Presence of slugs is often indicated by slime trails they leave on the leaf surface. A band of slaked or hydrated lime along margins may reduce slug movement into the bed.

Pre-Transplant Soil Applications for Tobacco Fields

Pre-plant Insecticides	Rate/Acre	Labeled Pests
<i>Brigade EC</i> <i>Capture LFR</i>	3.4 to 6.8 fl oz 4 to 6.4 fl oz	Cutworms, white grubs, wireworms
<i>Lorsban 4E</i> (chlorpyrifos)	2 qts	Cutworms, wireworms
<i>Mocap 15% G</i> (ethoprop)	13 lbs See label	Wireworms From 2 weeks before transplant up to transplant

Soil insecticides used for **cutworm** or **wireworm** control should be applied at least one to two weeks before transplant and immediately disked into the top 2" to 4" of soil. A soil insecticide should be used when going into established sod. Liquid formulations are more toxic to handlers than are granular formulations.

Transplant - Tray Drench Applications

Admire 2F, **Belay**, and **Platinum** are systemic insecticides that are labeled for application as a drench to float trays or flats prior to transplant. Most rates are expressed as fluid ounces per 1,000 plants. Admire can be applied in the transplant water at the rate of 0.6 to 1.2 fl oz per 1,000 plants to suppress the symptoms of **tomato spotted wilt (TSWV)**. Agitate or mix the insecticide frequently to keep it from settling in the tank. The plants should be watered from above after application to wash the insecticide from the foliage into the potting soil-less media. Failure to wash the insecticide from the foliage may result in reduced control. Adverse growing conditions may cause a delay in the uptake of the product into the plants and delay control.

Insecticide Tray Drench	Rate	Comment
Admire Pro 4F	0.5 fl oz/ 1,000 plants 0.6 to 1.2 fl oz	Aphids, flea beetles Wireworms (high rate)
Orthene 97	3/4 lb per acre	Flea beetles, cutworms
Belay 16 WSG	5 oz / acre 10 oz / acre	Flea beetles Aphids
Platinum 2 SC	0.8 to 1.3 fl oz / 1,000 plants 1.3 fl oz / 1,000 plants	Aphids, flea beetles, Japanese beetles Wireworms

Transplant Water Applications

Insecticide Transplant Water	Rate	Comment
Admire Pro (42.8%)	0.6 to 1.2 fl oz / 1,000 plants	Aphids, flea beetles Wireworms (high rate)
Orthene 97	3/4 lb per acre	Flea beetles, cutworms
Belay 16 WSG	5 oz / acre 10 oz / acre	Flea beetles Aphids
<i>Capture LFR</i> <i>Brigade 2 EC</i>	5.3 to 8.5 fl oz 4 to 6.4 fl oz	Cutworms, wireworms
Platinum 2 SC	0.8 to 1.3 fl oz / 1,000 plants 1.3 fl oz / 1,000 plants	Aphids, flea beetles, Japanese beetles, wireworms

Give proper attention to mixing for application equipment that has minimal agitation. Keep the suspension agitated or mix regularly to avoid settling in the transplant tank. Adverse growing conditions may cause a delay in the uptake of Admire into the plants and a delay in control. Premix **Orthene 97** in water to form a slurry before putting it into the transplant water tank. If premixing is not done, allow time for the product to dissolve. Use of more than the label rate may result in some plant damage.

Foliar Treatments for Tobacco Fields

The treatment guidelines listed on the next page allow proper timing of insecticide applications. Weekly field scouting is necessary to collect the information needed to use them. Check at least 100 plants per field - 10 groups of ten or 5 groups of twenty up to 5 acres. Add two locations for each additional 5 acres of field size. Pick your locations randomly. Examine the plants carefully for damage or live insects. Record your counts, calculate the average, and compare them to the table values. Keep these counts so that you can look for trends in insect numbers during the season.

