

INSECTICIDE RECOMMENDATIONS FOR TOBACCO BEDS AND FIELDS- 2007 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.

Insecticides for Float Plant Pests (Outdoor or Greenhouse)

Acephate or Orthene 75 SP (1 tablespoon) or 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.

Slugs

Deadline M-P slug bait (metaldehyde) can be used in greenhouses where tobacco transplants are grown to reduce slug infestations. Apply at the rate of 1 lb of pellets per 1,100 to 3,600 sq ft. This bait is most effective when slugs do not have access to water so it may be less effective in greenhouses.

Conventional Beds

Pre-seeding Treatments

Di-Syston 15%G can be applied at the rate of 1 oz per 100 sq ft of bed area (3/5 lb per 9' bed, 3/4 lb per 12' bed) for flea beetle control. Broadcast evenly and incorporate before seeding. *Di-Syston* is highly toxic.

Post-seeding Treatments (Rates for 100' of 9'-wide or 12'-wide beds)

Insecticide	Rate	Comments
Sprays Acephate 75 SP, Orthene 75 S Orthene 97	1 Tbs/ gal/ 1,000 sq ft of bed 3/4 Tbs per gal	Aphids, Cutworms, Flea beetles
Granules <i>Di-Syston 15G</i>	1 oz per 100 sq ft of bed area	Flea beetles

Wear protective clothing and gloves during mixing and application.

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.

Green June beetle grubs occasionally can cause a problem by uprooting plants in the bed. Use a soil drench of Sevin or Endosulfan to treat affected areas. See the product label for rates.

Pre-Transplant Soil Applications for Tobacco Fields

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.

Pre-plant Insecticides for Cutworms and Wireworms	Rate/Acre	Comment
Lorsban 15%G <i>Lorsban 4E</i>	13.5 to 20 lbs 2 to 3 qts	
<i>Mocap 10% G or Mocap 15%G Mocap 6 EC</i>	20 lbs 13 lbs See label 1-1/3 qts	Wireworms only for G Wireworms only for G From 2 weeks before transplant up to transplant
<i>Di-Syston 15% G</i>	27 lbs	Wireworms only

Pre-plant Insecticides for Aphids and Flea Beetles	Rate/Acre	Comment
<i>Di-Syston 15% G Di-Syston 8 E</i>	13.5 to 26.7 lbs 4 pts	
<i>Furadan 4F *</i>	1 gallon	Flea beetles only

Broadcast and incorporate spray or granules according to label instructions immediately before transplant.

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)**.

Transplant - Tray Drench Applications

Acephate 75 SP or Orthene 75 SP can be used at the rate of 1 lb per acre in the transplant water to provide 3 to 4 weeks of control of flea beetles, cutworms and thrips. **Orthene 97** is used at the rate of 3/4 lb per acre. Using more than the label rate may result in plant damage. **Orthene 97** has a 2ee label for a transplant water tank mix with **Admire**. See the label for more information.

Admire 2F, Belay, and Platinum are systemic insecticide 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.

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 2F	1 fl oz / 1,000 plants 1.4 to 2.8 fl oz / 1,000 plants	Aphids, flea beetles Wireworms (high rate)
Admire Pro 4F	0.5 fl oz/ 1,000 plants 0.6 to 1.2 fl oz	
Orthene 97 Acephate 75 SP, Orthene 75S	3/4 lb per acre 1 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

For application equipment which has minimal agitation, such as tobacco transplanters, give proper attention to mixing. Keep the water 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. Orthene 97 has a 2ee label for a transplant water tank mix with Admire. See the label for more information.

Insecticide Transplant Water	Rate	Comment
Admire 2F, Admire Pro (42.8%)	1.4 fl oz / 1,000 plants 1.4 to 2.8 fl oz / 1,000 plants 0.6 to 1.2 fl oz / 1,000 plants	Aphids, flea beetles Wireworms (high rate)
Orthene 97 Acephate 75 SP, Orthene 75S	3/4 lb per acre 1 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

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.

Treatment Guidelines for Key Tobacco Insect Pest

Insect	Treatment Guidelines
Aphids	Colonies of 50 or more aphids on at least 1 upper leaf of 20% of the plants from 3 weeks after transplant until topping.
Budworms	5 or more budworms per 50 plants from 3 weeks after transplant until 1 week before topping.
Cutworms	5 or more freshly cut plants per 100 plants checked
Flea Beetles	3+ beetles per plant on new transplants, 10 + beetles on 2 to 4 wk old plants, 60+ beetles on plants more than 4 weeks old.

Grasshoppers	Grasshoppers active along field margins or 10+ grasshoppers per 50 plants.
Hornworms	5 or more hornworms (1" or longer) per 50 plants from 3 weeks after transplant until harvest. Do not count hornworms with white cocoons on their backs.

Tobacco aphids may infest tobacco plant beds but populations are usually highest following the flight of winged aphids into fields in mid- to late June. Look on the undersides of mid and upper level leaves, especially in shaded areas of the field. Thorough spray coverage is essential to obtain satisfactory aphid control.