Insect	Treatment Guidelines
1-4 weeks after transplant	
Cutworms	Five or more freshly cut plants per 100 plants checked.
Flea Beetles	Three or more beetles per plant on new transplants, 10 or more beetles on 2-4 week old plants, 60 or more beetles on plants more than four weeks old.
4 weeks after transplant until topping	
Aphids	Colonies of 50 or more aphids on at least one upper leaf of 10% of the plants from three weeks after transplant until topping.
Budworms	Five or more budworms per 50 plants from three weeks after transplant until one week before topping.
Hornworms	Five or more hornworms (1" or longer) per 50 plants from three weeks after transplant until harvest. Do not count hornworms with white cocoons on their backs.
Topping until harvest	
Hornworms	Five or more hornworms (1" or longer) per 50 plants. Do not count hornworms with white cocoons on their backs.

Tobacco aphid infestations generally begin when winged adults fly into fields and deposit live young on plants. This happens about 4 to 6 weeks after transplant. Offspring of these "colonizers" mature in 7 to 10 days and begin to produce 60 to 70 live young each. Aphid numbers can double about every 2 to 3 days. Fields that do not receive a preventive treatment at transplant should be checked weekly by examining the bud area of 10 consecutive plants in at least 5 locations for colonies (clusters) of aphids on the undersides of leaves, especially in shaded areas of the field. *An insecticide application is recommended if aphid colonies are found on 10% or more of the plants that are examined.*

Thorough coverage with sprays directed to the underside of leaves at the top of the plant is essential to obtain satisfactory aphid control. Aphid infestations tend to be higher in later-set fields, where more than minimum recommended rates of nitrogen are used, and when topping is delayed.

Tobacco Aphid Insecticides	Rate/Acre	Harvest Interval (days)
Orthene 97	3/4 lb	3
Actara 25% WDG	2 to 3 oz	14
Assail 30 G Assail 70 WP	1.5 to 4.0 oz 0.6 to 1.7 oz	7
Capture LFR Brigade 2 EC	3.4 to 8.5 fl oz 2.56 to 6.4 fl oz	Do not apply later than layby
Fulfill 50 WDG	2.75 oz	14
Lannate 90 SP	½ lb	14
Provado 1.6 F	2 to 4 fl oz	14

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Budworm and Hornworm Control

Budworms feed in the buds causing rounded holes in developing leaves. Infestations tend to be greatest in the earliest-set fields in an area. Moths lay single eggs so infestations are scattered randomly over a field. Examine the bud area carefully for the black ground pepper-like droppings, small holes, or the caterpillars. Damage will increase as the caterpillars feed and grow. If the bud is destroyed, the plant will be forced to develop new terminal growth. Direct leaf damage and stunting can reduce yields significantly. Examine the buds for feeding damage and the small

green to black worms. *Treat if there are 5 or more live budworms (less than 1-1/4 inches long) per 50 plants, and topping is at least one week away.*

Tobacco plants can compensate for budworm damage so follow treatment guidelines to avoid unnecessary treatments. Do not count the plant as infested if you cannot find a budworm. Sprays are most effective if applied when larvae are small and feeding actively. Use 25 to 50 gallons of water per acre and spray in the morning or early evening when the bud area is open and the budworms are most exposed to sprays. Use the highest labeled rates for heavy populations.

Budworm and Hornworm Insecticides	Rate/Acre	Harvest Interval (Days)
Orthene 97	½ lb HW ¾ lb BW	3
Agree WG (Bt aizawai)	1 to 2 lbs	0
Biobit HP or F (Bt kurstaki)	Z	0
Brigade EC Capture LFR	2.56 to 6.4 fl oz 3.4 to 8.5 fl oz	Do not apply later than layby
Denim 0.16 EC	8 to 12 fl oz	14
Dipel 10 G	5 to 10 lbs	0
Dipel DF Dipel ES	1/2 to 1 lb 1 to 2 pts (BW) ½ to 1 pt (HW)	0
Javelin WG	1/8 to 1-1/4 lb	Hornworm only 0
Lannate SP	½ lb	14
Lepinox WDG	1 to 2 lbs	0
Sevin 80S	1-1/4 lbs	Hornworms only 0
Tracer 4SC*	1.4 to 2.9 fl oz*	3
Warrior 1 CS	1.9 to 3.8 fl oz	40
XenTari DF	½ to 2 lb	0

Hornworms eat large amounts of tobacco foliage. The first brood appears in June and is active throughout the remainder of the growing season. A second, usually much larger brood is active from late July through late August. Weekly field checks will allow detection of infestations that would benefit from treatment. Examine the upper third of the plant for holes or hornworms hanging from the underside of leaves. Examine the entire plant for signs of damage and live worms. *Treat if there are 5 or more hornworms (1" or longer) per 50 plants, and topping is at least one week away.* Treatments applied before most worms exceed 1-1/2 inches in length will greatly reduce yield loss. Hornworms with white egg-like cocoons on their back are parasitized by a small wasp. These worms will not contribute to yield loss. By late August or early September as much as 90% of the hornworm population may be parasitized.

Hornworms pose the greatest threat at the end of the growing season. Those present on plants at harvest will continue to feed on wilting and curing tobacco. Check fields for hornworms about one week before harvest. Apply a short residue insecticide if necessary to prevent taking significant numbers to the barn. There are no treatments to

control hornworms effectively on housed tobacco.

Tobacco flea beetles are present in every field each season. Damage tends to be most severe in fields that are set first, especially following a mild winter when beetle survival is greatest. Flea beetles move frequently, chewing small round holes (shot holes) in the leaves. Extensive damage can occur when beetles feed in the bud of the plant. This injury can add to transplant stress and slow plant establishment. Flea beetles can be controlled with systemic insecticides applied in the transplant water or by a foliar spray if a preventive treatment was not used. *An average of 3 or more beetles per plant is enough to cause significant damage. Treat if there are 3 or more beetles per plant during the first 2 weeks after transplant. Established plants rarely need protection from this insect.*

Flea beetle Insecticides	Rate/Acre Small plants	Rate/Acre Large plants	Harvest Interval (days)
Orthene 97	½ lb	½ lb	3
Actara 25% WDG	2 to 3 oz	2 to 3 oz	14
<i>Brigade EC</i> <i>Capture LFR</i>	2.56 to 6.4 fl oz 3.4 to 8.5 fl oz	2.56 to 6.4 fl oz 3.4 to 8.5 fl oz	Do not apply later than layby
<i>Lannate 90 SP</i>	½ lb	½ lb	14
Provado 1.6 F	4 fl oz	4 fl oz	14
Sevin 80S	1-1/4 lbs	2-1/2 lbs	0
Carbaryl 4L	1 lb	2 lb	
<i>Warrior 1 CS</i>	1.92 to 3.84 fl oz	1.92 to 3.84 fl oz	40

Grasshoppers usually remain in hayfields and along waterways but under dry conditions they may move from these into tobacco. Treatment of field borders to prevent mass migration into the field should be considered. When selecting an insecticide for this use consider the possibility of residues and time from application to cutting or grazing of hay.

Grasshopper Insecticides	Rate/Acre	Harvest Interval (days)
Orthene 97	1/3 lb to 2/3 lb	3
<i>Capture LFR</i> <i>Brigade 2 EC</i>	3.4 to 8.5 fl oz 2.56 to 6.4 fl oz	Do not apply after layby
<i>Lannate 90 SP</i>	½ lb	14
<i>Warrior 1 CS</i>	1.92 to 3.84 fl oz	40

Occasional Pests

Armyworms may be present in no-till tobacco fields transplanted into burned-down grass or small grain cover crop. Brigade and Capture are labeled for control.