Tobacco Aphid Insecticides	Rate/Acre	Harvest Interval (days)
Acephate 75 SP, Orthene 75 SP Orthene 97	2/3 lb to 1 lb 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
Fulfill 50 WDG	2.75 oz	14
Endosulfan 3E	2/3 to 1-1/3 qt	5*
Lannate 90 SP	½ lb	14
Provado 1.6 F	2 to 4 fl oz	14

* Application of products containing endosulfan within 28 days of harvest can lead to increased residue on the on the crop. Do not spray in the heat of the day.

Budworm and Hornworm Control

Budworms feed in the buds of young tobacco plants causing rounded holes in developing leaves. Tobacco plants may be topped by these pests resulting in early sucker growth. Examine the buds for feeding damage and the small green to black worms. Treat if there are **5** or more live budworms per **50** plants. Do not count the plant as infested if you cannot find a budworm.

The potential for budworm problems is greatest on early-set tobacco. *Bacillus thuringiensis* baits have given excellent control of this insect in flue-cured areas but there are no efficient ways to apply baits to large acreages. Bt sprays are most effective if applied when larvae are small and feeding actively. Use high rates for heavy populations.

Hornworms eat large amounts of tobacco foliage. They first appear in June and are active throughout the remainder of the growing season. 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. 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.

Check fields for hornworms about one week before harvest. Apply a short residue insecticide if necessary to prevent taking significant numbers of this pest to the barn. There are no treatments to control hornworms effectively on housed tobacco.

Budworms (BW) and Hornworms (HW)

Budworm and Hornworm Insecticides	Rate/Acre	Harvest Interval (Days)
Acephate 75 SP, Orthene 75 SP Orthene 97	2/3 lb (HW) to 1 lb (BW) 2/3 lb (HW) to 1 lb (BW) ½ lb HW 3/4 lb BW	3
Agree WG (3.8% (Bt aizawai)	1 to 2 lbs	0
Biobit HP or F (6.4% (Bt kurstaki)	½ to 1 lb 1 to 4 pts	0
<i>Denim 0.16 EC</i>	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
Endosulfan 3E	2/3 to 1-1/3 qt	5*
Javelin WG	1/8 to 1-1/4 lb	Hornworm only 0
<i>Lannate SP</i>	½ lb	14
Lepinox WDG	1 to 2 lbs	0
Sevin 80S	1-1/4 lbs	0
Tracer 4SC*	1.4 to 2.9 fl oz*	3
<i>Warrior 1 CS</i>	1.9 to 3.8 fl oz	40
XenTari DF	½ to 2 lb	0

Flea beetles cause "shot hole" feeding damage to tobacco leaves. This injury can add to transplant stress and slow plant establishment. 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)
Acephate 75 SP, Orthene 75 SP Orthene 97	2/3 lb ½ lb	1 lb ½ lb	3
Actara 25% WDG	2 to 3 oz	2 to 3 oz	14
Endosulfan 3E	2/3 qt	1-1/3 qt	5*
<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	
Warrior 1 CS	1.92 to 3.84 fl oz	1.92 to 3.84 fl oz	40

* Application of products containing endosulfan within 28 days of harvest can lead to increased residue on the on the crop. Do not spray in the heat of the day.

Occasional Pests

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. Rescue treatments are generally less effective when damage is confined to the underground portion of the plant. Orthene 97 at 3/4 lb (Orthene 75S at 1 lb) or **Warrior 1 CS** at 1.92 to 3.84 fl oz per acre can be used as a broadcast spray. Proxol 80S, applied in a 12" band over the row can be used as a rescue treatment.

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 Small plants	Rate/Acre Large plants	Harvest Interval (days)
Acephate 75 SP, Orthene 75 SP	1/3 lb	2/3 lb	3
Orthene 97	1/4 to 1/2 lb	1/4 to 1/2 lb	
Endosulfan 3E	2/3 qt	1-1/3 qt	5*
Lannate 90 SP	1/2 lb	1/2 lb	14
Warrior 1 CS	1.92 to 3.84 fl oz	1.92 to 3.84 fl oz	40

Japanese beetles and **green June beetles** can be found on tobacco. Japanese beetles occasionally feed on the plants but green June beetles do not. The damage usually appears worse than it actually is. Sevin 80 S may be used for control at 1-1/4 to 2-1/2 lbs /a if Japanese beetles are causing significant damage. Actara 25% WDG, Orthene 97 and **Warrior 1 CS** are labeled for Japanese beetle control. Provado 1.6 F can be used at the rate of 4 fl oz per acre.

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 75 SP, Orthene 75S and Orthene 97, several products containing endosulfan (Phaser and Thiodan) and **Warrior 1 CS** are labeled for stink bug control. Treatment is not justified unless stink bugs are found in the field.

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
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
lambda-Cyhalothrin	<i>Warrior, Silencer, Taiga</i>	24	3
disulfoton	<i>Di-Syston 15 G</i>	48*	1B
emamectin benzoate	<i>Denim EC</i>	48	6
endosulfan	Endosulfan EC	24	2A
Ethoprop	<i>Mocap 15G</i>	48*	1B
Fipronil	<i>Regent 4SC</i>	02B	2B
imidacloprid	Admire 2F, Admire Pro, Alias, Couraze, Pasada 1.6F, Provado 1.6F	12*	4A
methyl bromide	<i>Bromo Gas</i>	See label	8A
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.

** Exceptions apply for corn, sunflowers, and sorghum. See label for details.

‡ For use in storage bins no reentry is allowed. See label for details.