Cutworms may be present in tobacco fields because of early season weed growth. Often these insects are relatively large by the time tobacco is set in the field. Cutworms feed at the base of transplants and can cut them off at ground level. Moths are active in March and April, laying their eggs on low, spreading weeds. Damage potential is highest in late-set fields where there has been a flush of winter annual weeds. Cutworms will begin to feed on the weeds and switch to transplants when the weed growth is removed. A foliar spray should be applied if 5 or more cut plants are found per 100 plants checked. Brigade, Orthene 97, or Warrior 1 CS can be used as a broadcast spray.

Proxol 80S, applied in a 12” band over the row can be used as a rescue treatment. Rescue treatments are generally less effective when damage is confined to the underground portion of the plant.

Japanese beetles can feed on tobacco. The damage usually is confined to a small number of plants. Actara, Orthene, Provado, Sevin 80 S or Warrior may be used if Japanese beetles are causing significant damage.

Stink bugs can feed on tobacco and cause the wilting or collapse of individual leaves which can become scalded. Generally the symptoms do not show until a day or two after feeding. The damage usually appears worse than it actually is. Acephate, Brigade, Orthene, or Warrior are labeled for stink bug control. Treatment is not justified unless stink bugs are found in the field.

Thrips can feed on tobacco plants but usually are only a temporary problem. Several insecticides are labeled as foliar sprays for thrips control.

Information Summary Table for Tobacco Insecticides

This table is provided for a quick comparison of insecticides labeled on tobacco. Insecticides are listed alphabetically by pesticide common name (usually present in the active ingredients section of the product label). One or more brand names are included along with the Restricted Entry Interval (REI) and Mode of Action Group number. Brand names of Restricted Use pesticides appear in *bold italics*.

Use pesticide products only in accordance with their labels and with the Worker Protection Standard. Do not enter or allow worker entry into treated areas during the restricted entry interval. Check the label for Personal Protective Equipment required for early entry to treated areas that is permitted under the Worker Protection Standard and involves contact with anything that has been treated, such as plants, soil, or water.

Mode of Action Group A numerical classification system has been developed to make it easy to recognize the modes of action of insecticide products. Insecticides with the same mode of action belong to groups with unique numbers. Selection of a labeled product from a different number category (different mode of action) will help to slow down the development of resistance to either group. For example, alternate use of pyrethroid insecticides and pyrethrins sprays (Category 3) with labeled organophosphate insecticides (Category 1B). Always avoid tank mixing products with the same mode of action. These Mode of Action Group codes are on many pesticide labels and have been developed by the Insecticide Resistance Action Committee (IRAC).

Common name	Brand Name	Restricted Entry Interval (hours)	Mode of Action Group
acephate	Acephate, Bracket, Orthene	24	1B
acetamiprid	Assail 30 G, Assail 70 WP	12	4A
bifenthrin	<i>Brigade 2E Capture LFR</i>	12	3
Bt aizawai	Agree WG, Xentari DF	4	11B1
Bt kurstaki	Dipel DF, Javelin WG Lepinox WDG, etc.	4	11B2
Carbaryl	Sevin XLR Plus	12	1A
carbofuran	<i>Furadan 4F</i>	48	1A
chlorpyrifos	Lorsban 15 G, Govern, Nufos, Warhawk, Whirlwind, Yuma	24	1B
clothianidin	Belay 16 WSG	12	4A
<i>lambda</i> -cyhalothrin	<i>Warrior, Silencer, Taiga</i>	24	3
emamectin benzoate	<i>Denim EC</i>	48	6
ethoprop	<i>Mocap 15G</i>	48*	1B
imidacloprid	Admire 2F, Admire Pro, Alias, Couraze, Pasada 1.6F, Provado 1.6F	12*	4A
methomyl	<i>Lannate</i>	48	1A
pymetrozine	Fullfil	12	9B
spinosad	Tracer	4	5
thiamethoxam	Actara, Platinum	12	4A

* If the product is soil-injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

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